COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

JOINT APPLICATION OF LOUISVILLE GAS AND ELECTRIC COMPANY AND KENTUCKY UTILITIES COMPANY FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY FOR THE CONSTRUCTION OF A COMBINED CYCLE COMBUSTION TURBINE AT THE GREEN RIVER GENERATING STATION AND A SOLAR PHOTOVOLTAIC FACILITY AT THE E.W. BROWN GENERATING STATION	**)))))))))**	**CASE NO. 2014-00002**

RESPONSE OF
LOUISVILLE GAS AND ELECTRIC COMPANY
AND KENTUCKY UTILITIES COMPANY
TO WALLACE MCMULLEN AND SIERRA CLUB'S
INITIAL DATA REQUESTS
DATED MARCH 13, 2014

FILED: MARCH 27, 2014

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **Gary H. Revlett**, being duly sworn, deposes and says that he is Director – Environmental Affairs for LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

Gary H. Revlett
Gary H. Revlett

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 27th day of March 2014.

Susan M. Watkins (SEAL)
Notary Public

My Commission Expires:

SUSAN M. WATKINS
Notary Public, State at Large, KY
My Commission Expires Mar. 19, 2017
Notary ID # 485723

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **David S. Sinclair**, being duly sworn, deposes and says that he is Vice President, Energy Supply and Analysis for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

David S. Sinclair

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 27th day of March 2014.

Susan M. Watkins (SEAL)
Notary Public

My Commission Expires:

SUSAN M. WATKINS
Notary Public, State at Large, KY
My Commission Expires Mar. 19, 2017
Notary ID # 485723

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **Edwin R. Staton**, being duly sworn, deposes and says that he is Vice President, State Regulation and Rates, for Louisville Gas and Electric Company and Kentucky Utilities Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

Edwin R. Staton

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 27th day of March 2014.

Susan M. Watkins (SEAL)
Notary Public

My Commission Expires:

SUSAN M. WATKINS
Notary Public, State at Large, KY
My Commission Expires Mar. 19, 2017
Notary ID # 485723

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **Paul W. Thompson**, being duly sworn, deposes and says that he is Chief Operating Officer for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

Paul W. Thompson

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 27th day of March 2014.

Susan M. Watkins (SEAL)
Notary Public

My Commission Expires:

SUSAN M. WATKINS
Notary Public, State at Large, KY
My Commission Expires Mar. 19, 2017
Notary ID # 485723

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **John N. Voyles, Jr.**, being duly sworn, deposes and says that he is the Vice President, Transmission and Generation Services for Louisville Gas and Electric Company and Kentucky Utilities Company and an employee of LG&E and KU Services Company, that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

John N. Voyles, Jr.

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 27th day of March 2014.

(SEAL)
Notary Public

My Commission Expires:

SUSAN M. WATKINS
Notary Public, State at Large, KY
My Commission Expires Mar. 19, 2017
Notary ID # 485723

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to Wallace McMullen and Sierra Club
First Set of Data Requests
Dated March 13, 2014

Case No. 2014-00002

Question No. 1

Witness: Edwin R. Staton

Q1.1. Please provide all LG&E/KU confidential responses to data requests from all parties in this proceeding.

A1.1. The requested documents will be provided after execution of a confidentiality agreement by the Companies and Sierra Club.

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to Wallace McMullen and Sierra Club
First Set of Data Requests
Dated March 13, 2014

Case No. 2014-00002

Question No. 2

Witness: Edwin R. Staton

Q1.2. Please provide all exhibits, testimony, and workpapers (machine readable, unprotected, with formulas in-tact) included in this filing in non-redacted, electronic versions.

A1.2. The requested documents will be provided after execution of a confidentiality agreement by the Companies and Sierra Club.

See the response to PSC 1-22.

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to Wallace McMullen and Sierra Club
First Set of Data Requests
Dated March 13, 2014

Case No. 2014-00002

Question No. 3

Witness: Edwin R. Staton

Q1.3. Please provide a non-redacted, full color or original digital copy of the two most recent Integrated Resource Plans developed and/or filed in Kentucky by LG&E/KU.

A1.3. The Companies' 2008 and 2011 Joint Integrated Resource Plans may be found on the PSC website in Case Nos. 2008-00148 and 2011-00140, respectively.

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to Wallace McMullen and Sierra Club
First Set of Data Requests
Dated March 13, 2014

Case No. 2014-00002

Question No. 4

Witnesses: John N. Voyles, Jr. / Edwin R. Staton

Q1.4. Please refer to page 3 of the Application, which describes the Companies' intention to retire units at the Green River, Tyrone, and Cane Run plants.

a. Please confirm which units are assumed to be retired in the Companies' analysis for this case, and please indicate the year in which each unit is assumed to be retired.

b. Please confirm that units at the Companies' Brown facility are not assumed to be retired in the Companies' analysis for this case.

c. Please provide a copy of any transmission adequacy or reliability studies performed by or for LG&E/KU over the past three years regarding the retirement of units, whether individually or in combination with other units, at these plants.

d. Please describe any and all steps the Companies have taken thus far to prepare for the retirement of these units.

e. Please describe the Companies' timeline of future actions necessary to retire these units.

f. Please provide copies of any notices to regulatory authorities of the upcoming retirement of these units.

A1.4.

a. See the response to PSC 1-29 and AG 1-190. For the analysis, Green River units 3 and 4 are assumed to be retired in April 2015. Cane Run units 4, 5, and 6 are assumed to be retired in May 2015. Tyrone unit 3 has already been retired.

b. The statement is correct.

c. See attached. The information requested is confidential and proprietary, and is being provided under seal pursuant to a joint petition for confidential treatment.

d. Tyrone has been retired. Once Green River 3 and 4 and Cane Run 4, 5, and 6 are retired the decommissioning process will begin. To date activities have been limited to planning for the decommissioning process.

e. The current decommission plans at Cane Run and Green River are similar. See the response to KPSC No. 1-29 (c) for the Green River plan. Both Green River and Cane Run will leave the existing plant structures in place, and will include a number of steps performed to ensure the plant is safe and environmentally secure. These actions will commence once the units are retired and will be completed within a year.

In addition, the coal combustion residual storage facilities at Cane Run will be closed by the Companies with state agency oversight.

f. The Companies did not provide "notice" to any regulatory authorities of the retirement of units at Green River, Tyrone and Cane Run. The fact of the retirements was set forth in pleadings, evidence and/or discovery in the following proceedings before the PSC: Case Nos. 2008-00148, 2011-00140, 2011-00161, 2011-00162, 2011-00375, 2012-00221, 2012-00222; Virginia State Corporation Commission Case No. PUE-2013-00013; and before FERC in Docket No. EC12-29-000. In accordance with generally accepted accounting requirements, industry practices or applicable regulatory requirements, LG&E and KU include discussions of (a) actual or anticipated material changes in plant and equipment and (b) major regulatory or environmental proceedings such as CPCN filings and EPA rule makings, including, in each case, capacity retirements and expansions associated therewith, in their annual or quarterly financial statements and other reports filed with the Securities and Exchange Commission (SEC) and the Federal Energy Regulatory Commission (FERC). Where applicable, information appears in (a) the Properties and Management's Discussion and Analysis sections of SEC Forms 10-K/10-Q, (b) the Notes to Financial Statements section of SEC Forms 10-K/10-Q and of FERC Forms 1/3-Q and (c) the text of SEC Form 8-K's. Since approximately August 2010, LG&E and KU financial statements have generally included references to the potential retirement actions relating to these three plants.

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to Wallace McMullen and Sierra Club
First Set of Data Requests
Dated March 13, 2014

Case No. 2014-00002

Question No. 5

Witness: David S. Sinclair

Q1.5. Please provide the following information for the years 2008-2014:

a. A list of all wind and solar energy projects built by LG&E/KU.

  i. For each such project, identify the size, capital cost, fixed and variable operating cost, levelized cost of energy, and tax revenue for each year of operation.

b. A list of all wind and solar energy power purchase agreements entered into by LG&E/KU.

  i. For each such project, identify the size, capital cost, fixed and variable operating cost, and the price at which LG&E/KU purchases power from the project for each year of the contract.

c. A list of all wind and solar energy projects or power purchase agreements that LG&E/KU considered but rejected participation in.

  i. For each such project, identify the size, capital cost, fixed and variable operating cost, and the LCOE or power purchase price for the project.
  ii. For each such project, explain why LG&E/KU decided not to participate in it.

A1.5.

a. The Companies have not built any wind or solar projects.

b. The Companies entered into two wind contracts with Invenergy that were filed with the Kentucky Public Service Commission in Case No. 2009-00353. Those contracts were terminated by the Companies and are not currently in effect.

c. i. The attached file lists the wind and solar energy projects or power purchase agreements that the Companies considered but ultimately rejected. These proposals were evaluated in the 2011 and 2013 resource assessments. The information requested is confidential and proprietary, and is being provided under seal pursuant to a joint petition for confidential treatment.

ii. See testimony and exhibits of Mr. Sinclair in this case and Case No. 2011-00375.

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to Wallace McMullen and Sierra Club
First Set of Data Requests
Dated March 13, 2014

Case No. 2014-00002

Question No. 6

Witness: David S. Sinclair

Q1.6. For the Companies' fleet, please provide the following historical annual data by unit, from 2004 to present:

a. Fixed O&M

b. Variable O&M (without fuel)

c. Fuel costs

d. Capital costs

e. Heat rate

f. Generation

g. Capacity rating

A1.6. See attached.

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2004

TYRONE - Steam

	YEAR TO DATE			
	UNIT 1	UNIT 2	UNIT 3	TOTAL
KWH Output				
Net KWH - Coal..	-	-	238,273,000	238,273,000
Net KWH - Oil..	(1,423,000)	(1,428,000)	-	(2,851,000)
Total KWH Output......................................	(1,423,000)	(1,428,000)	238,273,000	235,422,000
Production Costs ($)				
Fuel Costs				
Coal, Inc. Freight...	-	-	6,449,297.11	6,449,297.11
Coal, Inc. Frt, Hand'l, Etc (2)................................	149,948.97	163,580.60	7,253,419.19	7,566,948.76
Total Fuel (2)...	149,948.97	163,580.60	7,253,419.19	7,566,948.76
Other Operation Expenses	180,242.11	196,630.90	1,115,724.71	1,492,597.72
Maintenance	117,521.44	128,200.49	1,456,970.23	1,702,692.16
Rents	-	-	-	-
Total Production Expenses	447,712.52	488,411.99	9,826,114.13	10,762,238.64
Fuel Costs - Cents				
Coal, Incl. Freight (1)	-	-	2.707	2.707
Coal and Other (1) (2)...	-	-	3.044	3.176
Total all Fuel Costs (2)..	(10.538)	(11.455)	3.044	3.214
Other Operation Expenses...	(12.666)	(13.770)	0.468	0.634
Maintenance..	(8.259)	(8.978)	0.611	0.723
Rents..	-	-	-	-
Total Production Expenses......................................	(31.463)	(34.203)	4.124	4.571
Quantities of Fuel Burned:				
Coal - Tons..	-	-	128,893	128,893
Oil - Gal - Start-up/Stab...................................	-	-	387,689	387,689
Million BTU Burned:				
Coal...	-	-	3,134,701	3,134,701
Oil - Start-up/Stab..	-	-	54,276	54,276
Total MMBTU Burned	-	-	3,188,977	3,188,977
Average BTU per Net KWH Output..........................	-	-	13,384	13,546

(1) Based on KWH generated by coal or oil as applicable

(2) Also includes oil used for firing, disposal of ashes and fly ash (net).

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2004

GREEN RIVER - Steam	YEAR TO DATE				
	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
KWH Output					
Net KWH - Coal..	(885,000)	(844,000)	335,347,000	465,396,000	799,014,000
Total KWH Output......................................	(885,000)	(844,000)	335,347,000	465,396,000	799,014,000
Production Costs ($)					
Fuel Costs					
Coal, Inc. Freight...	-	-	5,790,573.32	7,316,639.20	13,107,212.52
Coal, Inc. Frt, Hand'l, Etc (1)................................	11,710.00	12,685.88	6,058,039.61	7,663,730.36	13,746,165.85
Total Fuel (1)...	11,710.00	12,685.88	6,058,039.61	7,663,730.36	13,746,165.85
Other Operation Expenses	30,492.55	33,033.58	1,624,904.55	1,951,327.02	3,639,757.70
Maintenance	49,800.05	40,408.68	1,434,627.79	1,958,647.81	3,483,484.33
Rents	-	-	-	-	-
Total Production Expenses	92,002.60	86,128.14	9,117,571.95	11,573,705.19	20,869,407.88
Fuel Costs - Cents					
Coal, Incl. Freight	-	-	1.727	1.572	1.640
Coal and Other (1)...	(1.323)	(1.503)	1.806	1.647	1.720
Total all Fuel Costs (1)..	(1.323)	(1.503)	1.806	1.647	1.720
Other Operation Expenses..	(3.445)	(3.914)	0.485	0.419	0.456
Maintenance..	(5.627)	(4.788)	0.428	0.421	0.436
Rents..	-	-	-	-	-
Total Production Expenses......................................	(10.396)	(10.205)	2.719	2.487	2.612
Quantities of Fuel Burned:					
Coal - Tons..	-	-	181,213	228,346	409,559
Oil - Gal - Start-up/Stab....................................	-	-	110,136	113,462	223,598
Million BTU Burned:					
Coal...	-	-	4,354,796	5,512,983	9,867,779
Oil - Start-up/Stab..	-	-	15,419	15,883	31,302
Total MMBTU Burned	-	-	4,370,215	5,528,866	9,899,081
Average BTU per Net KWH Output..........................	-	-	13,032	11,880	12,389

(1) Also includes oil used for firing, disposal of ashes and fly ash (net).

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2004

EW Brown - Steam	YEAR TO DATE			
	UNIT 1	UNIT 2	UNIT 3	TOTAL
KWH Output				
Net KWH - Coal...	568,432,000	971,532,000	2,246,620,000	3,786,584,000
Total KWH Output.......................................	568,432,000	971,532,000	2,246,620,000	3,786,584,000
Production Costs ($)				
Fuel Costs				
Coal, Inc. Freight..	9,731,465.17	15,421,959.13	37,341,635.42	62,495,059.72
Coal, Inc. Frt, Hand'l, Etc (1).................................	10,063,960.14	15,810,614.28	38,226,569.00	64,101,143.42
Total Fuel (1)...	10,063,960.14	15,810,614.28	38,226,569.00	64,101,143.42
Other Operation Expenses	1,015,862.33	1,626,427.24	4,398,574.26	7,040,863.83
Maintenance	1,896,504.42	2,405,632.95	5,166,128.12	9,468,265.49
Rents	-	-	-	-
Total Production Expenses	12,976,326.89	19,842,674.47	47,791,271.38	80,610,272.74
Fuel Costs - Cents				
Coal, Incl. Freight	1.712	1.587	1.662	1.650
Coal and Other (1)	1.770	1.627	1.702	1.693
Total all Fuel Costs (1)...	1.770	1.627	1.702	1.693
Other Operation Expenses...	0.179	0.167	0.196	0.186
Maintenance...	0.334	0.248	0.230	0.250
Rents...	-	-	-	-
Total Production Expenses.......................................	2.283	2.042	2.127	2.129
Quantities of Fuel Burned:				
Coal - Tons...	249,996	397,291	945,909	1,593,196
Oil - Gal - Start-up/Stab....................................	139,768	86,739	125,399	351,906
Million BTU Burned:				
Coal...	6,252,725	9,954,342	23,649,354	39,856,421
Oil - Start-up/Stab...	19,569	12,143	17,556	49,268
Total MMBTU Burned	6,272,294	9,966,485	23,666,910	39,905,689
Average BTU per Net KWH Output...........................	11,034	10,259	10,534	10,539

(1) Also includes oil used for firing, disposal of ashes and fly ash (net).

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2004

GHENT - Steam

	YEAR TO DATE				
	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
KWH Output					
Net KWH - Coal	3,304,417,000	2,843,658,000	2,829,972,000	3,088,747,000	12,066,794,000
Total KWH Output	3,304,417,000	2,843,658,000	2,829,972,000	3,088,747,000	12,066,794,000
Production Costs ($)					
Fuel Costs					
Coal, Inc. Freight	39,505,172.57	47,558,603.77	50,824,901.88	55,509,423.52	193,398,101.74
Coal, Inc. Frt, Hand'l, Etc (1)	40,114,001.80	48,161,777.53	51,729,322.64	56,924,053.93	196,929,155.90
Total Fuel (1)	40,114,001.80	48,161,777.53	51,729,322.64	56,924,053.93	196,929,155.90
Other Operation Expenses	3,383,782.20	2,805,886.85	2,952,198.84	3,809,929.84	12,951,797.73
Maintenance	6,641,811.94	4,775,435.59	4,260,277.23	3,881,879.86	19,559,404.62
Rents	-	-	-	-	-
Total Production Expenses	50,139,595.94	55,743,099.97	58,941,798.71	64,615,863.63	229,440,358.25
Fuel Costs - Cents					
Coal, Incl. Freight	1.196	1.672	1.796	1.797	1.603
Coal and Other (1)	1.214	1.694	1.828	1.843	1.632
Total all Fuel Costs (1)	1.214	1.694	1.828	1.843	1.632
Other Operation Expenses	0.102	0.099	0.104	0.123	0.107
Maintenance	0.201	0.168	0.151	0.126	0.162
Rents	-	-	-	-	-
Total Production Expenses	1.517	1.960	2.083	2.092	1.901
Quantities of Fuel Burned:					
Coal - Tons	1,419,580	1,212,203	1,291,811	1,427,666	5,351,260
Oil - Gal - Start-up/Stab	233,733	197,012	443,994	368,197	1,242,936
Million BTU Burned:					
Coal	34,229,899	28,468,511	30,398,013	33,540,020	126,636,443
Oil - Start-up/Stab	32,722	27,581	62,158	51,548	174,009
Total MMBTU Burned	34,262,621	28,496,092	30,460,171	33,591,568	126,810,452
Average BTU per Net KWH Output	10,369	10,021	10,763	10,875	10,509

(1) Also includes oil used for firing, disposal of ashes and fly ash (net).

LOUISVILLE GAS AND ELECTRIC COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2004

	YEAR TO DATE					
Cane Run - Steam	UNITS 1 & 2	UNIT 3	UNIT 4	UNIT 5	UNIT 6	TOTAL
KWH Output						
Net KWH - Coal...	-	-	813,652,000	897,296,000	1,514,046,000	3,224,994,000
Production Costs ($)						
Fuel Costs						
Coal, Inc. Freight..	-	-	10,143,032.37	11,031,856.68	17,775,532.90	38,950,421.95
Coal, Inc. Frt, Hand'l, Etc (2)................................	-	-	10,973,941.06	11,844,203.91	18,533,272.82	41,351,417.79
Total Fuel (2)...	-	-	10,973,941.06	11,844,203.91	18,533,272.82	41,351,417.79
Other Operation Expenses	-	534,799.06	4,547,214.30	5,134,955.55	8,565,850.93	18,782,819.84
Maintenance	39,012.70	281,244.47	5,186,613.42	3,482,681.28	3,430,607.92	12,420,159.79
Rents	-	4,356.42	12,813.00	14,094.30	19,988.28	51,252.00
Total Production Expenses	39,012.70	820,399.95	20,720,581.78	20,475,935.04	30,549,719.95	72,605,649.42
Fuel Costs - Cents						
Coal, Incl. Freight (1)	-	-	1.247	1.229	1.174	1.208
Coal and Other (1) (2)...	-	-	1.349	1.320	1.224	1.282
Total all Fuel Costs (2)..	-	-	1.349	1.320	1.224	1.282
Other Operation Expenses...	-	-	0.559	0.572	0.566	0.582
Maintenance...	-	-	0.637	0.388	0.227	0.385
Rents..	-	-	0.002	0.002	0.001	0.002
Total Production Expenses......................................	-	-	2.547	2.282	2.018	2.251
Quantities of Fuel Burned:						
Coal - Tons...	-	-	394,872.00	427,060.00	689,319.00	1,511,251.00
Gas - MCF - Start-up/Stab....................................	-	-	71,344	63,329	38,119	172,792
Oil - Gallons..	-	-	-	-	-	-
Million BTU Burned:						
Coal...	-	-	8,951,653	9,673,230	15,629,779	34,254,662
Gas - Start-up/Stab...	-	-	73,130	64,913	39,071	177,114
Oil..	-	-	-	-	-	-
Total MMBTU Burned	-	-	9,024,783	9,738,143	15,668,850	34,431,776
Average BTU per Net KWH Output (Heat Rate)	-	-	11,092	10,853	10,349	10,677

(1) Based on KWH generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net).

LOUISVILLE GAS AND ELECTRIC COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2004

	YEAR TO DATE				
Mill Creek - Steam	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
KWH Output					
Net KWH - Coal...	1,847,144,000	2,019,094,000	2,297,199,000	3,423,665,000	9,587,102,000
Production Costs ($)					
Fuel Costs					
Coal, Inc. Freight..	21,996,456.95	24,454,644.77	27,547,124.16	40,970,848.06	114,969,073.94
Coal, Inc. Frt, Hand'l, Etc (2).................................	23,310,602.68	25,484,924.13	30,128,106.17	43,985,270.59	122,908,903.57
Total Fuel (2)..	23,310,602.68	25,484,924.13	30,128,106.17	43,985,270.59	122,908,903.57
Other Operation Expenses	5,014,410.41	4,717,370.91	3,913,278.13	6,216,722.93	19,861,782.38
Maintenance	5,209,966.04	2,767,568.28	7,532,757.56	4,524,471.24	20,034,763.12
Rents	-	-	-	-	-
Total Production Expenses	33,534,979.13	32,969,863.32	41,574,141.86	54,726,464.76	162,805,449.07
Fuel Costs - Cents					
Coal, Incl. Freight (1)	1.191	1.211	1.199	1.197	1.199
Coal and Other (1) (2)..	1.262	1.262	1.312	1.285	1.282
Total all Fuel Costs (2)...	1.262	1.262	1.312	1.285	1.282
Other Operation Expenses..	0.271	0.234	0.170	0.182	0.207
Maintenance...	0.282	0.137	0.328	0.132	0.209
Rents..	-	-	-	-	-
Total Production Expenses.......................................	1.816	1.633	1.810	1.598	1.698
Quantities of Fuel Burned:					
Coal - Tons...	856,405	948,017	1,062,543	1,588,452	4,455,417
Gas - MCF - Start-up/Stab....................................	49,271	13,570	174,809	211,177	448,827
Oil - Gallons..	-	-	-	-	-
Million BTU Burned:					
Coal..	19,290,578	21,360,521	23,974,931	35,809,104	100,435,134
Gas - Start-up/Stab...	50,501	13,909	179,181	216,457	460,048
Oil..	-	-	-	-	-
Total MMBTU Burned	19,341,079	21,374,430	24,154,112	36,025,561	100,895,182
Average BTU per Net KWH Output (Heat Rate)	10,471	10,586	10,515	10,523	10,524

(1) Based on KWH generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net).

LOUISVILLE GAS AND ELECTRIC COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2004

	CURRENT MONTH		YEAR TO DATE		YEAR ENDED CURRENT MONTH	
Trimble County - Steam (3)	THIS YEAR	LAST YEAR	THIS YEAR	LAST YEAR	THIS YEAR	LAST YEAR
Net KWH - LGE..	233,677,000	238,536,000	3,114,522,000	2,771,658,000	3,114,522,000	2,771,658,000
IMEA...	38,464,000	39,896,000	532,440,000	462,742,000	532,440,000	462,742,000
IMPA...	43,060,000	42,433,000	568,134,000	490,395,000	568,134,000	490,395,000
Total KWH Output.....................................	315,201,000	320,865,000	4,215,096,000	3,724,795,000	4,215,096,000	3,724,795,000
Fuel Costs $:						
Coal, Inc. Freight..	4,082,145.60	3,413,263.87	48,705,512.27	41,497,886.41	48,705,512.27	41,497,886.41
Coal, Inc. Frt, Hand'l, Etc (2).............................	4,202,011.85	3,578,571.18	49,710,027.01	42,555,676.99	49,710,027.01	42,555,676.99
Total Fuel (2)..	4,202,011.85	3,578,571.18	49,710,027.01	42,555,676.99	49,710,027.01	42,555,676.99
Other Operation Expenses $............................	603,713.96	569,266.09	6,503,737.85	6,323,697.68	6,503,737.85	6,323,697.68
Maintenance $..	1,118,842.32	543,622.82	6,528,286.12	6,194,621.29	6,528,286.12	6,194,621.29
Rents $...	-	-	-	-	-	-
Total Production Expenses $................................	5,924,568.13	4,691,460.09	62,742,050.98	55,073,995.96	62,742,050.98	55,073,995.96
Cost per Net KWH Output-Cents:						
Coal Inc. Freight (1)................................	1.295	1.064	1.156	1.114	1.156	1.114
Coal Inc. Frt, Hand'l, Etc (1) (2)..........................	1.333	1.115	1.179	1.142	1.179	1.142
Total all Fuel Costs (2)....................................	1.333	1.115	1.179	1.142	1.179	1.142
Other Operation Expenses...................................	0.192	0.177	0.154	0.170	0.154	0.170
Maintenance..	0.355	0.169	0.155	0.166	0.155	0.166
Rents..	-	-	-	-	-	-
Total Production Expenses.................................	1.880	1.462	1.489	1.479	1.489	1.479
Quantities of Fuel Burned:						
Coal - Tons..	138,268.00	143,024.00	1,846,564.00	1,646,519.00	1,846,564.00	1,646,519.00
Oil - Gallons..	33,747	54,512	105,914	255,020	105,914	255,020
Million BTU Burned:						
Coal..	3,247,086	3,200,591	43,006,316	37,510,031	43,006,316	37,510,031
Oil...	4,724	7,631	14,826	35,703	14,826	35,703
Total..	3,251,810	3,208,222	43,021,142	37,545,734	43,021,142	37,545,734
Average BTU Per Net KWH Output.......................	10,317	9,999	10,206	10,080	10,206	10,080
Average BTU Per pound of Coal........................	11,742	11,189	11,645	11,391	11,645	11,391
Per Cu. Ft. of Gas.................................	-	-	-	-	-	-
Per Gallon of Oil...................................	139,983	139,988	139,981	140,001	139,981	140,001
Cost Coal & Freight per MBTU (Cents).................	125.717	106.645	113.252	110.631	113.252	110.631
Total All Fuel Cost per MBTU (2).....................	129.221	111.544	115.548	113.344	115.548	113.344
Cost of Coal & Freight Per Ton ($)...................	29.523	23.865	26.376	25.203	26.376	25.203

(1) Based on KWH generated by coal or gas as applicable.

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net).

(3) Information on this report represents 100% generation, quantities used, and costs.

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2005

TYRONE - Steam	YEAR TO DATE			
	UNIT 1	UNIT 2	UNIT 3	TOTAL
KWH Output				
Net KWH - Coal...	-	-	355,762,000	355,762,000
Net KWH - Oil..	(1,404,000)	(1,408,000)	-	(2,812,000)
Total KWH Output.......................................	(1,404,000)	(1,408,000)	355,762,000	352,950,000
Production Costs ($)				
Fuel Costs				
Coal, Inc. Freight..	-	-	10,932,472.90	10,932,472.90
Coal, Inc. Frt, Hand'l, Etc (2)................................	45,725.29	49,881.96	11,353,278.53	11,448,885.78
Total Fuel (2)...	45,725.29	49,881.96	11,353,278.53	11,448,885.78
Other Operation Expenses	195,377.43	213,138.72	1,310,125.73	1,718,641.88
Maintenance	111,132.75	122,433.26	1,484,056.46	1,717,622.47
Rents	-	-	-	-
Total Production Expenses	352,235.47	385,453.94	14,147,460.72	14,885,150.13
Fuel Costs - Cents				
Coal, Incl. Freight (1)	-	-	3.073	3.073
Coal and Other (1) (2)..	-	-	3.191	3.218
Total all Fuel Costs (2)...	(3.257)	(3.543)	3.191	3.244
Other Operation Expenses...	(13.916)	(15.138)	0.368	0.487
Maintenance...	(7.915)	(8.696)	0.417	0.487
Rents..	-	-	-	-
Total Production Expenses.......................................	(25.088)	(27.376)	3.977	4.217
Quantities of Fuel Burned:				
Coal - Tons...	-	-	183,916.00	183,916.00
Oil - Gal - Start-up/Stab....................................	-	-	153,163	153,163
Million BTU Burned:				
Coal...	-	-	4,585,419.48	4,585,419.48
Oil - Start-up/Stab..	-	-	21,442.00	21,442.00
Total MMBTU Burned	-	-	4,606,861.48	4,606,861.48
Average BTU per Net KWH Output...........................	-	-	12,949	13,052

(1) Based on KWH generated by coal or oil as applicable
(2) Also includes oil used for firing, disposal of ashes and fly ash (net).

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
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GREEN RIVER - Steam	YEAR TO DATE				
	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
KWH Output					
Net KWH - Coal...	-	-	336,573,000	338,730,000	675,303,000
Total KWH Output......................................	-	-	336,573,000	338,730,000	675,303,000
Production Costs ($)					
Fuel Costs					
Coal, Inc. Freight..	-	-	6,376,990.80	5,773,633.78	12,150,624.58
Coal, Inc. Frt, Hand'l, Etc (1).................................	-	-	6,767,148.87	6,306,741.65	13,073,890.52
Total Fuel (1)...	-	-	6,767,148.87	6,306,741.65	13,073,890.52
Other Operation Expenses	-	-	1,961,873.83	1,511,047.98	3,472,921.81
Maintenance	2,635.01	2,548.17	1,325,526.72	3,393,996.88	4,724,706.78
Rents	-	-	-	-	-
Total Production Expenses	2,635.01	2,548.17	10,054,549.42	11,211,786.51	21,271,519.11
Fuel Costs - Cents					
Coal, Incl. Freight	-	-	1.895	1.704	1.799
Coal and Other (1)..	-	-	2.011	1.862	1.936
Total all Fuel Costs (1)...	-	-	2.011	1.862	1.936
Other Operation Expenses..	-	-	0.583	0.446	0.514
Maintenance..	-	-	0.394	1.002	0.700
Rents...	-	-	-	-	-
Total Production Expenses.......................................	-	-	2.987	3.310	3.150
Quantities of Fuel Burned:					
Coal - Tons..	-	-	176,672.00	160,089.00	336,761.00
Oil - Gal - Start-up/Stab....................................	-	-	96,837	112,313	209,150
Million BTU Burned:					
Coal...	-	-	4,322,681.98	3,893,586.48	8,216,268.46
Oil - Start-up/Stab...	-	-	13,557.00	15,724.00	29,281.00
Total MMBTU Burned	-	-	4,336,238.98	3,909,310.48	8,245,549.46
Average BTU per Net KWH Output..........................	-	-	12,884	11,541	12,210

(1) Also includes oil used for firing, disposal of ashes and fly ash (net).

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
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EW Brown - Steam	YEAR TO DATE			
	UNIT 1	UNIT 2	UNIT 3	TOTAL
KWH Output				
Net KWH - Coal..	563,532,000	1,075,007,000	1,584,997,000	3,223,536,000
Total KWH Output......................................	563,532,000	1,075,007,000	1,584,997,000	3,223,536,000
Production Costs ($)				
Fuel Costs				
Coal, Inc. Freight...	11,671,502.96	20,222,044.67	30,971,527.19	62,865,074.82
Coal, Inc. Frt, Hand'l, Etc (1)................................	12,074,686.50	20,607,669.78	32,053,776.73	64,736,133.01
Total Fuel (1)..	12,074,686.50	20,607,669.78	32,053,776.73	64,736,133.01
Other Operation Expenses	593,552.07	946,240.08	4,981,496.98	6,521,289.13
Maintenance	1,461,003.44	2,077,471.02	9,131,533.90	12,670,008.36
Rents	-	-	-	-
Total Production Expenses	14,129,242.01	23,631,380.88	46,166,807.61	83,927,430.50
Fuel Costs - Cents				
Coal, Incl. Freight	2.071	1.881	1.954	1.950
Coal and Other (1)	2.143	1.917	2.022	2.008
Total all Fuel Costs (1)..	2.143	1.917	2.022	2.008
Other Operation Expenses...	0.105	0.088	0.314	0.202
Maintenance..	0.259	0.193	0.576	0.393
Rents..	-	-	-	-
Total Production Expenses......................................	2.507	2.198	2.913	2.604
Quantities of Fuel Burned:				
Coal - Tons..	250,826.00	434,723.00	667,213.00	1,352,762.00
Oil - Gal - Start-up/Stab....................................	139,258	45,186	180,773	365,217
Million BTU Burned:				
Coal..	6,251,337.55	10,832,617.97	16,615,108.94	33,699,064.46
Oil - Start-up/Stab..	19,497.00	6,326.00	25,307.00	51,130.00
Total MMBTU Burned	6,270,834.55	10,838,943.97	16,640,415.94	33,750,194.46
Average BTU per Net KWH Output..........................	11,128	10,083	10,499	10,470

(1) Also includes oil used for firing, disposal of ashes and fly ash (net).

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2005

GHENT - Steam

	YEAR TO DATE				
	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
KWH Output					
Net KWH - Coal...	3,488,619,000	2,762,178,000	3,086,506,000	3,249,370,000	12,586,673,000
Total KWH Output.......................................	3,488,619,000	2,762,178,000	3,086,506,000	3,249,370,000	12,586,673,000
Production Costs ($)					
Fuel Costs					
Coal, Inc. Freight..	49,428,890.87	51,888,110.19	66,930,111.49	62,212,204.88	230,459,317.43
Coal, Inc. Frt, Hand'l, Etc (1).................................	49,983,929.71	52,666,338.54	67,989,543.98	63,951,030.45	234,590,842.68
Total Fuel (1)..	49,983,929.71	52,666,338.54	67,989,543.98	63,951,030.45	234,590,842.68
Other Operation Expenses	3,318,668.21	2,531,401.79	2,776,142.44	3,949,286.14	12,575,498.58
Maintenance	6,663,927.24	7,105,463.15	3,495,988.81	3,774,041.46	21,039,420.66
Rents	-	-	-	-	-
Total Production Expenses	59,966,525.16	62,303,203.48	74,261,675.23	71,674,358.05	268,205,761.92
Fuel Costs - Cents					
Coal, Incl. Freight	1.417	1.879	2.168	1.915	1.831
Coal and Other (1)..	1.433	1.907	2.203	1.968	1.864
Total all Fuel Costs (1)...	1.433	1.907	2.203	1.968	1.864
Other Operation Expenses..	0.095	0.092	0.090	0.122	0.100
Maintenance...	0.191	0.257	0.113	0.116	0.167
Rents..	-	-	-	-	-
Total Production Expenses......................................	1.719	2.256	2.406	2.206	2.131
Quantities of Fuel Burned:					
Coal - Tons...	1,494,626.00	1,166,409.00	1,515,661.00	1,406,119.00	5,582,815.00
Oil - Gal - Start-up/Stab....................................	108,292	239,124	416,881	392,047	1,156,344
Million BTU Burned:					
Coal..	35,750,245.77	27,149,962.92	35,254,320.16	32,697,874.24	130,852,403.11
Oil - Start-up/Stab..	15,161.00	33,475.00	58,365.00	54,888.00	161,889.00
Total MMBTU Burned	35,765,407.77	27,183,437.92	35,312,685.16	32,752,762.26	131,014,292.11
Average BTU per Net KWH Output...........................	10,252	9,841	11,441	10,080	10,409

(1) Also includes oil used for firing, disposal of ashes and fly ash (net).

LOUISVILLE GAS AND ELECTRIC COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2005

	YEAR TO DATE					
Cane Run - Steam	UNITS 1 & 2	UNIT 3	UNIT 4	UNIT 5	UNIT 6	TOTAL
KWH Output						
Net KWH - Coal..	-	-	1,052,063,000	1,091,048,000	1,542,731,000	3,685,842,000
Production Costs ($)						
Fuel Costs						
Coal, Inc. Freight...	-	-	14,337,827.16	14,378,189.62	19,794,690.50	48,510,707.28
Coal, Inc. Frt, Hand'l, Etc (2)................................	-	-	15,190,036.69	15,476,021.94	21,007,862.67	51,673,921.30
Total Fuel (2)..	-	-	15,190,036.69	15,476,021.94	21,007,862.67	51,673,921.30
Other Operation Expenses	-	-	5,670,001.82	5,929,846.36	9,251,777.59	20,851,625.77
Maintenance	861.83	28,837.83	2,889,144.59	2,791,490.41	5,247,876.15	10,958,210.81
Rents	-	-	13,838.04	15,375.60	22,038.36	51,252.00
Total Production Expenses	861.83	28,837.83	23,763,021.14	24,212,734.31	35,529,554.77	83,535,009.88
Fuel Costs - Cents						
Coal, Incl. Freight (1)	-	-	1.363	1.318	1.283	1.316
Coal and Other (1) (2)...	-	-	1.444	1.418	1.362	1.402
Total all Fuel Costs (2)..	-	-	1.444	1.418	1.362	1.402
Other Operation Expenses...	-	-	0.539	0.544	0.600	0.566
Maintenance...	-	-	0.275	0.256	0.340	0.297
Rents..	-	-	0.001	0.001	0.001	0.001
Total Production Expenses......................................	-	-	2.259	2.219	2.303	2.266
Quantities of Fuel Burned:						
Coal - Tons...	-	-	506,195.10	505,524.65	695,762.95	1,707,482.70
Gas - MCF - Start-up/Stab....................................	-	-	50,573	78,973	75,952	205,498
Oil - Gallons...	-	-	-	-	-	-
Million BTU Burned:						
Coal..	-	-	11,402,407.53	11,382,279.89	15,678,004.21	38,462,691.63
Gas - Start-up/Stab..	-	-	51,837.00	80,946.00	77,852.00	210,635.00
Oil...	-	-	-	-	-	-
Total MMBTU Burned	-	-	11,454,244.53	11,463,225.89	15,755,856.21	38,673,326.63
Average BTU per Net KWH Output (Heat Rate)	-	-	10,887	10,507	10,213	10,492

(1) Based on KWH generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net).

LOUISVILLE GAS AND ELECTRIC COMPANY
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	YEAR TO DATE				
Mill Creek - Steam	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
KWH Output					
Net KWH - Coal...	2,223,638,000	1,828,966,000	2,969,840,000	3,092,783,000	10,115,227,000
Production Costs ($)					
Fuel Costs					
Coal, Inc. Freight..	29,866,953.99	25,735,947.75	39,584,702.17	41,953,817.20	137,141,421.11
Coal, Inc. Frt, Hand'l, Etc (2).................................	31,046,386.82	26,859,292.59	42,148,451.18	45,400,619.67	145,454,750.26
Total Fuel (2)..	31,046,386.82	26,859,292.59	42,148,451.18	45,400,619.67	145,454,750.26
Other Operation Expenses	5,382,780.60	4,758,851.13	4,550,634.15	6,213,763.13	20,906,029.01
Maintenance	2,975,210.06	5,673,185.15	3,856,700.24	5,659,689.17	18,164,784.62
Rents	-	-	-	-	-
Total Production Expenses	39,404,377.48	37,291,328.87	50,555,785.57	57,274,071.97	184,525,563.89
Fuel Costs - Cents					
Coal, Incl. Freight (1)	1.343	1.407	1.333	1.357	1.356
Coal and Other (1) (2)..	1.396	1.469	1.419	1.468	1.438
Total all Fuel Costs (2)...	1.396	1.469	1.419	1.468	1.438
Other Operation Expenses..	0.242	0.260	0.153	0.201	0.207
Maintenance...	0.134	0.310	0.130	0.183	0.180
Rents...	-	-	-	-	-
Total Production Expenses.......................................	1.772	2.039	1.702	1.852	1.824
Quantities of Fuel Burned:					
Coal - Tons...	1,010,247.05	870,685.05	1,340,470.90	1,416,215.70	4,637,618.70
Gas - MCF - Start-up/Stab....................................	25,830	22,264	139,593	203,209	390,896
Oil - Gallons..	-	-	-	-	-
Million BTU Burned:					
Coal..	23,037,474.62	19,850,321.47	30,567,047.41	32,275,974.87	105,730,818.37
Gas - Start-up/Stab...	26,477.00	22,822.00	143,084.00	208,287.00	400,670.00
Oil..	-	-	-	-	-
Total MMBTU Burned	23,063,951.62	19,873,143.47	30,710,131.47	32,484,261.87	106,131,488.37
Average BTU per Net KWH Output (Heat Rate)	10,372	10,866	10,341	10,503	10,492

(1) Based on KWH generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net).

LOUISVILLE GAS AND ELECTRIC COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
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	CURRENT MONTH		YEAR TO DATE		YEAR ENDED CURRENT MONTH	
Trimble County - Steam (3)	THIS YEAR	LAST YEAR	THIS YEAR	LAST YEAR	THIS YEAR	LAST YEAR
Net KWH - LGE	284,428,600	233,677,000	2,886,772,400	3,114,522,000	2,886,772,400	3,114,522,000
IMEA	46,160,000	38,464,000	475,819,700	532,440,000	475,819,700	532,440,000
IMPA	49,056,400	43,060,000	505,962,900	568,134,000	505,962,900	568,134,000
Total KWH Output	379,645,000	315,201,000	3,868,555,000	4,215,096,000	3,868,555,000	4,215,096,000
Fuel Costs $:						
Coal, Inc. Freight	5,229,091.70	4,082,145.60	53,150,454.22	48,705,512.27	53,150,454.22	48,705,512.27
Coal, Inc. Frt, Hand'l, Etc (2)	5,332,189.83	4,202,011.85	54,505,773.25	49,710,027.01	54,505,773.25	49,710,027.01
Total Fuel (2)	5,332,189.83	4,202,011.85	54,505,773.25	49,710,027.01	54,505,773.25	49,710,027.01
Other Operation Expenses $	712,381.78	603,713.96	7,071,964.72	6,503,737.85	7,071,964.72	6,503,737.85
Maintenance $	377,884.44	1,118,842.32	8,224,434.34	6,528,286.12	8,224,434.34	6,528,286.12
Rents $	-	-	-	-	-	-
Total Production Expenses $	6,422,456.05	5,924,568.13	69,802,172.31	62,742,050.98	69,802,172.31	62,742,050.98
Cost per Net KWH Output-Cents:						
Coal Inc. Freight (1)	1.377	1.295	1.374	1.156	1.374	1.156
Coal Inc. Frt, Hand'l, Etc (1) (2)	1.405	1.333	1.409	1.179	1.409	1.179
Total all Fuel Costs (2)	1.405	1.333	1.409	1.179	1.409	1.179
Other Operation Expenses	0.188	0.192	0.183	0.154	0.183	0.154
Maintenance	0.100	0.355	0.213	0.155	0.213	0.155
Rents	-	-	-	-	-	-
Total Production Expenses	1.692	1.880	1.804	1.489	1.804	1.489
Quantities of Fuel Burned:						
Coal - Tons	163,692.50	138,268.00	1,645,163.00	1,846,564.00	1,645,163.00	1,846,564.00
Oil - Gallons	6,063	33,747	318,606	105,914	318,606	105,914
Million BTU Burned:						
Coal	3,848,679.95	3,247,086.00	38,848,075.73	43,006,316.00	38,848,075.73	43,006,316.00
Oil	849.00	4,724.00	44,606.00	14,826.00	44,606.00	14,826.00
Total	3,849,528.95	3,251,810.00	38,892,681.73	43,021,142.00	38,892,681.73	43,021,142.00
Average BTU Per Net KWH Output	10,140	10,317	10,054	10,206	10,054	10,206
Average BTU Per pound of Coal	11,756	11,742	11,807	11,645	11,807	11,645
Per Cu. Ft. of Gas	-	-	-	-	-	-
Per Gallon of Oil	140,030	139,983	140,004	139,981	140,004	139,981
Cost Coal & Freight per MBTU (Cents)	135.867	125.717	136.816	113.252	136.816	113.252
Total All Fuel Cost per MBTU (2)	138.515	129.221	140.144	115.548	140.144	115.548
Cost of Coal & Freight Per Ton ($)	31.945	29.523	32.307	26.376	32.307	26.376

(1) Based on KWH generated by coal or gas as applicable.

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net).

(3) Information on this report represents 100% generation, quantities used, and costs.

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2006

TYRONE - Steam

	YEAR TO DATE			
	UNIT 1	UNIT 2	UNIT 3	TOTAL
KWH Output				
Net KWH - Coal...	-	-	253,848,000	253,848,000
Net KWH - Oil..	(1,203,000)	(1,208,000)	-	(2,411,000)
Total KWH Output.......................................	(1,203,000)	(1,208,000)	253,848,000	251,437,000
Production Costs ($)				
Fuel Costs				
Coal, Inc. Freight..	-	-	8,878,472.27	8,878,472.27
Coal, Inc. Frt, Hand'l, Etc (2)................................	51,633.14	56,327.00	9,417,107.82	9,525,067.96
Total Fuel (2)...	51,633.14	56,327.00	9,417,107.82	9,525,067.96
Other Operation Expenses	222,117.31	242,309.07	1,464,934.59	1,929,360.97
Maintenance	107,324.56	111,536.23	1,399,697.68	1,618,558.47
Rents	-	-	-	-
Total Production Expenses	381,075.01	410,172.30	12,281,740.09	13,072,987.40
Fuel Costs - Cents				
Coal, Incl. Freight (1)	-	-	3.498	3.498
Coal and Other (1) (2)..	-	-	3.710	3.752
Total All Fuel Costs (2)...	(4.292)	(4.663)	3.710	3.788
Other Operation Expenses...	(18.464)	(20.059)	0.577	0.767
Maintenance...	(8.921)	(9.233)	0.551	0.644
Rents...	-	-	-	-
Total Production Expenses.......................................	(31.677)	(33.955)	4.838	5.199
Quantities of Fuel Burned:				
Coal - Tons...	-	-	131,112.00	131,112.00
Oil - Gal - Start-up/Stab....................................	-	-	175,379	175,379
Million BTU Burned:				
Coal..	-	-	3,265,220.53	3,265,220.53
Oil - Start-up/Stab...	-	-	24,554.00	24,554.00
Total MMBTU Burned	-	-	3,289,774.53	3,289,774.53
Average BTU per Net KWH Output...........................	-	-	12,960	13,084

(1) Based on KWH generated by coal or oil as applicable
(2) Also includes oil used for firing, disposal of ashes and fly ash (net).

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2006

GREEN RIVER - Steam

	YEAR TO DATE				
	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
KWH Output					
Net KWH - Coal..	-	-	206,046,000	433,665,000	639,711,000
Total KWH Output......................................	-	-	206,046,000	433,665,000	639,711,000
Production Costs ($)					
Fuel Costs					
Coal, Inc. Freight...	-	-	4,770,843.47	8,811,954.99	13,582,798.46
Coal, Inc. Frt, Hand'l, Etc (1)................................	-	-	5,158,433.52	9,398,666.78	14,557,100.30
Total Fuel (1)...	-	-	5,158,433.52	9,398,666.78	14,557,100.30
Other Operation Expenses	-	-	1,311,462.16	2,579,803.84	3,891,266.00
Maintenance	-	-	1,621,485.26	2,129,437.02	3,750,922.28
Rents	-	-	-	-	-
Total Production Expenses	-	-	8,091,380.94	14,107,907.64	22,199,288.58
Fuel Costs - Cents					
Coal, Incl. Freight	-	-	2.315	2.032	2.123
Coal and Other (1)...	-	-	2.504	2.167	2.276
Total All Fuel Costs (1)..	-	-	2.504	2.167	2.276
Other Operation Expenses..	-	-	0.636	0.595	0.608
Maintenance..	-	-	0.787	0.491	0.586
Rents..	-	-	-	-	-
Total Production Expenses......................................	-	-	3.927	3.253	3.470
Quantities of Fuel Burned:					
Coal - Tons..	-	-	113,648.00	212,919.00	326,567.00
Oil - Gal - Start-up/Stab....................................	-	-	56,821	89,248	146,069
Million BTU Burned:					
Coal..	-	-	2,629,509.04	4,921,536.88	7,551,045.92
Oil - Start-up/Stab..	-	-	7,955.00	12,496.00	20,451.00
Total MMBTU Burned	-	-	2,637,464.04	4,934,032.88	7,571,496.92
Average BTU per Net KWH Output..........................	-	-	12,800	11,378	11,836

(1) Also includes oil used for firing, disposal of ashes and fly ash (net).

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2006

EW Brown - Steam

	YEAR TO DATE			
	UNIT 1	UNIT 2	UNIT 3	TOTAL
KWH Output				
Net KWH - Coal...	480,534,000	956,008,000	2,031,288,000	3,467,830,000
Total KWH Output.......................................	480,534,000	956,008,000	2,031,288,000	3,467,830,000
Production Costs ($)				
Fuel Costs				
Coal, Inc. Freight..	11,934,970.62	21,373,263.70	46,213,311.03	79,521,545.35
Coal, Inc. Frt, Hand'l, Etc (1)................................	12,572,599.06	21,768,976.02	47,435,832.43	81,777,407.51
Total Fuel (1)...	12,572,599.06	21,768,976.02	47,435,832.43	81,777,407.51
Other Operation Expenses	685,554.25	1,109,623.37	5,904,472.42	7,699,650.04
Maintenance	2,228,747.12	2,274,841.53	5,623,903.15	10,127,491.80
Rents	-	-	-	-
Total Production Expenses	15,486,900.43	25,153,440.92	58,964,208.00	99,604,549.35
Fuel Costs - Cents				
Coal, Incl. Freight	2.484	2.236	2.275	2.293
Coal and Other (1)	2.616	2.277	2.335	2.358
Total All Fuel Costs (1)...	2.616	2.277	2.335	2.358
Other Operation Expenses...	0.143	0.116	0.291	0.222
Maintenance...	0.464	0.238	0.277	0.292
Rents..	-	-	-	-
Total Production Expenses.......................................	3.223	2.631	2.903	2.872
Quantities of Fuel Burned:				
Coal - Tons...	220,177.00	397,613.00	857,446.00	1,475,236.00
Oil - Gal - Start-up/Stab....................................	221,600	35,298	179,363	436,261
Million BTU Burned:				
Coal...	5,459,868.27	9,868,251.86	21,239,582.87	36,567,703.00
Oil - Start-up/Stab..	31,023.00	4,941.00	25,109.00	61,073.00
Total MMBTU Burned	5,490,891.27	9,873,192.86	21,264,691.87	36,628,776.00
Average BTU per Net KWH Output..........................	11,427	10,328	10,469	10,562

(1) Also includes oil used for firing, disposal of ashes and fly ash (net).

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2006

GHENT - Steam

	YEAR TO DATE				
	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
KWH Output					
Net KWH - Coal..	3,374,404,000	3,013,392,000	2,967,905,000	2,852,022,000	12,207,723,000
Total KWH Output......................................	3,374,404,000	3,013,392,000	2,967,905,000	2,852,022,000	12,207,723,000
Production Costs ($)					
Fuel Costs					
Coal, Inc. Freight...	51,369,577.17	66,608,790.01	76,898,606.60	71,777,921.35	266,654,895.13
Coal, Inc. Frt, Hand'l, Etc (1)................................	52,198,303.58	67,534,233.85	78,223,135.79	73,857,907.66	271,813,580.88
Total Fuel (1)..	52,198,303.58	67,534,233.85	78,223,135.79	73,857,907.66	271,813,580.88
Other Operation Expenses	4,104,944.39	3,187,189.20	3,524,407.43	4,107,477.09	14,924,018.11
Maintenance	7,590,097.26	4,553,437.89	3,892,077.25	4,534,728.77	20,570,341.17
Rents	-	-	-	-	-
Total Production Expenses	63,893,345.23	75,274,860.94	85,639,620.47	82,500,113.52	307,307,940.16
Fuel Costs - Cents					
Coal, Incl. Freight	1.522	2.210	2.591	2.517	2.184
Coal and Other (1)..	1.547	2.241	2.636	2.590	2.227
Total All Fuel Costs (1)..	1.547	2.241	2.636	2.590	2.227
Other Operation Expenses..	0.122	0.106	0.119	0.144	0.122
Maintenance..	0.225	0.151	0.131	0.159	0.169
Rents..	-	-	-	-	-
Total Production Expenses......................................	1.893	2.498	2.886	2.893	2.517
Quantities of Fuel Burned:					
Coal - Tons..	1,495,766.00	1,278,327.00	1,483,378.00	1,382,820.00	5,640,291.00
Oil - Gal - Start-up/Stab...................................	216,430	251,346	436,391	484,747	1,388,914
Million BTU Burned:					
Coal...	35,660,930.77	29,421,479.45	33,934,849.25	31,733,751.24	130,751,010.71
Oil - Start-up/Stab..	30,302.00	35,190.00	61,096.00	67,864.00	194,452.00
Total MMBTU Burned	35,691,232.77	29,456,669.45	33,995,945.25	31,801,615.24	130,945,462.71
Average BTU per Net KWH Output..........................	10,577	9,775	11,455	11,151	10,726

(1) Also includes oil used for firing, disposal of ashes and fly ash (net).

LOUISVILLE GAS AND ELECTRIC COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2006

	YEAR TO DATE					
Cane Run - Steam	UNITS 1 & 2	UNIT 3	UNIT 4	UNIT 5	UNIT 6	TOTAL
KWH Output						
Net KWH - Coal..	-	-	961,053,000	1,087,296,000	1,530,907,000	3,579,256,000
Production Costs ($)						
Fuel Costs						
Coal, Inc. Freight..	-	-	15,254,683.74	18,057,707.37	24,258,404.32	57,570,795.43
Coal, Inc. Frt, Hand'l, Etc (2)................................	-	-	16,133,180.57	18,830,549.09	25,114,692.51	60,078,422.17
Total Fuel (2)..	-	-	16,133,180.57	18,830,549.09	25,114,692.51	60,078,422.17
Other Operation Expenses	-	-	5,475,463.04	6,593,756.71	9,786,927.75	21,856,147.50
Maintenance	-	-	4,017,006.19	3,294,914.65	5,992,982.91	13,304,903.75
Rents	-	-	13,838.04	15,375.60	22,038.36	51,252.00
Total Production Expenses	-	-	25,639,487.84	28,734,596.05	40,916,641.53	95,290,725.42
Fuel Costs - Cents						
Coal, Incl. Freight (1)	-	-	1.587	1.661	1.585	1.608
Coal and Other (1) (2)...	-	-	1.679	1.732	1.641	1.679
Total All Fuel Costs (2)...	-	-	1.679	1.732	1.641	1.679
Other Operation Expenses...	-	-	0.570	0.606	0.639	0.611
Maintenance..	-	-	0.418	0.303	0.391	0.372
Rents..	-	-	0.001	0.001	0.001	0.001
Total Production Expenses.......................................	-	-	2.668	2.643	2.673	2.662
Quantities of Fuel Burned:						
Coal - Tons..	-	-	444,050.50	525,182.50	707,462.50	1,676,695.50
Gas - MCF - Start-up/Stab....................................	-	-	58,237	42,284	30,908	131,429
Oil - Gallons..	-	-	-	-	-	-
Million BTU Burned:						
Coal...	-	-	10,036,737.05	11,866,560.79	15,984,446.14	37,887,743.98
Gas - Start-up/Stab...	-	-	59,693.00	43,340.50	31,679.50	134,713.00
Oil..	-	-	-	-	-	-
Total MMBTU Burned	-	-	10,096,430.05	11,909,901.29	16,016,125.64	38,022,456.98
Average BTU per Net KWH Output (Heat Rate)	-	-	10,506	10,954	10,462	10,623

(1) Based on KWH generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net).

LOUISVILLE GAS AND ELECTRIC COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2006

	YEAR TO DATE				
Mill Creek - Steam	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
KWH Output					
Net KWH - Coal...	1,975,638,000	2,032,265,000	2,842,591,000	2,954,368,000	9,804,862,000
Production Costs ($)					
Fuel Costs					
Coal, Inc. Freight..	30,777,412.11	32,567,103.27	44,287,775.00	46,070,612.73	153,702,903.11
Coal, Inc. Frt, Hand'l, Etc (2).................................	32,081,562.76	33,551,706.89	46,876,405.33	48,764,594.93	161,274,269.91
Total Fuel (2)..	32,081,562.76	33,551,706.89	46,876,405.33	48,764,594.93	161,274,269.91
Other Operation Expenses	5,099,182.11	4,972,810.09	4,467,589.34	6,326,878.80	20,866,460.34
Maintenance	6,394,163.45	4,278,315.86	5,579,210.36	7,857,245.84	24,108,935.51
Rents	-	-	-	-	-
Total Production Expenses	43,574,908.32	42,802,832.84	56,923,205.03	62,948,719.57	206,249,665.76
Fuel Costs - Cents					
Coal, Incl. Freight (1)	1.558	1.603	1.558	1.559	1.568
Coal and Other (1) (2)..	1.624	1.651	1.649	1.651	1.645
Total All Fuel Costs (2)...	1.624	1.651	1.649	1.651	1.645
Other Operation Expenses...	0.258	0.245	0.157	0.214	0.213
Maintenance...	0.324	0.211	0.196	0.266	0.246
Rents..	-	-	-	-	-
Total Production Expenses.......................................	2.206	2.106	2.003	2.131	2.104
Quantities of Fuel Burned:					
Coal - Tons...	897,848.05	948,347.30	1,288,058.80	1,335,232.40	4,469,486.55
Gas - MCF - Start-up/Stab....................................	52,861	13,491	167,457	156,545	390,354
Oil - Gallons..	-	-	-	-	-
Million BTU Burned:					
Coal..	20,697,482.94	21,866,910.45	29,707,520.23	30,811,465.69	103,083,379.31
Gas - Start-up/Stab..	54,185.00	13,829.00	171,646.00	160,460.00	400,120.00
Oil..	-	-	-	-	-
Total MMBTU Burned	20,751,667.94	21,880,739.45	29,879,166.23	30,971,925.69	103,483,499.31
Average BTU per Net KWH Output (Heat Rate)	10,504	10,767	10,511	10,483	10,554

(1) Based on KWH generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net).

LOUISVILLE GAS AND ELECTRIC COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2006

	CURRENT MONTH		YEAR TO DATE		YEAR ENDED CURRENT MONTH	
Trimble County - Steam (3)	THIS YEAR	LAST YEAR	THIS YEAR	LAST YEAR	THIS YEAR	LAST YEAR
Net KWH - LGE..	277,027,000	284,428,600	3,160,653,100	2,886,772,400	3,160,653,100	2,886,772,400
IMEA...	46,225,000	46,160,000	519,678,100	475,819,700	519,678,100	475,819,700
IMPA...	49,121,000	49,056,400	552,253,800	505,962,900	552,253,800	505,962,900
Total KWH Output......................................	372,373,000	379,645,000	4,232,585,000	3,868,555,000	4,232,585,000	3,868,555,000
Production Costs ($)						
Fuel Costs $:						
Coal, Inc. Freight..	5,438,666.89	5,229,091.70	60,256,799.02	53,150,454.22	60,256,799.02	53,150,454.22
Coal, Inc. Frt, Hand'l, Etc (2)..............................	5,556,563.32	5,332,189.83	61,627,384.94	54,505,773.25	61,627,384.94	54,505,773.25
Total Fuel (2)..	5,556,563.32	5,332,189.83	61,627,384.94	54,505,773.25	61,627,384.94	54,505,773.25
Other Operation Expenses $.............................	1,022,771.21	712,381.78	7,895,094.97	7,071,964.72	7,895,094.97	7,071,964.72
Maintenance $...	809,952.88	377,884.44	7,615,910.36	8,224,434.34	7,615,910.36	8,224,434.34
Rents $...	-	-	-	-	-	-
Total Production Expenses $................................	7,389,287.41	6,422,456.05	77,138,390.27	69,802,172.31	77,138,390.27	69,802,172.31
Cost per Net KWH Output-Cents:						
Coal Inc. Freight (1)................................	1.461	1.377	1.424	1.374	1.424	1.374
Coal Inc. Frt, Hand'l, Etc (1) (2)..........................	1.492	1.405	1.456	1.409	1.456	1.409
Total All Fuel Costs (2).....................................	1.492	1.405	1.456	1.409	1.456	1.409
Other Operation Expenses....................................	0.275	0.188	0.187	0.183	0.187	0.183
Maintenance..	0.218	0.100	0.180	0.213	0.180	0.213
Rents..	-	-	-	-	-	-
Total Production Expenses.................................	1.984	1.692	1.822	1.804	1.822	1.804
Quantities of Fuel Burned:						
Coal - Tons..	158,777.00	163,692.50	1,787,705.50	1,645,163.00	1,787,705.50	1,645,163.00
Oil - Gallons..	1,000	6,063	221,998	318,606	221,998	318,606
Million BTU Burned:						
Coal..	3,776,666.66	3,848,679.95	42,456,098.55	38,848,075.73	42,456,098.55	38,848,075.73
Oil...	140.00	849.00	31,080.00	44,606.00	31,080.00	44,606.00
Total..	3,776,806.66	3,849,528.95	42,487,178.55	38,892,681.73	42,487,178.55	38,892,681.73
Average BTU Per Net KWH Output.......................	10,143	10,140	10,038	10,054	10,038	10,054
Average BTU Per pound of Coal.........................	11,893	11,756	11,874	11,807	11,874	11,807
Per Gallon of Oil...................................	140,000	140,030	140,001	140,004	140,001	140,004
Cost Coal & Freight per MBTU (Cents).................	144.007	135.867	141.927	136.816	141.927	136.816
Total All Fuel Cost per MBTU (2)......................	147.123	138.515	145.049	140.144	145.049	140.144
Cost of Coal & Freight Per Ton ($)....................	34.253	31.945	33.706	32.307	33.706	32.307

(1) Based on KWH generated by coal or gas as applicable.

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net).

(3) Information on this report represents 100% generation, quantities used, and costs.

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2007

TYRONE - Steam

	YEAR TO DATE			
	UNIT 1	UNIT 2	UNIT 3	TOTAL
KWH Output				
Net KWH - Coal	-	-	390,188,000	390,188,000
Net KWH - Oil	(192,000)	(193,000)	-	(385,000)
Total KWH Output	(192,000)	(193,000)	390,188,000	389,803,000
Production Costs ($)				
Fuel Costs				
Coal, Inc. Freight	-	-	13,790,037.67	13,790,037.67
Coal, Inc. Frt, Hand'l, Etc (2)	63,840.76	69,644.56	14,864,979.39	14,998,464.71
Total Fuel (2)	63,840.76	69,644.56	14,864,979.39	14,998,464.71
Other Operation Expenses	209,923.17	229,105.64	1,417,482.76	1,856,511.57
Maintenance	110,754.62	121,716.97	1,502,624.81	1,735,096.40
Total Production Expenses	384,518.55	420,467.17	17,785,086.96	18,590,072.68
Fuel Costs - Cents				
Coal, Incl. Freight (1)	-	-	3.534	3.534
Coal and Other (1) (2)	-	-	3.810	3.844
Total All Fuel Costs (2)	(33.250)	(36.085)	3.810	3.848
Other Operation Expenses	(109.335)	(118.708)	0.363	0.476
Maintenance	(57.685)	(63.066)	0.385	0.445
Total Production Expenses	(200.270)	(217.859)	4.558	4.769
Quantities of Fuel Burned:				
Coal - Tons	-	-	199,025.85	199,025.85
Oil - Gal - Start-up/Stab	-	-	135,388	135,388
Million BTU Burned:				
Coal	-	-	5,038,538.73	5,038,538.73
Oil - Start-up/Stab	-	-	18,954.32	18,954.32
Total MMBTU Burned	-	-	5,057,493.05	5,057,493.05
Average BTU per Net KWH Output	-	-	12,962	12,974

(1) Based on KWH generated by coal or oil as applicable

(2) Also includes oil used for firing, disposal of ashes and fly ash (net).

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2007

GREEN RIVER - Steam

	YEAR TO DATE		
	UNIT 3	UNIT 4	TOTAL
KWH Output			
Net KWH - Coal...	420,678,000	576,042,000	996,720,000
Total KWH Output.......................................	420,678,000	576,042,000	996,720,000
Production Costs ($)			
Fuel Costs			
Coal, Inc. Freight...	9,501,562.12	11,661,885.09	21,163,447.21
Coal, Inc. Frt, Hand'l, Etc (1)................................	9,837,599.26	12,131,651.41	21,969,250.67
Total Fuel (1)..	9,837,599.26	12,131,651.41	21,969,250.67
Other Operation Expenses	1,697,002.70	2,211,679.83	3,908,682.53
Maintenance	1,671,935.41	3,062,604.38	4,734,539.79
Total Production Expenses	13,206,537.37	17,405,935.62	30,612,472.99
Fuel Costs - Cents			
Coal, Incl. Freight	2.259	2.024	2.123
Coal and Other (1)...	2.339	2.106	2.204
Total All Fuel Costs (1)..	2.339	2.106	2.204
Other Operation Expenses...	0.403	0.384	0.392
Maintenance...	0.397	0.532	0.475
Total Production Expenses.......................................	3.139	3.022	3.071
Quantities of Fuel Burned:			
Coal - Tons...	218,165.00	266,289.00	484,454.00
Oil - Gal - Start-up/Stab....................................	62,416	78,776	141,192
Million BTU Burned:			
Coal..	5,241,798.29	6,380,919.56	11,622,717.85
Oil - Start-up/Stab..	8,738.24	11,028.64	19,766.88
Total MMBTU Burned	5,250,536.53	6,391,948.20	11,642,484.73
Average BTU per Net KWH Output..........................	12,481	11,096	11,681

Attachment to Response to Sierra Club Question No. 6 (a)(b)(c)

Witness Sinclair

(1) Also includes oil used for firing, disposal of ashes and fly ash (net).

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2007

EW Brown - Steam

	YEAR TO DATE			
	UNIT 1	UNIT 2	UNIT 3	TOTAL
KWH Output				
Net KWH - Coal...	493,483,000	1,013,933,000	2,396,909,000	3,904,325,000
Total KWH Output.......................................	493,483,000	1,013,933,000	2,396,909,000	3,904,325,000
Production Costs ($)				
Fuel Costs				
Coal, Inc. Freight..	12,809,959.73	24,316,349.02	57,051,160.69	94,177,469.44
Coal, Inc. Frt, Hand'l, Etc (1).................................	13,399,655.08	24,792,881.97	58,358,986.36	96,551,523.41
Total Fuel (1)..	13,399,655.08	24,792,881.97	58,358,986.36	96,551,523.41
Other Operation Expenses	614,156.70	1,043,683.56	6,077,536.39	7,735,376.65
Maintenance	5,148,693.19	2,159,281.59	5,810,625.67	13,118,600.45
Total Production Expenses	19,162,504.97	27,995,847.12	70,247,148.42	117,405,500.51
Fuel Costs - Cents				
Coal, Incl. Freight	2.596	2.398	2.380	2.412
Coal and Other (1)	2.715	2.445	2.435	2.473
Total All Fuel Costs (1)..	2.715	2.445	2.435	2.473
Other Operation Expenses..	0.124	0.103	0.254	0.198
Maintenance...	1.043	0.213	0.242	0.336
Total Production Expenses.......................................	3.883	2.761	2.931	3.007
Quantities of Fuel Burned:				
Coal - Tons...	224,065.00	428,237.00	1,005,580.00	1,657,882.00
Oil - Gal - Start-up/Stab....................................	156,586	48,979	174,780	380,345
Million BTU Burned:				
Coal...	5,492,004.69	10,498,526.02	24,638,305.01	40,628,835.72
Oil - Start-up/Stab..	21,922.04	6,857.06	24,469.20	53,248.30
Total MMBTU Burned	5,513,926.73	10,505,383.08	24,662,774.21	40,682,084.02
Average BTU per Net KWH Output..........................	11,173	10,361	10,289	10,420

Attachment to Response to Sierra Club Question No. 6 (a)(b)(c)

Witness Sinclair

(1) Also includes oil used for firing, disposal of ashes and fly ash (net).

KENTUCKY UTILITIES COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2007

GHENT - Steam

	YEAR TO DATE				
	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
KWH Output					
Net KWH - Coal..	2,915,043,000	3,454,216,000	2,358,308,000	3,232,661,000	11,960,228,000
Total KWH Output......................................	2,915,043,000	3,454,216,000	2,358,308,000	3,232,661,000	11,960,228,000
Production Costs ($)					
Fuel Costs					
Coal, Inc. Freight...	47,321,308.53	85,089,854.45	46,128,546.84	84,047,848.21	262,587,558.03
Coal, Inc. Frt, Hand'l, Etc (1)................................	48,475,316.80	86,313,019.08	48,149,108.94	86,070,631.21	269,008,076.03
Total Fuel (1)..	48,475,316.80	86,313,019.08	48,149,108.94	86,070,631.21	269,008,076.03
Other Operation Expenses	4,277,978.12	3,599,055.59	3,687,607.76	4,296,339.09	15,860,980.56
Maintenance	12,751,666.25	4,748,583.37	7,342,430.36	4,580,933.63	29,423,613.61
Total Production Expenses	65,504,961.17	94,660,658.04	59,179,147.06	94,947,903.93	314,292,670.20
Fuel Costs - Cents					
Coal, Incl. Freight	1.623	2.463	1.956	2.600	2.196
Coal and Other (1)...	1.663	2.499	2.042	2.663	2.249
Total All Fuel Costs (1)..	1.663	2.499	2.042	2.663	2.249
Other Operation Expenses..	0.147	0.104	0.156	0.133	0.133
Maintenance...	0.437	0.137	0.311	0.142	0.246
Total Production Expenses......................................	2.247	2.740	2.509	2.937	2.628
Quantities of Fuel Burned:					
Coal - Tons...	1,316,642.00	1,448,552.00	1,108,471.00	1,431,096.00	5,304,761.00
Oil - Gal - Start-up/Stab....................................	298,637	329,928	711,004	408,296	1,747,865
Million BTU Burned:					
Coal..	31,118,913.48	34,960,432.85	26,006,225.88	34,572,753.84	126,658,326.05
Oil - Start-up/Stab..	41,809.18	46,189.92	99,540.56	57,161.44	244,701.10
Total MMBTU Burned	31,160,722.66	35,006,622.77	26,105,766.44	34,629,915.28	126,903,027.15
Average BTU per Net KWH Output..........................	10,690	10,134	11,070	10,713	10,610

(1) Also includes oil used for firing, disposal of ashes and fly ash (net).

LOUISVILLE GAS AND ELECTRIC COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2007

	YEAR TO DATE			
Cane Run - Steam	UNIT 4	UNIT 5	UNIT 6	TOTAL
KWH Output				
Net KWH - Coal...	1,105,274,000	1,043,893,000	1,395,319,000	3,544,486,000
Production Costs ($)				
Fuel Costs				
Coal, Inc. Freight..	18,183,020.14	17,715,100.58	22,453,024.43	58,351,145.15
Coal, Inc. Frt, Hand'l, Etc (2).................................	19,028,166.24	18,489,572.84	23,472,491.61	60,990,230.69
Total Fuel (2)..	19,028,166.24	18,489,572.84	23,472,491.61	60,990,230.69
Other Operation Expenses	5,918,298.20	5,959,356.85	9,376,682.61	21,254,337.66
Maintenance	2,978,076.13	3,540,096.07	6,390,793.01	12,908,965.21
Rents	13,838.04	15,375.60	22,038.36	51,252.00
Total Production Expenses	27,938,378.61	28,004,401.36	39,262,005.59	95,204,785.56
Fuel Costs - Cents				
Coal, Incl. Freight (1)	1.645	1.697	1.609	1.646
Coal and Other (1) (2)..	1.722	1.771	1.682	1.721
Total All Fuel Costs (2)...	1.722	1.771	1.682	1.721
Other Operation Expenses...	0.535	0.571	0.672	0.600
Maintenance..	0.269	0.339	0.458	0.364
Rents..	0.001	0.001	0.002	0.001
Total Production Expenses.......................................	2.528	2.683	2.814	2.686
Quantities of Fuel Burned:				
Coal - Tons..	520,726.00	507,214.70	642,267.90	1,670,208.60
Gas - MCF - Start-up/Stab....................................	59,449	46,805	56,446	162,700
Oil - Gallons..	-	-	-	-
Million BTU Burned:				
Coal...	11,666,199.15	11,363,888.80	14,387,745.39	37,417,833.34
Gas - Start-up/Stab...	60,934.00	47,975.00	57,857.00	166,766.00
Oil..	-	-	-	-
Total MMBTU Burned	11,727,133.15	11,411,863.80	14,445,602.39	37,584,599.34
Average BTU per Net KWH Output (Heat Rate)	10,610	10,932	10,353	10,604

(1) Based on KWH generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net).

LOUISVILLE GAS AND ELECTRIC COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2007

	YEAR TO DATE				
Mill Creek - Steam	UNIT 1	UNIT 2	UNIT 3	UNIT 4	TOTAL
KWH Output					
Net KWH - Coal	2,163,431,000	1,944,646,000	2,805,103,000	3,584,949,000	10,498,129,000
Production Costs ($)					
Fuel Costs					
Coal, Inc. Freight	35,309,144.72	32,383,914.26	46,325,747.38	59,850,870.59	173,869,676.95
Coal, Inc. Frt, Hand'l, Etc (2)	36,618,254.10	33,545,522.34	48,531,019.51	62,681,254.42	181,376,050.37
Total Fuel (2)	36,618,254.10	33,545,522.34	48,531,019.51	62,681,254.42	181,376,050.37
Other Operation Expenses	4,767,229.16	4,316,394.81	3,452,950.89	5,737,552.33	18,274,127.19
Maintenance	4,596,866.02	5,879,180.38	6,869,390.20	6,386,633.26	23,732,069.86
Total Production Expenses	45,982,349.28	43,741,097.53	58,853,360.60	74,805,440.01	223,382,247.42
Fuel Costs - Cents					
Coal, Incl. Freight (1)	1.632	1.665	1.651	1.670	1.656
Coal and Other (1) (2)	1.693	1.725	1.730	1.748	1.728
Total All Fuel Costs (2)	1.693	1.725	1.730	1.748	1.728
Other Operation Expenses	0.220	0.222	0.123	0.160	0.174
Maintenance	0.212	0.302	0.245	0.178	0.226
Total Production Expenses	2.125	2.249	2.098	2.087	2.128
Quantities of Fuel Burned:					
Coal - Tons	978,943.60	897,662.25	1,283,412.00	1,658,997.85	4,819,015.70
Gas - MCF - Start-up/Stab	30,832	10,971	101,080	144,216	287,099
Oil - Gallons	-	-	-	-	-
Million BTU Burned:					
Coal	22,564,556.17	20,692,578.70	29,584,917.26	38,249,835.06	111,091,887.19
Gas - Start-up/Stab	31,602.00	11,247.00	103,606.00	147,822.00	294,277.00
Oil	-	-	-	-	-
Total MMBTU Burned	22,596,158.17	20,703,825.70	29,688,523.26	38,397,657.06	111,386,164.19
Average BTU per Net KWH Output (Heat Rate)	10,445	10,647	10,584	10,711	10,610

(1) Based on KWH generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net).

LOUISVILLE GAS AND ELECTRIC COMPANY
ELECTRIC GENERATING COSTS AND FUEL PERFORMANCE
DECEMBER 31, 2007

	CURRENT MONTH		YEAR TO DATE		YEAR ENDED CURRENT MONTH	
Trimble County - Steam (3)	THIS YEAR	LAST YEAR	THIS YEAR	LAST YEAR	THIS YEAR	LAST YEAR
Net KWH - LGE	267,657,000	277,027,000	2,708,402,000	3,160,653,100	2,708,402,000	3,160,653,100
IMEA	44,164,000	46,225,000	449,962,000	519,678,100	449,962,000	519,678,100
IMPA	47,128,000	49,121,000	477,581,000	552,253,800	477,581,000	552,253,800
Total KWH Output	358,949,000	372,373,000	3,635,945,000	4,232,585,000	3,635,945,000	4,232,585,000
Production Costs ($)						
Fuel Costs $:						
Coal, Inc. Freight	5,696,978.91	5,438,666.89	55,626,485.33	60,256,799.02	55,626,485.33	60,256,799.02
Coal, Inc. Frt, Hand'l, Etc (2)	5,886,599.67	5,556,563.32	57,421,989.26	61,627,384.94	57,421,989.26	61,627,384.94
Total Fuel (2)	5,886,599.67	5,556,563.32	57,421,989.26	61,627,384.94	57,421,989.26	61,627,384.94
Other Operation Expenses $	739,181.15	1,022,771.21	8,160,819.79	7,895,094.97	8,160,819.79	7,895,094.97
Maintenance $	1,209,104.76	809,952.88	11,066,335.82	7,615,910.36	11,066,335.82	7,615,910.36
Total Production Expenses $	7,834,885.58	7,389,287.41	76,649,144.87	77,138,390.27	76,649,144.87	77,138,390.27
Cost per Net KWH Output-Cents:						
Coal Inc. Freight (1)	1.587	1.461	1.530	1.424	1.530	1.424
Coal Inc. Frt, Hand'l, Etc (1) (2)	1.640	1.492	1.579	1.456	1.579	1.456
Total All Fuel Costs (2)	1.640	1.492	1.579	1.456	1.579	1.456
Other Operation Expenses	0.206	0.275	0.224	0.187	0.224	0.187
Maintenance	0.337	0.218	0.304	0.180	0.304	0.180
Total Production Expenses	2.183	1.984	2.108	1.822	2.108	1.822
Quantities of Fuel Burned:						
Coal - Tons	157,436.64	158,777.00	1,553,094.19	1,787,705.50	1,553,094.19	1,787,705.50
Oil - Gallons	34,054	1,000	366,367	221,998	366,367	221,998
Million BTU Burned:						
Coal	3,714,534.91	3,776,666.66	37,034,130.12	42,456,098.55	37,034,130.12	42,456,098.55
Oil	4,767.56	140.00	51,291.38	31,080.00	51,291.38	31,080.00
Total	3,719,302.47	3,776,806.66	37,085,421.50	42,487,178.55	37,085,421.50	42,487,178.55
Average BTU Per Net KWH Output	10,362	10,143	10,200	10,038	10,200	10,038
Average BTU Per pound of Coal	11,797	11,893	11,923	11,874	11,923	11,874
Per Gallon of Oil	140,000	140,000	140,000	140,001	140,000	140,001
Cost Coal & Freight per MBTU (Cents)	153.370	144.007	150.203	141.927	150.203	141.927
Total All Fuel Cost per MBTU (2)	158.272	147.123	154.837	145.049	154.837	145.049
Cost of Coal & Freight Per Ton ($)	36.186	34.253	35.817	33.706	35.817	33.706

(1) Based on KWH generated by coal or gas as applicable.
(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net).
(3) Information on this report represents 100% generation, quantities used, and costs.

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
December 31, 2008

Tyrone - Steam

	Year to Date			
	Unit 1	Unit 2	Unit 3	Total
Kwh Output				
Net Kwh - Coal...	-	-	355,632,000	355,632,000
Net Kwh - Oil...	-	-	-	-
Total Kwh Output...	-	-	355,632,000	355,632,000
Production Costs ($)				
Fuel Costs				
Coal, Including Freight...	-	-	12,788,947.49	12,788,947.49
Coal, Including Freight, Handling, Etc (2)............................	-	-	14,287,470.49	14,287,470.49
Total Fuel (2)...	-	-	14,287,470.49	14,287,470.49
Other Operation Expenses	-	-	1,955,523.61	1,955,523.61
Maintenance	1,886.77	2,738.85	1,674,853.00	1,679,478.62
Total Production Expenses	1,886.77	2,738.85	17,917,847.10	17,922,472.72
Cost per Net Kwh Output-Cents:				
Coal, Including Freight (1)	-	-	3.596	3.596
Coal Including Freight, Handling, Etc (1) (2).......................	-	-	4.017	4.017
Total All Fuel Costs (2)..	-	-	4.017	4.017
Other Operation Expenses...	-	-	0.550	0.550
Maintenance..	-	-	0.472	0.472
Total Production Expenses......................................	-	-	5.039	5.039
Quantities of Fuel Burned:				
Coal - Tons...	-	-	176,178.39	176,178.39
Oil - Gallons - Start-up/Stabilization..................................	-	-	184,970.00	184,970.00
MMBtu Burned:				
Coal..	-	-	4,479,233.87	4,479,233.87
Oil - Start-up/Stabilization..	-	-	25,895.80	25,895.80
Total MMBtu Burned	-	-	4,505,129.67	4,505,129.67
Average Btu per Net Kwh Output..	-	-	12,668	12,668

(1) Based on Kwh generated by coal or oil as applicable
(2) Also includes oil used for firing, disposal of ashes and fly ash (net)

January 22, 2009

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
December 31, 2008

Green River - Steam

	Year to Date		
	Unit 3	Unit 4	Total
Kwh Output			
Net Kwh - Coal...	379,545,000	582,590,000	962,135,000
Total Kwh Output.......................................	379,545,000	582,590,000	962,135,000
Production Costs ($)			
Fuel Costs			
Coal, Including Freight...	10,042,635.69	14,266,042.69	24,308,678.38
Coal, Including Freight, Handling, Etc (1)............................	10,705,324.64	15,215,312.41	25,920,637.05
Total Fuel (1)..	10,705,324.64	15,215,312.41	25,920,637.05
Other Operation Expenses	1,472,139.97	2,269,590.45	3,741,730.42
Maintenance	2,095,419.06	2,312,233.38	4,407,652.44
Total Production Expenses	14,272,883.67	19,797,136.24	34,070,019.91
Cost per Net Kwh Output-Cents:			
Coal, Including Freight	2.646	2.449	2.527
Coal Including Freight, Handling, Etc (1)..............................	2.821	2.612	2.694
Total All Fuel Costs (1)..	2.821	2.612	2.694
Other Operation Expenses...	0.388	0.390	0.389
Maintenance..	0.552	0.397	0.458
Total Production Expenses.......................................	3.761	3.399	3.541
Quantities of Fuel Burned:			
Coal - Tons..	193,206.00	274,949.00	468,155.00
Oil - Gallons - Start-up/Stabilization..................................	69,753.50	90,719.50	160,473.00
MMBtu Burned:			
Coal..	4,534,743.81	6,453,083.57	10,987,827.38
Oil - Start-up/Stabilization..	9,765.49	12,700.73	22,466.22
Total MMBtu Burned	4,544,509.30	6,465,784.30	11,010,293.60
Average Btu per Net Kwh Output..	11,974	11,098	11,444

(1) Also includes oil used for firing, disposal of ashes and fly ash (net)

January 22, 2009

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
December 31, 2008

	Year to Date			
EW Brown - Steam	Unit 1	Unit 2	Unit 3	Total
Kwh Output				
Net Kwh - Coal	513,921,000	1,074,881,000	2,534,659,000	4,123,461,000
Total Kwh Output	513,921,000	1,074,881,000	2,534,659,000	4,123,461,000
Production Costs ($)				
Fuel Costs				
Coal, Including Freight	14,892,563.87	28,929,864.37	68,776,133.70	112,598,561.94
Coal, Including Freight, Handling, Etc (1)	15,611,072.83	29,723,818.32	70,132,892.00	115,467,783.15
Total Fuel (1)	15,611,072.83	29,723,818.32	70,132,892.00	115,467,783.15
Other Operation Expenses	978,237.58	1,794,614.64	4,383,855.16	7,156,707.38
Maintenance	2,874,450.20	2,853,362.49	6,364,793.62	12,092,606.31
Total Production Expenses	19,463,760.61	34,371,795.45	80,881,540.78	134,717,096.84
Cost per Net Kwh Output-Cents:				
Coal, Including Freight	2.898	2.691	2.713	2.731
Coal Including Freight, Handling, Etc (1)	3.038	2.765	2.767	2.800
Total All Fuel Costs (1)	3.038	2.765	2.767	2.800
Other Operation Expenses	0.190	0.167	0.173	0.174
Maintenance	0.559	0.265	0.251	0.293
Total Production Expenses	3.787	3.197	3.191	3.267
Quantities of Fuel Burned:				
Coal - Tons	237,034.00	460,588.00	1,090,176.00	1,787,798.00
Oil - Gallons - Start-up/Stabilization	159,840.00	135,279.00	119,412.00	414,531.00
MMBtu Burned:				
Coal	5,737,708.79	11,149,847.29	26,382,669.08	43,270,225.16
Oil - Start-up/Stabilization	22,377.60	18,939.06	16,717.68	58,034.34
Total MMBtu Burned	5,760,086.39	11,168,786.35	26,399,386.76	43,328,259.50
Average Btu per Net Kwh Output	11,208	10,391	10,415	10,508

(1) Also includes oil used for firing, disposal of ashes and fly ash (net)

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Kentucky Utilities Company
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Ghent - Steam	Year to Date				
	Unit 1	Unit 2	Unit 3	Unit 4	Total
Kwh Output					
Net Kwh - Coal	3,598,899,000	2,804,097,000	3,262,152,000	2,840,532,000	12,505,680,000
Total Kwh Output	3,598,899,000	2,804,097,000	3,262,152,000	2,840,532,000	12,505,680,000
Production Costs ($)					
Fuel Costs					
Coal, Including Freight	72,698,475.31	90,378,388.75	68,705,438.35	72,048,015.41	303,830,317.82
Coal, Including Freight, Handling, Etc (1)	74,045,372.25	92,323,278.03	71,190,434.66	75,083,522.10	312,642,607.04
Total Fuel (1)	74,045,372.25	92,323,278.03	71,190,434.66	75,083,522.10	312,642,607.04
Other Operation Expenses	5,483,438.95	2,974,160.94	6,471,556.67	5,420,352.51	20,349,509.07
Maintenance	6,199,458.50	7,088,861.06	6,157,132.79	9,940,734.89	29,386,187.24
Total Production Expenses	85,728,269.70	102,386,300.03	83,819,124.12	90,444,609.50	362,378,303.35
Cost per Net Kwh Output-Cents:					
Coal, Including Freight	2.020	3.223	2.106	2.536	2.430
Coal Including Freight, Handling, Etc (1)	2.057	3.292	2.182	2.643	2.500
Total All Fuel Costs (1)	2.057	3.292	2.182	2.643	2.500
Other Operation Expenses	0.152	0.106	0.198	0.191	0.163
Maintenance	0.172	0.253	0.189	0.350	0.235
Total Production Expenses	2.381	3.651	2.569	3.184	2.898
Quantities of Fuel Burned:					
Coal - Tons	1,638,782.00	1,202,574.00	1,547,730.00	1,316,066.00	5,705,152.00
Oil - Gallons - Start-up/Stabilization	269,898.00	436,861.00	611,246.00	545,170.00	1,863,175.00
MMBtu Burned:					
Coal	38,270,583.12	29,115,821.10	36,146,218.69	31,060,626.11	134,593,249.02
Oil - Start-up/Stabilization	37,785.72	61,160.54	85,574.44	76,323.80	260,844.50
Total MMBtu Burned	38,308,368.84	29,176,981.64	36,231,793.13	31,136,949.91	134,854,093.52
Average Btu per Net Kwh Output	10,644	10,405	11,107	10,962	10,783

(1) Also includes oil used for firing, disposal of ashes and fly ash (net)

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	Year to Date			
Cane Run - Steam	Unit 4	Unit 5	Unit 6	Total
Kwh Output				
Net Kwh - Coal...	1,044,031,000	886,232,000	1,482,371,000	3,412,634,000
Production Costs ($)				
Fuel Costs				
Coal, Including Freight..	19,759,867.14	16,108,840.91	27,484,594.75	63,353,302.80
Coal, Including Freight, Handling, Etc (2)............................	21,154,036.12	17,183,233.75	29,081,915.56	67,419,185.43
Total Fuel (2)..	21,154,036.12	17,183,233.75	29,081,915.56	67,419,185.43
Other Operation Expenses	7,224,508.07	6,668,424.44	12,762,871.19	26,655,803.70
Maintenance	4,173,053.16	6,954,246.17	5,718,941.53	16,846,240.86
Rents	4,612.68	5,125.20	7,346.12	17,084.00
Total Production Expenses	32,556,210.03	30,811,029.56	47,571,074.40	110,938,313.99
Fuel Costs - Cents				
Coal, Including Freight (1)	1.893	1.818	1.854	1.856
Coal and Other (1) (2)...	2.026	1.939	1.962	1.976
Total All Fuel Costs (2)...	2.026	1.939	1.962	1.976
Other Operation Expenses...	0.692	0.752	0.861	0.781
Maintenance...	0.400	0.785	0.386	0.494
Rents..	-	0.001	-	0.001
Total Production Expenses.......................................	3.118	3.477	3.209	3.252
Quantities of Fuel Burned:				
Coal - Tons...	501,955.45	416,929.37	700,608.58	1,619,493.40
Gas - Mcf - Start-up/Stabilization................................	51,223.00	36,516.00	64,995.00	152,734.00
Oil - Gallons - Start-up/Stabilization..................................	-	-	-	-
MMBtu Burned:				
Coal..	11,181,616.20	9,273,219.07	15,602,539.10	36,057,374.37
Gas - Start-up/Stabilization...	52,504.00	37,429.00	66,622.00	156,555.00
Oil - Start-up/Stabilization...	-	-	-	-
Total MMBtu Burned	11,234,120.20	9,310,648.07	15,669,161.10	36,213,929.37
Average Btu per Net Kwh Output (Heat Rate)	10,760	10,506	10,570	10,612

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net)

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Louisville Gas and Electric Company
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	Year to Date				
Mill Creek - Steam	Unit 1	Unit 2	Unit 3	Unit 4	Total
Kwh Output					
Net Kwh - Coal...	1,994,139,000	2,083,269,000	3,002,860,000	3,335,864,000	10,416,132,000
Production Costs ($)					
Fuel Costs					
Coal, Including Freight...	35,383,612.06	37,372,206.25	52,883,771.43	57,822,956.79	183,462,546.53
Coal, Including Freight, Handling, Etc (2)..............................	37,730,819.41	39,153,226.19	56,418,415.05	62,938,622.31	196,241,082.96
Total Fuel (2)...	37,730,819.41	39,153,226.19	56,418,415.05	62,938,622.31	196,241,082.96
Other Operation Expenses	5,312,620.67	5,024,114.65	4,684,588.91	7,398,166.10	22,419,490.33
Maintenance	6,915,053.94	3,678,889.74	5,828,763.62	9,575,443.96	25,998,151.26
Total Production Expenses	49,958,494.02	47,856,230.58	66,931,767.58	79,912,232.37	244,658,724.55
Fuel Costs - Cents					
Coal, Including Freight (1)	1.774	1.794	1.761	1.733	1.761
Coal and Other (1) (2)...	1.892	1.879	1.879	1.887	1.884
Total All Fuel Costs (2)..	1.892	1.879	1.879	1.887	1.884
Other Operation Expenses...	0.266	0.241	0.156	0.222	0.215
Maintenance..	0.347	0.177	0.194	0.287	0.250
Total Production Expenses.......................................	2.505	2.297	2.229	2.396	2.349
Quantities of Fuel Burned:					
Coal - Tons..	926,296.85	985,386.30	1,389,177.95	1,518,150.70	4,819,011.80
Gas - Mcf - Start-up/Stabilization................................	59,349.00	19,119.00	109,601.00	191,198.00	379,267.00
Oil - Gallons - Start-up/Stabilization.....................................	-	-	-	-	-
MMBtu Burned:					
Coal..	21,108,342.48	22,462,932.31	31,662,153.13	34,632,640.39	109,866,068.31
Gas - Start-up/Stabilization..	60,833.00	19,599.00	112,341.00	195,979.00	388,752.00
Oil - Start-up/Stabilization...	-	-	-	-	-
Total MMBtu Burned	21,169,175.48	22,482,531.31	31,774,494.13	34,828,619.39	110,254,820.31
Average Btu per Net Kwh Output (Heat Rate)	10,616	10,792	10,581	10,441	10,585

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net)

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	Current Month		Year to Date		Year Ended Current Month	
Trimble County - Steam (3)	This Year	Last Year	This Year	Last Year	This Year	Last Year
Net Kwh - LGE...	245,994,000	267,657,000	3,058,244,000	2,708,402,000	3,058,244,000	2,708,402,000
IMEA..	38,793,000	44,164,000	515,584,000	449,962,000	515,584,000	449,962,000
IMPA...	41,161,000	47,128,000	547,951,000	477,581,000	547,951,000	477,581,000
Total Kwh Output......................................	325,948,000	358,949,000	4,121,779,000	3,635,945,000	4,121,779,000	3,635,945,000
Production Costs ($)						
Fuel Costs:						
Coal, Including Freight..	7,116,583.81	5,696,978.91	76,969,574.84	55,626,485.33	76,969,574.84	55,626,485.33
Coal, Including Freight, Handling, Etc (2)......................	7,430,261.46	5,886,599.67	78,852,262.31	57,421,989.26	78,852,262.31	57,421,989.26
Total Fuel (2)..	7,430,261.46	5,886,599.67	78,852,262.31	57,421,989.26	78,852,262.31	57,421,989.26
Other Operation Expenses......................................	974,707.40	739,181.15	10,107,060.57	8,160,819.79	10,107,060.57	8,160,819.79
Maintenance...	1,408,787.04	1,209,104.76	10,151,818.88	11,066,335.82	10,151,818.88	11,066,335.82
Total Production Expenses...	9,813,755.90	7,834,885.58	99,111,141.76	76,649,144.87	99,111,141.76	76,649,144.87
Cost per Net Kwh Output-Cents:						
Coal Including. Freight (1)................................	2.183	1.587	1.867	1.530	1.867	1.530
Coal Including Freight, Handling, Etc (1) (2)..................	2.280	1.640	1.913	1.579	1.913	1.579
Total All Fuel Costs (2).....................................	2.280	1.640	1.913	1.579	1.913	1.579
Other Operation Expenses....................................	0.299	0.206	0.245	0.224	0.245	0.224
Maintenance..	0.432	0.337	0.246	0.304	0.246	0.304
Total Production Expenses.................................	3.011	2.183	2.404	2.107	2.404	2.107
Quantities of Fuel Burned:						
Coal - Tons..	146,210.00	157,436.64	1,813,014.85	1,553,094.19	1,813,014.85	1,553,094.19
Oil - Gallons - Start-up/Stabilization..............................	66,095.00	34,054.00	241,086.00	366,367.00	241,086.00	366,367.00
MMBtu Burned:						
Coal..	3,345,981.30	3,714,534.91	42,196,914.98	37,034,130.12	42,196,914.98	37,034,130.12
Oil - Start-up/Stabilization..	9,253.30	4,767.56	33,752.04	51,291.38	33,752.04	51,291.38
Total MMBtu Burned...	3,355,234.60	3,719,302.47	42,230,667.02	37,085,421.50	42,230,667.02	37,085,421.50
Average Btu per Net Kwh Output.......................	10,294	10,362	10,246	10,200	10,246	10,200
Average Btu per Pound of Coal................................	11,442	11,797	11,637	11,923	11,637	11,923
Average Btu per Gallon of Oil...	140,000	140,000	140,000	140,000	140,000	140,000
Cost Coal & Freight per MMBtu (Cents)...........................	212.690	153.370	182.406	150.203	182.406	150.203
Total All Fuel Cost per MMBtu (2)...................................	221.453	158.272	186.718	154.837	186.718	154.837
Cost of Coal & Freight per Ton ($)....................................	48.674	36.186	42.454	35.817	42.454	35.817

(1) Based on Kwh generated by coal or gas as applicable
(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net)
(3) Information on this report represents 100% generation, quantities used, and costs

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	Year to Date			
Tyrone - Steam	Unit 1	Unit 2	Unit 3	Total
Kwh Output				
Net Kwh - Coal...	-	-	23,524,000	23,524,000
Net Kwh - Oil...	-	-	-	-
Total Kwh Output..	-	-	23,524,000	23,524,000
Production Costs ($)				
Fuel Costs:				
Coal, Including Freight..	-	-	940,115.51	940,115.51
Coal, Including Freight, Handling, Etc (2)..............................	-	-	1,131,201.90	1,131,201.90
Total Fuel (2)...	-	-	1,131,201.90	1,131,201.90
Other Operation Expenses	-	-	876,873.64	876,873.64
Maintenance	-	323.47	349,820.93	350,144.40
Total Production Expenses	-	323.47	2,357,896.47	2,358,219.94
Cost per Net Kwh Output-Cents:				
Coal, Including Freight (1)	-	-	3.996	3.996
Coal Including Freight, Handling, Etc (1) (2).......................	-	-	4.809	4.809
Total All Fuel Costs (2)...	-	-	4.809	4.809
Other Operation Expenses...	-	-	3.728	3.728
Maintenance...	-	-	1.487	1.488
Total Production Expenses.......................................	-	-	10.024	10.025
Quantities of Fuel Burned:				
Coal - Tons...	-	-	12,091.58	12,091.58
Oil - Gallons - Start-up/Stabilization....................................	-	-	22,296.00	22,296.00
MMBtu Burned:				
Coal...	-	-	309,478.50	309,478.50
Oil - Start-up/Stabilization..	-	-	3,121.44	3,121.44
Total MMBtu Burned	-	-	312,599.94	312,599.94
Average Btu per Net Kwh Output (Heat Rate).........................	-	-	13,289	13,289

(1) Based on Kwh generated by coal or oil as applicable
(2) Also includes oil used for firing, disposal of ashes and fly ash (net)

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	Year to Date		
Green River - Steam	Unit 3	Unit 4	Total
Kwh Output			
Net Kwh - Coal	216,614,000	408,847,000	625,461,000
Total Kwh Output	216,614,000	408,847,000	625,461,000
Production Costs ($)			
Fuel Costs:			
Coal, Including Freight	6,682,764.91	11,856,086.11	18,538,851.02
Coal, Including Freight, Handling, Etc (1)	7,240,291.89	12,708,857.52	19,949,149.41
Total Fuel (1)	7,240,291.89	12,708,857.52	19,949,149.41
Other Operation Expenses	1,462,179.63	2,486,068.87	3,948,248.50
Maintenance	2,000,821.33	3,714,277.35	5,715,098.68
Total Production Expenses	10,703,292.85	18,909,203.74	29,612,496.59
Cost per Net Kwh Output-Cents:			
Coal, Including Freight	3.085	2.900	2.964
Coal Including Freight, Handling, Etc (1)	3.342	3.108	3.190
Total All Fuel Costs (1)	3.342	3.108	3.190
Other Operation Expenses	0.675	0.608	0.631
Maintenance	0.924	0.908	0.914
Total Production Expenses	4.941	4.624	4.735
Quantities of Fuel Burned:			
Coal - Tons	108,979.00	194,126.00	303,105.00
Oil - Gallons - Start-up/Stabilization	82,215.00	129,961.00	212,176.00
MMBtu Burned:			
Coal	2,553,385.22	4,546,751.94	7,100,137.16
Oil - Start-up/Stabilization	11,510.10	18,194.54	29,704.64
Total MMBtu Burned	2,564,895.32	4,564,946.48	7,129,841.80
Average Btu per Net Kwh Output	11,841	11,165	11,399

(1) Also includes oil used for firing, disposal of ashes and fly ash (net)

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	Year to Date			
EW Brown - Steam	Unit 1	Unit 2	Unit 3	Total
Kwh Output				
Net Kwh - Coal...	217,008,000	547,458,000	1,740,829,000	2,505,295,000
Total Kwh Output..	217,008,000	547,458,000	1,740,829,000	2,505,295,000
Production Costs ($)				
Fuel Costs:				
Coal, Including Freight..	7,967,225.02	18,098,625.23	58,457,231.99	84,523,082.24
Coal, Including Freight, Handling, Etc (1).............................	8,552,903.80	18,947,664.47	59,958,770.20	87,459,338.47
Total Fuel (1)..	8,552,903.80	18,947,664.47	59,958,770.20	87,459,338.47
Other Operation Expenses	888,857.93	1,746,377.38	4,866,017.06	7,501,252.37
Maintenance	2,312,405.47	6,023,566.07	7,300,240.79	15,636,212.33
Total Production Expenses	11,754,167.20	26,717,607.92	72,125,028.05	110,596,803.17
Cost per Net Kwh Output-Cents:				
Coal, Including Freight	3.671	3.306	3.358	3.374
Coal Including Freight, Handling, Etc (1).............................	3.941	3.461	3.444	3.491
Total All Fuel Costs (1)...	3.941	3.461	3.444	3.491
Other Operation Expenses...	0.410	0.319	0.280	0.299
Maintenance...	1.066	1.100	0.419	0.624
Total Production Expenses.......................................	5.417	4.880	4.143	4.414
Quantities of Fuel Burned:				
Coal - Tons...	103,543.00	234,006.00	755,102.00	1,092,651.00
Oil - Gallons - Start-up/Stabilization..................................	130,637.00	170,311.00	176,350.00	477,298.00
MMBtu Burned:				
Coal..	2,516,670.71	5,709,694.01	18,403,751.66	26,630,116.38
Oil - Start-up/Stabilization..	18,289.18	23,843.54	24,689.00	66,821.72
Total MMBtu Burned	2,534,959.89	5,733,537.55	18,428,440.66	26,696,938.10
Average Btu per Net Kwh Output...	11,681	10,473	10,586	10,656

(1) Also includes oil used for firing, disposal of ashes and fly ash (net)

Kentucky Utilities Company
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	Year to Date				
Ghent - Steam	Unit 1	Unit 2	Unit 3	Unit 4	Total
Kwh Output					
Net Kwh - Coal	2,867,588,000	2,413,738,000	3,182,388,000	2,881,867,000	11,345,581,000
Total Kwh Output	2,867,588,000	2,413,738,000	3,182,388,000	2,881,867,000	11,345,581,000
Production Costs ($)					
Fuel Costs:					
Coal, Including Freight	72,472,831.27	65,904,570.47	86,213,479.80	76,770,979.05	301,361,860.59
Coal, Including Freight, Handling, Etc (1)	73,356,378.97	67,048,885.97	87,500,919.90	79,011,121.18	306,917,306.02
Total Fuel (1)	73,356,378.97	67,048,885.97	87,500,919.90	79,011,121.18	306,917,306.02
Other Operation Expenses	6,492,917.15	6,167,616.27	7,069,818.76	8,152,029.46	27,882,381.64
Maintenance	11,606,518.80	8,067,327.72	7,095,221.09	6,330,377.06	33,099,444.67
Total Production Expenses	91,455,814.92	81,283,829.96	101,665,959.75	93,493,527.70	367,899,132.33
Cost per Net Kwh Output-Cents:					
Coal, Including Freight	2.527	2.730	2.709	2.664	2.656
Coal Including Freight, Handling, Etc (1)	2.558	2.778	2.750	2.742	2.705
Total All Fuel Costs (1)	2.558	2.778	2.750	2.742	2.705
Other Operation Expenses	0.226	0.256	0.222	0.283	0.246
Maintenance	0.405	0.334	0.223	0.220	0.292
Total Production Expenses	3.189	3.368	3.195	3.245	3.243
Quantities of Fuel Burned:					
Coal - Tons	1,304,851.00	1,089,304.00	1,552,115.00	1,385,617.00	5,331,887.00
Oil - Gallons - Start-up/Stabilization	248,919.00	397,708.00	467,049.00	489,107.00	1,602,783.00
MMBtu Burned:					
Coal	30,142,970.24	25,389,808.75	35,890,668.93	32,039,410.58	123,462,858.50
Oil - Start-up/Stabilization	34,848.66	55,679.12	65,386.86	68,474.98	224,389.62
Total MMBtu Burned	30,177,818.90	25,445,487.87	35,956,055.79	32,107,885.56	123,687,248.12
Average Btu per Net Kwh Output	10,524	10,542	11,298	11,141	10,902

(1) Also includes oil used for firing, disposal of ashes and fly ash (net)

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	Year to Date			
Cane Run - Steam	Unit 4	Unit 5	Unit 6	Total
Kwh Output				
Net Kwh - Coal..	950,924,000	956,126,000	1,340,828,000	3,247,878,000
Production Costs ($)				
Fuel Costs				
Coal, Including Freight..	17,809,761.15	17,864,023.03	25,508,514.77	61,182,298.95
Coal, Including Freight, Handling, Etc (2)..............................	19,301,755.70	18,937,137.37	26,751,641.11	64,990,534.18
Total Fuel (2)...	19,301,755.70	18,937,137.37	26,751,641.11	64,990,534.18
Other Operation Expenses	6,609,388.35	6,916,996.33	11,730,652.89	25,257,037.57
Maintenance	3,774,419.10	4,128,256.21	5,681,632.28	13,584,307.59
Total Production Expenses	29,685,563.15	29,982,389.91	44,163,926.28	103,831,879.34
Fuel Costs - Cents				
Coal, Including Freight (1)	1.873	1.868	1.902	1.884
Coal and Other (1) (2)...	2.030	1.981	1.995	2.001
Total All Fuel Costs (2)..	2.030	1.981	1.995	2.001
Other Operation Expenses...	0.695	0.723	0.875	0.778
Maintenance...	0.397	0.432	0.424	0.418
Total Production Expenses	3.122	3.136	3.294	3.197
Quantities of Fuel Burned:				
Coal - Tons...	460,928.00	459,815.00	655,227.90	1,575,970.90
Gas - Mcf - Start-up/Stabilization................................	71,426.00	41,169.00	36,997.00	149,592.00
Oil - Gallons - Start-up/Stabilization....................................	-	-	-	-
MMBtu Burned:				
Coal..	10,140,259.20	10,120,728.93	14,420,251.43	34,681,239.56
Gas - Start-up/Stabilization..	73,211.00	42,197.00	37,921.00	153,329.00
Oil - Start-up/Stabilization..	-	-	-	-
Total MMBtu Burned	10,213,470.20	10,162,925.93	14,458,172.43	34,834,568.56
Average Btu per Net Kwh Output (Heat Rate)	10,741	10,629	10,783	10,725

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net)

Louisville Gas and Electric Company
Electric Generating Costs and Fuel Performance
December 31, 2009

	Year to Date				
Mill Creek - Steam	Unit 1	Unit 2	Unit 3	Unit 4	Total
Kwh Output					
Net Kwh - Coal..	2,121,020,000	1,860,292,000	2,805,833,000	3,587,250,000	10,374,395,000
Production Costs ($)					
Fuel Costs					
Coal, Including Freight..	39,709,657.35	35,867,516.03	52,047,789.14	65,456,844.18	193,081,806.70
Coal, Including Freight, Handling, Etc (2)..............................	41,363,177.60	37,494,573.09	54,866,428.02	69,170,415.38	202,894,594.09
Total Fuel (2)...	41,363,177.60	37,494,573.09	54,866,428.02	69,170,415.38	202,894,594.09
Other Operation Expenses	5,910,909.77	5,242,034.02	5,138,220.97	8,339,509.19	24,630,673.95
Maintenance	4,981,216.48	7,400,615.75	7,715,608.95	6,985,222.86	27,082,664.04
Total Production Expenses	52,255,303.85	50,137,222.86	67,720,257.94	84,495,147.43	254,607,932.08
Fuel Costs - Cents					
Coal, Including Freight (1)	1.872	1.928	1.855	1.825	1.861
Coal and Other (1) (2)...	1.950	2.016	1.955	1.928	1.956
Total All Fuel Costs (2)..	1.950	2.016	1.955	1.928	1.956
Other Operation Expenses..	0.279	0.282	0.183	0.232	0.237
Maintenance...	0.235	0.398	0.275	0.195	0.261
Total Production Expenses.......................................	2.464	2.696	2.413	2.355	2.454
Quantities of Fuel Burned:					
Coal - Tons...	975,528.55	878,969.30	1,283,228.50	1,610,066.20	4,747,792.55
Gas - Mcf - Start-up/Stabilization................................	27,867.00	26,461.00	90,624.00	134,547.00	279,499.00
Oil - Gallons - Start-up/Stabilization.....................................	-	-	-	-	-
MMBtu Burned:					
Coal..	22,387,042.74	20,166,056.23	29,451,658.99	36,956,256.52	108,961,014.48
Gas - Start-up/Stabilization..	28,564.00	27,123.00	92,891.00	137,910.00	286,488.00
Oil - Start-up/Stabilization...	-	-	-	-	-
Total MMBtu Burned	22,415,606.74	20,193,179.23	29,544,549.99	37,094,166.52	109,247,502.48
Average Btu per Net Kwh Output (Heat Rate)	10,568	10,855	10,530	10,341	10,530

(1) Based on Kwh generated by coal or gas as applicable
(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net)

January 25, 2010

Louisville Gas and Electric Company
Electric Generating Costs and Fuel Performance
December 31, 2009

	Current Month		Year to Date		Year Ended Current Month	
Trimble County - Steam (3)	This Year	Last Year	This Year	Last Year	This Year	Last Year
Kwh Output						
Net Kwh - LGE...	176,725,000	245,994,000	2,346,678,000	3,058,244,000	2,346,678,000	3,058,244,000
IMEA...	26,304,000	38,793,000	387,195,000	515,584,000	387,195,000	515,584,000
IMPA..	27,914,000	41,161,000	399,974,000	547,951,000	399,974,000	547,951,000
Total Kwh Output......................................	230,943,000	325,948,000	3,133,847,000	4,121,779,000	3,133,847,000	4,121,779,000
Production Costs ($)						
Fuel Costs:						
Coal, Including Freight..	4,449,835.10	7,116,583.81	65,458,757.72	76,969,574.84	65,458,757.72	76,969,574.84
Coal, Including Freight, Handling, Etc (2)......................	5,059,444.09	7,430,261.46	68,048,823.15	78,852,262.31	68,048,823.15	78,852,262.31
Total Fuel (2)..	5,059,444.09	7,430,261.46	68,048,823.15	78,852,262.31	68,048,823.15	78,852,262.31
Other Operation Expenses......................................	876,709.76	974,707.40	10,522,941.74	10,107,060.57	10,522,941.74	10,107,060.57
Maintenance...	1,147,409.47	1,408,787.04	17,025,319.35	10,151,818.88	17,025,319.35	10,151,818.88
Total Production Expenses..	7,083,563.32	9,813,755.90	95,597,084.24	99,111,141.76	95,597,084.24	99,111,141.76
Cost per Net Kwh Output-Cents:						
Coal Including. Freight (1)................................	1.927	2.183	2.089	1.867	2.089	1.867
Coal Including Freight, Handling, Etc (1) (2)..................	2.191	2.280	2.171	1.913	2.171	1.913
Total All Fuel Costs (2).....................................	2.191	2.280	2.171	1.913	2.171	1.913
Other Operation Expenses....................................	0.380	0.299	0.336	0.245	0.336	0.245
Maintenance..	0.497	0.432	0.543	0.246	0.543	0.246
Total Production Expenses..................................	3.068	3.011	3.050	2.404	3.050	2.404
Quantities of Fuel Burned:						
Coal - Tons..	101,870.81	146,210.00	1,409,665.16	1,813,014.85	1,409,665.16	1,813,014.85
Oil - Gallons - Start-up/Stabilization..............................	161,506.00	66,095.00	717,202.00	241,086.00	717,202.00	241,086.00
MMBtu Burned:						
Coal...	2,316,655.07	3,345,981.30	32,308,420.94	42,196,914.98	32,308,420.94	42,196,914.98
Oil - Start-up/Stabilization..	22,610.84	9,253.30	100,408.28	33,752.04	100,408.28	33,752.04
Total MMBtu Burned..	2,339,265.91	3,355,234.60	32,408,829.22	42,230,667.02	32,408,829.22	42,230,667.02
Average Btu per Net Kwh Output.......................	10,129	10,294	10,342	10,246	10,342	10,246
Average Btu per Pound of Coal.................................	11,371	11,442	11,460	11,637	11,460	11,637
Average Btu per Gallon of Oil...	140,000	140,000	140,000	140,000	140,000	140,000
Cost Coal & Freight per MMBtu (Cents)...........................	192.080	212.690	202.606	182.406	202.606	182.406
Total All Fuel Cost per MMBtu (2)..................................	216.283	221.453	209.970	186.718	209.970	186.718
Cost of Coal & Freight per Ton ($)....................................	43.681	48.674	46.436	42.454	46.436	42.454

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of ashes and fly ash (net)

(3) Information on this report represents 100% generation, quantities used, and costs

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
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	Year to Date			
Tyrone - Steam	Unit 1	Unit 2	Unit 3	Total
Kwh Output				
Net Kwh - Coal..	-	-	137,167,000	137,167,000
Net Kwh - Oil..	-	-	-	-
Total Kwh Output...	-	-	137,167,000	137,167,000
Production Costs ($)				
Fuel Costs:				
Coal, Including Freight..	$ -	$ -	$ 6,447,718.39	$ 6,447,718.39
Coal, Including Freight, Handling, Etc (2)................	-	-	6,952,081.25	6,952,081.25
Total Fuel (2)...	-	-	6,952,081.25	6,952,081.25
Other Operation Expenses...	-	-	1,178,048.25	1,178,048.25
Maintenance..	842.37	2,064.30	1,051,005.15	1,053,911.82
Rents...	-	-	-	-
Total Production Expenses..	$ 842.37	$ 2,064.30	$ 9,181,134.65	$ 9,184,041.32
Cost per Net Kwh Output - Cents:				
Coal, Including Freight (1)..	-	-	4.701	4.701
Coal Including Freight, Handling, Etc (1) (2)............	-	-	5.068	5.068
Total All Fuel Costs (2)..	-	-	5.068	5.068
Other Operation Expenses...	-	-	0.859	0.859
Maintenance..	-	-	0.766	0.768
Rents...	-	-	-	-
Total Production Expenses..	-	-	6.693	6.695
Quantities of Fuel Burned:				
Coal - Tons...	-	-	72,111.00	72,111.00
Oil - Gallons - Start-up/Stabilization.........................	-	-	73,398.00	73,398.00
MMBtu Burned:				
Coal..	-	-	1,838,303.72	1,838,303.72
Oil - Start-up/Stabilization...	-	-	10,275.72	10,275.72
Total MMBtu Burned	-	-	1,848,579.44	1,848,579.44
Average Btu per Net Kwh Output (Heat Rate)...............	-	-	13,477	13,477

(1) Based on Kwh generated by coal or oil as applicable

(2) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

January 31, 2011

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
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	Year to Date		
Green River - Steam	Unit 3	Unit 4	Total
Kwh Output			
Net Kwh - Coal………………………………………	345,262,000	544,049,000	889,311,000
Total Kwh Output……………………………………	345,262,000	544,049,000	889,311,000
Production Costs ($)			
Fuel Costs:			
Coal, Including Freight………………………………	$ 10,698,608.57	$ 15,688,056.70	$ 26,386,665.27
Coal, Including Freight, Handling, Etc (1)……………	11,116,546.36	16,347,727.49	27,464,273.85
Total Fuel (1)…………………………………………	11,116,546.36	16,347,727.49	27,464,273.85
Other Operation Expenses …………………………	1,488,230.96	2,481,630.16	3,969,861.12
Maintenance ………………………………………	4,146,772.25	3,389,705.16	7,536,477.41
Rents…………………………………………………	-	-	-
Total Production Expenses …………………………	$ 16,751,549.57	$ 22,219,062.81	$ 38,970,612.38
Cost per Net Kwh Output - Cents:			
Coal, Including Freight ………………………………	3.099	2.884	2.967
Coal Including Freight, Handling, Etc (1)……………	3.220	3.005	3.088
Total All Fuel Costs (1)………………………………	3.220	3.005	3.088
Other Operation Expenses……………………………	0.431	0.456	0.446
Maintenance…………………………………………	1.201	0.623	0.847
Rents…………………………………………………	-	-	-
Total Production Expenses……………………………	4.852	4.084	4.381
Quantities of Fuel Burned:			
Coal - Tons…………………………………………	174,073.00	254,351.00	428,424.00
Oil - Gallons - Start-up/Stabilization…………………	53,900.00	94,386.00	148,286.00
MMBtu Burned:			
Coal…………………………………………………	4,118,275.38	6,019,962.35	10,138,237.73
Oil - Start-up/Stabilization……………………………	7,546.00	13,214.04	20,760.04
Total MMBtu Burned …………………………………	4,125,821.38	6,033,176.39	10,158,997.77
Average Btu per Net Kwh Output………………………	11,950	11,089	11,423

(1) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

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Kentucky Utilities Company
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	Year to Date			
EW Brown - Steam	Unit 1	Unit 2	Unit 3	Total
Kwh Output				
Net Kwh - Coal...	411,311,000	763,280,000	1,828,361,000	3,002,952,000
Total Kwh Output...	411,311,000	763,280,000	1,828,361,000	3,002,952,000
Production Costs ($)				
Fuel Costs:				
Coal, Including Freight...	$ 15,171,727.17	$ 26,108,687.67	$ 67,424,689.33	$ 108,705,104.17
Coal, Including Freight, Handling, Etc (1)..................	15,780,544.69	26,850,948.38	68,698,589.93	111,330,083.00
Total Fuel (1)..	15,780,544.69	26,850,948.38	68,698,589.93	111,330,083.00
Other Operation Expenses...	1,302,900.54	2,241,160.63	5,460,506.89	9,004,568.06
Maintenance..	2,846,036.14	3,285,757.43	6,673,182.49	12,804,976.06
Rents..	2,232.87	3,572.57	9,080.26	14,885.70
Total Production Expenses..	$ 19,931,714.24	$ 32,381,439.01	$ 80,841,359.57	$ 133,154,512.82
Cost per Net Kwh Output - Cents:				
Coal, Including Freight...	3.689	3.421	3.688	3.620
Coal Including Freight, Handling, Etc (1)...................	3.837	3.518	3.757	3.707
Total All Fuel Costs (1)...	3.837	3.518	3.757	3.707
Other Operation Expenses...	0.317	0.294	0.299	0.300
Maintenance..	0.692	0.430	0.365	0.426
Rents..	0.001	0.000	0.000	0.002
Total Production Expenses..	4.847	4.242	4.421	4.435
Quantities of Fuel Burned:				
Coal - Tons..	185,326.00	319,944.00	829,367.00	1,334,637.00
Oil - Gallons - Start-up/Stabilization...........................	153,258.00	140,584.00	80,285.00	374,127.00
MMBtu Burned:				
Coal..	4,532,440.79	7,828,089.25	20,266,133.13	32,626,663.17
Oil - Start-up/Stabilization..	21,456.12	19,681.76	11,239.90	52,377.78
Total MMBtu Burned	4,553,896.91	7,847,771.01	20,277,373.03	32,679,040.95
Average Btu per Net Kwh Output...................................	11,072	10,282	11,090	10,882

(1) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

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	Year to Date				
Ghent - Steam	Unit 1	Unit 2	Unit 3	Unit 4	Total
Kwh Output					
Net Kwh - Coal	3,295,876,000	3,201,480,000	3,431,840,000	2,667,176,000	12,596,372,000
Total Kwh Output	3,295,876,000	3,201,480,000	3,431,840,000	2,667,176,000	12,596,372,000
Production Costs ($)					
Fuel Costs:					
Coal, Including Freight	$ 75,625,304.04	$ 73,767,242.17	$ 82,719,727.65	$ 65,577,565.05	$ 297,689,838.91
Coal, Including Freight, Handling, Etc (1)	76,419,104.62	74,535,767.67	84,000,184.52	67,617,184.78	302,572,241.59
Total Fuel (1)	76,419,104.62	74,535,767.67	84,000,184.52	67,617,184.78	302,572,241.59
Other Operation Expenses	7,979,878.25	4,810,856.22	8,676,565.21	9,271,950.63	30,739,250.31
Maintenance	10,054,633.53	7,542,210.43	6,995,664.47	10,245,476.64	34,837,985.07
Rents	-	-	-	-	-
Total Production Expenses	$ 94,453,616.40	$ 86,888,834.32	$ 99,672,414.20	$ 87,134,612.05	$ 368,149,476.97
Cost per Net Kwh Output - Cents:					
Coal, Including Freight	2.295	2.304	2.410	2.459	2.363
Coal Including Freight, Handling, Etc (1)	2.319	2.328	2.448	2.535	2.402
Total All Fuel Costs (1)	2.319	2.328	2.448	2.535	2.402
Other Operation Expenses	0.242	0.150	0.253	0.348	0.244
Maintenance	0.305	0.236	0.204	0.384	0.277
Rents	-	-	-	-	-
Total Production Expenses	2.866	2.714	2.905	3.267	2.923
Quantities of Fuel Burned:					
Coal - Tons	1,498,423.00	1,461,441.00	1,629,927.00	1,275,474.00	5,865,265.00
Oil - Gallons - Start-up/Stabilization	143,952.00	122,025.00	350,041.00	299,667.00	915,685.00
MMBtu Burned:					
Coal	34,450,154.94	33,604,139.84	37,479,455.95	29,333,000.41	134,866,751.14
Oil - Start-up/Stabilization	20,153.28	17,083.50	49,005.74	41,953.38	128,195.90
Total MMBtu Burned	34,470,308.22	33,621,223.34	37,528,461.69	29,374,953.79	134,994,947.04
Average Btu per Net Kwh Output	10,459	10,502	10,935	11,014	10,717

(1) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

Kentucky Utilities Company
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	Current Month		Year to Date		Year Ended Current Month	
Trimble County - Steam (3)	This Year	Last Year	This Year	Last Year	This Year	Last Year
Kwh Output						
Net Kwh - Coal..	120,425,000	-	273,933,000	-	273,933,000	-
IMEA...	19,453,000	-	44,892,000	-	44,892,000	-
IMPA...	20,678,000	-	47,694,000	-	47,694,000	-
Total Kwh Output..	160,556,000	-	366,519,000	-	366,519,000	-
Production Costs ($)						
Fuel Costs:						
Coal, Including Freight....................................	$ 3,358,977.86	$ -	$ 7,230,413.20	$ -	$ 7,230,413.20	$ -
Coal, Including Freight, Handling, Etc (2)........	3,619,076.74	-	10,305,542.47	-	10,305,542.47	-
Total Fuel (2)...	3,619,076.74	-	10,305,542.47	-	10,305,542.47	-
Other Operation Expenses....................................	-	-	672,440.02	-	672,440.02	-
Maintenance..	-	-	861,524.14	-	861,524.14	-
Rents..	-	-	-	-	-	-
Total Production Expenses...................................	$ 3,619,076.74	$ -	$ 11,839,506.63	$ -	$ 11,839,506.63	$ -
Cost per Net Kwh Output - Cents:	-	-	-	-	-	-
Coal, Including Freight (1)...............................	2.092	-	1.973	-	1.973	-
Coal Including Freight, Handling, Etc (1) (2)....	2.254	-	2.812	-	2.812	-
Total All Fuel Costs (2)...................................	2.254	-	2.812	-	2.812	-
	-	-	-	-	-	-
Other Operation Expenses....................................	-	-	0.183	-	0.183	-
Maintenance..	-	-	0.235	-	0.235	-
Rents..	-	-	-	-	-	-
Total Production Expenses...................................	2.254	-	3.230	-	3.230	-
Quantities of Fuel Burned:						
Coal - Tons..	71,977.16	-	149,700.16	-	149,700.16	-
Oil - Gallons - Start-up/Stabilization................	107,922.00	-	1,380,217.00	-	1,380,217.00	-
MMBtu Burned:						
Coal...	1,532,476.15	-	3,276,483.54	-	3,276,483.54	-
Oil - Start-up/Stabilization...............................	15,109.09	-	193,230.28	-	193,230.28	-
Total MMBtu Burned...	1,547,585.24	-	3,469,713.82	-	3,469,713.82	-
Average Btu per Net Kwh Output...............................	9,639	-	9,467	-	9,467	-
Average Btu per Pound of Coal............................	10,646	-	10,943	-	10,943	-
Average Btu per Gallon of Oil.............................	140,000	-	140,000	-	140,000	-
Cost Coal and Freight per MMBtu (Cents)...........	219.186	-	220.676	-	220.676	-
Total All Fuel Cost per MMBtu (2)......................	233.853	-	297.014	-	297.014	-
Cost of Coal and Freight Per Ton ($)....................	46.667	-	48.299	-	48.299	-

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)

(3) Information on this report represents 100% of KU's portion of Trimble County Unit #2 generation, quantities used, and costs of Trimble County Unit #2

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	Year to Date				
Cane Run - Steam	Unit 3	Unit 4	Unit 5	Unit 6	Total
Kwh Output					
Net Kwh - Coal................………………………	-	927,129,000	1,110,383,000	1,222,086,000	3,259,598,000
Production Costs ($)					
Fuel Costs					
Coal, Including Freight...	$ -	$ 20,831,765.50	$ 23,638,328.56	$ 26,040,900.15	$ 70,510,994.21
Coal, Including Freight, Handling, Etc (2)..............................	-	22,017,671.16	24,625,180.71	27,241,604.26	73,884,456.13
Total Fuel (2)...	-	22,017,671.16	24,625,180.71	27,241,604.26	73,884,456.13
Other Operation Expenses	-	6,484,671.39	7,862,116.20	10,191,054.67	24,537,842.26
Maintenance	(114.66)	5,145,458.92	3,498,654.12	12,401,934.20	21,045,932.58
Rents ....………………………	-	2,754.00	3,060.00	4,386.00	10,200.00
Total Production Expenses	$ (114.66)	$ 33,650,555.47	$ 35,989,011.03	$ 49,838,979.13	$ 119,478,430.97
Fuel Costs - Cents					
Coal, Including Freight (1)	-	2.247	2.129	2.131	2.163
Coal and Other (1) (2)...	-	2.375	2.218	2.229	2.267
Total All Fuel Costs (2)..	-	2.375	2.218	2.229	2.267
Other Operation Expenses..	-	0.699	0.708	0.834	0.753
Maintenance..	-	0.555	0.315	1.015	0.646
Rents ....………………………	-	-	-	-	-
Total Production Expenses......................................	-	3.629	3.241	4.078	3.666
Quantities of Fuel Burned:					
Coal - Tons..	-	473,917.00	536,117.01	593,528.00	1,603,562.01
Gas - Mcf - Start-up/Stabilization................................	-	49,363.00	35,957.00	39,464.00	124,784.00
Oil - Gallons - Start-up/Stabilization..................................	-	-	-	-	-
MMBtu Burned:					
Coal...	-	10,414,517.03	11,777,066.70	13,040,374.81	35,231,958.54
Gas - Start-up/Stabilization..	-	50,598.00	36,854.00	40,452.00	127,904.00
Oil - Start-up/Stabilization..	-	-	-	-	-
Total MMBtu Burned	-	10,465,115.03	11,813,920.70	13,080,826.81	35,359,862.54
Average Btu per Net Kwh Output (Heat Rate)	-	11,288	10,640	10,704	10,848

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)

January 31, 2011

Louisville Gas and Electric Company
Electric Generating Costs and Fuel Performance
December 31, 2010

	Year to Date				
Mill Creek - Steam	Unit 1	Unit 2	Unit 3	Unit 4	Total
Kwh Output					
Net Kwh - Coal..................………………………	2,009,037,000	2,101,040,000	2,914,876,000	3,348,610,000	10,373,563,000
Production Costs ($)					
Fuel Costs					
Coal, Including Freight..	$ 38,600,936.67	$ 40,960,587.08	$ 56,250,643.28	$ 63,108,707.29	$ 198,920,874.32
Coal, Including Freight, Handling, Etc (2)..............................	40,205,901.61	42,530,167.18	58,646,783.46	66,464,377.51	207,847,229.76
Total Fuel (2)...	40,205,901.61	42,530,167.18	58,646,783.46	66,464,377.51	207,847,229.76
Other Operation Expenses	5,794,577.26	5,539,310.02	5,796,067.26	7,666,272.88	24,796,227.42
Maintenance	8,435,601.95	5,173,858.47	6,996,647.28	10,360,350.63	30,966,458.33
Rents..................................…………………………….	14,852.25	14,852.25	18,388.50	22,632.00	70,725.00
Total Production Expenses	$ 54,450,933.07	$ 53,258,187.92	$ 71,457,886.50	$ 84,513,633.02	$ 263,680,640.51
Fuel Costs - Cents					
Coal, Including Freight (1)	1.921	1.950	1.930	1.885	1.918
Coal and Other (1) (2)...	2.001	2.024	2.012	1.985	2.004
Total All Fuel Costs (2)..	2.001	2.024	2.012	1.985	2.004
Other Operation Expenses...	0.288	0.264	0.199	0.229	0.239
Maintenance..	0.420	0.246	0.240	0.309	0.299
Rents..................................…………………………….	0.001	0.001	0.001	0.001	0.001
Total Production Expenses.......................................	2.710	2.535	2.452	2.524	2.543
Quantities of Fuel Burned:					
Coal - Tons...	934,149.65	992,301.25	1,361,933.45	1,530,988.05	4,819,372.40
Gas - Mcf - Start-up/Stabilization................................	45,335.00	44,726.00	93,184.00	157,246.00	340,491.00
Oil - Gallons - Start-up/Stabilization....................................	-	-	-	-	-
MMBtu Burned:					
Coal..	21,416,794.55	22,740,636.04	31,203,400.56	35,065,853.54	110,426,684.69
Gas - Start-up/Stabilization..	46,467.00	45,844.00	95,513.00	161,177.00	349,001.00
Oil - Start-up/Stabilization..	-	-	-	-	-
Total MMBtu Burned	21,463,261.55	22,786,480.04	31,298,913.56	35,227,030.54	110,775,685.69
Average Btu per Net Kwh Output (Heat Rate)	10,683	10,845	10,738	10,520	10,679

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)

January 31, 2011

Louisville Gas and Electric Company
Electric Generating Costs and Fuel Performance
December 31, 2010

	Year to Date		
Trimble County - Steam (3)	Unit 1	Unit 2	Total
Kwh Output			
Net Kwh - LGE	2,672,799,000	64,257,000	2,737,056,000
IMEA	455,790,000	10,530,000	466,320,000
IMPA	486,774,000	11,187,000	497,961,000
Total Kwh Output	3,615,363,000	85,974,000	3,701,337,000
Production Costs ($)			
Fuel Costs:			
Coal, Including Freight	$ 80,776,283.92	$ 1,696,871.06	$ 82,473,154.98
Coal, Including Freight, Handling, Etc (2)	85,240,588.41	2,421,739.66	87,662,328.07
Total Fuel (2)	85,240,588.41	2,421,739.66	87,662,328.07
Other Operation Expenses	8,875,777.61	157,732.83	9,033,510.44
Maintenance	14,240,238.24	229,097.35	14,469,335.59
Rents	10,849.15	-	10,849.15
Total Production Expenses	$ 108,367,453.41	$ 2,808,569.84	$ 111,176,023.25
Cost per Net Kwh Output - Cents:			
Coal Including. Freight (1)	2.234	1.974	2.228
Coal Including Freight, Handling, Etc (1) (2)	2.358	2.817	2.368
Total All Fuel Costs (2)	2.358	2.817	2.368
Other Operation Expenses	0.246	0.183	0.244
Maintenance	0.394	0.266	0.391
Rents	-	-	-
Total Production Expenses	2.998	3.266	3.003
Quantities of Fuel Burned:			
Coal - Tons	1,654,066.50	35,130.56	1,689,197.06
Oil - Gallons - Start-up/Stabilization	1,365,638.00	325,327.00	1,690,965.00
MMBtu Burned:			
Coal	38,172,214.24	768,924.97	38,941,139.21
Oil - Start-up/Stabilization	191,189.24	45,545.82	236,735.06
Total MMBtu Burned	38,363,403.48	814,470.79	39,177,874.27
Average Btu per Net Kwh Output	10,611	9,473	10,585
Average Btu per Pound of Coal	11,539	10,944	11,527
Average Btu per Gallon of Oil	140,000	140,000	140,000
Cost Coal & Freight per MMBtu (Cents)	211.610	220.681	211.789
Total All Fuel Cost per MMBtu (2)	222.192	297.339	223.755
Cost of Coal & Freight per Ton ($)	48.835	48.302	48.824

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)

(3) Information on this report represents 100% generation, quantities used, and costs of Trimble County Unit #1 and 100% of LG&E's portion of Trimble County Unit #2

January 31, 2011

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
December 31, 2011

	Current Month		Year to Date		Year Ended Current Month	
Tyrone - Steam	This Year	Last Year	This Year	Last Year	This Year	Last Year
Kwh Output						
Net Kwh - Coal	(97,000)	26,218,000	22,022,000	137,167,000	22,022,000	137,167,000
Net Kwh - Oil	-	-	-	-	-	-
Total Kwh Output	(97,000)	26,218,000	22,022,000	137,167,000	22,022,000	137,167,000
Production Costs ($)						
Fuel Costs:						
Coal, Including Freight	$ -	$ 1,264,196.36	$ 1,219,816.51	$ 6,447,718.39	$ 1,219,816.51	$ 6,447,718.39
Coal, Including Freight, Handling, Etc (2)	1,715.98	1,326,072.09	1,395,692.86	6,952,081.25	1,395,692.86	6,952,081.25
Total Fuel (2)	1,715.98	1,326,072.09	1,395,692.86	6,952,081.25	1,395,692.86	6,952,081.25
Other Operation Expenses	30,816.18	145,631.61	888,868.58	1,178,048.25	888,868.58	1,178,048.25
Maintenance	17,677.36	43,883.06	299,923.49	1,053,911.82	299,923.49	1,053,911.82
Rents	-	-	-	-	-	-
Total Production Expenses	$ 50,209.52	$ 1,515,586.76	$ 2,584,484.93	$ 9,184,041.32	$ 2,584,484.93	$ 9,184,041.32
Cost per Net Kwh Output - Cents:						
Coal, Including Freight (1)	-	4.822	5.539	4.701	5.539	4.701
Coal Including Freight, Handling, Etc (1) (2)	(1.769)	5.058	6.338	5.068	6.338	5.068
Total All Fuel Costs (2)	(1.769)	5.058	6.338	5.068	6.338	5.068
Other Operation Expenses	(31.769)	0.555	4.036	0.859	4.036	0.859
Maintenance	(18.224)	0.167	1.362	0.768	1.362	0.768
Rents	-	-	-	-	-	-
Total Production Expenses	(51.762)	5.780	11.736	6.695	11.736	6.695
Quantities of Fuel Burned:						
Coal - Tons	-	13,349.20	12,671.40	72,111.00	12,671.40	72,111.00
Oil - Gallons - Start-up/Stabilization	-	14,600.00	37,050.00	73,398.00	37,050.00	73,398.00
MMBtu Burned:						
Coal	-	338,849.23	323,742.10	1,838,303.72	323,742.10	1,838,303.72
Oil - Start-up/Stabilization	-	2,044.00	5,187.00	10,275.72	5,187.00	10,275.72
Total MMBtu Burned	-	340,893.23	328,929.10	1,848,579.44	328,929.10	1,848,579.44
Average Btu per Net Kwh Output	-	13,002	14,936	13,477	14,936	13,477
Average Btu per Pound of Coal	-	12,692	12,775	12,746	12,775	12,746
Average Btu per Gallon of Oil	-	140,000	140,000	140,000	140,000	140,000
Cost Coal & Freight per MMBtu (Cents)	-	373.085	376.786	350.743	376.786	350.743
Total All Fuel Cost per MMBtu (2)	-	388.999	424.314	376.077	424.314	376.077
Cost of Coal & Freight Per Ton ($)	-	94.702	96.265	89.414	96.265	89.414

(1) Based on Kwh generated by coal or oil as applicable

(2) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

Attachment to Response to Sierra Club Question No. 6 (a)(b)(c)

January 26, 201

Witness Sinclair

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
December 31, 2011

	Year to Date		
Green River - Steam	Unit 3	Unit 4	Total
Kwh Output			
Net Kwh - Coal……………………………………	329,516,000	458,964,000	788,480,000
Total Kwh Output………………………………………	329,516,000	458,964,000	788,480,000
Production Costs ($)			
Fuel Costs:			
Coal, Including Freight…………………………………	$ 10,635,897.94	$ 13,541,513.51	$ 24,177,411.45
Coal, Including Freight, Handling, Etc (1)…………………	11,174,382.05	14,311,701.45	25,486,083.50
Total Fuel (1)…………………………………………	11,174,382.05	14,311,701.45	25,486,083.50
Other Operation Expenses …………………………	1,722,402.05	2,347,406.41	4,069,808.46
Maintenance ………………………………………	1,639,530.33	4,668,286.76	6,307,817.09
Rents………………………………………………	-	-	-
Total Production Expenses …………………………	$ 14,536,314.43	$ 21,327,394.62	$ 35,863,709.05
Cost per Net Kwh Output - Cents:			
Coal, Including Freight …………………………	3.228	2.950	3.066
Coal, Including Freight, Handling, Etc (1)…………	3.391	3.118	3.232
Total All Fuel Costs (1)………………………………	3.391	3.118	3.232
Other Operation Expenses…………………………	0.523	0.511	0.516
Maintenance………………………………………	0.498	1.017	0.800
Rents………………………………………………	-	-	-
Total Production Expenses…………………………	4.412	4.646	4.548
Quantities of Fuel Burned:			
Coal - Tons………………………………………	169,473.00	214,312.00	383,785.00
Oil - Gallons - Start-up/Stabilization…………………	82,171.00	110,738.00	192,909.00
MMBtu Burned:			
Coal………………………………………………	4,090,207.67	5,178,266.14	9,268,473.81
Oil - Start-up/Stabilization…………………………	11,503.94	15,503.32	27,007.26
Total MMBtu Burned ………………………………	4,101,711.61	5,193,769.46	9,295,481.07
Average Btu per Net Kwh Output…………………………	12,448	11,316	11,789

(1) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

January 26, 2012

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
December 31, 2011

	Year to Date			
EW Brown - Steam	Unit 1	Unit 2	Unit 3	Total
Kwh Output				
Net Kwh - Coal..	317,251,000	616,832,000	1,563,842,000	2,497,925,000
Total Kwh Output..	317,251,000	616,832,000	1,563,842,000	2,497,925,000
Production Costs ($)				
Fuel Costs:				
Coal, Including Freight...	$ 11,952,310.09	$ 22,126,923.81	$ 58,026,884.01	$ 92,106,117.91
Coal, Including Freight, Handling, Etc (1)..................	12,685,803.46	23,163,727.49	59,789,850.25	95,639,381.20
Total Fuel (1)...	12,685,803.46	23,163,727.49	59,789,850.25	95,639,381.20
Other Operation Expenses...	1,361,331.45	2,241,272.55	5,717,969.65	9,320,573.65
Maintenance...	2,373,077.55	4,177,149.42	7,109,295.20	13,659,522.17
Rents...	2,238.44	3,581.48	9,102.84	14,922.76
Total Production Expenses..	$ 16,422,450.90	$ 29,585,730.94	$ 72,626,217.94	$ 118,634,399.78
Cost per Net Kwh Output - Cents:				
Coal, Including Freight...	3.767	3.587	3.711	3.687
Coal, Including Freight, Handling, Etc (1)..................	3.999	3.755	3.823	3.829
Total All Fuel Costs (1)...	3.999	3.755	3.823	3.829
Other Operation Expenses...	0.429	0.363	0.366	0.373
Maintenance...	0.748	0.677	0.455	0.547
Rents...	0.001	0.001	0.001	0.002
Total Production Expenses..	5.177	4.796	4.645	4.751
Quantities of Fuel Burned:				
Coal - Tons...	163,976.00	286,081.00	744,530.00	1,194,587.00
Oil - Gallons - Start-up/Stabilization...........................	163,321.00	193,404.00	199,556.00	556,281.00
MMBtu Burned:				
Coal..	3,847,487.17	6,804,619.29	17,742,432.60	28,394,539.06
Oil - Start-up/Stabilization..	22,864.94	27,076.56	27,937.84	77,879.34
Total MMBtu Burned	3,870,352.11	6,831,695.85	17,770,370.44	28,472,418.40
Average Btu per Net Kwh Output...................................	12,200	11,075	11,363	11,398

(1) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
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	Year to Date				
Ghent - Steam	Unit 1	Unit 2	Unit 3	Unit 4	Total
Kwh Output					
Net Kwh - Coal...	3,394,813,000	3,345,081,000	2,866,840,000	2,899,005,000	12,505,739,000
Total Kwh Output...	3,394,813,000	3,345,081,000	2,866,840,000	2,899,005,000	12,505,739,000
Production Costs ($)					
Fuel Costs:					
Coal, Including Freight...	$ 79,272,884.66	$ 81,190,125.54	$ 68,938,843.71	$ 70,463,486.67	$ 299,865,340.58
Coal, Including Freight, Handling, Etc (1)..................	80,141,908.28	82,179,336.66	70,201,579.87	72,923,589.55	305,446,414.36
Total Fuel (1)...	80,141,908.28	82,179,336.66	70,201,579.87	72,923,589.55	305,446,414.36
Other Operation Expenses...	9,040,343.82	5,942,023.45	8,780,036.62	11,537,869.92	35,300,273.81
Maintenance..	9,497,921.46	6,761,335.69	18,188,486.93	6,901,577.36	41,349,321.44
Rents...	-	-	-	-	-
Total Production Expenses..	$ 98,680,173.56	$ 94,882,695.80	$ 97,170,103.42	$ 91,363,036.83	$ 382,096,009.61
Cost per Net Kwh Output - Cents:					
Coal, Including Freight...	2.335	2.427	2.405	2.431	2.398
Coal, Including Freight, Handling, Etc (1)..................	2.361	2.457	2.449	2.515	2.442
Total All Fuel Costs (1)...	2.361	2.457	2.449	2.515	2.442
Other Operation Expenses...	0.266	0.178	0.306	0.398	0.282
Maintenance..	0.280	0.202	0.634	0.238	0.331
Rents...	-	-	-	-	-
Total Production Expenses..	2.907	2.837	3.389	3.151	3.055
Quantities of Fuel Burned:					
Coal - Tons..	1,560,490.00	1,601,231.00	1,354,863.00	1,388,355.00	5,904,939.00
Oil - Gallons - Start-up/Stabilization...........................	143,561.00	177,623.00	265,867.00	375,509.00	962,560.00
MMBtu Burned:					
Coal..	35,957,258.13	36,893,931.77	31,210,727.04	31,994,949.26	136,056,866.20
Oil - Start-up/Stabilization..	20,098.54	24,867.22	37,221.38	52,571.26	134,758.40
Total MMBtu Burned..	35,977,356.67	36,918,798.99	31,247,948.42	32,047,520.52	136,191,624.60
Average Btu per Net Kwh Output...................................	10,598	11,037	10,900	11,055	10,890

(1) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
December 31, 2011

	Current Month		Year to Date		Year Ended Current Month	
Trimble County - Steam (3)	This Year	Last Year	This Year	Last Year	This Year	Last Year
Kwh Output						
Net Kwh - Coal..	256,770,000	120,425,000	2,791,871,000	273,933,000	2,791,871,000	273,933,000
IMEA..	42,238,000	19,453,000	459,156,000	44,892,000	459,156,000	44,892,000
IMPA..	44,940,000	20,678,000	488,140,000	47,694,000	488,140,000	47,694,000
Total Kwh Output..	343,948,000	160,556,000	3,739,167,000	366,519,000	3,739,167,000	366,519,000
Production Costs ($)						
Fuel Costs:						
Coal, Including Freight....................................	$ 7,234,927.40	$ 3,358,977.86	$ 77,472,242.75	$ 7,230,413.20	$ 77,472,242.75	$ 7,230,413.20
Coal, Including Freight, Handling, Etc (2)........	7,574,927.58	3,619,076.74	83,209,442.34	10,305,542.47	83,209,442.34	10,305,542.47
Total Fuel (2)..	7,574,927.58	3,619,076.74	83,209,442.34	10,305,542.47	83,209,442.34	10,305,542.47
Other Operation Expenses....................................	711,988.32	-	7,803,039.69	672,440.02	7,803,039.69	672,440.02
Maintenance..	612,517.19	-	6,308,824.75	861,524.14	6,308,824.75	861,524.14
Rents..	-	-	-	-	-	-
Total Production Expenses...................................	$ 8,899,433.09	$ 3,619,076.74	$ 97,321,306.78	$ 11,839,506.63	$ 97,321,306.78	$ 11,839,506.63
Cost per Net Kwh Output - Cents:						
Coal, Including Freight (1)...............................	2.103	2.092	2.072	1.973	2.072	1.973
Coal Including Freight, Handling, Etc (1) (2)....	2.202	2.254	2.225	2.812	2.225	2.812
Total All Fuel Costs (2)...................................	2.202	2.254	2.225	2.812	2.225	2.812
Other Operation Expenses....................................	0.207	-	0.209	0.183	0.209	0.183
Maintenance..	0.178	-	0.169	0.235	0.169	0.235
Rents..	-	-	-	-	-	-
Total Production Expenses...................................	2.587	2.254	2.603	3.230	2.603	3.230
Quantities of Fuel Burned:						
Coal - Tons..	152,026.09	71,977.16	1,637,009.09	149,700.16	1,637,009.09	149,700.16
Oil - Gallons - Start-up/Stabilization................	84,703.00	107,922.00	1,472,612.00	1,380,217.00	1,472,612.00	1,380,217.00
MMBtu Burned:						
Coal...	3,240,794.84	1,532,476.15	35,041,100.14	3,276,483.54	35,041,100.14	3,276,483.54
Oil - Start-up/Stabilization...............................	11,858.47	15,109.09	206,165.72	193,230.28	206,165.72	193,230.28
Total MMBtu Burned...	3,252,653.31	1,547,585.24	35,247,265.86	3,469,713.82	35,247,265.86	3,469,713.82
Average Btu per Net Kwh Output...............................	9,457	9,639	9,427	9,467	9,427	9,467
Average Btu per Pound of Coal............................	10,659	10,646	10,703	10,943	10,703	10,943
Average Btu per Gallon of Oil.............................	140,000	140,000	140,000	140,000	140,000	140,000
Cost Coal and Freight per MMBtu (Cents)...........	223.245	219.186	221.090	220.676	221.090	220.676
Total All Fuel Cost per MMBtu (2)......................	232.885	233.853	236.073	297.014	236.073	297.014
Cost of Coal and Freight Per Ton ($)...................	47.590	46.667	47.325	48.299	47.325	48.299

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)

(3) Information on this report represents 100% of KU's portion of Trimble County Unit #2 generation, quantities used, and costs of Trimble County Unit #2

Louisville Gas and Electric Company
Electric Generating Costs and Fuel Performance
December 31, 2011

Year to Date

Cane Run - Steam	Unit 4	Unit 5	Unit 6	Total
Kwh Output				
Net Kwh - Coal..	974,308,000	958,713,000	1,289,138,000	3,222,159,000
Production Costs ($)				
Fuel Costs:				
Coal, Including Freight..	$ 22,007,659.86	$ 20,154,458.60	$ 26,798,723.55	$ 68,960,842.01
Coal, Including Freight, Handling, Etc (2)............................	23,146,047.97	21,196,585.24	28,596,016.96	72,938,650.17
Total Fuel (2)..	23,146,047.97	21,196,585.24	28,596,016.96	72,938,650.17
Other Operation Expenses	7,371,386.63	7,211,994.17	11,855,942.17	26,439,322.97
Maintenance	3,396,607.20	6,075,763.31	4,281,481.84	13,753,852.35
Rents	2,524.50	2,805.00	4,020.50	9,350.00
Total Production Expenses	$ 33,916,566.30	$ 34,487,147.72	$ 44,737,461.47	$ 113,141,175.49
Fuel Costs - Cents				
Coal, Including Freight (1)	2.259	2.102	2.079	2.140
Coal and Other (1) (2)..	2.376	2.211	2.218	2.264
Total All Fuel Costs (2)...	2.376	2.211	2.218	2.264
Other Operation Expenses...	0.757	0.752	0.920	0.821
Maintenance...	0.349	0.634	0.332	0.427
Rents	0.000	0.000	0.000	0.000
Total Production Expenses.......................................	3.482	3.597	3.470	3.512
Quantities of Fuel Burned:				
Coal - Tons...	498,546.00	456,960.01	608,316.99	1,563,823.00
Gas - Mcf - Start-up/Stabilization................................	46,287.00	43,552.00	94,594.00	184,433.00
Oil - Gallons - Start-up/Stabilization..................................	-	-	-	-
MMBtu Burned:				
Coal..	11,066,458.23	10,137,987.65	13,503,631.90	34,708,077.78
Gas - Start-up/Stabilization...	47,444.26	44,641.18	96,958.04	189,043.48
Oil - Start-up/Stabilization...	-	-	-	-
Total MMBtu Burned	11,113,902.49	10,182,628.83	13,600,589.94	34,897,121.26
Average Btu per Net Kwh Output (Heat Rate)	11,407	10,621	10,550	10,830

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)

Louisville Gas and Electric Company
Electric Generating Costs and Fuel Performance
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	Year to Date				
Mill Creek - Steam	Unit 1	Unit 2	Unit 3	Unit 4	Total
Kwh Output					
Net Kwh - Coal..	2,044,330,000	1,980,508,000	1,878,796,000	3,160,051,000	9,063,685,000
Production Costs ($)					
Fuel Costs:					
Coal, Including Freight..	$ 42,525,040.40	$ 43,033,925.73	$ 39,271,501.75	$ 65,649,563.30	$ 190,480,031.18
Coal, Including Freight, Handling, Etc (2)..............................	43,865,485.75	44,559,707.29	41,712,257.31	68,815,619.91	198,953,070.26
Total Fuel (2)...	43,865,485.75	44,559,707.29	41,712,257.31	68,815,619.91	198,953,070.26
Other Operation Expenses	5,744,959.63	5,189,820.96	4,614,136.65	7,694,879.45	23,243,796.69
Maintenance	6,572,462.03	4,603,072.44	12,560,202.72	8,146,286.35	31,882,023.54
Rents..	15,183.00	15,183.00	18,798.00	23,136.00	72,300.00
Total Production Expenses	$ 56,198,090.41	$ 54,367,783.69	$ 58,905,394.68	$ 84,679,921.71	$ 254,151,190.49
Fuel Costs - Cents					
Coal, Including Freight (1)	2.080	2.173	2.090	2.077	2.102
Coal and Other (1) (2)...	2.146	2.250	2.220	2.178	2.195
Total All Fuel Costs (2)...	2.146	2.250	2.220	2.178	2.195
Other Operation Expenses...	0.281	0.262	0.246	0.244	0.256
Maintenance..	0.321	0.232	0.669	0.258	0.352
Rents..	0.001	0.001	0.001	0.001	0.001
Total Production Expenses.......................................	2.749	2.745	3.136	2.681	2.804
Quantities of Fuel Burned:					
Coal - Tons...	946,228.85	954,569.90	861,596.10	1,458,716.25	4,221,111.10
Gas - Mcf - Start-up/Stabilization................................	54,165.00	72,013.00	147,217.00	192,235.00	465,630.00
Oil - Gallons - Start-up/Stabilization....................................	-	-	-	-	-
MMBtu Burned:					
Coal..	21,665,806.25	21,861,836.39	19,720,103.11	33,401,351.69	96,649,097.44
Gas - Start-up/Stabilization...	55,518.21	73,814.93	150,898.74	197,040.38	477,272.26
Oil - Start-up/Stabilization...	-	-	-	-	-
Total MMBtu Burned	21,721,324.46	21,935,651.32	19,871,001.85	33,598,392.07	97,126,369.70
Average Btu per Net Kwh Output (Heat Rate)	10,625	11,076	10,576	10,632	10,716

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)

January 26, 2012

Louisville Gas and Electric Company
Electric Generating Costs and Fuel Performance
December 31, 2011

	Year to Date		
Trimble County - Steam (3)	Unit 1	Unit 2	Total
Kwh Output			
Net Kwh - LGE	2,350,170,000	654,882,000	3,005,052,000
IMEA	419,989,000	107,700,000	527,689,000
IMPA	441,880,000	114,503,000	556,383,000
Total Kwh Output	3,212,039,000	877,085,000	4,089,124,000
Production Costs ($)			
Fuel Costs:			
Coal, Including Freight	$ 74,409,865.26	$ 18,178,941.36	$ 92,588,806.62
Coal, Including Freight, Handling, Etc (2)	77,292,361.11	19,511,991.24	96,804,352.35
Total Fuel (2)	77,292,361.11	19,511,991.24	96,804,352.35
Other Operation Expenses	6,884,566.13	1,844,725.46	8,729,291.59
Maintenance	14,811,454.18	1,483,314.56	16,294,768.74
Rents	9,931.15	-	9,931.15
Total Production Expenses	$ 98,998,312.57	$ 22,840,031.26	$ 121,838,343.83
Cost per Net Kwh Output - Cents:			
Coal Including. Freight (1)	2.317	2.073	2.264
Coal Including Freight, Handling, Etc (1) (2)	2.406	2.225	2.367
Total All Fuel Costs (2)	2.406	2.225	2.367
Other Operation Expenses	0.214	0.210	0.213
Maintenance	0.461	0.169	0.398
Rents	0.000	-	0.000
Total Production Expenses	3.081	2.604	2.978
Quantities of Fuel Burned:			
Coal - Tons	1,493,805.55	384,124.74	1,877,930.29
Oil - Gallons - Start-up/Stabilization	623,566.00	345,432.00	968,998.00
MMBtu Burned:			
Coal	34,263,825.70	8,222,613.54	42,486,439.24
Oil - Start-up/Stabilization	87,299.24	48,360.51	135,659.75
Total MMBtu Burned	34,351,124.94	8,270,974.05	42,622,098.99
Average Btu per Net Kwh Output	10,694	9,430	10,423
Average Btu per Pound of Coal	11,469	10,703	11,312
Average Btu per Gallon of Oil	140,000	140,000	140,000
Cost Coal & Freight per MMBtu (Cents)	217.167	221.085	217.926
Total All Fuel Cost per MMBtu (2)	225.007	235.909	227.122
Cost of Coal & Freight per Ton ($)	49.812	47.326	49.304

(1) Based on Kwh generated by coal or gas as applicable
(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)
(3) Information on this report represents 100% generation, quantities used, and costs of Trimble County Unit #1 and 100% of LG&E's portion of Trimble County Unit #2

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
December 31, 2012

	Current Month		Year to Date		Year Ended Current Month	
Tyrone - Steam	This Year	Last Year	This Year	Last Year	This Year	Last Year
Kwh Output						
Net Kwh - Coal...	(89,000)	(97,000)	(1,407,000)	22,022,000	(1,407,000)	22,022,000
Net Kwh - Oil..	-	-	-	-	-	-
Total Kwh Output..	(89,000)	(97,000)	(1,407,000)	22,022,000	(1,407,000)	22,022,000
Production Costs ($)						
Fuel Costs:						
Coal, Including Freight..	$ -	$ -	$ -	$ 1,219,816.51	$ -	$ 1,219,816.51
Coal, Including Freight, Handling, Etc (2)................	1,891.82	1,715.98	35,824.23	1,395,692.86	35,824.23	1,395,692.86
Total Fuel (2)...	1,891.82	1,715.98	35,824.23	1,395,692.86	35,824.23	1,395,692.86
Other Operation Expenses	45,846.12	30,816.18	371,632.65	888,868.58	371,632.65	888,868.58
Maintenance	1,085.80	17,677.36	158,968.19	299,923.49	158,968.19	299,923.49
Rents...	-	-	-	-	-	-
Total Production Expenses..	$ 48,823.74	$ 50,209.52	$ 566,425.07	$ 2,584,484.93	$ 566,425.07	$ 2,584,484.93
Cost per Net Kwh Output - Cents:						
Coal, Including Freight (1).......................................	-	-	-	5.539	-	5.539
Coal Including Freight, Handling, Etc (1) (2)...........	(2.126)	(1.769)	(2.546)	6.338	(2.546)	6.338
Total All Fuel Costs (2)...	(2.126)	(1.769)	(2.546)	6.338	(2.546)	6.338
Other Operation Expenses...	(51.512)	(31.769)	(26.413)	4.036	(26.413)	4.036
Maintenance..	(1.220)	(18.224)	(11.298)	1.362	(11.298)	1.362
Rents...	-	-	-	-	-	-
Total Production Expenses..	(54.858)	(51.762)	(40.257)	11.736	(40.257)	11.736
Quantities of Fuel Burned:						
Coal - Tons..	-	-	-	12,671.40	-	12,671.40
Oil - Gallons - Start-up/Stabilization........................	-	-	-	37,050.00	-	37,050.00
MMBtu Burned:						
Coal...	-	-	-	323,742.10	-	323,742.10
Oil - Start-up/Stabilization.......................................	-	-	-	5,187.00	-	5,187.00
Total MMBtu Burned..	-	-	-	328,929.10	-	328,929.10
Average Btu per Net Kwh Output................................	-	-	-	14,936	-	14,936
Average Btu per Pound of Coal...................................	-	-	-	12,775	-	12,775
Average Btu per Gallon of Oil.....................................	-	-	-	140,000	-	140,000
Cost Coal & Freight per MMBtu (Cents)....................	-	-	-	376.786	-	376.786
Total All Fuel Cost per MMBtu (2).............................	-	-	-	424.314	-	424.314
Cost of Coal & Freight Per Ton ($).............................	-	-	-	96.265	-	96.265

(1) Based on Kwh generated by coal or oil as applicable
(2) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
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	Year to Date		
Green River - Steam	Unit 3	Unit 4	Total
Kwh Output			
Net Kwh - Coal..................…………….……………	270,773,000	635,500,000	906,273,000
Total Kwh Output................……………………………	270,773,000	635,500,000	906,273,000
Production Costs ($)			
Fuel Costs:			
Coal, Including Freight...........................…………	$ 9,485,399.09	$ 18,102,424.28	$ 27,587,823.37
Coal, Including Freight, Handling, Etc (1).................	10,073,746.88	19,046,397.25	29,120,144.13
Total Fuel (1)..............................…………………..	10,073,746.88	19,046,397.25	29,120,144.13
Other Operation Expenses ....…………….	1,266,780.17	2,769,323.68	4,036,103.85
Maintenance ....………………….	2,877,694.50	2,967,959.42	5,845,653.92
Rents...................................…………………………	-	-	-
Total Production Expenses ....………………	$ 14,218,221.55	$ 24,783,680.35	$ 39,001,901.90
Cost per Net Kwh Output - Cents:			
Coal, Including Freight ....…………….	3.503	2.849	3.044
Coal, Including Freight, Handling, Etc (1)………….	3.720	2.997	3.213
Total All Fuel Costs (1).....................………………	3.720	2.997	3.213
Other Operation Expenses......................…………….	0.468	0.436	0.445
Maintenance...................................…………………	1.063	0.467	0.645
Rents...................................…………………………	-	-	-
Total Production Expenses....................……………….	5.251	3.900	4.303
Quantities of Fuel Burned:			
Coal - Tons..................................………………….	159,343.00	310,510.00	469,853.00
Oil - Gallons - Start-up/Stabilization........................…	54,561.00	100,238.00	154,799.00
MMBtu Burned:			
Coal...…………………….	3,795,674.98	7,396,704.26	11,192,379.24
Oil - Start-up/Stabilization..........................………	7,638.54	14,033.32	21,671.86
Total MMBtu Burned ....………………	3,803,313.52	7,410,737.58	11,214,051.10
Average Btu per Net Kwh Output…..................................	14,046	11,661	12,374

(1) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

January 25, 2013

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
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	Year to Date			
EW Brown - Steam	Unit 1	Unit 2	Unit 3	Total
Kwh Output				
Net Kwh - Coal	324,035,000	721,085,000	1,323,503,000	2,368,623,000
Total Kwh Output	324,035,000	721,085,000	1,323,503,000	2,368,623,000
Production Costs ($)				
Fuel Costs:				
Coal, Including Freight	$ 11,748,921.54	$ 23,855,858.46	$ 45,499,367.56	$ 81,104,147.56
Coal, Including Freight, Handling, Etc (1)	12,529,145.32	24,909,929.03	47,373,280.38	84,812,354.73
Total Fuel (1)	12,529,145.32	24,909,929.03	47,373,280.38	84,812,354.73
Other Operation Expenses	1,449,153.78	3,039,111.93	5,317,225.84	9,805,491.55
Maintenance	3,971,953.18	3,732,698.06	14,411,908.06	22,116,559.30
Rents	2,428.92	3,886.27	9,877.59	16,192.78
Total Production Expenses	$ 17,952,681.20	$ 31,685,625.29	$ 67,112,291.87	$ 116,750,598.36
Cost per Net Kwh Output - Cents:				
Coal, Including Freight	3.626	3.308	3.438	3.424
Coal, Including Freight, Handling, Etc (1)	3.867	3.455	3.579	3.581
Total All Fuel Costs (1)	3.867	3.455	3.579	3.581
Other Operation Expenses	0.447	0.421	0.402	0.414
Maintenance	1.226	0.518	1.089	0.934
Rents	0.001	0.001	0.001	0.002
Total Production Expenses	5.541	4.395	5.071	4.931
Quantities of Fuel Burned:				
Coal - Tons	169,481.00	339,217.00	646,088.00	1,154,786.00
Oil - Gallons - Start-up/Stabilization	147,661.00	176,369.00	199,941.00	523,971.00
MMBtu Burned:				
Coal	3,898,580.52	7,824,139.09	14,885,581.37	26,608,300.98
Oil - Start-up/Stabilization	20,672.54	24,691.66	27,991.74	73,355.94
Total MMBtu Burned	3,919,253.06	7,848,830.75	14,913,573.11	26,681,656.92
Average Btu per Net Kwh Output	12,095	10,885	11,268	11,265

(1) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

January 25, 2013

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
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	Year to Date				
Ghent - Steam	Unit 1	Unit 2	Unit 3	Unit 4	Total
Kwh Output					
Net Kwh - Coal	3,166,600,000	3,052,544,000	3,302,452,000	2,653,566,000	12,175,162,000
Total Kwh Output	3,166,600,000	3,052,544,000	3,302,452,000	2,653,566,000	12,175,162,000
Production Costs ($)					
Fuel Costs:					
Coal, Including Freight	$ 76,117,596.36	$ 72,431,241.36	$ 80,720,976.26	$ 66,940,962.40	$ 296,210,776.38
Coal, Including Freight, Handling, Etc (1)	77,415,101.60	73,544,662.19	82,055,649.64	69,205,003.14	302,220,416.57
Total Fuel (1)	77,415,101.60	73,544,662.19	82,055,649.64	69,205,003.14	302,220,416.57
Other Operation Expenses	8,934,740.13	5,456,024.91	9,951,105.65	10,906,006.82	35,247,877.51
Maintenance	12,401,482.62	16,159,649.78	9,850,162.15	8,629,268.79	47,040,563.34
Rents	-	-	-	-	-
Total Production Expenses	$ 98,751,324.35	$ 95,160,336.88	$ 101,856,917.44	$ 88,740,278.75	$ 384,508,857.42
Cost per Net Kwh Output - Cents:					
Coal, Including Freight	2.404	2.373	2.444	2.523	2.433
Coal, Including Freight, Handling, Etc (1)	2.445	2.409	2.485	2.608	2.482
Total All Fuel Costs (1)	2.445	2.409	2.485	2.608	2.482
Other Operation Expenses	0.282	0.179	0.301	0.411	0.290
Maintenance	0.392	0.529	0.298	0.325	0.386
Rents	-	-	-	-	-
Total Production Expenses	3.119	3.117	3.084	3.344	3.158
Quantities of Fuel Burned:					
Coal - Tons	1,497,671.00	1,428,925.00	1,590,198.00	1,307,491.00	5,824,285.00
Oil - Gallons - Start-up/Stabilization	251,102.00	186,848.00	250,413.00	245,542.00	933,905.00
MMBtu Burned:					
Coal	33,863,883.02	32,355,067.66	35,976,953.24	29,567,721.26	131,763,625.18
Oil - Start-up/Stabilization	35,154.28	26,158.72	35,057.82	34,375.88	130,746.70
Total MMBtu Burned	33,899,037.30	32,381,226.38	36,012,011.06	29,602,097.14	131,894,371.88
Average Btu per Net Kwh Output	10,705	10,608	10,905	11,156	10,833

(1) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
December 31, 2012

	Current Month		Year to Date		Year Ended Current Month	
Trimble County - Steam (3)	This Year	Last Year	This Year	Last Year	This Year	Last Year
Kwh Output						
Net Kwh - Coal..	(5,749,000)	256,770,000	2,015,516,000	2,791,871,000	2,015,516,000	2,791,871,000
IMEA..	8,000	42,238,000	333,787,000	459,156,000	333,787,000	459,156,000
IMPA..	8,000	44,940,000	354,748,000	488,140,000	354,748,000	488,140,000
Total Kwh Output..	(5,733,000)	343,948,000	2,704,051,000	3,739,167,000	2,704,051,000	3,739,167,000
Production Costs ($)						
Fuel Costs:						
Coal, Including Freight....................................	$ 24,169.40	$ 7,234,927.40	$ 59,594,544.95	$ 77,472,242.75	$ 59,594,544.95	$ 77,472,242.75
Coal, Including Freight, Handling, Etc (2)........	573,103.33	7,574,927.58	65,140,300.11	83,209,442.34	65,140,300.11	83,209,442.34
Total Fuel (2)...	573,103.33	7,574,927.58	65,140,300.11	83,209,442.34	65,140,300.11	83,209,442.34
Other Operation Expenses....................................	500,422.42	711,988.32	8,662,361.63	7,803,039.69	8,662,361.63	7,803,039.69
Maintenance..	1,504,213.91	612,517.19	10,860,900.04	6,308,824.75	10,860,900.04	6,308,824.75
Rents..	-	-	-	-	-	-
Total Production Expenses...................................	$ 2,577,739.66	$ 8,899,433.09	$ 84,663,561.78	$ 97,321,306.78	$ 84,663,561.78	$ 97,321,306.78
Cost per Net Kwh Output - Cents:						
Coal, Including Freight (1)...............................	(0.422)	2.103	2.204	2.072	2.204	2.072
Coal Including Freight, Handling, Etc (1) (2)....	(9.997)	2.202	2.409	2.225	2.409	2.225
Total All Fuel Costs (2)...................................	(9.997)	2.202	2.409	2.225	2.409	2.225
Other Operation Expenses....................................	(8.729)	0.207	0.320	0.209	0.320	0.209
Maintenance..	(26.238)	0.178	0.402	0.169	0.402	0.169
Rents..	-	-	-	-	-	-
Total Production Expenses...................................	(44.964)	2.587	3.131	2.603	3.131	2.603
Quantities of Fuel Burned:						
Coal - Tons..	480.62	152,026.09	1,186,532.05	1,637,009.09	1,186,532.05	1,637,009.09
Oil - Gallons - Start-up/Stabilization................	129,275.00	84,703.00	1,426,397.00	1,472,612.00	1,426,397.00	1,472,612.00
MMBtu Burned:						
Coal...	10,270.38	3,240,794.84	25,352,319.82	35,041,100.14	25,352,319.82	35,041,100.14
Oil - Start-up/Stabilization...............................	18,098.52	11,858.47	199,695.59	206,165.72	199,695.59	206,165.72
Total MMBtu Burned..	28,368.90	3,252,653.31	25,552,015.41	35,247,265.86	25,552,015.41	35,247,265.86
Average Btu per Net Kwh Output........................	(4,948)	9,457	9,450	9,427	9,450	9,427
Average Btu per Pound of Coal............................	10,685	10,659	10,683	10,703	10,683	10,703
Average Btu per Gallon of Oil.............................	140,000	140,000	140,000	140,000	140,000	140,000
Cost Coal and Freight per MMBtu (Cents)...........	235.331	223.245	235.065	221.090	235.065	221.090
Total All Fuel Cost per MMBtu (2)......................	2,020.182	232.885	254.932	236.073	254.932	236.073
Cost of Coal and Freight Per Ton ($)....................	50.288	47.590	50.226	47.325	50.226	47.325

(1) Based on Kwh generated by coal or gas as applicable
(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)
(3) Information on this report represents 100% of KU's portion of Trimble County Unit #2 generation, quantities used, and costs of Trimble County Unit #2

Louisville Gas and Electric Company
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	Year to Date			
Cane Run - Steam	Unit 4	Unit 5	Unit 6	Total
Kwh Output				
Net Kwh - Coal..	653,072,000	928,589,000	1,084,657,000	2,666,318,000
Production Costs ($)				
Fuel Costs:				
Coal, Including Freight..	$ 17,179,507.85	$ 22,312,529.33	$ 25,840,587.99	$ 65,332,625.17
Coal, Including Freight, Handling, Etc (2)..................	18,391,960.94	23,288,813.95	26,978,376.57	68,659,151.46
Total Fuel (2)...	18,391,960.94	23,288,813.95	26,978,376.57	68,659,151.46
Other Operation Expenses	5,750,645.93	7,512,618.37	12,669,578.32	25,932,842.62
Maintenance	8,014,612.27	3,794,602.04	6,357,990.30	18,167,204.61
Rents	3,213.00	3,570.00	5,117.00	11,900.00
Total Production Expenses	$ 32,160,432.14	$ 34,599,604.36	$ 46,011,062.19	$ 112,771,098.69
Fuel Costs - Cents				
Coal, Including Freight (1)	2.631	2.403	2.382	2.450
Coal and Other (1) (2)...	2.816	2.508	2.487	2.575
Total All Fuel Costs (2).......................................	2.816	2.508	2.487	2.575
Other Operation Expenses...	0.881	0.809	1.168	0.973
Maintenance..	1.227	0.409	0.586	0.681
Rents	0.000	0.000	0.000	0.000
Total Production Expenses..	4.924	3.726	4.241	4.229
Quantities of Fuel Burned:				
Coal - Tons..	345,700.43	449,436.32	519,907.55	1,315,044.30
Gas - Mcf - Start-up/Stabilization..............................	60,106.00	36,760.00	39,517.00	136,383.00
Oil - Gallons - Start-up/Stabilization..........................	-	-	-	-
MMBtu Burned:				
Coal...	7,621,880.32	9,910,389.34	11,462,941.19	28,995,210.85
Gas - Start-up/Stabilization....................................	61,608.69	37,679.06	40,504.98	139,792.73
Oil - Start-up/Stabilization....................................	-	-	-	-
Total MMBtu Burned	7,683,489.01	9,948,068.40	11,503,446.17	29,135,003.58
Average Btu per Net Kwh Output (Heat Rate)	11,765	10,713	10,606	10,927

(1) Based on Kwh generated by coal or gas as applicable
(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)

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Louisville Gas and Electric Company
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	Year to Date				
Mill Creek - Steam	Unit 1	Unit 2	Unit 3	Unit 4	Total
Kwh Output					
Net Kwh - Coal	2,016,171,000	1,452,212,000	2,611,560,000	2,281,218,000	8,361,161,000
Production Costs ($)					
Fuel Costs:					
Coal, Including Freight	$ 49,450,175.97	$ 36,504,578.79	$ 62,834,530.92	$ 55,922,805.47	$ 204,712,091.15
Coal, Including Freight, Handling, Etc (2)	50,530,804.98	37,633,465.21	65,098,797.22	59,245,749.53	212,508,816.94
Total Fuel (2)	50,530,804.98	37,633,465.21	65,098,797.22	59,245,749.53	212,508,816.94
Other Operation Expenses	6,166,640.61	5,370,549.19	6,038,195.39	7,110,647.10	24,686,032.29
Maintenance	5,438,510.28	11,573,207.68	6,125,976.03	10,266,924.77	33,404,618.76
Rents	9,702.00	9,702.00	12,012.00	14,784.00	46,200.00
Total Production Expenses	$ 62,145,657.87	$ 54,586,924.08	$ 77,274,980.64	$ 76,638,105.40	$ 270,645,667.99
Fuel Costs - Cents					
Coal, Including Freight (1)	2.453	2.514	2.406	2.451	2.448
Coal and Other (1) (2)	2.506	2.591	2.493	2.597	2.542
Total All Fuel Costs (2)	2.506	2.591	2.493	2.597	2.542
Other Operation Expenses	0.306	0.370	0.231	0.312	0.295
Maintenance	0.270	0.797	0.235	0.450	0.400
Rents	0.000	0.001	0.000	0.001	0.001
Total Production Expenses	3.082	3.759	2.959	3.360	3.238
Quantities of Fuel Burned:					
Coal - Tons	936,736.20	688,687.55	1,189,467.15	1,064,326.05	3,879,216.95
Gas - Mcf - Start-up/Stabilization	17,821.00	24,847.00	115,246.00	204,934.00	362,848.00
Oil - Gallons - Start-up/Stabilization	-	-	-	-	-
MMBtu Burned:					
Coal	21,373,706.74	15,733,119.13	27,136,378.83	24,278,360.98	88,521,565.68
Gas - Start-up/Stabilization	18,266.59	25,468.23	118,127.20	210,057.40	371,919.42
Oil - Start-up/Stabilization	-	-	-	-	-
Total MMBtu Burned	21,391,973.33	15,758,587.36	27,254,506.03	24,488,418.38	88,893,485.10
Average Btu per Net Kwh Output (Heat Rate)	10,610	10,851	10,436	10,735	10,632

(1) Based on Kwh generated by coal or gas as applicable
(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)

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Louisville Gas and Electric Company
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	Year to Date		
Trimble County - Steam (3)	Unit 1	Unit 2	Total
Kwh Output			
Net Kwh - Coal	2,865,938,000	472,775,000	3,338,713,000
IMEA	493,160,000	78,296,000	571,456,000
IMPA	507,548,000	83,213,000	590,761,000
Total Kwh Output	3,866,646,000	634,284,000	4,500,930,000
Production Costs ($)			
Fuel Costs:			
Coal, Including Freight	$ 93,863,807.60	$ 13,978,958.21	$ 107,842,765.81
Coal, Including Freight, Handling, Etc (2)	96,198,904.89	15,522,667.12	111,721,572.01
Total Fuel (2)	96,198,904.89	15,522,667.12	111,721,572.01
Other Operation Expenses	8,327,802.65	2,031,910.89	10,359,713.54
Maintenance	9,519,780.36	1,929,269.56	11,449,049.92
Rents	11,269.74	-	11,269.74
Total Production Expenses	$ 114,057,757.64	$ 19,483,847.57	$ 133,541,605.21
Cost per Net Kwh Output - Cents:			
Coal Including. Freight (1)	2.428	2.204	2.396
Coal Including Freight, Handling, Etc (1) (2)	2.488	2.447	2.482
Total All Fuel Costs (2)	2.488	2.447	2.482
Other Operation Expenses	0.215	0.320	0.230
Maintenance	0.246	0.304	0.254
Rents	0.000	-	0.000
Total Production Expenses	2.949	3.071	2.966
Quantities of Fuel Burned:			
Coal - Tons	1,808,397.98	278,322.36	2,086,720.34
Oil - Gallons - Start-up/Stabilization	421,549.00	334,587.00	756,136.00
MMBtu Burned:			
Coal	41,347,558.15	5,946,843.16	47,294,401.31
Oil - Start-up/Stabilization	59,016.86	46,842.18	105,859.04
Total MMBtu Burned	41,406,575.01	5,993,685.34	47,400,260.35
Average Btu per Net Kwh Output	10,709	9,450	10,531
Average Btu per Pound of Coal	11,432	10,683	11,332
Average Btu per Gallon of Oil	140,000	140,000	140,000
Cost Coal & Freight per MMBtu (Cents)	227.012	235.065	228.024
Total All Fuel Cost per MMBtu (2)	232.328	258.984	235.698
Cost of Coal & Freight per Ton ($)	51.904	50.226	51.681

(1) Based on Kwh generated by coal or gas as applicable
(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)
(3) Information on this report represents 100% generation, quantities used, and costs of Trimble County Unit #1 and 100% of LG&E's portion of Trimble County Unit #2

January 25, 2013

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
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	Current Month		Year to Date		Year Ended Current Month	
Tyrone - Steam	This Year	Last Year	This Year	Last Year	This Year	Last Year
Kwh Output						
Net Kwh - Coal..	-	(89,000)	(114,000)	(1,407,000)	(114,000)	(1,407,000)
Net Kwh - Oil...	-	-	-	-	-	-
Total Kwh Output...	-	(89,000)	(114,000)	(1,407,000)	(114,000)	(1,407,000)
Production Costs ($)						
Fuel Costs:						
Coal, Including Freight..	$ -	$ -	$ -	$ -	$ -	$ -
Coal, Including Freight, Handling, Etc (2)................	-	1,891.82	79,556.50	35,824.23	79,556.50	35,824.23
Total Fuel (2)...	-	1,891.82	79,556.50	35,824.23	79,556.50	35,824.23
Other Operation Expenses	14,423.80	45,846.12	400,041.93	371,632.65	400,041.93	371,632.65
Maintenance	-	1,085.80	6,519.06	158,968.19	6,519.06	158,968.19
Rents...	-	-	-	-	-	-
Total Production Expenses..	$ 14,423.80	$ 48,823.74	$ 486,117.49	$ 566,425.07	$ 486,117.49	$ 566,425.07
Cost per Net Kwh Output - Cents:						
Coal, Including Freight (1).......................................	-	-	-	-	-	-
Coal Including Freight, Handling, Etc (1) (2)...........	-	(2.126)	(69.786)	(2.546)	(69.786)	(2.546)
Total All Fuel Costs (2)...	-	(2.126)	(69.786)	(2.546)	(69.786)	(2.546)
Other Operation Expenses...	-	(51.512)	(350.914)	(26.413)	(350.914)	(26.413)
Maintenance..	-	(1.220)	(5.718)	(11.298)	(5.718)	(11.298)
Rents...	-	-	-	-	-	-
Total Production Expenses..	-	(54.858)	(426.419)	(40.258)	(426.419)	(40.258)
Quantities of Fuel Burned:						
Coal - Tons..	-	-	-	-	-	-
Oil - Gallons - Start-up/Stabilization........................	-	-	-	-	-	-
MMBtu Burned:						
Coal...	-	-	-	-	-	-
Oil - Start-up/Stabilization..	-	-	-	-	-	-
Total MMBtu Burned..	-	-	-	-	-	-
Average Btu per Net Kwh Output................................	-	-	-	-	-	-
Average Btu per Pound of Coal...................................	-	-	-	-	-	-
Average Btu per Gallon of Oil.....................................	-	-	-	-	-	-
Cost Coal & Freight per MMBtu (Cents)....................	-	-	-	-	-	-
Total All Fuel Cost per MMBtu (2).............................	-	-	-	-	-	-
Cost of Coal & Freight Per Ton ($).............................	-	-	-	-	-	-

(1) Based on Kwh generated by coal or oil as applicable
(2) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

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Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
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	Year to Date		
Green River - Steam	Unit 3	Unit 4	Total
Kwh Output			
Net Kwh - Coal.................……………..……………	310,970,000	652,894,000	963,864,000
Total Kwh Output...............……………………………	310,970,000	652,894,000	963,864,000
Production Costs ($)			
Fuel Costs:			
Coal, Including Freight...........................…………	$ 9,848,005.71	$ 17,761,912.35	$ 27,609,918.06
Coal, Including Freight, Handling, Etc (1).................	10,340,877.35	18,572,022.11	28,912,899.46
Total Fuel (1)...............................…………………..	10,340,877.35	18,572,022.11	28,912,899.46
Other Operation Expenses ....…………….	1,495,993.67	2,809,000.31	4,304,993.98
Maintenance ....………………….	2,022,457.24	4,189,093.45	6,211,550.69
Rents...................................…………………………	-	-	-
Total Production Expenses ....………………	$ 13,859,328.26	$ 25,570,115.87	$ 39,429,444.13
Cost per Net Kwh Output - Cents:			
Coal, Including Freight ....………………	3.167	2.720	2.865
Coal, Including Freight, Handling, Etc (1)……………	3.325	2.845	3.000
Total All Fuel Costs (1).....................………………	3.325	2.845	3.000
Other Operation Expenses......................………………	0.481	0.430	0.447
Maintenance...................................……………………	0.650	0.642	0.644
Rents...................................…………………………	-	-	-
Total Production Expenses....................……………….	4.457	3.916	4.091
Quantities of Fuel Burned:			
Coal - Tons...................................…………………	171,867.00	309,791.00	481,658.00
Oil - Gallons - Start-up/Stabilization.........................…	42,877.00	86,836.00	129,713.00
MMBtu Burned:			
Coal...……………………..	4,034,104.39	7,270,713.73	11,304,818.12
Oil - Start-up/Stabilization..........................……….	6,002.78	12,157.04	18,159.82
Total MMBtu Burned ....………………	4,040,107.17	7,282,870.77	11,322,977.94
Average Btu per Net Kwh Output…................................	12,992	11,155	11,747

(1) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

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Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
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	Year to Date			
EW Brown - Steam	Unit 1	Unit 2	Unit 3	Total
Kwh Output				
Net Kwh - Coal...	378,905,000	875,868,000	1,599,752,000	2,854,525,000
Total Kwh Output...	378,905,000	875,868,000	1,599,752,000	2,854,525,000
Production Costs ($)				
Fuel Costs:				
Coal, Including Freight...	$ 13,706,374.56	$ 28,392,146.19	$ 54,427,800.52	$ 96,526,321.27
Coal, Including Freight, Handling, Etc (1).................	14,403,930.11	29,195,232.60	56,256,697.75	99,855,860.46
Total Fuel (1)...	14,403,930.11	29,195,232.60	56,256,697.75	99,855,860.46
Other Operation Expenses...	1,627,893.21	3,191,828.61	7,670,937.59	12,490,659.41
Maintenance..	2,629,202.28	4,073,442.15	7,366,516.63	14,069,161.06
Rents...	1,786.90	2,859.03	7,266.72	11,912.65
Total Production Expenses..	$ 18,662,812.50	$ 36,463,362.39	$ 71,301,418.69	$ 126,427,593.58
Cost per Net Kwh Output - Cents:				
Coal, Including Freight...	3.617	3.242	3.402	3.382
Coal, Including Freight, Handling, Etc (1).................	3.801	3.333	3.517	3.498
Total All Fuel Costs (1)...	3.801	3.333	3.517	3.498
Other Operation Expenses...	0.430	0.364	0.480	0.438
Maintenance..	0.694	0.465	0.460	0.493
Rents...	0.000	0.000	0.000	0.000
Total Production Expenses..	4.925	4.163	4.457	4.429
Quantities of Fuel Burned:				
Coal - Tons..	199,731.00	411,928.00	794,623.00	1,406,282.00
Oil - Gallons - Start-up/Stabilization..........................	123,877.00	99,487.00	185,390.00	408,754.00
MMBtu Burned:				
Coal..	4,541,881.80	9,382,989.23	18,068,111.74	31,992,982.77
Oil - Start-up/Stabilization..	17,342.78	13,928.18	25,954.60	57,225.56
Total MMBtu Burned	4,559,224.58	9,396,917.41	18,094,066.34	32,050,208.33
Average Btu per Net Kwh Output.................................	12,033	10,729	11,311	11,228

(1) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

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Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
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	Year to Date				
Ghent - Steam	Unit 1	Unit 2	Unit 3	Unit 4	Total
Kwh Output					
Net Kwh - Coal...	3,334,601,000	3,513,063,000	3,294,839,000	3,011,140,000	13,153,643,000
Total Kwh Output...	3,334,601,000	3,513,063,000	3,294,839,000	3,011,140,000	13,153,643,000
Production Costs ($)					
Fuel Costs:					
Coal, Including Freight..	$ 77,777,785.76	$ 81,386,705.06	$ 79,532,631.63	$ 72,302,670.40	$ 310,999,792.85
Coal, Including Freight, Handling, Etc (1).................	78,874,602.60	82,411,055.54	80,923,698.38	74,804,746.92	317,014,103.44
Total Fuel (1)..	78,874,602.60	82,411,055.54	80,923,698.38	74,804,746.92	317,014,103.44
Other Operation Expenses...	9,252,868.20	6,267,770.53	9,613,630.75	12,893,948.23	38,028,217.71
Maintenance..	10,380,952.50	6,741,666.14	6,500,320.24	9,327,737.79	32,950,676.67
Rents...	-	-	-	-	-
Total Production Expenses..	$ 98,508,423.30	$ 95,420,492.21	$ 97,037,649.37	$ 97,026,432.94	$ 387,992,997.82
Cost per Net Kwh Output - Cents:					
Coal, Including Freight..	2.332	2.317	2.414	2.401	2.364
Coal, Including Freight, Handling, Etc (1).................	2.365	2.346	2.456	2.484	2.410
Total All Fuel Costs (1)...	2.365	2.346	2.456	2.484	2.410
Other Operation Expenses...	0.277	0.178	0.292	0.428	0.289
Maintenance..	0.311	0.192	0.197	0.310	0.251
Rents...	-	-	-	-	-
Total Production Expenses..	2.954	2.716	2.945	3.222	2.950
Quantities of Fuel Burned:					
Coal - Tons...	1,594,244.00	1,666,171.00	1,617,865.00	1,474,696.00	6,352,976.00
Oil - Gallons - Start-up/Stabilization..........................	181,896.00	152,633.00	259,539.00	299,847.00	893,915.00
MMBtu Burned:					
Coal..	35,935,318.77	37,555,823.76	36,469,488.91	33,233,322.67	143,193,954.11
Oil - Start-up/Stabilization..	25,465.44	21,368.62	36,335.46	41,978.58	125,148.10
Total MMBtu Burned..	35,960,784.21	37,577,192.38	36,505,824.37	33,275,301.25	143,319,102.21
Average Btu per Net Kwh Output.................................	10,784	10,696	11,080	11,051	10,896

(1) Also includes oil used for firing, disposal of bottom ash and fly ash (net)

Kentucky Utilities Company
Electric Generating Costs and Fuel Performance
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	Current Month		Year to Date		Year Ended Current Month	
Trimble County - Steam (3)	This Year	Last Year	This Year	Last Year	This Year	Last Year
Kwh Output						
Net Kwh - Coal..	265,414,000	(5,749,000)	2,533,399,000	2,015,516,000	2,533,399,000	2,015,516,000
IMEA...	41,894,000	8,000	415,990,000	333,787,000	415,990,000	333,787,000
IMPA...	44,601,000	8,000	442,368,000	354,748,000	442,368,000	354,748,000
Total Kwh Output..	351,909,000	(5,733,000)	3,391,757,000	2,704,051,000	3,391,757,000	2,704,051,000
Production Costs ($)						
Fuel Costs:						
Coal, Including Freight....................................	$ 7,445,978.29	$ 24,169.40	$ 75,544,052.21	59,594,544.95	$ 75,544,052.21	$ 59,594,544.95
Coal, Including Freight, Handling, Etc (2)........	8,159,035.50	573,103.33	80,468,330.55	65,140,300.11	80,468,330.55	65,140,300.11
Total Fuel (2)...	8,159,035.50	573,103.33	80,468,330.55	65,140,300.11	80,468,330.55	65,140,300.11
Other Operation Expenses....................................	1,195,340.13	500,422.42	9,383,355.55	8,662,361.63	9,383,355.55	8,662,361.63
Maintenance..	531,934.94	1,504,213.91	9,476,099.85	10,860,900.04	9,476,099.85	10,860,900.04
Rents..	-	-	-	-	-	-
Total Production Expenses...................................	$ 9,886,310.57	$ 2,577,739.66	$ 99,327,785.95	$ 84,663,561.78	$ 99,327,785.95	$ 84,663,561.78
Cost per Net Kwh Output - Cents:						
Coal, Including Freight (1)...............................	2.116	(0.422)	2.227	2.204	2.227	2.204
Coal Including Freight, Handling, Etc (1) (2)....	2.319	(9.997)	2.372	2.409	2.372	2.409
Total All Fuel Costs (2)...................................	2.319	(9.997)	2.372	2.409	2.372	2.409
Other Operation Expenses....................................	0.340	(8.729)	0.277	0.320	0.277	0.320
Maintenance..	0.151	(26.238)	0.279	0.402	0.279	0.402
Rents..	-	-	-	-	-	-
Total Production Expenses...................................	2.809	(44.963)	2.929	3.131	2.929	3.131
Quantities of Fuel Burned:						
Coal - Tons..	149,194.21	480.62	1,481,791.82	1,186,532.05	1,481,791.82	1,186,532.05
Oil - Gallons - Start-up/Stabilization................	198,731.88	129,275.19	1,149,446.70	1,426,397.04	1,149,446.70	1,426,397.04
MMBtu Burned:						
Coal...	3,188,151.37	10,270.38	31,611,456.58	25,352,319.82	31,611,456.58	25,352,319.82
Oil - Start-up/Stabilization...............................	27,822.47	18,098.52	160,922.57	199,695.59	160,922.57	199,695.59
Total MMBtu Burned..	3,215,973.84	28,368.90	31,772,379.15	25,552,015.41	31,772,379.15	25,552,015.41
Average Btu per Net Kwh Output........................	9,139	(4,948)	9,368	9,450	9,368	9,450
Average Btu per Pound of Coal............................	10,685	10,685	10,667	10,683	10,667	10,683
Average Btu per Gallon of Oil.............................	140,000	140,000	140,000	140,000	140,000	140,000
Cost Coal and Freight per MMBtu (Cents)...........	233.552	235.331	238.977	235.065	238.977	235.065
Total All Fuel Cost per MMBtu (2)......................	253.703	2,020.182	253.265	254.932	253.265	254.932
Cost of Coal and Freight Per Ton ($)....................	49.908	50.288	50.982	50.226	50.982	50.226

(1) Based on Kwh generated by coal or gas as applicable
(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)
(3) Information on this report represents 100% of KU's portion of Trimble County Unit #2 generation, quantities used, and costs of Trimble County Unit #2

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	Year to Date			
Cane Run - Steam	Unit 4	Unit 5	Unit 6	Total
Kwh Output				
Net Kwh - Coal..	696,703,000	864,302,000	995,291,000	2,556,296,000
Production Costs ($)				
Fuel Costs:				
Coal, Including Freight...	$ 17,363,230.82	$ 20,426,142.22	$ 23,423,937.64	$ 61,213,310.68
Coal, Including Freight, Handling, Etc (2)............................	18,715,875.72	21,400,877.74	24,661,496.62	64,778,250.08
Total Fuel (2)...	18,715,875.72	21,400,877.74	24,661,496.62	64,778,250.08
Other Operation Expenses	6,270,348.96	7,365,482.69	10,989,291.05	24,625,122.70
Maintenance	3,175,020.46	4,357,975.87	4,882,337.94	12,415,334.27
Rents	2,295.00	2,550.00	3,655.00	8,500.00
Total Production Expenses	$ 28,163,540.14	$ 33,126,886.30	$ 40,536,780.61	$ 101,827,207.05
Fuel Costs - Cents				
Coal, Including Freight (1)	2.492	2.363	2.353	2.395
Coal and Other (1) (2)...	2.686	2.476	2.478	2.534
Total All Fuel Costs (2)..	2.686	2.476	2.478	2.534
Other Operation Expenses...	0.900	0.852	1.104	0.963
Maintenance...	0.456	0.504	0.491	0.486
Rents	0.000	0.000	0.000	0.000
Total Production Expenses......................................	4.042	3.833	4.073	3.983
Quantities of Fuel Burned:				
Coal - Tons...	360,686.07	422,154.96	486,422.18	1,269,263.21
Gas - Mcf - Start-up/Stabilization................................	51,390.00	30,798.00	35,026.00	117,214.00
Oil - Gallons - Start-up/Stabilization..................................	-	-	-	-
MMBtu Burned:				
Coal..	7,999,400.44	9,353,146.30	10,780,444.32	28,132,991.06
Gas - Start-up/Stabilization...	52,674.80	31,568.01	35,901.71	120,144.52
Oil - Start-up/Stabilization...	-	-	-	-
Total MMBtu Burned	8,052,075.24	9,384,714.31	10,816,346.03	28,253,135.58
Average Btu per Net Kwh Output (Heat Rate)	11,557	10,858	10,868	11,052

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)

Louisville Gas and Electric Company
Electric Generating Costs and Fuel Performance
December 31, 2013

	Year to Date				
Mill Creek - Steam	Unit 1	Unit 2	Unit 3	Unit 4	Total
Kwh Output					
Net Kwh - Coal..	1,466,563,000	1,898,669,000	2,212,407,000	2,709,274,000	8,286,913,000
Production Costs ($)					
Fuel Costs:					
Coal, Including Freight..	$ 36,665,281.60	$ 47,853,690.86	$ 55,086,533.90	$ 68,840,460.44	$ 208,445,966.80
Coal, Including Freight, Handling, Etc (2)............................	38,072,239.83	49,279,774.99	57,701,723.00	72,520,187.47	217,573,925.29
Total Fuel (2)...	38,072,239.83	49,279,774.99	57,701,723.00	72,520,187.47	217,573,925.29
Other Operation Expenses	5,787,185.49	5,777,151.80	5,402,306.65	7,458,956.49	24,425,600.43
Maintenance	12,414,517.14	4,658,317.62	11,644,864.55	8,305,130.68	37,022,829.99
Rents...	9,345.00	9,345.00	11,570.00	14,240.00	44,500.00
Total Production Expenses	$ 56,283,287.46	$ 59,724,589.41	$ 74,760,464.20	$ 88,298,514.64	$ 279,066,855.71
Fuel Costs - Cents					
Coal, Including Freight (1)	2.500	2.520	2.490	2.541	2.515
Coal and Other (1) (2)...	2.596	2.595	2.608	2.677	2.626
Total All Fuel Costs (2)..	2.596	2.595	2.608	2.677	2.626
Other Operation Expenses..	0.395	0.304	0.244	0.275	0.295
Maintenance..	0.847	0.245	0.526	0.307	0.447
Rents...	0.001	0.000	0.001	0.001	0.001
Total Production Expenses......................................	3.838	3.146	3.379	3.259	3.368
Quantities of Fuel Burned:					
Coal - Tons..	669,720.35	870,281.55	995,862.15	1,251,685.30	3,787,549.35
Gas - Mcf - Start-up/Stabilization................................	46,815.00	49,078.00	149,082.00	219,066.00	464,041.00
Oil - Gallons - Start-up/Stabilization..................................	-	-	-	-	-
MMBtu Burned:					
Coal...	15,582,516.04	20,210,141.90	23,076,867.98	29,108,955.11	87,978,481.03
Gas - Start-up/Stabilization..	47,985.43	50,304.98	152,809.10	224,542.72	475,642.23
Oil - Start-up/Stabilization..	-	-	-	-	-
Total MMBtu Burned	15,630,501.47	20,260,446.88	23,229,677.08	29,333,497.83	88,454,123.26
Average Btu per Net Kwh Output (Heat Rate)	10,658	10,671	10,500	10,827	10,674

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)

Louisville Gas and Electric Company
Electric Generating Costs and Fuel Performance
December 31, 2013

	Year to Date		
Trimble County - Steam (3)	Unit 1	Unit 2	Total
Kwh Output			
Net Kwh - Coal	2,539,649,000	594,254,000	3,133,903,000
IMEA	457,014,000	97,579,000	554,593,000
IMPA	476,175,000	103,765,000	579,940,000
Total Kwh Output	3,472,838,000	795,598,000	4,268,436,000
Production Costs ($)			
Fuel Costs:			
Coal, Including Freight	$ 87,886,473.14	$ 17,467,924.06	$ 105,354,397.20
Coal, Including Freight, Handling, Etc (2)	90,374,965.04	18,642,847.71	109,017,812.75
Total Fuel (2)	90,374,965.04	18,642,847.71	109,017,812.75
Other Operation Expenses	8,580,582.04	2,200,852.74	10,781,434.78
Maintenance	12,365,145.36	2,222,094.39	14,587,239.75
Rents	1,873.90	-	1,873.90
Total Production Expenses	$ 111,322,566.34	$ 23,065,794.84	$ 134,388,361.18
Cost per Net Kwh Output - Cents:			
Coal Including. Freight (1)	2.531	2.196	2.468
Coal Including Freight, Handling, Etc (1) (2)	2.602	2.343	2.554
Total All Fuel Costs (2)	2.602	2.343	2.554
Other Operation Expenses	0.247	0.277	0.253
Maintenance	0.356	0.279	0.342
Rents	0.000	-	0.000
Total Production Expenses	3.206	2.899	3.148
Quantities of Fuel Burned:			
Coal - Tons	1,635,232.49	347,868.17	1,983,100.66
Oil - Gallons - Start-up/Stabilization	478,098.00	269,623.30	747,721.30
MMBtu Burned:			
Coal	37,309,250.78	7,421,169.51	44,730,420.29
Oil - Start-up/Stabilization	66,933.72	37,747.26	104,680.98
Total MMBtu Burned	37,376,184.50	7,458,916.77	44,835,101.27
Average Btu per Net Kwh Output	10,762	9,375	10,504
Average Btu per Pound of Coal	11,408	10,667	11,278
Average Btu per Gallon of Oil	140,000	140,000	140,000
Cost Coal & Freight per MMBtu (Cents)	235.562	235.380	235.532
Total All Fuel Cost per MMBtu (2)	241.798	249.940	243.153
Cost of Coal & Freight per Ton ($)	53.746	50.214	53.126

(1) Based on Kwh generated by coal or gas as applicable

(2) Also includes oil and gas used for firing, disposal of bottom ash and fly ash (net)

(3) Information on this report represents 100% generation, quantities used, and costs of Trimble County Unit #1 and 100% of LG&E's portion of Trimble County Unit #2

Attachment to Response to Sierra Club Question No. 6(d)
Page 1 of 1
Witness Sinclair

LKE capital 2005-2013 - Accounts 107001,108799,108901
$000's

	Capital								
	2005	2006	2007	2008	2009	2010	2011	2012	2013
STEAM									
Ghent	36,178	163,967	292,750	161,378	66,664	53,277	86,727	210,985	351,070
GH Common	3,198	34,673	90,527	13,014	16,464	13,840	61,816	131,364	95,657
GH1	1,838	9,037	13,281	1,609	2,631	10,841	3,031	13,310	50,302
GH1&2	52	26	9	52	1	-	287	16	59
GH2	3,711	10,562	47,018	89,388	42,850	743	10,900	27,451	22,777
GH3	25,682	66,528	56,530	10,983	1,190	6,539	7,118	25,384	99,850
GH3&4	87	28	82	4	21	20	15	-	977
GH4	1,610	43,112	85,304	46,328	3,507	21,293	3,560	13,460	81,447
Brown	12,781	20,885	128,113	148,759	141,246	107,738	67,293	62,778	38,580
BR Common	2,216	16,253	119,284	141,493	133,091	70,373	4,433	6,505	5,321
BR1	220	1,987	4,425	1,647	896	2,267	1,741	688	1,178
BR1&2	43	205	(0)	149	-	70	366	49	9
BR2	625	163	497	3,537	5,849	2,405	4,893	540	2,321
BR2&3	18	-	-	-	-	-	17	-	-
BR3	9,660	2,277	3,907	1,934	1,410	32,622	55,842	54,995	29,751
Green River	2,519	1,602	359	1,066	383	2,787	705	1,265	526
GR Common	1,688	357	(58)	338	172	696	311	938	60
GR1&2	-	-	-	18	-	(96)	-	-	-
GR3	42	505	129	224	114	1,292	26	162	(13)
GR4	789	740	287	485	97	896	367	165	479
Tyrone	1,269	1,348	623	1,263	163	77	8	-	4,001
Pineville	-	-	-	-	-	-	-	222	(0)
Mill Creek	14,496	19,750	12,243	16,667	14,945	28,243	33,337	89,948	282,333
MC Common	947	440	354	111	174	(218)	1,119	(1,043)	363
MC1	722	2,424	1,010	7,102	(200)	3,349	1,166	21,226	67,019
MC2	3,177	810	2,123	217	5,360	5,280	8,644	21,446	36,709
MC3	274	2,867	6,429	691	2,019	4,112	10,379	11,533	52,700
MC4	9,376	13,210	2,327	8,546	7,593	15,720	12,030	36,786	125,543
Cane Run	5,834	9,387	7,303	7,224	7,872	8,554	4,104	1,463	8,611
CR Common	606	2,064	3	409	1,369	921	301	294	62
CR3	(31)	-	-	-	-	-	-	-	-
CR4	833	967	124	499	962	495	535	603	1,351
CR5	1,808	512	2,049	4,267	1,218	400	489	369	400
CR6	2,619	5,844	5,138	2,048	4,322	6,738	2,778	197	6,798
CR1&2	-	-	(12)	-	-	-	-	-	-
Trimble County	16,693	121,190	308,236	276,054	177,841	39,060	28,916	39,850	22,733
TC common	(73)	830	343	1,316	558	853	(95)	13	38
TC1	12,517	8,211	19,610	1,583	7,490	6,140	9,225	5,250	15,074
TC2	4,248	112,150	288,283	273,155	169,793	32,067	19,786	34,587	7,620
Total Steam	89,769	338,130	749,626	612,412	409,115	239,735	221,089	406,510	707,852

Attachment to Response to PSC-1 Question No. 6(e)
1 of 3
Sinclair

Station	Unit	Average Net Heat Rate (Btu/Kwh) 2004	Average Net Heat Rate (Btu/Kwh) 2005	Average Net Heat Rate (Btu/Kwh) 2006	Average Net Heat Rate (Btu/Kwh) 2007	Average Net Heat Rate (Btu/Kwh) 2008	Average Net Heat Rate (Btu/Kwh) 2009	Average Net Heat Rate (Btu/Kwh) 2010	Average Net Heat Rate (Btu/Kwh) 2011	Average Net Heat Rate (Btu/Kwh) 2012	Average Net Heat Rate (Btu/Kwh) 2013
		(Q.1.6.e.)	(Q.1.6.e.)	(Q.1.6.e.)	(Q.1.6.e.)	(Q.1.6.e.)	(Q.1.6.e.)	(Q.1.6.e.)	(Q.1.6.e.)	(Q.1.6.e.)	(Q.1.6.e.)
Brown	1	10,994	11,115	11,318	11,167	11,063	11,682	11,064	12,021	12,092	12,026
Brown	2	10,330	10,082	10,256	10,354	10,282	10,414	10,293	10,825	10,710	10,457
Brown	3	10,521	10,538	10,453	10,291	10,321	10,534	10,815	11,154	11,267	11,308
Brown	5	0	12,265	13,389	15,582	21,983	23,867	17,401	24,738	18,529	24,324
Brown	6	14,551	10,832	11,177	11,519	13,439	12,583	13,095	14,822	11,507	9,689
Brown	7	12,364	11,222	10,986	11,744	12,075	11,546	13,698	12,977	11,560	12,117
Brown	8	0	18,923	13,775	14,816	17,485	17,357	17,650	20,569	21,175	20,979
Brown	9	0	24,969	15,031	15,524	19,714	28,521	19,671	22,337	17,585	17,924
Brown	10	32,847	24,433	15,257	21,431	27,104	20,463	20,873	31,003	23,499	38,448
Brown	11	62,734	19,121	15,615	15,911	44,845	18,038	16,941	38,470	18,458	31,950
Cane Run	4	11,043	10,897	10,469	9,907	10,776	10,830	10,418	10,602	11,764	11,556
Cane Run	5	10,887	10,532	11,030	11,227	10,495	10,648	10,748	10,720	10,713	10,858
Cane Run	6	10,387	10,234	10,491	10,556	10,602	10,823	10,718	10,593	11,286	10,841
Cane Run	11	32,988	21,437	9,511	42,849	84,423	20,943	144,188	21,328	28,638	38,642
Dix Dam	1	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---
Dix Dam	2	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---
Dix Dam	3	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---
Ghent	1	10,371	10,303	10,628	10,647	10,653	10,437	10,329	10,413	10,705	10,784
Ghent	2	10,308	10,232	10,145	10,158	10,323	10,465	10,399	10,905	10,608	10,696
Ghent	3	10,546	10,671	10,957	10,896	10,998	11,131	10,801	10,768	10,905	11,080
Ghent	4	10,298	10,110	10,664	10,679	10,797	10,988	10,887	10,900	11,156	11,051
Green River	3	12,995	14,411	12,746	12,522	11,936	11,942	11,929	12,426	14,058	13,154
Green River	4	11,532	14,726	11,339	11,175	11,067	11,278	11,043	11,485	11,668	11,311
Haefling	1	0	0	0	0	0	0	--,---	--,---	--,---	--,---
Haefling	2	0	0	0	0	0	0	--,---	--,---	--,---	--,---
Mill Creek	1	10,552	10,446	10,567	10,493	10,646	10,639	10,684	10,622	10,607	10,658
Mill Creek	2	10,682	10,956	10,895	10,695	10,820	10,928	10,845	11,075	10,867	10,672
Mill Creek	3	10,584	10,424	10,570	10,625	10,619	10,619	10,738	10,602	10,436	10,504
Mill Creek	4	10,592	10,588	10,548	10,759	10,653	10,410	10,518	10,616	10,735	10,827
Ohio Falls	1	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---
Ohio Falls	2	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---
Ohio Falls	3	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---
Ohio Falls	4	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---
Ohio Falls	5	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---
Ohio Falls	6	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---
Ohio Falls	7	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---
Ohio Falls	8	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---	--,---
Paddys Run	11	0	23,443	21,836	38,035	0	151,188	42,947	74,663	43,968	0
Paddys Run	12	0	14,606	15,293	226,781	0	0	55,026	0	49,351	0
Paddys Run	13	10,723	9,140	10,850	10,704	11,118	11,886	10,956	11,100	11,571	11,355
Trimble County	1	10,388	10,222	10,191	10,358	10,368	10,554	10,695	10,665	10,705	10,763
Trimble County	2	--,---	--,---	--,---	--,---	--,---	--,---	--,---	9,560	9,435	9,359
Trimble County	5	11,014	11,194	11,597	11,577	11,085	11,833	11,529	10,925	11,178	13,196
Trimble County	6	11,628	11,586	11,547	11,356	11,693	12,592	11,766	11,576	11,188	12,975
Trimble County	7	--,---	11,705	11,437	11,491	11,796	10,809	14,835	10,560	11,819	13,033
Trimble County	8	--,---	11,619	11,332	11,380	11,215	12,222	11,755	10,861	11,352	12,653
Trimble County	9	--,---	11,626	11,241	11,313	11,119	12,346	11,678	11,057	10,589	13,659
Trimble County	10	--,---	11,080	11,125	11,261	11,074	13,512	11,570	10,720	11,533	10,680
Zorn	1	36,729	0	19,820	22,120	0	16,419	22,881	0	20,911	25,818

Station	Unit	Net Generation (MWh) 2004	Net Generation (MWh) 2005	Net Generation (MWh) 2006	Net Generation (MWh) 2007	Net Generation (MWh) 2008	Net Generation (MWh) 2009	Net Generation (MWh) 2010	Net Generation (MWh) 2011	Net Generation (MWh) 2012	Net Generation (MWh) 2013
		(Q.1.6.f.)	(Q.1.6.f.)	(Q.1.6.f.)	(Q.1.6.f.)	(Q.1.6.f.)	(Q.1.6.f.)	(Q.1.6.f.)	(Q.1.6.f.)	(Q.1.6.f.)	(Q.1.6.f.)
Brown	1	568,432	563,532	480,534	493,483	513,921	217,008	411,311	317,251	324,035	378,905
Brown	2	961,837	1,075,007	956,008	1,013,933	1,074,881	547,458	763,280	616,832	721,085	875,868
Brown	3	2,246,620	1,584,997	2,031,288	2,396,909	2,534,659	1,740,829	1,828,361	1,563,842	1,323,503	1,599,792
Brown	5	(1,161)	122,928	30,777	19,823	2,340	2,380	8,061	3,634	6,618	3,382
Brown	6	10,767	165,122	97,500	88,563	21,817	36,780	48,131	28,481	127,748	50,307
Brown	7	20,684	156,711	99,276	51,599	33,143	26,632	46,851	33,892	95,198	42,879
Brown	8	(758)	2,954	46,642	19,870	6,622	7,658	7,864	4,340	2,561	2,834
Brown	9	(14)	1,636	27,105	11,236	3,411	1,509	5,196	4,718	7,403	5,316
Brown	10	772	1,683	20,966	5,334	1,722	2,370	4,365	1,741	2,188	875
Brown	11	636	1,854	12,875	4,458	677	4,551	8,529	1,301	5,671	1,299
Cane Run	4	810,896	1,049,200	964,843	1,102,772	1,042,427	947,128	927,127	967,087	653,192	696,743
Cane Run	5	894,265	1,088,209	1,081,141	1,041,443	883,495	952,330	1,110,385	952,048	928,589	864,302
Cane Run	6	1,508,846	1,538,197	1,529,163	1,392,399	1,477,446	1,335,527	1,233,866	1,287,984	1,084,657	995,291
Cane Run	11	33	143	1,179	239	4	210	228	198	296	200
Dix Dam	1	0	(20)	(6)	2,385	25,148	28,950	15,173	33,650	13,582	26,593
Dix Dam	2	49,088	17,306	22,875	17,364	25,078	32,016	14,736	13,098	5,416	39,906
Dix Dam	3	45,522	19,304	24,157	15,319	201	7,905	6,012	34,236	18,728	40,124
Ghent	1	3,304,417	3,488,919	3,374,706	2,915,043	3,598,899	2,867,642	3,295,876	3,394,813	3,166,600	3,298,654
Ghent	2	2,843,658	2,762,380	3,013,652	3,454,216	2,804,097	2,413,738	3,201,480	3,346,081	3,053,242	3,513,063
Ghent	3	2,829,972	3,086,729	2,968,147	2,358,308	3,262,152	3,182,388	3,431,840	2,866,840	3,333,292	3,294,839
Ghent	4	3,088,747	3,249,587	2,852,269	3,232,661	2,840,532	2,881,867	2,667,176	2,899,005	2,653,566	3,011,140
Green River	3	335,746	336,573	206,046	420,678	379,545	216,618	345,263	329,516	270,552	310,970
Green River	4	479,159	338,730	433,395	576,042	582,590	408,851	544,049	458,964	635,128	652,894
Haefling	1	(133)	(200)	(130)	(118)	(122)	(136)	175	143	585	383
Haefling	2	(135)	(204)	109	(3)	(130)	(147)	193	167	326	37
Mill Creek	1	1,836,791	2,211,424	1,964,526	2,153,807	1,985,134	2,106,620	2,009,037	2,044,329	2,016,171	1,466,563
Mill Creek	2	2,007,643	1,818,869	2,008,722	1,936,303	2,073,872	1,847,309	2,101,040	1,980,508	1,452,211	1,898,669
Mill Creek	3	2,285,926	2,953,575	2,827,105	2,793,210	2,989,529	2,786,525	2,914,876	1,875,925	2,611,560	2,212,407
Mill Creek	4	3,405,217	3,077,144	2,938,797	3,569,587	3,263,083	3,562,608	3,348,610	3,163,052	2,281,218	2,709,274
Ohio Falls	1	32,025	25,611	28,749	15,124	9,054	14,442	16,315	14,285	4,852	0
Ohio Falls	2	28,454	24,523	26,106	14,100	7,036	18,324	22,157	18,257	12,466	1,258
Ohio Falls	3	31,760	20,774	34,100	11,599	11,578	27,760	21,876	15,804	3,906	26,932
Ohio Falls	4	33,246	31,924	41,959	11,217	26,414	29,682	36,320	33,599	25,974	30,840
Ohio Falls	5	32,101	37,200	31,261	22,348	5,340	0	0	0	40,352	35,715
Ohio Falls	6	21,491	28,768	31,684	0	28,106	47,707	53,248	46,812	48,320	28,041
Ohio Falls	7	6,493	769	2,097	37,819	47,125	50,786	56,181	48,324	46,337	49,328
Ohio Falls	8	26,281	26,024	43,706	31,439	29,642	44,297	34,505	33,726	30,662	23,872
Paddys Run	11	0	700	882	159	0	12	279	95	221	(38)
Paddys Run	12	0	473	376	8	0	0	76	(272)	340	(182)
Paddys Run	13	31,365	134,409	88,772	66,112	6,480	1,247	14,831	31,411	56,710	29,267
Trimble County	1	3,119,354	2,858,445	3,131,213	2,683,007	3,048,777	2,300,055	2,722,317	2,410,890	2,899,985	2,604,629
Trimble County	2	-,---	-,---	-,---	-,---	-,---	-,---	-,---	3,116,818	2,506,228	3,140,516
Trimble County	5	20,883	8,924	11,776	92,506	73,991	43,455	129,011	59,355	226,311	66,372
Trimble County	6	22,862	22,459	23,796	83,951	69,781	28,243	100,288	66,423	259,618	89,149
Trimble County	7	-,---	44,210	50,944	112,700	59,476	39,368	108,211	72,925	100,026	72,123
Trimble County	8	-,---	77,152	76,817	149,773	63,037	33,230	98,266	54,521	102,009	27,346
Trimble County	9	-,---	46,514	59,506	148,369	58,190	29,731	125,065	75,141	259,734	84,647
Trimble County	10	-,---	90,645	71,376	130,927	51,429	21,366	103,882	47,533	86,050	26,433
Zorn	1	12	0	392	272	0	216	198	(74)	649	212

Station	Unit	Net Summer Capacity (MW) 2004	Net Summer Capacity (MW) 2005	Net Summer Capacity (MW) 2006	Net Summer Capacity (MW) 2007	Net Summer Capacity (MW) 2008	Net Summer Capacity (MW) 2009	Net Summer Capacity (MW) 2010	Net Summer Capacity (MW) 2011	Net Summer Capacity (MW) 2012	Net Summer Capacity (MW) 2013
		(Q.1.6.g.)	(Q.1.6.g.)	(Q.1.6.g.)	(Q.1.6.g.)	(Q.1.6.g.)	(Q.1.6.g.)	(Q.1.6.g.)	(Q.1.6.g.)	(Q.1.6.g.)	(Q.1.6.g.)
Brown	1	101	101	101	101	101	101	101	106	106	106
Brown	2	167	167	167	167	167	167	167	166	166	166
Brown	3	429	429	429	429	429	429	416	412	412	410
Brown	IAC	98	98	98	98	98	98	98	98	98	98
Brown	5	117	117	117	117	117	117	117	112	112	112
Brown	6	154	154	154	154	154	154	154	146	146	146
Brown	7	154	154	154	154	154	154	154	146	14	146
Brown	8	106	106	106	106	106	106	106	102	102	102
Brown	9	106	106	106	106	106	106	106	102	102	102
Brown	10	106	106	106	106	106	106	106	102	102	102
Brown	11	106	106	106	106	106	106	106	102	102	102
Cane Run	4	155	155	155	155	155	155	155	155	155	155
Cane Run	5	168	168	168	168	168	168	168	168	168	168
Cane Run	6	240	240	240	240	240	240	240	240	240	240
Cane Run	11	14	14	14	14	14	14	14	14	14	14
Dix Dam	1	8	8	8	8	8	8	8	8	8	8
Dix Dam	2	8	8	8	8	8	8	8	8	8	8
Dix Dam	3	8	8	8	8	8	8	8	8	8	8
Ghent	1	475	475	475	475	475	475	475	479	479	479
Ghent	2	484	484	484	484	484	484	484	495	495	495
Ghent	3	493	493	493	480	480	480	480	489	489	489
Ghent	4	493	493	493	493	493	479	479	469	469	469
Green River	3	68	68	68	68	68	68	68	68	68	68
Green River	4	95	95	95	95	95	95	95	95	95	93
Haefling	1	12	12	12	12	12	12	12	12	12	12
Haefling	2	12	12	12	12	12	12	12	12	12	12
Mill Creek	1	303	303	303	303	303	303	303	303	303	303
Mill Creek	2	301	301	301	301	301	301	301	301	301	301
Mill Creek	3	391	391	391	391	391	391	391	391	391	391
Mill Creek	4	477	477	477	477	477	477	477	477	477	477
Ohio Falls	1	6	6	6	6	6	6	6	6	6	6
Ohio Falls	2	6	6	6	6	6	6	6	6	6	6
Ohio Falls	3	6	6	6	6	6	6	6	6	6	6
Ohio Falls	4	6	6	6	6	6	6	6	6	6	6
Ohio Falls	5	6	6	6	6	6	6	6	6	8	8
Ohio Falls	6	6	6	6	8	8	8	8	8	8	8
Ohio Falls	7	6	6	6	8	8	8	8	8	8	8
Ohio Falls	8	6	6	6	6	6	6	6	6	6	6
Paddys Run	11	12	12	12	12	12	12	12	12	12	12
Paddys Run	12	23	23	23	23	23	23	23	23	23	23
Paddys Run	13	158	158	158	158	158	158	158	147	147	147
Trimble County	1	383	383	383	383	383	383	383	383	383	383
Trimble County	2	---	---	---	---	---	---	---	549	549	549
Trimble County	5	160	160	160	160	160	160	160	157	157	157
Trimble County	6	160	160	160	160	160	160	160	157	157	157
Trimble County	7	160	160	160	160	160	160	160	157	157	157
Trimble County	8	160	160	160	160	160	160	160	157	157	157
Trimble County	9	160	160	160	160	160	160	160	157	157	157
Trimble County	10	160	160	160	160	160	160	160	157	157	157
Zorn	1	14	14	14	14	14	14	14	14	14	14

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to Wallace McMullen and Sierra Club
First Set of Data Requests
Dated March 13, 2014

Case No. 2014-00002

Question No. 7

Witness: David S. Sinclair

Q1.7. For the Companies' fleet, please provide the following projected annual data by unit, for the economic analysis period in this filing:

a. Fixed O&M

b. Variable O&M (without fuel)

c. Fuel costs

d. Capital costs

e. Heat Rate

f. Generation

g. Capacity rating

A1.7. See attached. Fixed O&M and capital costs are only reported by station through 2023. The information requested is confidential and proprietary, and is being provided under seal pursuant to a joint petition for confidential treatment.

CONFIDENTIAL INFORMATION REDACTED

Sierra Club/NRDC Data Request

LKE 2014 BP - Power Generation & PE

$000's

75% Share of Trimble County (STEAM) is reflected in Capital; 100% in Fixed O&M

Capital										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
STEAM										
Ghent	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Tyrone	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Pineville	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble County	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SCCT/NGCC										
Trimble County	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Paddys Run	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Zorn	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Canal	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
BR CTS	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River 5	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Haefling	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
HYDRO										
Ohio Falls	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Dix Dam	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
LGE Common	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KU Common	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total Capital	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

CONFIDENTIAL INFORMATION REDACTED

Sierra Club/NRDC Data Request

LKE 2014 BP - Power Generation & PE

$000's

75% Share of Trimble County (STEAM) is reflected in Capital; 100% in Fixed O&M

	Fixed Costs									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
STEAM										
Ghent	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Tyrone	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Pineville	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble County	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SCCT/NGCC										
Trimble County	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Paddys Run	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Zorn	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Canal	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
BR CTS	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River 5	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Haefling	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
HYDRO										
Ohio Falls	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Dix Dam	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
LGE Common	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KU Common	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total Fixed Costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

CONFIDENTIAL INFORMATION REDACTED

Variable O&M ($000)

Mid Gas, Base Load, Zero Carbon Scenario; 75% Share of Trimble County 1 & 2

Unit	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Brown 1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 10	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 11	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 5	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 6	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 7	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 8	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 9	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown Solar	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 11	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 5	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 6	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 7	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Dix Dam	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River 3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River 4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River 5	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Haefling	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ohio Falls	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Paddys Run 11	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Paddys Run 12	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

CONFIDENTIAL INFORMATION REDACTED

Variable O&M ($000)

Mid Gas, Base Load, Zero Carbon Scenario; 75% Share of Trimble County 1 & 2

Unit	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Paddys Run 13	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 05	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 08	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 09	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 10	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble County 1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble County 2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Zorn 1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

CONFIDENTIAL I

Variable O&M ($000)

Mid Gas, Base Load, Zer

Unit	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Brown 1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 10	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 11	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 5	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 6	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 7	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 8	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 9	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown Solar	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 11	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 5	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 6	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 7	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Dix Dam	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River 3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River 4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River 5	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Haefling	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ohio Falls	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Paddys Run 11	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Paddys Run 12	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

CONFIDENTIAL I

Variable O&M ($000)

Mid Gas, Base Load, Zer

Unit	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Paddys Run 13	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 05	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 08	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 09	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 10	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble County 1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble County 2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Zorn 1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

CONFIDENTIAL INFORMATION REDACTED

Fuel Costs ($000)

Mid Gas, Base Load, Zero Carbon Scenario; 75% Share of Trimble County 1 & 2

Unit	Cost	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Brown 1	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 10	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 11	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 2	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 3	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 5	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 6	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 7	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 8	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 9	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown Solar	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 11	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 4	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 5	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 6	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 7	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Dix Dam	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 1	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 2	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 3	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 4	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River 3	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

CONFIDENTIAL INFORMATION REDACTED

Fuel Costs ($000)

Mid Gas, Base Load, Zero Carbon Scenario; 75% Share of Trimble County 1 & 2

Unit	Cost	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Green River 4	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River 5	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Haefling	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 1	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 2	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 3	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 4	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ohio Falls	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Paddys Run 11	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Paddys Run 12	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Paddys Run 13	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 05	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 06	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 07	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 08	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 09	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 10	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble County 1	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble County 2	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Zorn 1	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

CONFIDENTIAL INFORMATION RE

Fuel Costs ($000)

Mid Gas, Base Load, Zero Carbon Scenario; 75%

Unit	Cost	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Brown 1	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 10	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 11	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 2	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 3	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 5	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 6	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 7	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 8	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown 9	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Brown Solar	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 11	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 4	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 5	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 6	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cane Run 7	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Dix Dam	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 1	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 2	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 3	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ghent 4	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River 3	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

CONFIDENTIAL INFORMATION RE

Fuel Costs ($000)

Mid Gas, Base Load, Zero Carbon Scenario; 75%

Unit	Cost	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Green River 4	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Green River 5	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Haefling	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 1	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 2	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 3	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mill Creek 4	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ohio Falls	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Paddys Run 11	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Paddys Run 12	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Paddys Run 13	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 05	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 06	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 07	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 08	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 09	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble Co 10	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble County 1	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Trimble County 2	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Zorn 1	Fuel Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Start Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Heat Rate (Btu/kWh)

Mid Gas, Base Load, Zero Carbon Scenario

Unit	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Brown 1	11,264	11,279	11,213	11,217	11,491	11,382	11,443	11,354	11,429	11,383	11,394	11,319	11,355	11,308	11,385
Brown 10	15,328	15,208	15,346	15,282	15,364	15,326	14,613	14,786	15,322	15,219	15,269	15,378	14,218	15,251	15,025
Brown 11	15,036	14,974	15,008	15,081	15,025	15,109	15,015	14,693	15,057	14,988	14,888	14,619	14,245	15,006	15,015
Brown 2	10,602	10,253	10,437	10,490	10,688	10,617	10,633	10,625	10,555	10,507	10,532	10,489	10,444	10,393	10,400
Brown 3	11,778	11,975	12,088	12,069	12,124	12,080	12,058	12,049	12,013	11,995	12,019	11,925	11,918	11,938	11,979
Brown 5	15,384	15,148	15,642	15,490	15,450	15,304	15,438	15,102	15,317	15,221	15,311	15,262	14,667	15,447	15,459
Brown 6	11,851	11,625	11,632	11,516	11,550	11,587	11,598	11,675	11,756	11,724	11,669	11,690	11,552	11,612	11,675
Brown 7	11,327	11,274	11,303	11,270	11,300	11,286	11,284	11,303	11,306	11,286	11,274	11,302	11,217	11,279	11,331
Brown 8	15,101	15,091	15,102	15,086	15,039	15,126	14,644	14,767	15,020	15,055	14,916	14,745	14,332	15,040	15,088
Brown 9	15,358	15,354	15,337	15,336	15,326	15,328	14,664	14,869	15,307	15,379	15,155	15,373	14,436	15,314	15,242
Brown Solar															
Cane Run 11	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117
Cane Run 4	10,797	10,579	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 5	10,504	10,369	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 6	10,751	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 7	0	6,862	6,837	6,839	6,848	6,855	6,846	6,851	6,863	6,893	6,914	6,991	7,006	7,071	7,083
Dix Dam															
Ghent 1	10,531	10,646	10,646	10,653	10,689	10,677	10,671	10,659	10,630	10,631	10,628	10,630	10,627	10,630	10,626
Ghent 2	10,640	10,663	10,880	10,918	10,967	10,931	10,933	10,916	10,868	10,852	10,848	10,845	10,839	10,840	10,841
Ghent 3	11,102	11,106	11,160	11,267	11,401	11,375	11,330	11,297	11,190	11,150	11,146	11,123	11,109	11,097	11,092
Ghent 4	11,011	11,337	11,324	11,604	11,882	11,708	11,757	11,703	11,630	11,523	11,536	11,489	11,421	11,367	11,388
Green River 3	12,242	12,110	0	0	0	0	0	0	0	0	0	0	0	0	0
Green River 4	10,521	10,418	0	0	0	0	0	0	0	0	0	0	0	0	0
Green River 5	0	0	0	0	6,822	6,821	6,820	6,823	6,823	6,841	6,845	6,879	6,874	6,916	6,923
Haefling	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Mill Creek 1	10,392	10,490	10,503	10,511	10,514	10,522	10,516	10,513	10,524	10,533	10,523	10,531	10,533	10,537	10,539
Mill Creek 2	10,254	10,367	10,404	10,397	10,406	10,406	10,400	10,397	10,405	10,406	10,406	10,407	10,410	10,410	10,409
Mill Creek 3	10,405	10,427	10,635	10,598	10,609	10,603	10,603	10,602	10,587	10,580	10,582	10,575	10,574	10,569	10,568
Mill Creek 4	10,705	10,862	10,860	10,751	10,760	10,749	10,739	10,734	10,713	10,709	10,706	10,705	10,703	10,705	10,702
Ohio Falls															

Heat Rate (Btu/kWh)

Mid Gas, Base Load, Zero Carbon Scenario

Unit	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Paddys Run 11	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479
Paddys Run 12	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005
Paddys Run 13	10,276	10,320	10,336	10,326	10,335	10,292	10,353	10,327	10,337	10,284	10,336	10,288	10,314	10,294	10,310
Trimble Co 05	11,343	11,153	10,916	10,875	11,042	11,030	11,214	11,335	11,708	11,684	11,802	11,823	11,829	11,896	11,969
Trimble Co 06	11,258	11,122	10,972	10,926	11,005	11,005	11,194	11,333	11,651	11,574	11,656	11,645	11,737	11,778	11,899
Trimble Co 07	11,222	11,090	10,893	10,924	10,982	11,007	11,199	11,275	11,575	11,465	11,586	11,580	11,610	11,683	11,781
Trimble Co 08	10,900	10,846	10,776	10,794	10,806	10,827	10,837	10,938	11,054	10,930	11,022	10,978	10,899	11,018	10,984
Trimble Co 09	11,182	11,085	10,883	10,896	11,039	11,005	11,129	11,176	11,472	11,392	11,490	11,412	11,462	11,592	11,596
Trimble Co 10	10,858	10,813	10,769	10,766	10,816	10,811	10,839	10,912	10,985	10,918	10,959	10,977	10,784	10,951	10,947
Trimble County 1	10,395	10,413	10,473	10,468	10,479	10,479	10,474	10,470	10,469	10,472	10,471	10,473	10,474	10,475	10,474
Trimble County 2	9,272	9,270	9,269	9,271	9,271	9,270	9,271	9,270	9,271	9,270	9,270	9,270	9,270	9,270	9,271
Zorn 1	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676

Heat Rate (Btu/kWh)

Mid Gas, Base Load, Zero C

Unit	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Brown 1	11,480	11,420	11,412	11,287	11,152	11,060	10,968	11,004	10,979	10,956	10,908	10,876	10,878	10,803
Brown 10	15,307	14,874	15,348	15,251	14,708	15,172	15,014	15,240	15,066	15,189	15,307	15,307	15,142	15,049
Brown 11	15,041	14,870	14,954	14,984	14,753	14,945	14,888	15,033	14,906	14,940	15,015	15,015	15,000	14,946
Brown 2	10,457	10,387	10,361	10,357	10,298	10,291	10,270	10,267	10,289	10,294	10,265	10,248	10,241	10,230
Brown 3	12,053	12,043	12,041	12,013	11,971	11,985	11,981	12,048	12,056	11,983	11,996	11,943	11,965	11,922
Brown 5	15,316	15,646	15,415	15,261	15,092	15,318	15,316	15,398	15,050	15,398	15,288	15,571	15,798	14,970
Brown 6	11,564	11,587	11,497	11,532	11,722	11,594	11,639	11,655	11,556	11,724	11,657	11,662	11,639	11,588
Brown 7	11,290	11,341	11,300	11,306	11,311	11,287	11,288	11,297	11,272	11,313	11,289	11,281	11,300	11,269
Brown 8	14,958	14,866	14,944	15,005	14,814	14,928	14,910	14,986	14,909	15,044	15,015	15,015	15,024	14,938
Brown 9	15,291	14,966	15,326	15,247	14,796	15,184	14,991	15,098	15,112	15,185	15,307	15,307	15,307	15,158
Brown Solar														
Cane Run 11	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117	16,117
Cane Run 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 7	7,174	7,200	7,234	7,294	7,312	7,315	7,325	7,375	7,408	7,406	7,399	7,410	7,401	7,404
Dix Dam														
Ghent 1	10,627	10,620	10,625	10,626	10,631	10,635	10,642	10,638	10,640	10,644	10,644	10,644	10,652	10,655
Ghent 2	10,839	10,841	10,841	10,840	10,837	10,837	10,833	10,835	10,841	10,837	10,841	10,836	10,839	10,838
Ghent 3	11,100	11,081	11,070	11,070	11,051	11,052	11,043	11,045	11,048	11,046	11,047	11,037	11,042	11,040
Ghent 4	11,379	11,301	11,283	11,208	11,186	11,165	11,153	11,152	11,133	11,134	11,137	11,116	11,117	11,118
Green River 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green River 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green River 5	6,930	6,948	6,991	6,986	7,047	7,044	7,039	7,084	7,118	7,151	7,141	7,183	7,148	7,121
Haefling	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Mill Creek 1	10,542	10,542	10,545	10,548	10,546	10,549	10,548	10,550	10,549	10,547	10,547	10,551	10,549	10,550
Mill Creek 2	10,410	10,411	10,411	10,411	10,412	10,412	10,412	10,410	10,411	10,411	10,411	10,412	10,411	10,411
Mill Creek 3	10,567	10,564	10,564	10,563	10,561	10,561	10,560	10,560	10,562	10,561	10,561	10,560	10,560	10,561
Mill Creek 4	10,703	10,707	10,709	10,713	10,713	10,715	10,713	10,714	10,714	10,713	10,716	10,715	10,714	10,716
Ohio Falls														

Heat Rate (Btu/kWh)

Mid Gas, Base Load, Zero C

Unit	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Paddys Run 11	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479	15,479
Paddys Run 12	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005	17,005
Paddys Run 13	10,374	10,355	10,357	10,375	10,285	10,333	10,343	10,388	10,343	10,295	10,376	10,377	10,348	10,306
Trimble Co 05	12,001	11,935	11,913	11,911	11,965	11,773	11,838	11,890	11,885	11,948	11,835	11,824	11,815	11,756
Trimble Co 06	11,875	11,791	11,765	11,821	11,831	11,660	11,738	11,856	11,905	11,754	11,752	11,904	11,722	11,689
Trimble Co 07	11,872	11,863	11,686	11,783	11,816	11,696	11,683	11,734	11,791	11,866	11,762	11,818	11,651	11,593
Trimble Co 08	10,956	11,071	10,916	10,953	10,965	10,928	10,976	11,009	10,903	10,965	10,940	10,936	10,975	10,882
Trimble Co 09	11,647	11,638	11,559	11,668	11,595	11,456	11,481	11,609	11,463	11,648	11,574	11,560	11,471	11,460
Trimble Co 10	10,882	11,006	10,899	10,878	10,910	10,862	10,890	10,894	10,938	10,790	10,801	10,881	10,956	10,844
Trimble County 1	10,476	10,474	10,475	10,475	10,476	10,475	10,476	10,475	10,474	10,474	10,475	10,474	10,474	10,474
Trimble County 2	9,270	9,271	9,270	9,270	9,270	9,272	9,270	9,270	9,270	9,270	9,270	9,270	9,270	9,270
Zorn 1	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676	18,676

Generation (GWh)

Mid Gas, Base Load, Zero Carbon Scenario; 75% Share of Trimble County 1 & 2

Unit	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Brown 1	266	288	252	286	193	230	188	206	290	338	283	340	331	359	294	262	270
Brown 10	5	7	4	5	2	3	4	4	3	5	4	3	6	3	1	1	1
Brown 11	11	11	7	9	4	5	5	5	5	7	6	5	7	5	2	2	2
Brown 2	688	768	725	644	499	547	601	603	751	716	614	761	770	841	806	766	774
Brown 3	1,225	1,143	969	1,036	942	837	804	893	885	1,013	954	1,072	1,039	1,204	1,066	1,066	1,181
Brown 5	8	12	7	9	3	4	3	5	5	8	8	5	11	8	3	4	3
Brown 6	72	70	52	58	26	37	30	31	38	41	37	33	35	31	18	15	17
Brown 7	111	107	77	81	38	46	43	53	57	67	56	59	57	54	37	27	55
Brown 8	15	14	10	11	5	8	6	6	7	10	9	7	7	6	3	2	3
Brown 9	8	9	5	6	3	3	4	5	3	6	6	4	6	4	2	2	2
Brown Solar	0	0	9	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Cane Run 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 4	812	356	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 5	966	391	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 6	701	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 7	0	3,420	5,301	5,135	5,321	4,404	5,190	4,882	4,628	3,364	4,334	3,853	4,135	3,502	3,063	3,171	3,186
Dix Dam	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73
Ghent 1	3,158	2,665	2,840	2,855	2,536	2,772	2,680	2,703	2,578	2,923	2,840	2,965	2,950	3,013	2,851	2,501	2,928
Ghent 2	3,567	3,204	3,102	2,994	2,732	2,566	2,898	2,923	3,190	3,281	3,368	3,326	3,008	3,446	3,357	3,371	3,351
Ghent 3	2,667	2,917	2,843	2,417	1,884	2,060	2,223	2,380	2,595	2,645	2,757	2,456	2,815	2,932	2,835	2,827	2,800
Ghent 4	2,819	2,746	2,695	2,007	1,410	1,668	1,623	1,634	2,152	2,312	2,281	2,351	2,445	2,571	2,271	2,527	2,496
Green River 3	263	94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green River 4	659	194	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green River 5	0	0	0	0	4,942	4,830	4,340	4,074	3,308	3,221	3,146	3,286	3,302	2,884	2,716	1,683	1,784
Haefling	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
Mill Creek 1	1,986	1,724	1,801	1,936	1,979	1,923	2,042	1,812	2,153	2,079	2,178	2,064	2,211	2,110	2,191	1,923	2,243
Mill Creek 2	1,958	1,787	1,701	2,126	1,923	2,087	1,805	2,149	2,084	2,232	2,098	2,248	2,129	2,252	1,936	2,225	2,124
Mill Creek 3	2,591	2,248	1,442	1,810	1,858	1,690	1,904	1,828	2,033	1,939	2,076	2,022	2,182	1,947	2,235	2,102	2,280
Mill Creek 4	2,298	2,155	2,063	2,830	2,536	2,736	2,661	2,871	2,630	3,140	2,929	3,174	2,994	3,252	3,075	3,224	2,815
Ohio Falls	240	255	262	261	261	261	262	261	261	261	262	261	261	261	262	261	261
Paddys Run 11	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Paddys Run 12	0	1	1	1	0	1	0	0	0	1	1	0	1	0	0	0	0

Generation (GWh)

Mid Gas, Base Load, Zero Carbon Scenario; 75% Share of Trimble County 1 & 2

Unit	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Paddys Run 13	175	152	122	133	81	112	93	102	102	107	100	111	116	117	99	69	74
Trimble Co 05	321	328	246	224	155	187	132	143	109	161	136	151	145	145	108	69	63
Trimble Co 06	284	291	166	214	131	163	115	106	130	151	119	137	132	120	95	60	56
Trimble Co 07	246	245	178	179	108	144	107	118	105	137	106	111	117	110	83	54	57
Trimble Co 08	71	70	54	54	28	38	32	33	29	42	36	32	36	31	15	13	16
Trimble Co 09	193	190	142	143	82	109	81	92	81	105	79	84	88	83	63	40	40
Trimble Co 10	54	57	42	47	16	27	22	21	21	27	31	23	25	22	12	9	10
Trimble County 1	2,991	2,798	2,965	2,353	2,612	2,435	2,745	2,561	2,905	2,707	2,908	2,466	2,972	2,704	2,961	2,619	2,930
Trimble County 2	3,759	4,390	4,032	4,323	3,644	4,374	4,008	4,361	3,995	4,350	3,987	4,370	3,687	4,359	3,947	4,353	3,974
Zorn 1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Generation (GWh)

Mid Gas, Base Load, Zer

Unit	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Brown 1	296	323	403	375	367	369	345	378	385	401	410	422
Brown 10	3	2	3	3	2	1	2	1	1	2	2	4
Brown 11	4	5	5	6	6	3	3	2	4	3	4	7
Brown 2	675	830	848	839	895	895	824	682	819	881	895	931
Brown 3	1,229	1,224	1,210	1,306	1,434	1,288	1,315	1,324	1,351	1,149	1,409	1,391
Brown 5	6	5	6	8	7	4	5	3	4	4	5	7
Brown 6	21	24	55	51	58	28	27	36	33	36	40	45
Brown 7	61	63	85	76	81	46	46	58	49	52	54	77
Brown 8	5	6	6	8	7	4	4	4	4	4	6	8
Brown 9	3	2	3	5	4	1	2	1	3	2	2	4
Brown Solar	15	15	15	15	15	15	15	15	15	15	15	15
Cane Run 11	0	0	0	0	0	0	0	0	0	0	0	1
Cane Run 4	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 5	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 6	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 7	2,923	2,940	2,418	2,828	2,815	2,751	2,462	2,314	2,595	2,822	2,632	2,847
Dix Dam	73	73	73	73	73	73	73	73	73	73	73	73
Ghent 1	2,740	2,954	2,967	3,032	3,030	2,579	2,931	2,881	2,976	2,881	3,015	3,111
Ghent 2	3,380	3,334	3,043	3,478	3,372	3,410	3,301	3,396	3,361	2,986	3,434	3,339
Ghent 3	3,008	2,687	3,128	3,136	3,113	3,122	3,020	3,207	2,796	3,179	3,122	3,203
Ghent 4	2,598	2,768	2,904	2,987	2,691	2,996	2,829	3,026	3,027	3,090	3,039	2,827
Green River 3	0	0	0	0	0	0	0	0	0	0	0	0
Green River 4	0	0	0	0	0	0	0	0	0	0	0	0
Green River 5	1,655	1,816	2,046	1,757	1,922	1,387	1,106	1,225	1,106	1,170	1,225	1,381
Haefling	0	0	0	0	0	0	0	0	0	0	0	0
Mill Creek 1	2,121	2,255	2,147	2,283	2,147	2,295	1,946	2,280	2,153	2,278	2,156	2,298
Mill Creek 2	2,264	2,150	2,250	2,124	2,261	1,952	2,272	2,134	2,256	2,149	2,270	2,139
Mill Creek 3	2,217	2,490	2,409	2,661	2,228	2,639	2,486	2,597	2,496	2,654	2,558	2,695
Mill Creek 4	3,263	3,164	3,423	3,149	3,398	3,262	3,319	2,961	3,444	3,223	3,451	3,264
Ohio Falls	261	262	261	261	261	262	261	261	261	262	261	261
Paddys Run 11	0	0	0	0	0	0	0	0	0	0	0	0
Paddys Run 12	0	0	0	0	0	0	0	0	0	0	0	0

Generation (GWh)

Mid Gas, Base Load, Zer

Unit	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Paddys Run 13	71	84	103	91	100	58	59	66	62	63	67	76
Trimble Co 05	68	74	92	88	104	57	42	52	48	52	62	67
Trimble Co 06	58	68	75	81	89	50	39	42	44	51	54	62
Trimble Co 07	52	61	69	77	76	46	33	36	36	46	46	53
Trimble Co 08	18	18	16	22	27	13	12	9	14	12	19	24
Trimble Co 09	46	45	47	59	60	34	24	29	28	31	38	42
Trimble Co 10	13	9	12	15	19	10	7	6	8	8	12	17
Trimble County 1	2,707	2,982	2,501	2,965	2,688	2,990	2,627	2,973	2,722	3,005	2,464	3,006
Trimble County 2	4,365	3,968	4,354	3,612	4,363	3,944	4,367	4,019	4,376	4,032	4,355	3,624
Zorn 1	0	0	0	0	0	0	0	0	0	0	0	0

Summer Capacity Rating (MW)

75% Share of Trimble County 1 & 2

Unit	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Brown 1	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106
Brown 2	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166
Brown 3	410	405	405	405	405	405	405	405	405	405	405	405	405	405	405
Brown IAC	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
Brown 5	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112
Brown 6	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146
Brown 7	146	146	146	146	146	146	146	146	146	146	146	146	146	146	146
Brown 8	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102
Brown 9	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102
Brown 10	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102
Brown 11	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102
Brown Solar	0	0	9	9	9	9	9	9	9	9	9	9	9	9	9
Cane Run 11	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Cane Run 4	155	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 5	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 6	240	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 7	0	640	640	640	640	640	640	640	640	640	640	640	640	640	640
Dix Dam 1	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Dix Dam 2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Dix Dam 3	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Ghent 1	487	481	481	481	481	481	481	481	481	481	481	481	481	481	481
Ghent 2	493	493	484	484	484	484	484	484	484	484	484	484	484	484	484
Ghent 3	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476
Ghent 4	477	471	471	471	471	471	471	471	471	471	471	471	471	471	471
Green River 3	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green River 4	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green River 5	0	0	0	0	670	670	670	670	670	670	670	670	670	670	670
Haefling 1	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Haefling 2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Haefling 3	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Mill Creek 1	303	300	300	300	300	300	300	300	300	300	300	300	300	300	300
Mill Creek 2	301	297	297	297	297	297	297	297	297	297	297	297	297	297	297
Mill Creek 3	391	391	385	385	385	385	385	385	385	385	385	385	385	385	385
Mill Creek 4	477	466	466	466	466	466	466	466	466	466	466	466	466	466	466
Ohio Falls 1	6	6	8	8	8	8	8	8	8	8	8	8	8	8	8
Ohio Falls 2	6	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Ohio Falls 3	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Ohio Falls 4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

Summer Capacity Rating (MW)
75% Share of Trimble County 1 & 2

Unit	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Ohio Falls 5	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Ohio Falls 6	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Ohio Falls 7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Ohio Falls 8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Paddy's Run 11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Paddy's Run 12	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
Paddy's Run 13	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147
Trimble County 1	383	383	379	379	379	379	379	379	379	379	379	379	379	379	379
Trimble County 2	549	549	549	549	549	549	549	549	549	549	549	549	549	549	549
Trimble County 5	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157
Trimble County 6	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157
Trimble County 7	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157
Trimble County 8	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157
Trimble County 9	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157
Trimble County 10	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157
Zorn 1	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14

Summer Capacity Rating (MW)

75% Share of Trimble County 1 & 2

Unit	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Brown 1	106	106	106	106	106	106	106	106	106	106	106	106	106	106
Brown 2	166	166	166	166	166	166	166	166	166	166	166	166	166	166
Brown 3	405	405	405	405	405	405	405	405	405	405	405	405	405	405
Brown IAC	98	98	98	98	98	98	98	98	98	98	98	98	98	98
Brown 5	112	112	112	112	112	112	112	112	112	112	112	112	112	112
Brown 6	146	146	146	146	146	146	146	146	146	146	146	146	146	146
Brown 7	146	146	146	146	146	146	146	146	146	146	146	146	146	146
Brown 8	102	102	102	102	102	102	102	102	102	102	102	102	102	102
Brown 9	102	102	102	102	102	102	102	102	102	102	102	102	102	102
Brown 10	102	102	102	102	102	102	102	102	102	102	102	102	102	102
Brown 11	102	102	102	102	102	102	102	102	102	102	102	102	102	102
Brown Solar	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Cane Run 11	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Cane Run 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cane Run 7	640	640	640	640	640	640	640	640	640	640	640	640	640	640
Dix Dam 1	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Dix Dam 2	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Dix Dam 3	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Ghent 1	481	481	481	481	481	481	481	481	481	481	481	481	481	481
Ghent 2	484	484	484	484	484	484	484	484	484	484	484	484	484	484
Ghent 3	476	476	476	476	476	476	476	476	476	476	476	476	476	476
Ghent 4	471	471	471	471	471	471	471	471	471	471	471	471	471	471
Green River 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green River 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green River 5	670	670	670	670	670	670	670	670	670	670	670	670	670	670
Haefling 1	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Haefling 2	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Haefling 3	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Mill Creek 1	300	300	300	300	300	300	300	300	300	300	300	300	300	300
Mill Creek 2	297	297	297	297	297	297	297	297	297	297	297	297	297	297
Mill Creek 3	385	385	385	385	385	385	385	385	385	385	385	385	385	385
Mill Creek 4	466	466	466	466	466	466	466	466	466	466	466	466	466	466
Ohio Falls 1	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Ohio Falls 2	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Ohio Falls 3	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Ohio Falls 4	8	8	8	8	8	8	8	8	8	8	8	8	8	8

Summer Capacity Rating (MW)

75% Share of Trimble County 1 & 2

Unit	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Ohio Falls 5	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Ohio Falls 6	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Ohio Falls 7	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Ohio Falls 8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Paddy's Run 11	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Paddy's Run 12	23	23	23	23	23	23	23	23	23	23	23	23	23	23
Paddy's Run 13	147	147	147	147	147	147	147	147	147	147	147	147	147	147
Trimble County 1	379	379	379	379	379	379	379	379	379	379	379	379	379	379.25
Trimble County 2	549	549	549	549	549	549	549	549	549	549	549	549	549	549
Trimble County 5	157	157	157	157	157	157	157	157	157	157	157	157	157	157
Trimble County 6	157	157	157	157	157	157	157	157	157	157	157	157	157	157
Trimble County 7	157	157	157	157	157	157	157	157	157	157	157	157	157	157
Trimble County 8	157	157	157	157	157	157	157	157	157	157	157	157	157	157
Trimble County 9	157	157	157	157	157	157	157	157	157	157	157	157	157	157
Trimble County 10	157	157	157	157	157	157	157	157	157	157	157	157	157	157
Zorn 1	14	14	14	14	14	14	14	14	14	14	14	14	14	14

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to Wallace McMullen and Sierra Club
First Set of Data Requests
Dated March 13, 2014

Case No. 2014-00002

Question No. 8

Witness: Paul W. Thompson

Q1.8. Refer to page 3, paragraph 3 of the Companies' application.

a. Please provide the Bluegrass Generation Company purchase agreement.

b. Please provide analyses and work papers supporting the Companies' choice of the Bluegrass Generation Company purchase agreement.

c. Provide the Companies' FERC filing seeking approval for this transaction.

A1.8. The requested documents may be found on the PSC website in Case No. 2011-00375.

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to Wallace McMullen and Sierra Club
First Set of Data Requests
Dated March 13, 2014

Case No. 2014-00002

Question No. 9

Witness: David S. Sinclair

Q1.9. Refer to page 4, paragraph 3 of the Companies' application.

a. Please provide all of the proposals received in response to the RFP referenced therein, including PPA's, new build proposals, self-build proposals and DSM programs.

b. Please provide any analyses of the proposals mentioned above, including supporting workpapers, that are not contained in the Resource Assessment.

A1.9. a. See the response to PSC 1-22. The folders containing the relevant files are 01_Correspondence\RFPResponses\, 02_Analysis\ModelInputs\HDR, 01_Correspondence\RFPResponses\DSM, and 02_Analysis\ModelInputs\DSM_EEOptions

b. See the response to PSC 1-22. See also the attached.

Attachment to Response to Sierra Club-1 Question No. 1.9
Attachment #1
Sinclair

New Generation Options Feasibility Study

February 25, 2013
HDR Project No. 189895
Revision 3
Final Issue Update

COMBINED CYCLE FEASIBILITY STUDY

Table of Contents

APPENDICES

COMBINED CYCLE FEASIBILITY STUDY

1.0 EXECUTIVE SUMMARY

LG&E and KU Services Company (LG&E/KU) is conducting a technology evaluation of Natural Gas Combined Cycle (NGCC) options applied to an intermediate load dispatched plant. The evaluated combined cycle arrangements considered for implementation at the E.W. Brown Generating Station include:

- 1x1 GE 7F5 – Lightly Fired Design
- 1x1 Siemens F(5)ee – Lightly Fired Design
- 1x1 MPS GAC – Lightly Fired Design
- 1x1 Siemens H – Lightly Fired Design
- 2x1 GE 7F5 – Lightly Fired Design
- 2x1 Siemens F (5)ee – Lightly Fired Design
- 2x1 Siemens F(5)ee – Moderately Fired Design
- 2x1 GE 7F7 – Moderately Fired Design
- 2x1 GE Siemens H – No Duct Burner
- 2x1 Siemens (F5)ee – Heavily Fired Design
- 2x1 GE 7F7 – Heavily Fired Design
- 2x1 Siemens H – Moderately Fired Design

The following design parameters were defined for lightly fired, moderately fired, and heavily fired plant configurations:

- The lightly fired plant designs include a duct fired plant design that allows for lightly firing the duct burner on a summer day to maintain net plant output to that of the average day design condition.
- The moderately fired plant designs include a duct fired plant design that is capable of achieving 700 MW net plant output on a summer day after plant degradation is account for.
- The heavily fired plant designs include a duct fired plant design that is capable of achieving a 760 MW net plant output on a summer day after plant degradation is accounted for.

In addition, a 10 MW PV generic site facility has also been evaluated and is included in this study.

An intermediate operational dispatch schedule of five days per week and 16 hours per day (4222 annual hours), has been assumed for all of the options considered. The plant will be operated as a cycling plant with approximately 250 starts per year.

This feasibility study describes the intended plant configuration, integration, power block arrangement, and design criteria proposed for the NGCC facility proposed to be located at the existing E. W. Brown Generating Station. Also, project schedule, plant performance, operational impacts, capital cost, lifecycle economics, air emissions, and water consumption estimates have been provided for comparison between NGCC arrangements and serve a foundation for future project development efforts.

LG&E/KU intends to take advantage of existing infrastructure at E.W. Brown as deemed reliable and appropriately sized, or modified economically to serve the NGCC facility. The 345 kV transmission system currently serving the existing coal fired generation capacity will be utilized for the interconnection point and transmission system capacity. The Unit 1 intake structure will be retrofitted with replacement traveling screens. The proposed modifications to the intake structure will meet the requirements set forth by Phase II of Section 316(b) for existing facilities and also Phase I requirements for new facilities. The NGCC facility's project schedule from full notice to proceed [FNTP] to commercial operation date has been estimated to be 36 months.

Natural gas will be supplied to the NGCC facility via the existing 11 mile long 20 inch lateral served by Texas Eastern upgraded as necessary to meet the pressure requirements of the technology selected. The feasibility study is based on natural gas pipeline minimum delivery pressure at the site boundary adequate to meet the combustion turbine OEM requirements (no on-site gas compression is required).

Table 1.0-1 provides a summary of expected "new and clean" plant performance for a variety of NGCC arrangements at annual average design conditions. Auxiliary loads represent a fully burdened, stand-alone plant.

Table 1.0-1. NGCC Plant Performance Comparison Annual Average Design Conditions (New and Clean)

		Unfired Performance		Fired Performance	
	Description	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)
1	1 x 1 7F 5	307.4	6,642	-	-
2	1 x 1 F(5)ee	343.7	6,679	-	-
3	1 x 1 GAC	383.2	6,649	-	-
4	1 x 1 H	389.8	6,453	-	-
5	2 x 1 7F 5	615.5	6,634	-	-
6	2 x 1 F(5)ee	688.7	6,665	-	-
2	2x1 F5EE - 700	687.6	6,676	755.4	6,853
4	2x1 7F7 - 700	703.1	6,422	757.8	6,571
6	2x1 H - 700	779.2	6,457	-	-
1	2x1 F5EE - 760	686.0	6,692	815.4	7,011
3	2x1 7F7 - 760	696.3	6,485	817.9	6,829
5	2x1 H - 760	782.9	6,426	831.8	6,567

A summary of the estimated plant EPC costs and Owner's costs are provided in Table 1.0-2 for each NGCC arrangement considered.

Table 1.0-2. Total Project Cost ($1,000)

			Owner's Costs				
	Plant Net Capacity (MW)	EPC Cost ($1,000)	Total Owner Indirects	Owner Contingency	LTSA	**Total Project Cost ($1,000)**	Total Project Cost ($/kW)
1 x 1 7F 5	307.4	$327,669	$63,775	$32,767	$12,682	**$436,893**	$1,421
1 x 1 F(5)ee	343.7	$319,623	$63,775	$31,962	$1,729	**$417,090**	$1,214
1 x 1 GAC	383.2	$353,870	$64,082	$35,387	$5,027	**$458,366**	$1,196
1 x 1 H	389.8	$359,340	$56,082	$35,934	$1,729	**$453,085**	$1,162
2 x 1 7F 5	615.5	$493,871	$69,225	$49,387	$12,682	**$625,165**	$1,016
2 x 1 F(5)ee	688.7	$497,201	$69,225	$49,720	$3,459	**$619,605**	$900
2x1 F5EE - 700	755.4	$502,740	$69,575	$50,274	$3,459	**$626,048**	$829
2x1 7F7 - 700	757.8	$555,014	$70,175	$55,501	$15,853	**$696,543**	$919
2x1 H - 700	779.2	$560,164	$70,175	$56,016	$3,459	**$689,814**	$885
2x1 F5EE - 760	815.4	$516,668	$70,125	$51,667	$3,459	**$641,918**	$787
2x1 7F7 - 760	817.9	$565,815	$70,725	$56,581	$15,853	**$708,974**	$867
2x1 H - 760	831.8	$571,524	$70,725	$57,152	$3,459	**$702,860**	$845
10 MW PV Solar	10.0	$37,750	$2,920	$5,663	$0	**$46,333**	$4,633

Incorporating the capital, operating and maintenance costs, the total cost of generation values for each intermediately dispatched NGCC option have been presented in Table 1.0-3. Costs are presented on both a first year basis and a 30 year levelized basis for an intermediate dispatch plant operating 4222 hours annually.

Table 1.0-3. Electrical Cost of Generation Summary (Intermediate Load NGCC Facility)

	First Year Cost of Generation						**Levelized Cost of Generation**
	Capital Recovery ($/MWH)	Fixed O&M ($/MWH)	Variable O&M ($/MWH)	Consumables ($/MWH)	Fuel Costs ($/MWH)	Total COG ($/MWH)	Total Levelized COG ($/MWH)
1 x 1 7F 5	$29.01	$6.10	$1.45	$2.72	$38.88	$78.16	$110.78
1 x 1 SGT6-5000F(5)ee	$24.74	$4.04	$2.61	$2.65	$39.09	$73.13	$105.74
1 x 1 GAC	$24.37	$3.97	$3.27	$2.63	$38.92	$73.16	$105.87
1 x 1 SGT6-8000H	$23.65	$3.76	$3.47	$2.58	$37.77	$71.23	$103.04
2 x 1 7F 5	$20.67	$3.69	$1.17	$2.56	$38.84	$66.92	$98.98
2 x 1 SGT6-5000F(5)ee	$18.28	$2.66	$2.60	$2.52	$39.02	$65.08	$97.48
2x1 F5EE - 700	$18.27	$2.65	$2.60	$2.76	$39.84	$66.13	$98.90
2x1 7F7 - 700	$19.93	$3.46	$1.25	$2.66	$38.19	$65.50	$96.82
2x1 H - 700	$17.96	$2.54	$3.47	$2.45	$37.80	$64.23	$95.92
2x1 F5EE - 760	$18.57	$2.65	$2.61	$2.80	$40.63	$67.25	$100.22
2x1 7F7 - 760	$20.25	$3.48	$1.27	$2.93	$39.36	$67.30	$99.27
2x1 H - 760	$18.07	$2.53	$3.45	$2.61	$38.13	$64.79	$96.55
10 MW PV Solar	$212.02	$6.87	$0.96	$0.00	$0.00	$219.85	$219.36

As shown in Table 1.0-3 1 a 2x1 combustion turbine arrangement produces a lower cost of generation than that of a 1x1 arrangement. The first year cost of generation ranges from approximately $65 per MWH for a 2x1 F class combined cycle plant arrangement to $78 per MWH for a 1x1 F class combined cycle plant configuration. The 1x1 SGT6-8000H (NGCC 4) provides the lowest cost of generation for a 1x1 plant configuration at $71 per MWH. The 700 MW 2x1 H plant configuration provides the lowest cost of generation for all of the options considered. Additionally, a 10 MW photovoltaic (PV) solar project has been determined to have a first year cost of generation of $220 per MWH. The cost of generation for PV is primarily a function of project capital costs. The current 30 percent investment tax credit has not been included as it is set to expire in 2016, therefore capital recovery cost is greater than if the project was implemented in 2016 or sooner or if the tax credit is extended beyond 2016.

2.0 NGCC INTRODUCTION

LG&E/KU is evaluating the need for a new natural gas-fired combined cycle generating station in Kentucky with a commercial operation date planned for June 2018. HDR has been retained by LG&E/KU to develop plant parameters for a potential new build unit to support their generation planning process.

This paper describes the intended plant configuration, integration, site layout, and site specific design criteria proposed for the NGCC facility at E. W. Brown Station. Also, project schedule, plant performance, operational impacts, capital cost, lifecycle economics, air emissions, and water consumption estimates have been provided for comparison between NGCC arrangements and as a foundation for future project development efforts.

The combined cycle arrangements evaluated include:

- 1x1 GE 7F5 – Lightly Fired Design
- 1x1 Siemens F(5)ee – Lightly Fired Design
- 1x1 MPS GAC – Lightly Fired Design
- 1x1 Siemens H – Lightly Fired Design
- 2x1 GE 7F5 – Lightly Fired Design
- 2x1 Siemens F (5)ee – Lightly Fired Design
- 2x1 Siemens F(5)ee – Moderately Fired Design
- 2x1 GE 7F7 – Moderately Fired Design
- 2x1 GE Siemens H – No Duct Burner
- 2x1 Siemens (F5)ee – Heavily Fired Design
- 2x1 GE 7F7 – Heavily Fired Design
- 2x1 Siemens H – Moderately Fired Design

The following design parameters were defined for lightly fired, moderately fired, and heavily fired plant configurations:

- The lightly fired plant designs include a duct fired plant design that allows for lightly firing the duct burner on a summer day to maintain net plant output to that of the average day design condition.
- The moderately fired plant designs include a duct fired plant design that is capable of achieving 700 MW net plant output on a summer day after plant degradation is account for.
- The heavily fired plant designs include a duct fired plant design that is capable of achieving a 760 MW net plant output on a summer day after plant degradation is accounted for.

Additionally, a 10 MW solar photovoltaic generic site facility is also to be included in the evaluation. A separate section is included in this report discussing the photovoltaic option, including plant performance, capital costs, and life cycle operating costs for a 10 MW solar photovoltaic facility.

Each combined cycle option was developed based similar cycle design criteria as detailed in Section 3.0. Major plant features included in the design are as follows:

- Utilization of ultra low NOx burners
- Selective catalytic reduction (SCR) for controlling NOx emissions is presented as an option for units that can guarantee less than 12 ppm of NOx. A SCR is included in the base price of the other units.

- Inclusion of a CO catalyst for emissions control as the base option
- Evaporative cooling is included for operation at ambient conditions above 60 °F
- Fuel gas performance heating is included
- Dearating condenser is included
- Duct burner firing is incorporated to maintain summer day net plant electrical output similar to that achieved at the unfired, annual average design conditions.
- Forced draft, wet cooling heat rejection system with 11 °F cooling tower design approach and 6 °F condenser design approach temperatures.
- Raw water provided from surface water source intake structure located on the site with pre-treatment consisting of clarification.

An intermediate operational schedule of five days per week and 16 hours per day, which equates to approximately 4222 hours per year, has been assumed for all of the options considered to allow for comparison between NGCC arrangements being evaluated. Additionally, 250 starts per year have been allotted in the analysis. This design requirement should result in a robust plant which will also perform well if called into base load service.

Further details regarding combustion turbine (CTG) technology, plant performance, emissions, capital costs, and life cycle economic evaluation are presented in the following report sections.

3.0 NGCC DESIGN BASIS

The following subsections describe available CTG technology, generic plant configuration, site layout, and site specific design criteria proposed for the NGCC facility at E. W. Brown Station. Also, plant performance, air emissions, and water consumption estimates have been provided for comparison between the NGCC options.

3.1 AVAILABLE CTG TECHNOLOGY

Dependent upon on the generation capacity LG&E/KU determines to be necessary, there are a multitude of options with regards to CTG OEM, frame size, and configuration. Table 3.1-1 depicts these options.

Table 3.1-1. Available CTG Technology

Manufacturer | Model		Gross Simple Cycle ISO Rating	
		Output MW	Heat Rate, LHV/HHV Btu/kWh
Alstom	GT24	230.7	8,531/9,444
GE	7F5	216	8,817/9,760
	7F7	250	8,530/9,443
MHI	501GAC	272.0	8,600/9,546
	501J	320.0	8,325/9,216

Siemens	SGT6-5000F(5)ee SGT6-8000H	230.0 274.0	8,848/9,795 8,530/9,443

Combustion turbine technology continues to evolve at a rapid rate. With the exception of the GE 7F 7 gas turbine, all the other turbines listed above are scheduled to achieve commercial operation in 60 Hz combined cycle power plants prior to turbine selection for a mid-2018 combined cycle plant. Technology risk should be considered in development of the acceptable supplier list and the final selection of the combustion turbine. Further details on the evolution and technology of each combustion turbine offering are outlined below.

3.1.1 Alstom

Alstom originally introduced the F-class GT24 CTG in 1996 and has since upgraded this machine multiple times as a means to improve reliability, output, and efficiency. Alstom stopped actively marketing the GT24 for several years but re-introduced the unit in 2011 as the "Next Generation GT24". This latest GT24 offers multiple modes of operation including a low-load "park mode" as well as "fast starting" capability and is expected to allow owners to increase intervals between major maintenance and also be capable of meeting spinning reserve and peak energy demands. However, this upgraded CTG has not been proven in commercial operation and the former GT24 has generally not achieved reliability statistics comparable to its peers. The first GT24 CTG manufactured in North America (Chattanooga, TN) was sold and shipped to Mexico in June 2012. This unit is of the previous design and currently no current designs have been sold. As such, the GT24 is not considered further in this assessment. However, if Alstom gains a significant market share prior to the final solicitation for the project's combustion turbines, participation by Alstom in the solicitation should be considered.

3.1.2 General Electric

GE's latest offering available for purchase, the 7F 5-Series gas turbine (available for commercial delivery in calendar year 2012) expands on the capabilities of the 7FA.03/7FA.04 fleet, including increased power output and improved efficiency and heat rate while maintaining a similar emissions profile. GE notes that since 2009, it has employed an incremental approach for testing and validation of the 7F 5 Series gas turbine, with the following being primary changes from the 7FA.03/7FA.04 platform using only internally "proven technologies":

- Advanced aviation-heritage compressor design, similar to that utilized on heavy duty gas turbines (GE5, GE10, 5002E, 6C)
- Heavy duty gas turbine compressor mechanical rotor structure
- Improved diffuser with hybrid radial flow path
- Continued use of proven DLN2.6 combustor with select minor modifications including upgraded fuel nozzles to allow for a higher fuel flow rate and optimization of the transition piece cooling flow

New 7FA Advanced Hot Gas Path (HGP) turbine section with improved cooling, sealing, and clearances resulting in improved efficiency and higher temperature-capable materials resulting in reduced life cycle maintenance costs.

These 7F 5 upgrades represent some significant physical changes to the 7FA.03 models, whereas the changes in reference to the 7FA.04 include far fewer differences. It should be noted that GE has tested the 7F 5 design at their full-scale test facility in Greenville, SC and can provide test data to prospective owners on request. Two (2) 7F 5 units are being provided to the Lower Colorado Power Authority as part of a repowering project in Marble Falls, Texas with an expected ship date in the 3rd quarter of 2013 and a commercial operation date of 2015. An additional eight (8) units are also being supplied to Saudi Arabia with an expected commercial operation date of 2015.

GE has also recently announced the 7F 7-Series gas turbine which is still in the process of validation testing. GE issued a press release on September 26, 2012 regarding the details of this unit. The 7F 7 will have an additional 4th stage within the turbine, a different combustor arrangement, and a modified compressor. The overall footprint will increase as a result of these changes. Expected CTG output is 250 MW with a simple cycle efficiency of over 36 percent on an HHV basis at ISO conditions. Combined cycle plant output in a 1 x 1 configuration is expected to be around 375 MW, and in a 2 x 1 configuration it would be expected to be around 750 MW with a claimed plant efficiency approaching 55 percent on an HHV basis. Chubu Electric Power Company is the launch customer for the 7F 7 combustion turbine. The first six (6) units will ship to Nagoya, Japan in the first quarter of 2016 with an expected commercial operation date of 2018. The first available unit from GE would ship in the second quarter of 2016. Therefore the earliest commercial operation date for a GE 7F 7 NGCC would be the second quarter of 2018 or later.

3.1.3 Mitsubishi Power Systems

Mitsubishi Power Systems (MPS) 501GAC has been commercially available since calendar year 2010. The GAC is an upgrade of the 501G1 CTG, with advanced air cooled dry low NOx combustor, 1st stage turbine blade/vane enhancements, and other cooling enhancements coupled with proven rotor/ casing design. The air cooled combustor technology allows for avoidance of steam injection, which was required on previous 501G gas turbine models. MPS completed significant test stand operation of this machine before offering the unit for sale, and multiple units have been sold. At present, no newly constructed GAC units are operational but a few existing units have been retrofitted to GAC configurations and a number of different stations are under construction that will utilize the GAC CTG. Six new GAC CTG's have been sold to Dominion Power, with three (3) units going to the Warren County Power Station in Front Royal, Virginia and the other three (3) units to the Brunswick County Power Station in Southern Virginia. The first gas turbine shipped to Dominion's Warren County Plant in October of 2012. Additionally, two units have also been sold to TransCanada for a power project in Ontario. A total of 14 GAC CTG's have been sold globally.

MPS has also been actively involved in developing a J-class CTG, principally focusing on a 50-Hertz model given that its research facility is located in Japan. Six (6) 60-Hz units have been sold to Kansai Electric Power Company in Japan. These units are scheduled for commercial operation between 2013 through 2015, with the first unit shipped in March of 2012. Several units have also been sold to firms in South Korea, also. However, no units have yet been sold in North America to date. Because of its elevated 3,000 ^{0}F (1,700 ^{0}C) firing temperature, the J-class CTG must be steam-cooled and is best configured for a base-loaded, combined cycle application. Although not operating commercially in North America, MHI has been actively pursuing applications since late 2009. Due to no existing 60 Hz applications in North America and the need for steam cooling, the MPS J is currently less suitable for the proposed LG&E/KU combined cycle plant, which requires the capability to be easily dispatched at intermediate load capability.

3.1.4 Siemens

Siemens SGT6-8000H combustion turbine was first announced in 2006. Siemens has acquired significant bench testing and commercial operation time at its German installation

(50 Hz). Subsequently, Florida Power & Light has acquired four (4) H-class CTGs for the repowering of its Cape Canaveral and Riviera Beach Plants, with first start up in calendar year 2013 (first 60 Hz commercial application). The H-class CTG is an air-cooled design that utilizes dry low NOx combustion technology. It does not require steam or water injection for cooling or emissions control.

Siemens has previously introduced and obtained contracts for the supply of multiple SGT6-5000F(5) combustion turbine units (26 units sold as of the first quarter of 2012). These F(5) units are described as their "power enhanced" unit design. Power generation enhancements in this unit were achieved by increasing the inlet capacity of the compressor, resulting in an approximate increase in inlet mass flow of 20 percent. The increased inlet capacity was the result of a re-design of the first five stages of the compressor. However, due to flow path limitations in the turbine section of the unit, the power generation capability of the unit did not correspondingly increase by 20 percent, but only by approximately 12 percent with an associated reduction in unit efficiency.

In order to remove these turbine flow path limitations, improve turbine expansion efficiencies, and recover some of the desired generation capacity, Siemens has made a series of technical enhancements (described below) to their F(5) "power enhanced" gas turbine. The F(5)ee "efficiency enhanced" gas turbine in a 2 x 1 combined cycle application is expected to generates increased combustion turbine output of approximately 19 MW on hot day conditions. Below approximately 65°F, there is no increase in plant output for the "efficiency enhanced" turbine design. Siemens has a total of 11 current evolution F units (including F(4), F(5), and F(5)ee versions) operating with 45 units under contract. Approximately 30 of those under contract are F(5) versions. Cane Run will be the first commercial F(5)ee units.

3.2 PLANT CONFIGURATION

3.2.1 Combined Cycle Plant Configuration / Integration

The NGCC facility will consist of one to two combustion turbine generators (CTGs) with evaporative cooling and fuel gas heating. Each combustion turbine will exhaust to a triple pressure, heat recovery steam generator (HRSG) with a low temperature economizer (LTE) and reheat section. High pressure steam generated by the HRSG will supply high pressure (HP) steam to the steam turbine throttle of a single steam turbine generator (STG) at a maximum pressure of 2400 psia; the pressure will slide downward as steam load to the steam turbine decreases. Steam will exhaust from the HP section of the STG, mix with intermediate pressure (IP) steam within the HRSG, and then will be reheated via the HRSG before entering back into the IP steam turbine section of the STG. Lastly, a low pressure (LP) steam induction on the STG will be supplied by the LP boiler of the HRSG.

The steam turbine will be of a single reheat, fully condensing design. The heat rejection system will include a deaerating, wet surface condenser with mechanical draft cooling tower.

Air emission control systems for the NGCC facility consist of low NO_x burners for controlling NO_x emissions and a selective catalytic reduction (SCR) system unless the combustion turbine is capable of producing NOx emissions of 12 ppm or less.

The plant will be designed as an outdoor plant with the steam turbine and boiler feedwater pump(s) located indoors. Each CTG will be located outdoors within enclosures provided by the CTG manufacturer.

Each CTG and the STG will have a main generator step-up transformer with a nominal output voltage of 345 kV. In addition, an auxiliary transformer fed from a tap on the isolated phase bus from each CTG will be provided. Each auxiliary transformer will have sufficient capacity to operate the entire NGCC facility.

The existing E. W, Brown demineralized water treatment system will provide the water quality required by the HRSG(s) and steam turbine manufacturers. The demineralized water treatment system includes recently installed first pass reverse osmosis and cation/anion exchange mixed bed technology. The NGCC facility will include forwarding pumps and a demineralized water storage tank.

Natural gas filters, scrubbers and pressure reducing stations will be provided as required to meet the pressure and cleanliness requirements of the CTG manufacturer. Pressure reduction to meet the natural gas pressure requirements of the HRSG duct burners will be provided with the HRSG(s). Gas compression is not included for all options.

The existing E. W. Brown Unit 3 fire protection system will be extended to serve the fire protection supply requirements of the NGCC facility. The Unit 3 system consists of two 3000 gpm diesel fire water pumps and dedicated fire water storage tanks.

For the purpose of this evaluation and developing cost estimates, the following primary external infrastructure systems which will interface with the proposed NGCC facility are assumed:

> Natural Gas Transmission – Natural gas transmission to the facility will be provided by an upgrade to the 20 inch, 11 mile long lateral interconnection to the Texas Eastern mainline. Supply pressure will be supplied to meet the minimum gas pressure requirements for the CTG.
>
> 19 Percent Aqueous Ammonia – Aqueous ammonia will be delivered by truck.
>
> Raw Water Supply – The NGCC facility will utilize raw water supplied from the existing E. W. Brown intake structure currently serving the Unit 1 coal-fired unit cooling tower.
>
> Potable Water Supply – Potable water will be received from a municipal water main.
>
> Waste Water Discharge – Wastewater will be discharged to the raw water source.
>
> Sanitary Sewer – The NGCC facility's sanitary sewer will discharge to the relocated E.W. Brown sanitary septic field.
>
> Storm Water – The existing E.W. Brown surface drainage system will be expanded and modified as necessary to accommodate the increased storm water runoff of the NGCC facility.
>
> Electrical Transmission – A new 345 kV class switchyard for the NGCC facility will interface with LG&E/KU transmission system. The interface is based on line capacity of 600 MW per circuit with one redundant line anticipated to be provided.

3.2.2 Natural Gas Transmission

Natural gas will be supplied to the NGCC facility via the existing 11 mile long 20 inch lateral served by Texas Eastern upgraded as necessary to meet the pressure requirements of the technology selected. The feasibility study is based on natural gas pipeline minimum delivery pressure at the site boundary adequate to meet the combustion turbine OEM requirements (no on-site gas compression is required).

3.2.3 Raw Water Supply

The retired E. W. Brown Unit 1 and Unit 2 intake structure will be retrofitted to provide raw makeup water to the combined cycle plant addition for use in the cooling tower, service water and potential future cycle makeup (existing cycle makeup treatment system will be utilized).

The retrofitted system will have to meet requirements as defined by Phase II of Section 316(b) of the Clean Water Act. Currently, Phase II of Section 316(b) is suspended and new guidelines are anticipated to be issued for existing facilities mid-2013. At present, the EPA has instructed regulators to address facilities on a case-by-case basis using best professional judgment. It is currently speculated that the revised rule when issued will require cooling towers or, if not feasible, then 90% of the reduction in organism losses that would result with cooling towers. In its current suspended form, Phase II of Section 316(b) also specifies the new combined cycle as an "existing facility" as the new plant will be constructed in place of an existing facility and will utilize the existing intake structure while not increasing the design capacity of the intake structure. Therefore, in evaluating the cost and regulatory implications of retrofitting the existing Unit 1 and 2 cooling system intake structure for use in the new combined cycle plant makeup water system, the following has been considered:

- Use of Unit 1 and 2 intake structure for the NGCC facility will not increase the total flow rate of the intake structure above that of the design capacity for the system.
- Use of Unit 1 and 2 intake structure for the NGCC facility target design to result in a flow velocity lower than 0.5 ft/s, thus minimizing fish impingement and entrainment significantly.
- A closed cycle cooling system with a wet mechanical draft cooling tower designed for five cycles of concentration is being implemented at the combined cycle plant.

Based on the above, the following modifications will be incorporated in the Unit 1 and 2 intake structure for use as raw makeup water to the combined cycle plant:

- Refurbishment of existing Unit 1 and Unit 2 raw water pumps for reliability and system condition improvements.
- Traveling screens will be replaced with new, fine mesh, basket screens to minimize impingement of aquatic life.
- Flow velocities in each of the two pump bays will be targeted to be below 0.5 ft/s, thus minimizing entrainment of aquatic life.
- A new high pressure screen wash system will be installed.
- Provisions for future installation of a low pressure wash system and a fish return system will be included in the new screen design.

The proposed modifications to the intake bay meet the requirements set forth by Phase II of Section 316(b) for existing facilities (currently suspended). The modifications also meet Phase I requirements for new facilities. It is possible that some testing will be required after plant startup to document losses due to entrainment and impingement. If losses due to entrainment are too high then the low pressure spray systems and fish return troughs can be readily added to the system.

3.3 SITE LAYOUT

The site for the NGCC facility has been arranged around some key considerations important to plant operation and maintenance as follows.

- Site location selected based on lowest development costs for property, common facilities interconnection, excavation/fill and transmission line relocation.

- The NGCC site layout takes into consideration retirement of E. W. Brown Unit 1 and Unit 2.
- The cooling tower has been located such that a future drifting plume does not impact the O&M function of the existing plant, NGCC facility, or switchyard.
- Provisions for rail delivery and heavy haul access to the construction laydown area have been considered for ease of equipment delivery storage.
- Road access to major pieces of equipment and the parking lot has been provided including a main paved drive to the turbine building for trailer access when removing turbine parts.
- Ample parking space for facility staff and visitors.
- Ample space for construction laydown and parking areas.
- Space and equipment arrangement provisions for future expansion of NGCC facility have been considered.

Site arrangements have been included within Appendix A. The appendix also includes a comparison of three areas within the E. W. Brown Station property evaluated for site selection the NGCC facility.

3.4 PLANT LAYOUT

Several key factors govern a well arranged power block minimizing building volume while at the same time allowing for equipment access and removal. Key requirements are as follows:

- As much as possible, there is a separation of the plant electrical functions from the major mechanical equipment and steam piping.
- Designated space has been reserved (with physical provisions for removal) for condenser tube replacement and condenser water box removal. O&M activities will not be impeded by structural steel, piping, conduit, cable trays, etc.
- All equipment coolers have space reserved for removal of coolers/tubes.
- The steam turbine room crane is capable of complying with the STG supplier requirements for maintenance including required hook height and requirements for a main hook for major turbine components and a second light duty crane hook for small components. In general, the turbine room crane will be capable of lifting the generator rotor in its removed location outside the generator. The second hook will be capable of overturning the heaviest shell component.
- The condensate pumps are removable through a hatch in the operating floor with no interfering piping or electrical cable trays.
- Generally, access aisles are 12 feet wide by 14 feet tall with access to all equipment. Likewise, important equipment routing provisions will be made and preserved via box out areas in the plant model to assure that primary equipment has a known and preserved maintenance removal and building egress route to the exterior, either through overhead doors or internal access to the truck load out bay in the turbine room at grade level.
- Maintenance access space will be made available to perform maintenance activities near the physical location of major equipment including condensate pumps, boiler feed pumps, and other major equipment as may be required during equipment laydown reviews.

Power block arrangements have been included within Appendix A.

3.5 SITE SPECIFIC DESIGN CRITERIA

Combined cycle plant efficiencies are a function of the selected combustion turbine efficiency, selected steam conditions, fuel quality, HRSG efficiency, steam turbine efficiency, and achievable steam turbine backpressures based upon ambient conditions, heat rejection system design, and the degree to which the duct burner is utilized. The following discussions identify the key factors which establish the achievable efficiencies for the proposed E. W. Brown NGCC facility.

3.5.1 Ambient Data

The evaluation design basis ambient conditions are defined as follows.

1 Percent Summer Design Day
Dry Bulb: 88 °F
Mean Coincident Wet Bulb: 78 °F
Relative Humidity: 65 percent

99 Percent Winter Design Day
Dry Bulb: 14 °F
Mean Coincident Wet Bulb: 12 °F
Relative Humidity: 67 percent

Annual Average Design Conditions
Dry Bulb: 57 °F
Mean Coincident Wet Bulb: 50 °F
Relative Humidity: 60 percent
Site Elevation: 875 ft.

All economic analyses and lifecycle cost analyses were performed using expected plant performance at the annual average design conditions.

3.5.2 Noise Limits

The equipment is designed for a near field noise emitting criterion of 85 dBA maximum at 3 feet from the equipment (in a free field) with exceptions. Where practicable, acoustical insulation and enclosures will be used as required for equipment that would otherwise exceed this criterion. The noise limit will not exceed 85 dBA accumulative for all areas of the site, regardless of individual noise emitted from each piece of equipment. Certain equipment noise may exceed this criterion, even with noise control measures, particularly within enclosures or rooms. In this case, signs indicating that hearing protection is required are included. Locations where noise levels can be expected to exceed limits stated above are the turbine steam chest, the boiler feed pumps, large air compressors, and steam generator safety valves. The HRSG power-actuated pressure relief valves will be equipped with discharge silencers.

The far field noise emissions limit is estimated to be 55 dBA at the property line based on the Kentucky Siting Board 1000 foot setback required.

3.5.3 Basic Structural Design Criteria

The building code to be used for the project is the International Building Code (IBC) 2006.

Snow Loads

Snow design shall be in accordance with IBC 2006, section 1608, utilizing the inputs below:

- Minimum ground snow load = 15 lb/ft2

Wind loads

Wind design shall be in accordance with IBC 2006, section 1609, utilizing the inputs below:

- 3 second gust = 90 miles/hr
- Exposure category = B

Seismic Loads

Seismic design shall be in accordance with IBC 2006, section 1613, utilizing the inputs below:

- Occupancy category = III
- Site (soil) class = D
- Seismic design category = C or D, contractor to verify exact location and category with building official

Frost Penetration

Underground fire water piping shall have a minimum depth of 30 inches to the top of the pipe. All other underground piping and foundations shall have a minimum depth of 30 inches.

3.5.4 Water Analyses

The raw water will be provided from Lake Herrington utilizing the existing intake structure and potable water by a municipal water main. The raw water system design is based on the installation of an intake and pumping facility. The NGCC facility design is based upon typical river based lake water analysis and does not include pre-treatment to support a cooling tower operating with minimum four and design of five cycles of concentration (COC). The cooling tower will be capable of operating across a range from three to five COC.

3.5.5 Precipitation

Point precipitation frequency estimates from NOAA Atlas 14 for Louisville, Kentucky:

• Annual average, inches	44.54
• 10 year, 24-hour, inches	6.9
• 25 year, 24-hour, inches	7.86
• 100 year, 24-hour, inches	9.34

3.5.6 Storm Water

Design the storm collection system for a 24 hour, 25 year point precipitation frequency.

3.6 PLANT PERFORMANCE

3.6.1 Thermal Cycle Design

The principal components defined by the cycle design are the HRSG(s), including duct firing requirements, the CTG(s), the STG(s), the heat rejection system and the associated pumps and piping networks.

Each NGCC arrangement has been held to the following general thermal cycle design constraints:

- Natural gas as the primary fuel (higher heating value of 22,029 Btu/lb), with an option for fuel oil as a backup fuel.
- Utilization of ultra low NO_x burners. Selective catalytic reduction (SCR) for controlling NO_x emissions is presented as an option for combustion turbines guaranteed at 12 ppm NOx or less as well.
- Inclusion of a CO catalyst for emissions control as the base option
- Evaporative cooling is included for operation at ambient conditions above 60 °F
- Fuel gas performance heating is included
- Triple pressure heat recovery steam generator (HRSG) with low temperature economizer (LTE).
- Low temperature economizer (LTE) recirculation to maintain 140°F condensate temperature entering the LTE.
- LTE bypass to avoid condensate steaming within the LTE
- 1050°F/1050°F main steam and reheat steam temperatures
- 2400 psig steam turbine throttle with sliding pressure as steam load decreases
- Dearating condenser is included
- A minimum stack exit temperature of 180 °F
- Light duct burner firing is incorporated to maintain summer day net plant electrical output equal to that achieved at the unfired, annual average design conditions.
- Forced draft, wet cooling heat rejection system with 11°F cooling tower design approach and 6°F condenser design approach temperatures.

Additionally, design criteria unique to each combustion turbine option include:

1x1 and 2x1 GE 7F5/7F7

- CTG Gas Pressure Requirement: 435 psig
- CTG Gas Temperature after Performance Heater:365 °F

1x1 and 2x1 Siemens SGT6-5000F (5)ee

- CTG Gas Pressure Requirement: 455 psig (hot day) to 563 psig (cold day)
- CTG Gas Temperature after Performance Heater: 410 °F

1x1 MHI GAC

- CTG Gas Pressure Requirement: 640 psig
- CTG Gas Temperature after Performance Heater: 392 °F

1x1 Siemens H

- CTG Gas Pressure Requirement: 510 psig (hot day) to 590 psig (cold day)
- CTG Gas Temperature after Performance Heater: 419 °F

3.6.2 Key Unit Ratings/Performance

Tables 3.6-1 through 3.5-3 provide a summary of expected "new and clean" plant performance for a variety of NGCC arrangements at 1 percent summer, annual average ambient, and 99 percent winter conditions. Auxiliary loads represent a fully burdened, stand-alone plant. All heat rates and plant efficiencies are presented on a higher heating value (HHV) basis.

Table 3.6-1. Average Ambient Performance, New and Clean

	Description	Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
1	1 x 1 7F 5	314.3	6,496	2.20%	307.4	6,642	51.42%
2	1 x 1 SGT6-5000F(5)ee	351.6	6,527	2.27%	343.7	6,679	51.15%
3	1 x 1 GAC	393.0	6,484	2.48%	383.2	6,649	51.38%
4	1 x 1 SGT6-8000H	399.6	6,295	2.45%	389.8	6,453	52.93%
5	2 x 1 7F 5	629.4	6,489	2.20%	615.5	6,634	51.49%
6	2 x 1 SGT6-5000F(5)ee	704.7	6,514	2.27%	688.7	6,665	51.25%

As can be noted, plant efficiencies vary from 51 percent for an F class plant design to 52.9 percent for the H class turbine. The H-Class configuration offers the highest efficiency as a result of utilizing a slightly more efficient CTG technology. The GAC is comparable to an F class in efficiency, although the GAC performance data provided by MPS appears to be conservative with a 1.5 percent positive heat rate error which is noticeable in the fact that the energy output from the CTG does not equal the energy input to the CTG when using the MPS provided performance data.

To represent how the plant performance will vary with ambient conditions, Tables 3.6-2 and 3.6-3 provide a summary of expected “new and clean” plant performance at 88 ºF / 65 percent relative humidity and 14 ºF / 67 percent relative humidity conditions, respectively.

Table 3.6-2. Summer Ambient Conditions, New and Clean

	Description	Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
1	1 x 1 7F 5	314.4	6,644	2.22%	307.4	6,795	50.27%
2	1 x 1 SGT6-5000F(5)ee	349.9	6,667	2.29%	341.9	6,824	50.06%
3	1 x 1 GAC	393.6	6,628	2.50%	383.8	6,798	50.25%
4	1 x 1 SGT6-8000H	400.6	6,464	2.47%	390.7	6,628	51.54%
5	2 x 1 7F 5	629.8	6,635	2.22%	615.8	6,786	50.33%
6	2 x 1 SGT6-5000F(5)ee	706.5	6,661	2.29%	690.4	6,817	50.11%

Table 3.6-3. Winter Ambient Conditions, New and Clean

	Description	Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
1	1 x 1 7F 5	331.3	6,576	2.18%	324.1	6,722	50.81%
2	1 x 1 SGT6-5000F(5)ee	345.8	6,541	2.35%	337.7	6,699	50.99%
3	1 x 1 GAC	433.4	6,515	2.46%	422.7	6,680	51.14%
4	1 x 1 SGT6-8000H	445.9	6,371	2.43%	435.1	6,529	52.31%
5	2 x 1 7F 5	663.3	6,568	2.18%	648.8	6,714	50.87%
6	2 x 1 SGT6-5000F(5)ee	693.1	6,527	2.35%	676.8	6,684	51.10%

When comparing Table 3.6-1 with Tables 3.6-2 and 3.6-3, higher ambient temperatures and duct firing reduce combined cycle plant efficiencies. It should be noted that while plant efficiency may improve with less duct firing the incremental generation afforded by duct firing comes at a relatively low capital cost increase.

Colder ambient temperatures result in a lower overall plant efficiency as compared to average day ambient conditions as a result of lower CTG exhaust gas temperatures and decreased HRSG steam temperatures.

Also, note that the Siemens SGT6-5000F has an artificial limit that Siemens has built into the CTG controls, which results in the same CTG output on a cold day and colder flue gas temperatures. It is possible that the HRSG could be duct fired lightly to increase STG output and maintain a constant plant net output over all ambient conditions without increasing the bottoming cycle size. A slight efficiency decrease would result due to duct firing on colder ambient days.

New and clean heat Balance diagrams for the cases depicted in Tables 3.6-1 through 3.6-3 are provided in Appendix B.

Degraded plant performance at annual average, summer, and winter design conditions has been depicted for each option in Tables 3.6-4, 3.6-5, and 3.6-6. Degraded plant performance is a function of operating hours and major plant equipment maintenance schedule. The following tables are representative of maximum non-recoverable (average plant life) plant degradation over the 30 year plant design life.

Table 3.6-4. Average Ambient Performance, Non Recoverable Degraded

	Description	Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
1	1 x 1 7F 5	305.2	6,613	2.20%	298.5	6,762	50.51%
2	1 x 1 SGT6-5000F(5)ee	341.5	6,645	2.27%	333.7	6,799	50.24%
3	1 x 1 GAC	381.6	6,600	2.48%	372.2	6,768	50.47%
4	1 x 1 SGT6-8000H	388.1	6,408	2.45%	378.6	6,569	52.00%
5	2 x 1 7F 5	611.2	6,605	2.20%	597.7	6,754	50.57%
6	2 x 1 SGT6-5000F(5)ee	684.3	6,631	2.27%	668.8	6,786	50.34%

Table 3.6-5. Summer Ambient Performance, Non Recoverable Degraded

	Description	Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
1	1 x 1 7F 5	305.3	6,764	2.22%	298.5	6,917	49.38%
2	1 x 1 SGT6-5000F(5)ee	339.8	6,787	2.29%	332.0	6,946	49.17%
3	1 x 1 GAC	382.2	6,747	2.50%	372.7	6,920	49.36%
4	1 x 1 SGT6-8000H	389.0	6,581	2.47%	379.4	6,747	50.63%
5	2 x 1 7F 5	611.6	6,755	2.22%	598.0	6,908	49.44%
6	2 x 1 SGT6-5000F(5)ee	686.1	6,781	2.29%	670.4	6,940	49.22%

Table 3.6-6. Winter Ambient Performance, Non Recoverable Degraded

	Description	Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
1	1 x 1 7F 5	321.7	6,694	2.18%	314.7	6,843	49.91%
2	1 x 1 SGT6-5000F(5)ee	335.8	6,659	2.35%	327.9	6,819	50.09%
3	1 x 1 GAC	420.9	6,633	2.46%	410.5	6,800	50.23%
4	1 x 1 SGT6-8000H	433.1	6,486	2.43%	422.5	6,647	51.39%
5	2 x 1 7F 5	644.1	6,686	2.18%	630.1	6,835	49.97%
6	2 x 1 SGT6-5000F(5)ee	673.0	6,645	2.35%	657.2	6,805	50.20%

Minimum plant load performance data is summarized in Table 3.6-7. Performance is indicated for average day ambient conditions and is representative of new and clean plant conditions.

Table 3.6-7. Minimum Load at Average Ambient Conditions

	Description	Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
1	1 x 1 7F 5	179.7	7,143	5.00%	170.7	7,519	45.43%
2	1 x 1 SGT6-5000F(5)ee	169.0	7,196	5.07%	160.5	7,581	45.06%
3	1 x 1 GAC	224.9	6,945	5.28%	213.1	7,332	46.59%
4	1 x 1 SGT6-8000H	261.2	6,602	5.25%	247.5	6,968	49.02%
5	2 x 1 7F 5	175.3	7,324	5.00%	166.5	7,710	44.30%
6	2 x 1 SGT6-5000F(5)ee	163.8	7,425	5.07%	155.5	7,822	43.67%

A simple cycle bypass stack with diverter damper is an option under consideration for the F class NGCC facility options. The G class and H class machines have been designed exclusively for combined cycle applications, and therefore have not been considered for the optional bypass stack supporting simple cycle operation. Simple cycle F class plant performance is indicated in Table 3.6-8 for new and clean, summer day ambient conditions. The simple cycle bypass stacks will have minimal impact to the combined cycle performance (capital cost and availability impacts are associated with the bypass diverter damper). A 0.5 in H20 increase in exhaust backpressure on the CTG as a result of the bypass damper and additional ductwork will result in a 100 kW decrease in net plant output and less than 5 btu/kWhr increase in net plant heat rate for a 1 x 1 plant configuration. A bypass stack will also make the environmental permitting significantly more complex.

A dual fuel capability (natural gas and distillate fuel oil) option has been developed for each NGCC configuration evaluated based on providing a dual fuel combustion turbine with water injection NOx control and 36 hours of distillate fuel oil storage. The application of dual fuel capability does not present an impact to the performance of the combined cycle unit. The availability and maintenance costs will be negatively impacted by dual fuel operation as a function of fuel oil fired operating hours.

Table 3.6-8. Simple Cycle (Bypass Stack) Performance at Summer Ambient Conditions

Description	Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
1 x 1 7F 5	207.7	9,829	1.50%	204.6	9,979	34.23%
1 x 1 SGT6-5000F(5)ee	232.4	9,874	1.57%	228.8	10,032	34.05%
2 x 1 7F 5	415.5	9,829	1.50%	409.2	9,979	34.23%
2 x 1 SGT6-5000F(5)ee	464.9	9,874	1.57%	457.6	10,032	34.05%

With respect to oil firing, no change in CTG performance or overall plant performance is noted when firing natural gas on a dual fuel combustion turbine.

3.6.3 Major Equipment Design Margins

Major equipment design margins are included in Table 3.6-5.

Table 3.6-5 Major Equipment Design Margins

Equipment	Design Margins
Cooling Tower	Circulating Water Range: 20 °F Cooling Tower Approach to Wet-bulb: 11 °F
Condenser	Condenser Terminal Temperature Difference: 6 °F
Condensate Pumps	Flow: 10%, Head: 10%

Equipment	**Design Margins**
Feedwater Pumps	Flow: 10%, Head: 10%
Circulating Water Pumps	Flow: 5%, Head: 5%

3.6.4 Major Auxiliary Equipment Redundancy

It is anticipated that the NGCC facility will be operated as a cycling plant at maximum continuous rating. Cyclic operation with overnight or longer shutdown is anticipated.

The design and redundancy of major auxiliary equipment will prevent complete loss of any main equipment item in event of the failure of the auxiliary equipment.

Major auxiliary equipment redundancy for the NGCC facility is intended to be specified as listed below:

- Condenser – 1 x 100%
- Cooling Tower – 1 x 100% (with one spare cell at summer ambient conditions)
- Condensate Pumps – 2 x 100%
- Boiler Feed Pumps – 1 x 100% (per HRSG with warehouse spare element)
- Condenser Vacuum Pumps – 2 x 100%
- Circulating Water Pumps – 2 x 60%
- Closed Cooling Water Pumps – 2 x 100%
- Raw Water Supply Pumps – 2 x 100%
- Auxiliary Cooling Water Pump – 1 x 100% (supports plant standby operation only when STG is off-line to supply closed cycle cooling water system)
- Unit Auxiliary Transformers - 2 x 100%

3.7 AIR EMISSIONS

Air pollutant emission rates should be in accordance with the final approved air permit. U.S. EPA test methods for each pollutant will be utilized in accordance with the permit. For the purposes of this assessment and the economic analysis completed in Section 10.0, the target emission levels utilizing emissions controls for the NGCC facility are summarized below in Table 3.7-1. Uncontrolled emissions are depicted in Table 3.7-2. Emissions are summarized for the entire plant on a lb/hr basis.

Table 3.7-1. Total Plant Stack Emissions w/ SCR (as necessary) and Oxidation Catalyst, Natural Gas (80% CO Reduction and 50% VOC reduction assumed by Oxidation Catalyst)

Plant Emissions		1x1 7FA	1x1 7FA	1x1 F5EE	1x1 F5EE	1x1 GAC	1x1 GAC	1x1 8000H	1x1 8000H	2x1 7FA	2x1 7FA	2x1 F5EE	2x1 F5EE
Ambient Temperature	deg F	88	14	88	14	88	14	88	14	88	14	88	14
Ambient RH	%	65	67	65	67	65	67	65	67	65	67	65	67
Evap Cooler		On	Off	On	Off	On	Off	On	Off	On	Off	On	Off
Duct Burner		On	Off	On	Off	On	Off	On	Off	On	Off	On	Off
CTG(s) Heat Input	mmBtu/hr	1990	2178	2213	2262	2403	2824	2358	2833	3980	4357	4425	4524
Duct Burner(s) Heat Input	mmBtu/hr	99	0	120	0	225	0	231	0	198	0	281	0
Total Plant Heat Input	mmBtu/hr	2089	2178	2333	2262	2628	2824	2589	2833	4179	4357	4706	4524
NOx	ppmvd @ 15% O2	9.45	9.00	9.92	9.00	12.00	12.00	12.00	12.00	9.45	9.01	10.07	9.00
	lb/hr	91.73	87.54	102.83	90.70	142.99	150.07	142.40	151.12	183.56	175.08	208.87	181.39
	lb/mmBtu	0.044	0.040	0.044	0.040	0.054	0.053	0.055	0.053	0.044	0.040	0.044	0.040
	SCR Required	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No
CO	ppmvd @ 15% O2	1.37	1.20	1.05	0.80	1.85	2.00	2.24	2.00	1.37	1.20	1.09	0.80
	lb/hr	8.09	7.10	6.61	4.91	13.42	15.22	16.19	15.33	16.19	14.21	13.74	9.81
	lb/mmBtu	0.004	0.003	0.003	0.002	0.005	0.005	0.006	0.005	0.004	0.003	0.003	0.002
VOC	ppmvd @ 15% O2	0.80	0.53	0.83	0.50	1.09	1.50	1.02	0.50	0.77	0.50	0.89	0.50
	lb/hr	2.69	1.78	3.00	1.75	4.50	6.52	4.19	2.19	5.22	3.38	6.41	3.51
	lb/mmBtu	0.0013	0.0008	0.0013	0.0008	0.0017	0.0023	0.0016	0.0008	0.0013	0.0008	0.0014	0.0008
PM10	lb/hr	6.04	5.42	6.81	5.48	7.85	6.37	7.92	6.68	12.09	10.83	14.03	10.96
	lb/mmBtu	0.003	0.002	0.003	0.002	0.003	0.002	0.003	0.002	0.003	0.002	0.003	0.002
PM Total	lb/hr	12.07	10.83	13.62	10.96	15.69	12.75	15.84	13.35	24.17	21.66	28.05	21.92
	lb/mmBtu	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005
SO2	lb/hr	1.76	1.83	1.96	1.90	2.21	2.38	2.18	2.38	3.52	3.67	3.96	3.81
	lb/mmBtu	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
H2SO4	lb/hr	0.42	0.44	0.47	0.45	0.53	0.56	0.52	0.57	0.84	0.87	0.94	0.90
	lb/mmBtu	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
NH3 Slip	ppmvd @ 15% O2	0.0	0.0	0.0	0.0	5.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0
	lb/hr	0.00	0.00	0.00	0.00	22.02	23.11	21.93	0.00	0.00	0.00	0.00	0.00
	lb/mmBtu	0.000	0.000	0.000	0.000	0.008	0.008	0.008	0.000	0.000	0.000	0.000	0.000

Table 3.7-2. Total Plant Uncontrolled Stack Emissions, Natural Gas

Plant Emissions		1x1 7FA	1x1 7FA	1x1 F5EE	1x1 F5EE	1x1 GAC	1x1 GAC	1x1 8000H	1x1 8000H	2x1 7FA	2x1 7FA	2x1 F5EE	2x1 F5EE
Ambient Temperature	deg F	88	14	88	14	88	14	88	14	88	14	88	14
Ambient RH	%	65	67	65	67	65	67	65	67	65	67	65	67
Evap Cooler		On	Off	On	Off	On	Off	On	Off	On	Off	On	Off
Duct Burner		On	Off	On	Off	On	Off	On	Off	On	Off	On	Off
CTG(s) Heat Input	mmBtu/hr	1990	2178	2213	2262	2403	2824	2358	2833	3980	4357	4425	4524
Duct Burner(s) Heat Input	mmBtu/hr	99	0	120	0	225	0	231	0	198	0	281	0
Total Plant Heat Input	mmBtu/hr	2089	2178	2333	2262	2628	2824	2589	2833	4179	4357	4706	4524
NOx	ppmvd @ 15% O2	9.45	9.00	9.92	9.00	12.37	15.00	24.38	25.00	9.45	9.01	10.07	9.00
	lb/hr	91.73	87.54	102.83	90.70	147.38	187.58	289.29	314.80	183.56	175.08	208.87	181.39
	lb/mmBtu	0.044	0.040	0.044	0.040	0.056	0.066	0.112	0.111	0.044	0.040	0.044	0.040
	SCR Required	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No
CO	ppmvd @ 15% O2	6.84	6.00	5.24	4.00	9.25	10.00	11.21	10.00	6.85	6.00	5.44	4.00
	lb/hr	40.43	35.52	33.04	24.54	67.12	76.12	80.95	76.65	80.94	71.05	68.69	49.07
	lb/mmBtu	0.019	0.016	0.014	0.011	0.026	0.027	0.031	0.027	0.019	0.016	0.015	0.011
VOC	ppmvd @ 15% O2	1.59	1.05	1.67	1.00	2.17	1.50	2.03	1.00	1.55	1.00	1.78	1.00
	lb/hr	5.37	3.55	6.01	3.51	8.99	6.52	8.39	4.38	10.45	6.77	12.82	7.01
	lb/mmBtu	0.0026	0.0016	0.0026	0.0015	0.0034	0.0023	0.0032	0.0015	0.0025	0.0016	0.0027	0.0015
PM10	lb/hr	6.04	5.42	6.81	5.48	7.85	6.37	7.92	6.68	12.09	10.83	14.03	10.96
	lb/mmBtu	0.003	0.002	0.003	0.002	0.003	0.002	0.003	0.002	0.003	0.002	0.003	0.002
PM Total	lb/hr	12.07	10.83	13.62	10.96	15.69	12.75	15.84	13.35	24.17	21.66	28.05	21.92
	lb/mmBtu	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005
SO2	lb/hr	1.76	1.83	1.96	1.90	2.21	2.38	2.18	2.38	3.52	3.67	3.96	3.81
	lb/mmBtu	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
H2SO4	lb/hr	0.42	0.44	0.47	0.45	0.53	0.56	0.52	0.57	0.84	0.87	0.94	0.90
	lb/mmBtu	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
NH3 Slip	ppmvd @ 15% O2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	lb/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	lb/mmBtu	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 3.7-3 and Table 3.7-4 summarize the controlled and uncontrolled emissions expected from the various configurations when fired by ultra low sulfur No. 2 oil during winter operation. It is assumed that the duct burner would not be utilized when firing with oil as natural gas is assumed to be unavailable, therefore winter operating conditions represents the maximum potential to emit.

Table 3.7-3. Total Plant Stack Emissions w/ SCR and Oxidation Catalyst, Ultra Low Sulfur Diesel (80% CO Reduction and 50% VOC reduction assumed by Oxidation Catalyst)

Plant Emissions							
		1x1 7FA	1x1 F5EE	1x1 GAC	1x1 8000H	2x1 7FA	2x1 F5EE
Ambient Temperature	deg F	14	14	14	14	14	14
Ambient RH	%	67	67	67	67	67	67
Evap Cooler		Off	Off	Off	Off	Off	Off
Duct Burner		Off	Off	Off	Off	Off	Off
CTG(s) Heat Input	mmBtu/hr	2350	2319	2268	2846	4700	4883
Duct Burner(s) Heat Input	mmBtu/hr	0	0	0	0	0	0
Total Plant Heat Input	mmBtu/hr	2350	2319	2268	2846	4700	4883
NOx	ppmvd @ 15% O2	33.50	33.50	33.50	33.50	33.50	33.50
	lb/hr	275.43	283.93	266.41	355.85	550.86	580.15
	lb/mmBtu	0.117	0.122	0.117	0.125	0.117	0.119
	SCR Required	Yes	Yes	Yes	Yes	Yes	Yes
CO	ppmvd @ 15% O2	4.00	2.00	10.00	0.80	2.00	2.00
	lb/hr	24.52	12.64	59.77	6.15	24.52	25.19
	lb/mmBtu	0.010	0.005	0.026	0.002	0.005	0.005
VOC	ppmvd @ 15% O2	1.14	0.50	5.00	0.50	0.75	1.00
	lb/hr	3.99	1.81	17.08	2.20	5.25	7.20
	lb/mmBtu	0.0017	0.0008	0.0075	0.0008	0.0011	0.0015
PM10 (Filterable)	lb/hr	34.00	51.73	18.60	6.80	10.16	52.55
	lb/mmBtu	0.014	0.022	0.008	0.002	0.002	0.011
PM Total (Filterable and Condensable)	lb/hr	68.00	103.46	37.20	13.61	20.33	105.11
	lb/mmBtu	0.029	0.045	0.016	0.005	0.004	0.022
SO2	lb/hr	3.20	3.16	3.09	3.88	6.40	6.65
	lb/mmBtu	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014
H2SO4	lb/hr	0.76	0.75	0.74	0.92	1.53	1.59
	lb/mmBtu	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
NH3 Slip	ppmvd @ 15% O2	5.0	5.0	5.0	5.0	5.0	5.0
	lb/hr	18.61	19.19	18.14	23.33	37.21	38.24
	lb/mmBtu	0.008	0.008	0.008	0.008	0.008	0.008

Table 3.7-4. Total Plant Uncontrolled Stack Emissions, Ultra Low Sulfur Diesel

Plant Emissions							
		1x1 7FA	1x1 F5EE	1x1 GAC	1x1 8000H	2x1 7FA	2x1 F5EE
Ambient Temperature	deg F	14	14	14	14	14	14
Ambient RH	%	67	67	67	67	67	67
Evap Cooler		Off	Off	Off	Off	Off	Off
Duct Burner		Off	Off	Off	Off	Off	Off
CTG(s) Heat Input	mmBtu/hr	2350	2319	2268	2846	4700	4883
Duct Burner(s) Heat Input	mmBtu/hr	0	0	0	0	0	0
Total Plant Heat Input	mmBtu/hr	2350	2319	2268	2846	4700	4883
NOx	ppmvd @ 15% O2	42.00	42.00	42.00	42.00	42.00	42.00
	lb/hr	422.92	436.19	412.39	530.33	845.84	869.16
	lb/mmBtu	0.180	0.188	0.182	0.186	0.180	0.178
	SCR Required	Yes	Yes	Yes	Yes	Yes	Yes
CO	ppmvd @ 15% O2	4.00	2.00	10.00	0.80	2.00	2.00
	lb/hr	24.52	12.64	59.77	6.15	24.52	25.19
	lb/mmBtu	0.010	0.005	0.026	0.002	0.005	0.005
VOC	ppmvd @ 15% O2	1.14	0.50	5.00	0.50	0.75	1.00
	lb/hr	3.99	1.81	17.08	2.20	5.25	7.20
	lb/mmBtu	0.0017	0.0008	0.0075	0.0008	0.0011	0.0015
PM10 (Filterable)	lb/hr	34.00	51.73	18.60	6.80	10.16	52.55
	lb/mmBtu	0.014	0.022	0.008	0.002	0.002	0.011
PM Total (Filterable and Condensable)	lb/hr	68.00	103.46	37.20	13.61	20.33	105.11
	lb/mmBtu	0.029	0.045	0.016	0.005	0.004	0.022
SO2	lb/hr	3.20	3.16	3.09	3.88	6.40	6.65
	lb/mmBtu	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014
H2SO4	lb/hr	0.76	0.75	0.74	0.92	1.53	1.59
	lb/mmBtu	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
NH3 Slip	ppmvd @ 15% O2	0.0	0.0	0.0	0.0	0.0	0.0
	lb/hr	0.00	0.00	0.00	0.00	0.00	0.00
	lb/mmBtu	0.000	0.000	0.000	0.000	0.000	0.000

3.8 WATER

Plant water streams including the following:

- Raw Water
- Service Water
- Steam Cycle Makeup
- Potable Water

Plant water consumption and wastewater discharge rates have been presented in Section 3.7.4 for each NGCC arrangement operating at annual average design conditions. Additionally, water mass balance (WMB) diagrams depicting water consumption and wastewater streams have been provided in Appendix C for each NGCC arrangement.

3.8.1 Raw Water

The raw water system distributes low-pressure water to the following uses:

- Cooling tower makeup

3.8.2 Service Water

The service water system served from the raw water system distributes low-pressure water throughout the power station for the following uses:

- CTG evaporative cooling system
- Hose stations for maintenance washdowns

The service water system consists of a storage tank, pumps and distribution piping network.

3.8.3 Steam Cycle Makeup Water

The steam cycle makeup water will be provided by the existing E. W. brown cycle makeup water treatment system for steam/condensate cycle makeup.

The NGCC facility demineralization system will include a demineralized water storage tank and pumps.

3.8.4 Potable Water

Potable water will be provided by the municipal water main. A single interface point with the water main will be made and routed into the power station site. Backflow preventers and water meters will be provided.

3.8.5 Water Consumption and Wastewater Discharge

Plant water consumption and wastewater discharge rates have been presented in Table 3.8-1 for each NGCC arrangement operating at full load during annual average design conditions. Additionally, refer to Appendix C for water mass balance diagrams of the six NGCC arrangements.

Table 3.8-1 has depicted the water consumption and wastewater discharge rates per MWH produced.

Table 3.8-1. NGCC Facility Water Consumption and Wastewater Discharge Rates (5 Cycles of Concentration Cooling Tower)

Option	Description	Cooling Tower Water Consumption (Gallons/MWH)	Misc. Water Consumption (Gallons/MWH)	Cycle Water Consumption (Gallons/MWH)	Total Water Consumption (Gallons/MWH)	Plant Wastewater Discharge (Gallons/MWH)
1	1 x 1 7F 5	234	0.20	11	245	48
2	1 x 1 SGT6-5000F(5)ee	242	0.18	11	253	50
3	1 x 1 GAC	231	0.16	10	241	47
4	1 x 1 SGT6-8000H	233	0.15	11	244	48
5	2 x 1 7F 5	233	0.10	11	244	48
6	2 x 1 SGT6-5000F(5)ee	237	0.09	11	248	49

3.9 WASTEWATER

The wastewater collection and transfer system will be provided to collect, monitor, and discharge of the facility wastewater streams including the following.

- Oily Wastewater
- HRSG Blowdown
- Cooling Tower Blowdown
- Gas Turbine Wash Water

All wastewater lift stations will be furnished with sump pumps installed in 100 percent capacity pairs. Sump pumps will be vertical sump pumps with the motor installed above the sump cover.

3.9.1 Sanitary Wastewater

The sanitary wastewater will be collected from the various points of origin in the facility and gravity feed (unless deemed impractical) to a relocated E. W. Brown sanitary septic field.

3.9.2 Oily Wastewater

Plant wastewater that has the potential for oil contamination will be collected and routed through an oil water separator.

The separator will be capable of removing entrained oil to a maximum instantaneous concentration of 10 ppm. A level probe with high level switches and leak detection devices will be provided. This system will be designed so that separated oily waste can be removed from the plant via vacuum truck. Separated wastewater will be periodically sampled by means of a grab sample and routed to the plant wastewater collection sump (PWCS).

3.9.3 Plant Wastewater

The effluent limits from the wastewater collection sump are anticipated to be in accordance with EPA Title 40, Chapter 1, Subchapter N, Part 423 - Steam Electric Power Generating Point Source Category based on representative river water data. Therefore, plant wastewater from the PWCS will not require wastewater treatment plant prior to discharge to the outfall. It should be noted that the above conclusions are based on a typical river water analysis.

The plant wastewater discharge will be automatically monitored and measured as required by the plant wastewater permits and all applicable federal, state and local codes. Provisions also will be made to provide grab samples. Sample collections on the water discharge piping to facilitate the collection of grab samples will be provided.

Treated water will be combined with cooling tower blowdown and discharged through the plant wastewater discharge outfall.

3.9.4 Cooling Tower Blowdown

Cooling tower blowdown will be routed directly to the facility’s outfall.

Cooling tower blowdown discharge will be monitored and measured as required by the plant wastewater permits and all applicable Federal, State and Local codes. Provisions to provide grab samples also will be made. Sample connections on the waste discharge piping to facilitate the collection of grab samples will be provided.

3.9.5 HRSG Blowdown

HRSG blowdown water will be quenched with service water and sent to the PWCS. Hot drain piping will be designed to accommodate temperatures up to 212 °F.

3.9.6 Combustion Turbine Water Wash

The CTG water wash system will be provided with a double wall, fiberglass holding tank or concrete sump sized to contain the wastewater from two complete CTG water wash cycles. The tank system will be provided with connections and designed for vacuum truck removal.

3.9.7 Storm Water

Site run-off will be collected and routed to maintain the site storm water drainage system with sentiment or detention ponds provided as required.

4.0 NGCC ELECTRICAL INTERCONNECTION

The NGCC Power Block will be interconnected at 345 kV to the LG&E/KU transmission system. The Project estimate includes the GSUs and a high-side take-off structure. A NGCC switchyard provided by the Transmission System Operator will be located adjacent to the power plant. The direct interconnection cost of the plant will be determined by an ITO study. An allowance for the direct interconnection cost is included in the Owners Indirect cost for each plant configuration.

The power block will be comprised of one or two combustion turbine generators (CTG) and one steam turbine generator (STG) to establish either a 1 x 1 or 2 x 1 combined cycle configuration. For the specific electric power system configurations refer to One Line Diagrams 189895-0MP-E1001 through 189895-0MP-E1004 located in Appendix D.

5.0 NGCC PROJECT SCHEDULE

The NGCC facility's project schedule from limited notice to proceed [LNTP] to commercial operation date has been estimated to be 36 months. Appendix E provides the assumed project scope, logic ties and estimated schedule activity durations required to complete the NGCC facility.

The project schedule for each of the six options considered is essentially the same duration driven by the steam turbine generator lead time, and similar construction and commissioning activity durations.

6.0 NGCC PROJECT COST ESTIMATES

Budgetary equipment pricing for certain major mechanical equipment, including the STG, HRSG's, CTG's, boiler feed pumps, condensate pumps, condenser, and cooling tower, as well as recent equipment estimates from similar projects were utilized in developing the total project cost. Other assumptions and project scope included in the estimate is summarized as follows:

- Brownfield site (E. W. Brown Station)
- Site specific topography includes rock excavation and imported fill
- No black start generation capacity included
- Condenser with vacuum pumps and mechanical draft cooling tower (no plume abatement)
- SCR (as required) and DLN combustors for NOx control
- Electrical scope includes the GSU transformers and high-side take-off structure
- Natural gas piping starting from site metering station
- Sales tax is included for non-production material
- Construction based on a ten hour per day, five day per week work week

The following Owner's costs have also been established and are included in the estimate:

- Project Development
- Transmission Interconnection
- Natural Gas Pipeline Interconnection
- Natural Gas Pipeline Fixed O&M (Startup Period)
- Construction Power (Service Installation and Energy)
- Owner Operations Personnel (Prior to COD)
- Owner's Project Management
- Owner's Engineer
- Owner's Legal Counsel
- Land Cost
- Operator Training

- Startup Testing (Includes Fuel & Power Sales)
- Site Security
- Operating Spare Parts (Excludes CTG LTSA Costs)
- Permanent Plant Equipment & Furnishings
- IT and Telecommunication Infrastructure
- AFUDC for KU Ownership Portion

An Owner's contingency of 10 percent of the total EPC project cost has been included within the project estimate.

A summary of the estimated plant EPC costs and Owner's costs are depicted in Tale 6.0-1.

Table 6.0-1. Total Project Cost ($1,000)

Project Costs	1 x 1 7F 5	1 x 1 SGT6-5000F(5)ee	1 x 1 GAC	1 x 1 SGT6-8000H	2 x 1 7F 5	2 x 1 SGT6-5000F(5)ee
Plant Net Capacity (MW)	307.4	343.7	383.2	389.8	615.5	688.7
EPC Cost ($1,000)	$327,669	$319,623	$353,870	$359,340	$493,871	$497,201
Owner's Costs						
Total Owner Indirects	$63,775	$63,775	$64,082	$56,082	$69,225	$69,225
Owner Contingency	$32,767	$31,962	$35,387	$35,934	$49,387	$49,720
LTSA	$12,682	$1,729	$5,027	$1,729	$12,682	$3,459
Total Project Cost ($1,000)	**$436,893**	**$417,090**	**$458,366**	**$453,085**	**$625,165**	**$619,605**
Total Project Cost ($/kW)	$1,421	$1,214	$1,196	$1,162	$1,016	$900

Complete line item details regarding the scope of costs included in the total project cost estimates are included in Appendix F.

7.0 NGCC LIFECYCLE COST ANALYSES

Detailed life cycle analyses have been completed to determine a cost of generation for each of the NGCC arrangements under evaluation. For reference, the life cycle analyses have been provided in Appendix G for the NGCC options considered herein. The following provides a summary description of each component of the cost of generation of electricity.

7.1 OPERATING AND MAINTENANCE COSTS

Fully burdened plant operations and maintenance staff as well as other fixed costs associated with facility operations such as building and site maintenance, insurances, and property taxes are summarized in Table 7.1-1. Escalation has been applied to these costs at 0.9 percent per year.

Table 7.1-1. Fixed Cost Assumptions

Fixed Cost	First Year Price (2018)
Annual Cost for Salaried Staff	$126,586
Annual Cost for Hourly Staff	$101,268
Insurance	0.106% of EPC Project Cost
Property Tax	0.150% of EPC Project Cost
Annual Site / Building Maintenance Cost	$139,244

Table 7.1-2, provides the assumed number of NGCC facility personnel on a salaried staff and hourly staff basis.

Table 7.1-2. NGCC Facility Personnel

Option	Description	Salaried Staff	Hourly Staff
1	1 x 1 7F 5	7	24
2	1 x 1 SGT6-5000F(5)ee	7	24
3	1 x 1 GAC	7	24
4	1 x 1 SGT6-8000H	7	24
5	2 x 1 7F 5	7	24
6	2 x 1 SGT6-5000F(5)ee	7	24

Equipment parts and maintenance costs are included in the analysis as fixed and variable O&M costs and are dependent upon maintenance schedules and hours of operation of the equipment. These costs have included expenses for replacement parts and outsourced labor to perform major maintenance on the combustion turbines, steam turbines, HRSGs, and other major equipment. Escalation has been applied to these costs at 2.4 percent per year.

Consumable costs include costs for material delivery and disposal for all of the materials utilized within the power generation process. These consumable costs include items such as ammonia, water, water treatment chemicals, and spare parts.

The plant will be installed with air quality control equipment intended to comply with reasonable emissions limits dictated by federal and state authorities, therefore emissions allowances have not been incorporated into the evaluation.

Unit costs used in the evaluation for the consumables and emissions allowances are as defined below in Table 7.1-3.

Table 7.1-3. Consumable Cost Basis

Consumable	First Year Unit Price (2018)
Consumable Escalation Rate	0.9%
Ammonia (as 19% Aqueous)	$165.69 / Ton
Clarified Water	$1.49 / kgal
Demineralized Water	$4.68 / kgal
Cycle Chemical Feed	$0.012 / Ton steam produced

7.2 FUEL COSTS

Fuel costs are strictly a function of the cost of fuel as delivered to the facility. These are then converted to a $/MWH basis by utilizing the cycle heat rates. The first year cost of fuel assumed for this evaluation is defined below in Table 7.2-1 with the forecast pricing indicated in Figure 7.2-1.

Table 7.2-1. Fuel Costs

Fuel Cost Assumptions		
Year		2018
Natural Gas	(US$/mmBtu)	$4.96

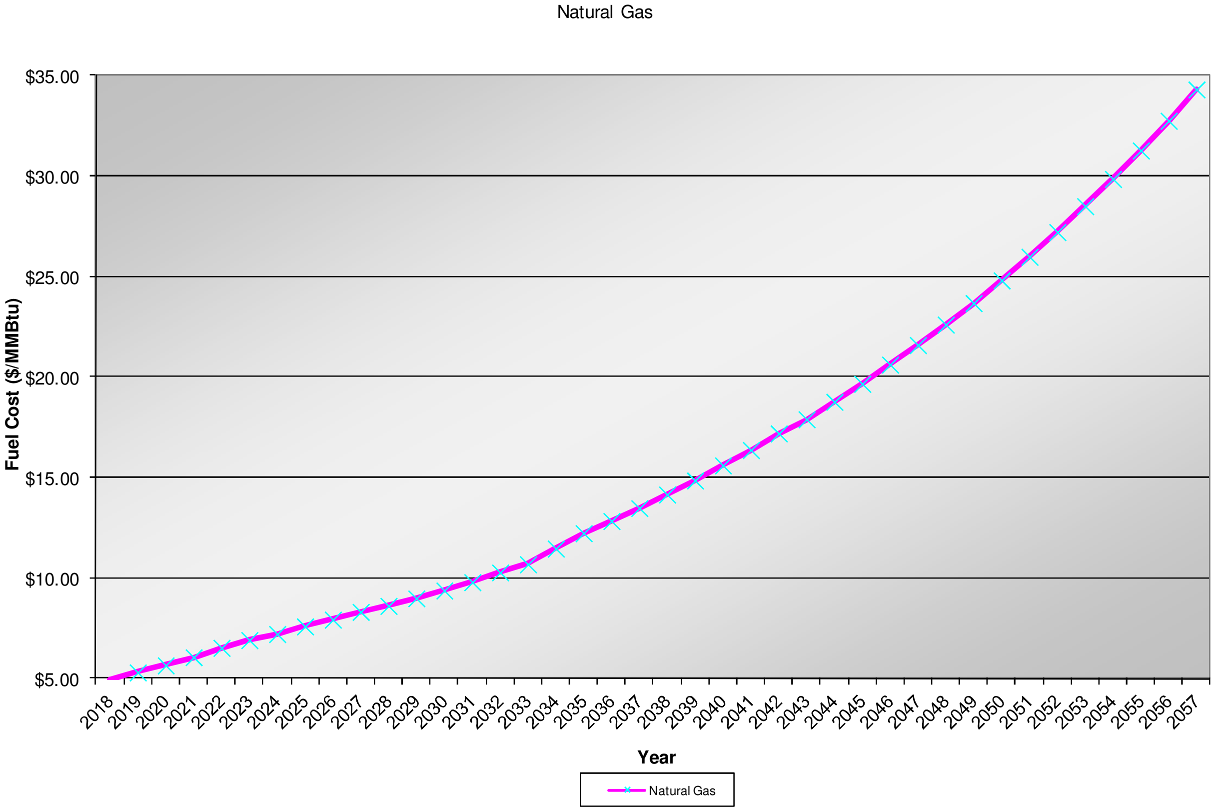


Figure 7.2-1 Fuel Cost Forecast

Table 7.2-2, depicts the annual demand charge Texas Eastern intends to invoice the proposed NGCC facility based on the NGCC option chosen. The annual demand charge was determined by the maximum natural gas demand required on a heat input per day MMBTU/day) basis, which correlates to the 99 percent winter design condition. A 24 hour operational period was used to determine the demand charge since a demand charge is usually determined on potential rather than typical or actual use (24 hours potential rather than 16 hours actual or typical). The annual demand charge remains constant for the life of the NGCC facility.

Table 7.2-2. Annual Natural Gas Demand Charge

	Description	Natural Gas Annual Demand Charge
1	1 x 1 7F 5	$7,172,281
2	1 x 1 SGT6-5000F(5)ee	$8,062,268
3	1 x 1 GAC	$8,950,089
4	1 x 1 SGT6-8000H	$8,836,199
5	2 x 1 7F 5	$14,344,562
6	2 x 1 SGT6-5000F(5)ee	$16,124,536

7.3 CAPITAL RECOVERY COSTS

Fixed capacity payments, or capital recovery costs have been established for this analysis based upon a 45.7 percent debt / 54.3 percent equity financing approach with a 6.75 percent rate of return expectation on that money. A 20 year debt term has been assumed with an interest rate of 3.73 percent. Capital cost differentials have been utilized as identified in Section 9.0.

Tax depreciation has been assumed based upon a 20 year MACRS schedule with book depreciation assumed as straight line over 30 years. To summarize other factors utilized to determine the fixed capacity payments, Table 7.3-1 is provided.

Table 7.3-1 Economic Assumptions

Common Proforma Parameters	
Discount Rate	6.75%
Depreciation Schedule - Tax	20 Year MACRS
Depreciation Schedule - Book	30 Year SL
Amortization	30 Years
Project Life	30 Years
Capital Escalation	2.40%
Income Tax Rate	38.90%
IRR	6.75%
Debt	45.7%
Interest Rate	3.73%

7.4 SUMMARY OF LIFECYCLE COST ANALYSIS

Incorporating all of the above capital cost expectations and operating and maintenance costs, the total cost of generation values for each intermediately loaded NGCC option have been presented in Table 7.4-1. Costs are presented on both a first year basis and a 30 year levelized basis for an intermediately loaded plant. Detailed data for the first 20 years of the lifecycle models for these cases are included in Appendix G.

Table 7.4-1. NGCC Electrical Cost of Generation Summary (Intermediate Load Dispatch)

		NGCC 1	NGCC 2	NGCC 3	NGCC 4	NGCC 5	NGCC 6
		1 x 1 7F 5	1 x 1 SGT6-5000F(5)ee	1 x 1 GAC	1 x 1 SGT6-8000H	2 x 1 7F 5	2 x 1 SGT6-5000F(5)ee
Gross Output	(MW)	314.3	351.6	393.0	399.6	629.4	704.7
Auxiliary Power	(MW)	6.9	8.0	9.7	9.8	13.8	16.0
Net Output	(MW)	307.4	343.7	383.2	389.8	615.5	688.7
Net Cycle Heat Rate, HHV	(Btu/kWH)	6,642	6,679	6,649	6,453	6,634	6,665
Net Cycle Efficiency	(% HHV)	51.42%	51.15%	51.38%	52.93%	51.49%	51.25%
Capital Cost	($/kW net)	$1,421	$1,214	$1,196	$1,162	$1,016	$900
First Year Cost of Generation							
Capital Recovery	($/MWH)	$29.01	$24.74	$24.37	$23.65	$20.67	$18.28
Fixed O&M	($/MWH)	$6.10	$4.04	$3.97	$3.76	$3.69	$2.66
Variable O&M	($/MWH)	$1.45	$2.61	$3.27	$3.47	$1.17	$2.60
Consumables	($/MWH)	$2.72	$2.65	$2.63	$2.58	$2.56	$2.52
Fuel Costs	($/MWH)	$38.88	$39.09	$38.92	$37.77	$38.84	$39.02
Total COG	($/MWH)	$78.16	$73.13	$73.16	$71.23	$66.92	$65.08
Levelized Cost of Generation							
Capital Recovery	($/MWH)	$29.01	$24.74	$24.37	$23.65	$20.67	$18.28
Fixed O&M	($/MWH)	$7.10	$4.50	$4.46	$4.20	$4.30	$3.01
Variable O&M	($/MWH)	$1.89	$3.43	$4.31	$4.57	$1.52	$3.42
Consumables	($/MWH)	$4.72	$4.63	$4.60	$4.49	$4.50	$4.46
Fuel Costs	($/MWH)	$68.07	$68.44	$68.13	$66.13	$67.99	$68.31
Total Levelized COG	($/MWH)	$110.78	$105.74	$105.87	$103.04	$98.98	$97.48

As shown in Table 7.4-1 a 2x1 combustion turbine arrangement produces a lower cost of generation than that of a 1x1 arrangement. The first year cost of generation ranges from approximately $65 per MWH for a 2x1 F class combined cycle plant arrangement to $78 per MWH for a 1x1 F class combined cycle plant configuration. The 1x1 SGT6-8000H (NGCC 4) provides the lowest cost of generation for a 1x1 plant configuration at $71 per MWH. The 2x1 SGT6-5000F(5)ee plant configuration (NGCC 6) provides the lowest cost of generation for all of the options considered.

For comparison, the cost of generation also has been developed for a base load facility operating at 8,400 hours annually. LTSA costs have been modified to reflect the OEM provided values based on an equivalent operating hours basis rather than an equivalent number of starts basis. Table 7.4-2 summarizes the first year and levelized cost of generation for each option in the case of a base load facility.

Table 7.4-2. NGCC Electrical Cost of Generation Summary (Base Load Dispatch)

		NGCC 1	NGCC 2	NGCC 3	NGCC 4	NGCC 5	NGCC 6
		1 x 1 7F 5	1 x 1 SGT6-5000F(5)ee	1 x 1 GAC	1 x 1 SGT6-8000H	2 x 1 7F 5	2 x 1 SGT6-5000F(5)ee
Gross Output	(MW)	314.3	351.6	393.0	399.6	629.4	704.7
Auxiliary Power	(MW)	6.9	8.0	9.7	9.8	13.8	16.0
Net Output	(MW)	307.4	343.7	383.2	389.8	615.5	688.7
Net Cycle Heat Rate, HHV	(Btu/kWH)	6,642	6,679	6,649	6,453	6,634	6,665
Net Cycle Efficiency	(% HHV)	51.42%	51.15%	51.38%	52.93%	51.49%	51.25%
Capital Cost	($/kW net)	$1,421	$1,214	$1,196	$1,162	$1,016	$900
First Year Cost of Generation							
Capital Recovery	($/MWH)	$14.57	$12.42	$12.23	$11.87	$10.37	$9.18
Fixed O&M	($/MWH)	$3.06	$2.03	$1.99	$1.89	$1.85	$1.33
Variable O&M	($/MWH)	$0.78	$1.56	$1.96	$2.08	$0.62	$1.56
Consumables	($/MWH)	$0.49	$0.45	$0.44	$0.44	$0.41	$0.39
Fuel Costs	($/MWH)	$36.09	$36.28	$36.12	$35.06	$36.04	$36.21
Total COG	($/MWH)	$54.98	$52.74	$52.74	$51.33	$49.30	$48.67
Levelized Cost of Generation							
Capital Recovery	($/MWH)	$14.57	$12.42	$12.23	$11.87	$10.37	$9.18
Fixed O&M	($/MWH)	$3.56	$2.26	$2.24	$2.11	$2.16	$1.51
Variable O&M	($/MWH)	$1.02	$2.03	$2.55	$2.70	$0.81	$2.02
Consumables	($/MWH)	$0.64	$0.59	$0.58	$0.58	$0.53	$0.50
Fuel Costs	($/MWH)	$65.21	$65.57	$65.27	$63.35	$65.13	$65.44
Total Levelized COG	($/MWH)	$84.99	$82.86	$82.87	$80.61	$79.01	$78.65

8.0 HEAVILY FIRED COMBINED CYCLE PLANT OPTIONS

Additional plant configurations have been evaluated for a 2 x 1 CC plant design that includes additional duct firing. The combustion turbine generator options evaluated include Siemens SGT6-5000F(5)ee, Siemens SGT6-8000H, and GE's new 7F7 Series turbine. These 2x1 configurations have been evaluated to produce two different plant sizes: a 760 MW nominal net degraded, heavily fired plant design and a 700 MW nominal net degraded, moderately fired plant design. Both plants have been designed to achieve the desired net capacity on a one percent summer day condition with non recoverable degradation applied.

8.1 PLANT PERFORMANCE

Tables 8.1-1 through 8.1-12 provide a summary of expected "new and clean" plant performance and degraded plant performace for the 760 MW and 700 MW NGCC plant configurations at 1 percent summer, annual average ambient, and 99 percent winter conditions. All heat rates and plant efficiencies are presented on a higher heating value (HHV) basis.

Table 8.1-1. 760 MW Design, Average Ambient, New and Clean

Description		Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
2x1 F5EE - 760	Fired	838.8	6,815	2.79%	815.4	7,011	48.72%
2x1 F5EE - 760	Unfired	702.1	6,539	2.29%	686.0	6,692	51.04%
2x1 7F7 - 760	Fired	840.8	6,644	2.72%	817.9	6,829	50.02%
2x1 7F7 - 760	Unfired	712.1	6,341	2.22%	696.3	6,485	52.67%
2x1 H - 760	Fired	857.3	6,372	2.97%	831.8	6,567	52.02%
2x1 H - 760	Unfired	802.8	6,267	2.47%	782.9	6,426	53.16%

Table 8.1-2. 760 MW Design, Summer Ambient, New and Clean

Description		Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
2x1 F5EE - 760	Fired	801.8	6,864	2.81%	779.3	7,063	48.36%
2x1 F5EE - 760	Unfired	671.8	6,587	2.31%	656.3	6,743	50.66%
2x1 7F7 - 760	Fired	805.9	6,714	2.74%	783.8	6,903	49.48%
2x1 7F7 - 760	Unfired	676.9	6,412	2.24%	661.8	6,559	52.07%
2x1 H - 760	Fired	805.6	6,428	2.99%	781.5	6,627	51.55%
2x1 H - 760	Unfired	748.4	6,303	2.49%	729.7	6,464	52.85%

Table 8.1-3. 760 MW Design, Winter Ambient, New and Clean

Description		Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
2x1 F5EE - 760	Fired	839.9	6,853	2.77%	816.6	7,048	48.46%
2x1 F5EE - 760	Unfired	689.2	6,564	2.27%	673.5	6,716	50.86%
2x1 7F7 - 760	Fired	851.3	6,692	2.70%	828.3	6,878	49.66%
2x1 7F7 - 760	Unfired	723.8	6,424	2.20%	707.9	6,569	52.00%
2x1 H - 760	Fired	938.4	6,406	2.95%	910.7	6,600	51.75%
2x1 H - 760	Unfired	895.9	6,325	2.45%	874.0	6,484	52.68%

Table 8.1-4. 760 MW Design, Average Ambient, Non Recoverable Degraded

Description		Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
2x1 F5EE - 760	Fired	814.6	6,938	2.79%	791.9	7,137	47.86%
2x1 F5EE - 760	Unfired	681.8	6,656	2.29%	666.2	6,812	50.14%
2x1 7F7 - 760	Fired	691.5	6,455	2.22%	676.2	6,602	51.74%
2x1 7F7 - 760	Unfired	691.5	6,455	2.22%	676.2	6,602	51.74%
2x1 H - 760	Fired	832.5	6,486	2.97%	807.8	6,685	51.10%
2x1 H - 760	Unfired	779.6	6,380	2.47%	760.3	6,542	52.21%

Table 8.1-4. 760 MW Design, Summer Ambient, Non Recoverable Degraded

Description		Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
2x1 F5EE - 760	Fired	778.7	6,988	2.81%	756.8	7,190	47.51%
2x1 F5EE - 760	Unfired	652.4	6,706	2.31%	637.3	6,865	49.76%
2x1 7F7 - 760	Fired	782.6	6,835	2.74%	761.1	7,027	48.61%
2x1 7F7 - 760	Unfired	657.4	6,528	2.24%	642.6	6,678	51.15%
2x1 H - 760	Fired	782.3	6,544	2.99%	758.9	6,746	50.63%
2x1 H - 760	Unfired	726.7	6,416	2.49%	708.7	6,580	51.91%

Table 8.1-6. 760 MW Design, Winter Ambient, Non Recoverable Degraded

Description		Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
2x1 F5EE - 760	Fired	815.6	6,977	2.77%	793.0	7,175	47.60%
2x1 F5EE - 760	Unfired	669.3	6,682	2.27%	654.1	6,837	49.96%
2x1 7F7 - 760	Fired	826.7	6,813	2.70%	804.4	7,002	48.78%
2x1 7F7 - 760	Unfired	702.9	6,540	2.20%	687.4	6,687	51.08%
2x1 H - 760	Fired	911.3	6,521	2.95%	884.4	6,719	50.84%
2x1 H - 760	Unfired	870.0	6,439	2.45%	848.7	6,601	51.75%

Table 8.1-7. 700 MW Design, Average Ambient, New and Clean

Description		Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
2x1 F5EE - 700	Fired	775.8	6,673	2.63%	755.4	6,853	49.85%
2x1 F5EE - 700	Unfired	703.6	6,524	2.28%	687.6	6,676	51.16%
2x1 7F7 - 700	Fired	777.7	6,403	2.56%	757.8	6,571	51.98%
2x1 7F7 - 700	Unfired	719.0	6,280	2.21%	703.1	6,422	53.19%
2x1 H - 700	Unfired	801.7	6,275	2.81%	779.2	6,457	52.90%

Table 8.1-8. 700 MW Design, Summer Ambient, New and Clean

Description		Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
2x1 F5EE - 700	Fired	740.8	6,725	2.65%	721.2	6,908	49.45%
2x1 F5EE - 700	Unfired	672.4	6,581	2.30%	656.9	6,736	50.71%
2x1 7F7 - 700	Fired	741.7	6,471	2.58%	722.6	6,642	51.43%
2x1 7F7 - 700	Unfired	683.7	6,349	2.23%	668.5	6,494	52.60%
2x1 H - 700	Unfired	745.0	6,331	2.83%	723.9	6,516	52.43%

Table 8.1-9. 700 MW Design, Winter Ambient, New and Clean

Description		Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
2x1 F5EE - 700	Fired	774.3	6,697	2.61%	754.1	6,876	49.67%
2x1 F5EE - 700	Unfired	691.5	6,542	2.26%	675.9	6,693	51.04%
2x1 7F7 - 700	Fired	730.2	6,369	2.19%	714.2	6,511	52.46%
2x1 7F7 - 700	Unfired	730.2	6,369	2.19%	714.2	6,511	52.46%
2x1 H - 700	Unfired	896.0	6,325	2.79%	871.0	6,506	52.50%

Table 8.1-10. 700 MW Design, Average Ambient, Non Recoverable Degraded

Description		Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
2x1 F5EE - 700	Fired	753.4	6,793	2.63%	733.6	6,976	48.96%
2x1 F5EE - 700	Unfired	683.3	6,642	2.28%	667.7	6,797	50.26%
2x1 7F7 - 700	Fired	755.2	6,518	2.56%	735.9	6,689	51.06%
2x1 7F7 - 700	Unfired	698.3	6,393	2.21%	682.8	6,537	52.25%
2x1 H - 700	Unfired	778.5	6,389	2.81%	756.7	6,573	51.96%

Table 8.1-11. 700 MW Design, Summer Ambient, Non Recoverable Degraded

Description		Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
2x1 F5EE - 700	Fired	719.4	6,846	2.65%	700.3	7,032	48.57%
2x1 F5EE - 700	Unfired	652.9	6,700	2.30%	637.9	6,858	49.81%
2x1 7F7 - 700	Fired	720.3	6,587	2.58%	701.7	6,762	50.51%
2x1 7F7 - 700	Unfired	663.9	6,463	2.23%	649.1	6,611	51.67%
2x1 H - 700	Unfired	723.5	6,445	2.83%	703.0	6,633	51.50%

Table 8.1-12. 700 MW Design, Winter Ambient, Non Recoverable Degraded

Description		Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
2x1 F5EE - 700	Fired	751.9	6,818	2.61%	732.3	7,000	48.79%
2x1 F5EE - 700	Unfired	671.6	6,659	2.26%	656.4	6,813	50.13%
2x1 7F7 - 700	Fired	767.7	6,594	2.54%	748.2	6,766	50.48%
2x1 7F7 - 700	Unfired	709.1	6,483	2.19%	693.5	6,628	51.53%
2x1 H - 700	Unfired	870.1	6,439	2.79%	845.8	6,623	51.57%

8.2 EMISSIONS

Plant stack emissions for the 760 MW and 700 MW NGCC plant configurations are summarized in Table 8.2-1 for summer day and winter day performance with duct firing. Uncontrolled emissions are depicted in Table 8.2-2. Emissions are summarized for the entire plant on a lb/hr basis.

Table 8.2-1. Fired Total Plant Stack Emissions w/ SCR (as necessary) and Oxidation Catalyst, Natural Gas (80% CO Reduction and 50% VOC reduction assumed by Oxidation Catalyst)

Plant Emissions		2x1 F5EE - 760		2x1 F5EE - 700		2x1 7F7 - 760		2x1 7F7 - 700		2x1 H - 760		2x1 H - 700	
		Summer Fired	Winter Fired	Summer Fired	Winter Fired	Summer Fired	Winter Fired	Summer Fired	Winter Fired	Summer Fired	Winter Fired	Summer Fired	Winter Fired
Ambient Temperature	deg F	88	14	88	14	88	14	88	14	88	14	88	14
Ambient RH	%	65	67	65	67	65	67	65	67	65	67	65	67
Evap Cooler		On	Off	On	Off	On	Off	On	Off	On	Off	On	Off
Duct Burner		On	Off	On	Off	On	Off	On	Off	On	Off	NA	NA
CTG(s) Heat Input	mmBtu/hr	4425	4524	4425	4524	4341	4650	4341	4650	4717	5667	4717	5667
Duct Burner(s) Heat Input	mmBtu/hr	1079	1232	556	661	1070	1047	459	471	462	344	0	0
Total Plant Heat Input	mmBtu/hr	5504	5756	4982	5185	5410	5697	4800	5121	5179	6011	4717	5667
NOx	ppmvd @ 15% O2	10.92	11.14	10.07	10.26	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
	lb/hr	272.69	279.95	230.92	234.31	291.44	298.90	262.82	271.13	284.76	319.19	251.20	294.47
	lb/mmBtu	0.050	0.049	0.046	0.045	0.054	0.052	0.055	0.053	0.055	0.053	0.053	0.052
	SCR Required	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CO	ppmvd @ 15% O2	1.59	1.69	1.24	1.32	2.11	2.39	2.10	2.09	2.24	2.17	2.07	2.05
	lb/hr	24.11	25.83	17.32	18.41	31.17	36.28	27.97	28.79	32.38	35.14	26.37	30.66
	lb/mmBtu	0.004	0.004	0.003	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005
VOC	ppmvd @ 15% O2	1.66	1.81	1.15	1.27					1.02	0.85	0.52	0.51
	lb/hr	14.39	15.82	9.17	10.12					8.39	7.82	3.77	4.38
	lb/mmBtu	0.0026	0.0027	0.0018	0.0020					0.0016	0.0013	0.0008	0.0008
PM10	lb/hr	22.00	23.28	16.78	17.58	20.92	21.48	14.81	15.72	15.84	16.80	11.22	13.35
	lb/mmBtu	0.004	0.004	0.003	0.003	0.004	0.004	0.003	0.003	0.003	0.003	0.002	0.002
PM Total	lb/hr	44.01	46.56	33.56	35.15	41.84	42.96	29.62	31.45	31.69	33.59	22.45	26.70
	lb/mmBtu	0.008	0.008	0.007	0.007	0.008	0.008	0.006	0.006	0.006	0.006	0.005	0.005
SO2	lb/hr	4.63	4.84	4.19	4.36	4.55	4.79	4.04	4.31	4.36	5.06	3.97	4.77
	lb/mmBtu	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
H2SO4	lb/hr	1.10	1.15	1.00	1.04	1.08	1.14	0.96	1.02	1.04	1.20	0.94	1.13
	lb/mmBtu	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
NH3 Slip	ppmvd @ 15% O2	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	lb/hr	0.00	0.00	0.00	0.00	44.88	46.03	40.47	41.75	43.85	49.15	38.68	45.34
	lb/mmBtu	0.000	0.000	0.000	0.000	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008

Table 8.2-2. Fired Total Plant Uncontrolled Stack Emissions, Natural Gas

Plant Emissions		2x1 F5EE - 760		2x1 F5EE - 700		2x1 7F7 - 760		2x1 7F7 - 700		2x1 H - 760		2x1 H - 700	
		Summer Fired	Winter Fired	Summer Fired	Winter Fired	Summer Fired	Winter Fired	Summer Fired	Winter Fired	Summer Fired	Winter Fired	Summer Fired	Winter Fired
Ambient Temperature	deg F	88	14	88	14	88	14	88	14	88	14	88	14
Ambient RH	%	65	67	65	67	65	67	65	67	65	67	65	67
Evap Cooler		On	Off	On	Off	On	Off	On	Off	On	Off	On	Off
Duct Burner		On	Off	On	Off	On	Off	On	Off	On	Off	NA	NA
CTG(s) Heat Input	mmBtu/hr	4425	4524	4425	4524	4341	4650	4341	4650	4717	5667	4717	5667
Duct Burner(s) Heat Input	mmBtu/hr	1079	1232	556	661	1070	1047	459	471	462	344	0	0
Total Plant Heat Input	mmBtu/hr	5504	5756	4982	5185	5410	5697	4800	5121	5179	6011	4717	5667
NOx	ppmvd @ 15% O2	10.92	11.14	10.07	10.26	16.50	19.97	20.02	19.98	24.38	24.71	25.87	25.66
	lb/hr	272.69	279.95	230.92	234.31	400.77	497.51	438.47	451.45	578.57	657.16	541.61	629.61
	lb/mmBtu	0.050	0.049	0.046	0.045	0.074	0.087	0.091	0.088	0.112	0.109	0.115	0.111
	SCR Required	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CO	ppmvd @ 15% O2	7.93	8.44	6.20	6.62	10.54	11.96	10.49	10.47	11.21	10.85	10.35	10.26
	lb/hr	120.54	129.15	86.60	92.07	155.87	181.38	139.87	143.96	161.90	175.68	131.87	153.30
	lb/mmBtu	0.022	0.022	0.017	0.018	0.029	0.032	0.029	0.028	0.031	0.029	0.028	0.027
VOC	ppmvd @ 15% O2	3.31	3.62	2.30	2.55					2.03	1.69	1.03	1.03
	lb/hr	28.78	31.65	18.33	20.24					16.78	15.65	7.54	8.76
	lb/mmBtu	0.0052	0.0055	0.0037	0.0039					0.0032	0.0026	0.0016	0.0015
PM10	lb/hr	22.00	23.28	16.78	17.58	20.92	21.48	14.81	15.72	15.84	16.80	11.22	13.35
	lb/mmBtu	0.004	0.004	0.003	0.003	0.004	0.004	0.003	0.003	0.003	0.003	0.002	0.002
PM Total	lb/hr	44.01	46.56	33.56	35.15	41.84	42.96	29.62	31.45	31.69	33.59	22.45	26.70
	lb/mmBtu	0.008	0.008	0.007	0.007	0.008	0.008	0.006	0.006	0.006	0.006	0.005	0.005
SO2	lb/hr	4.63	4.84	4.19	4.36	4.55	4.79	4.04	4.31	4.36	5.06	3.97	4.77
	lb/mmBtu	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
H2SO4	lb/hr	1.10	1.15	1.00	1.04	1.08	1.14	0.96	1.02	1.04	1.20	0.94	1.13
	lb/mmBtu	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
NH3 Slip	ppmvd @ 15% O2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	lb/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	lb/mmBtu	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

8.3 WATER

Plant water consumption and wastewater discharge rates have been presented in Table 8.4-1 for both the 760 MW and 700 MW NGCC plant configurations when operating at full load during annual average design conditions. Additionally, refer to Appendix C for water mass balance diagrams.

Table 8.3-1. 760 MW and 700 MW NGCC Facility Water Consumption and Wastewater Discharge Rates (5 Cycles of Concentration Cooling Tower)

Description	Cooling Tower Water Consumption (Gallons/MWH)	Misc. Water Consumption (Gallons/MWH)	Cycle Water Consumption (Gallons/MWH)	Total Water Consumption (Gallons/MWH)	Plant Wastewater Discharge (Gallons/MWH)
2x1 F5EE - 760	288	0.07	14	302	60
2x1 F5EE - 700	264	0.08	13	277	55
2x1 7F7 - 760	282	0.07	13	296	59
2x1 7F7 - 700	249	0.08	12	260	52
2x1 H - 760	251	0.07	12	263	52
2x1 H - 700	230	0.08	11	240	48

8.4 COST ESTIMATES

A summary of the estimated plant EPC costs and Owner's costs are depicted in Tale 8.4-1. Cost estimates have been developed based on the same assumptions indicated in Section 6.0 of this document. Complete line item details regarding the scope of costs included in the total project cost estimates are included in Appendix F.

Table 8 .4-1 760 MW and 700 MW Plant Designs, Total Project Cost ($1,000)

Project Costs	2x1 F5EE - 760	2x1 F5EE - 700	2x1 7F7 - 760	2x1 7F7 - 700	2x1 H - 760	2x1 H - 700
Plant Net Capacity (MW)	815.4	755.4	817.9	757.8	831.8	779.2
EPC Cost ($1,000)	$516,668	$502,740	$565,815	$555,014	$571,524	$560,164
Owner's Costs						
Total Owner Indirects	$70,125	$69,575	$70,725	$70,175	$70,725	$70,175
Owner Contingency	$51,667	$50,274	$56,581	$55,501	$57,152	$56,016
LTSA	$3,459	$3,459	$15,853	$15,853	$3,459	$3,459
Total Project Cost ($1,000)	**$641,918**	**$626,048**	**$708,974**	**$696,543**	**$702,860**	**$689,814**
Total Project Cost ($/kW)	$787	$829	$867	$919	$845	$885

8.5 LIFE CYCLE COST ANALYSIS

The total cost of generation is presented for each 760 MW and 700 MW plant configuration utilizing the inputs and assumptions defined in Section 7.0 of this document. Table 8.5-1 depicts an intermediate dispatch schedule and Table 8.5-2 depicts a base load dispatch schedule. Duct firing is assumed to be dispatched approximately 500 hours per year in both cases. Costs are presented on both a first year basis and a 30 year levelized basis. Detailed data for the first 20 years of the lifecycle models for these cases are included in Appendix G.

Table 8.5-1. 760 MW and 700 MW Electrical Cost of Generation Summary (Intermediate Load Dispatch

		2x1 F5EE - 760	**2x1 F5EE - 700**	**2x1 7F7 - 760**	**2x1 7F7 - 700**	**2x1 H - 760**	**2x1 H - 700**
Gross Output	(MW)	838.8	775.8	840.8	777.7	857.3	801.7
Auxiliary Power	(MW)	23.4	20.4	22.9	19.9	25.5	22.5
Net Output	(MW)	815.4	755.4	817.9	757.8	831.8	779.2
Net Cycle Heat Rate, HHV	(Btu/kWH)	7,011	6,853	6,829	6,571	6,567	6,457
Net Cycle Efficiency	(% HHV)	48.72%	49.85%	50.02%	51.98%	52.02%	52.90%
Capital Cost	($/kW net)	$787	$829	$867	$919	$845	$885
First Year Cost of Generation							
Capital Recovery	($/MWH)	$18.57	$18.27	$20.25	$19.93	$18.07	$17.96
Fixed O&M	($/MWH)	$2.65	$2.65	$3.48	$3.46	$2.53	$2.54
Variable O&M	($/MWH)	$2.61	$2.60	$1.27	$1.25	$3.45	$3.47
Consumables	($/MWH)	$2.80	$2.76	$2.93	$2.66	$2.61	$2.45
Fuel Costs	($/MWH)	$40.63	$39.84	$39.36	$38.19	$38.13	$37.80
Total COG	($/MWH)	$67.25	$66.13	$67.30	$65.50	$64.79	$64.23
Levelized Cost of Generation							
Capital Recovery	($/MWH)	$18.57	$18.27	$20.25	$19.93	$18.07	$17.96
Fixed O&M	($/MWH)	$2.99	$2.99	$4.07	$4.05	$2.87	$2.88
Variable O&M	($/MWH)	$3.44	$3.43	$1.66	$1.63	$4.55	$4.57
Consumables	($/MWH)	$4.97	$4.91	$5.20	$4.70	$4.61	$4.33
Fuel Costs	($/MWH)	$70.25	$69.30	$68.09	$66.50	$66.45	$66.17
Total Levelized COG	($/MWH)	$100.22	$98.90	$99.27	$96.82	$96.55	$95.92

Table 8.5-2. 760 MW and 700 MW Electrical Cost of Generation Summary (Base Load Dispatch

		2x1 F5EE - 760	2x1 F5EE - 700	2x1 7F7 - 760	2x1 7F7 - 700	2x1 H - 760	2x1 H - 700
Gross Output	(MW)	838.8	775.8	840.8	777.7	857.3	801.7
Auxiliary Power	(MW)	23.4	20.4	22.9	19.9	25.5	22.5
Net Output	(MW)	815.4	755.4	817.9	757.8	831.8	779.2
Net Cycle Heat Rate, HHV	(Btu/kWH)	7,011	6,853	6,829	6,571	6,567	6,457
Net Cycle Efficiency	(% HHV)	48.72%	49.85%	50.02%	51.98%	52.02%	52.90%
Capital Cost	($/kW net)	$787	$829	$867	$919	$845	$885
First Year Cost of Generation							
Capital Recovery	($/MWH)	$9.43	$9.23	$10.27	$10.05	$9.11	$9.02
Fixed O&M	($/MWH)	$1.34	$1.34	$1.76	$1.75	$1.27	$1.28
Variable O&M	($/MWH)	$1.57	$1.57	$0.69	$0.67	$2.08	$2.08
Consumables	($/MWH)	$1.49	$1.46	$1.55	$1.40	$1.37	$1.29
Fuel Costs	($/MWH)	$37.12	$36.67	$35.97	$35.20	$35.18	$35.08
Total COG	($/MWH)	$50.96	$50.26	$50.24	$49.07	$49.00	$48.74
Levelized Cost of Generation							
Capital Recovery	($/MWH)	$9.43	$9.23	$10.27	$10.05	$9.11	$9.02
Fixed O&M	($/MWH)	$1.52	$1.51	$2.06	$2.04	$1.44	$1.45
Variable O&M	($/MWH)	$2.05	$2.03	$0.89	$0.87	$0.41	$2.70
Consumables	($/MWH)	$2.59	$2.54	$2.70	$2.43	$2.38	$2.23
Fuel Costs	($/MWH)	$66.58	$66.01	$64.52	$63.41	$63.40	$63.39
Total Levelized COG	($/MWH)	$82.16	$81.32	$80.45	$78.80	$76.74	$78.79

As compared to the 2x1 options considered in Section 7.0 of this report, the heavily fired duct fired options generally have a higher cost of generation than as a result of the increased fuel costs associated with a lower plant efficiency when duct firing. The 700 MW 2 x 1 H class plant configuration offers the lowest cost of generation of all of the studies presented in this report.

9.0 SOLAR PHOTOVOLTAIC FACILITY

In addition to the combined cycle plant options, HDR has developed performance, capital costs, and life cycle generation costs for a 10 MW PV plant. Due to the difference in technology, it is discussed separately.

In general, two types of PV panels are available for consideration: mono/poly-silicon and thin film. There are tradeoffs to the different types of panels, such as higher capital costs for mono/poly-silicon panels resulting in greater efficiency versus lower cost and lower efficiency for thin film panels. Thin film panels are generally lighter and therefore have lower installed costs.

PV systems are either installed in a fixed position or are equipped with one or two-dimensional tracking systems which enable the panel to remain at a more optimized orientation with respect to the sun across the course of a day. Tracking systems add significant capital costs, demand more real estate than for fixed systems, and add more annual maintenance costs, but can produce additional generation depending on weather conditions, shading, and other factors.

Typically the quantity of land available and the cost to purchase the land influence the technology selected. High land costs or limited land availability tend to favor higher efficiency, higher cost panels as compared to projects with low land costs and adequate land area available tend to favor lower efficiency, lower cost panels.

The design basis for this PV plant is not site-specific and capital costs are therefore representative of recent installations of similar size based on thin film fixed panel technology.

9.1 SOLAR PV PERFORMANCE/FOOTPRINT

HDR modeled the generation of a 10 MW PV plant using NREL's PVWatts v.2 solar modeling program, which is an industry standard solar generation estimation tool. PVWatts uses hourly historic meteorological data that has been gathered to estimate the output of a PV system, thus generating the annual generation for a facility in an average weather year. PVWatts was used to pick a central location within LG&E/KU's service territory for the PV plant site. The following additional PV system specifications were also utilized based on PVWatts evaluation of the picked site location:

- DC Rating: 12,701 kW
- DC to AC Conversion Efficiency Factor: 0.80
- AC Rating: 10,000 kW
- Array Tilt: 37.5 degrees
- Array Azimuth: 180 degrees

A 10 MW PV solar array would require a DC rating of approximately 13 MW due to DC to AC conversion losses. A fixed axis array type has been utilized, which results in slightly lower annual energy production but also results in lower capital costs over a 1-axis or 2-axis tracking system.

The results of PVWatts indicate an average annual solar irradiation of 4.65 kWh/m2/day and annual AC energy production of 15,732,944 kWh's. This equates to an annual average capacity factor of 18 percent for a 10 MW facility.

Energy produced from the solar array will vary on a monthly basis. Figures 9.1-1 and 9.1-2 depict the variation in solar radiation and resulting variation in energy produced each month for a typical year. Furthermore, power output varies throughout the day. As can be expected, monthly energy production peaks during the summer months when solar radiation and daylight hours are greater.

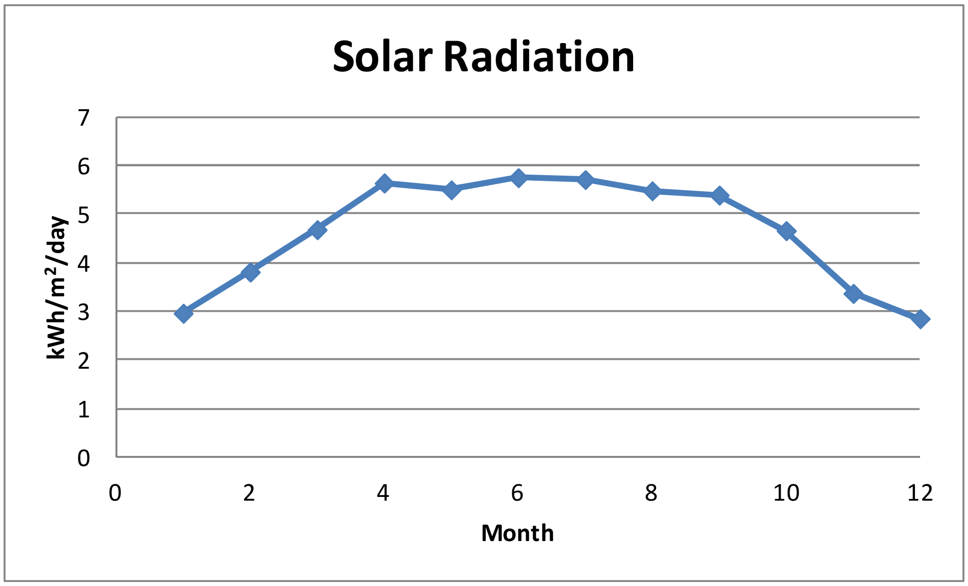


Figure 9.1-1. Solar Radiation Variation by Month

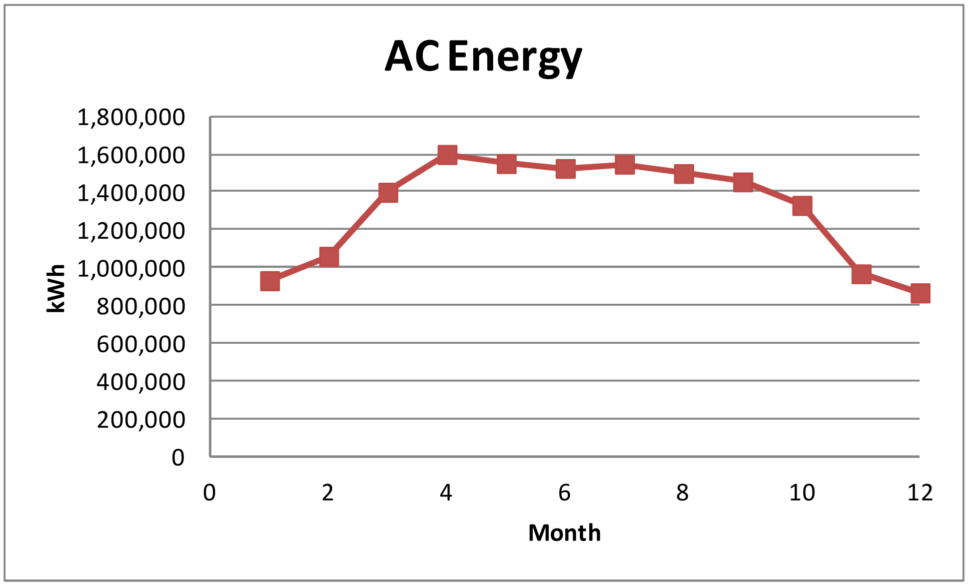


Figure 9.1-2. AC Energy Production Variation by Month

Power output from the solar array will also fluctuate during the day, with peak power production occurring in the afternoon. Figure 9.1-3 depicts the typical daily variation expected based on an average calculated daily variation over the course of a year. Actual daily variation will vary by month.

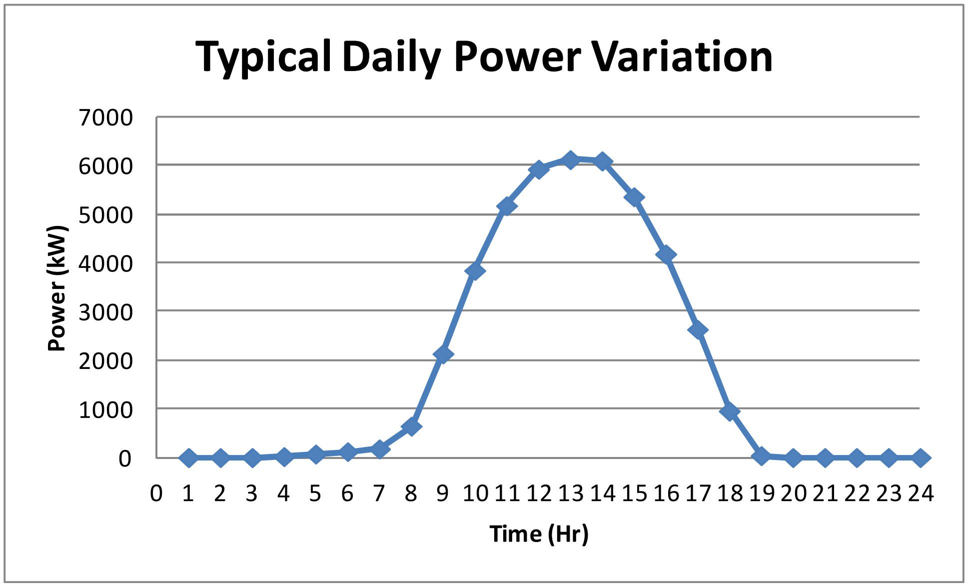


Figure 9.1-3. Hourly Power Variation for a Typical Day

The estimated land requirement for a 10 MW fixed array thin film PV plant in Kentucky is between 85 and 90 acres based on a fixed array with maintenance access. An alternate compact arrangement can be provided at additional equipment cost should land cost or availability become prohibitive. This arrangement provides for adequate spacing between rows to avoid row on row shading, balance of plant system equipment such as inverter pads, substation and maintenance access.

9.2 SOLAR PV PROJECT CAPITAL COST & SCHEDULE

Equipment pricing for major equipment, including the PV panels, inverters, switchgear and 69 kV substation, a well as recent equipment estimates from similar projects were utilized in developing the total project cost. Other assumptions and project scope included in the estimate is summarized as follows:

- Brownfield or Greenfield site
- Site topography generally level
- Packaged 500 kW inverters serving 13.8 kV underground direct buried electric distribution collector system
- Sales tax is included for non-production material
- No permanent office or warehouse space is provided

The following Owner's costs have also been established and are included in the estimate.

- Project Development
- 69 kV Transmission Interconnection (Single 10 MVA 13.8/69 kV transformer, two breaker loop feed 69 kV line interface)
- Construction Power (Service Installation and Energy)
- Owner's Project Management
- Owner's Engineer
- Owner's Legal Counsel
- Land Cost
- Site Security
- Operating Spare Parts
- AFUDC for KU Ownership Portion

An Owner's contingency of 15 percent of the total EPC project cost has been included within the project estimate.

A summary of the estimated plant EPC costs and Owner's costs are depicted in Tale 9.0-1.

Table 9.0-1. Solar PV Project Cost

Description	Qty	Unit	Unit Cost	Total Cost
EPC Direct Cost				
Site Preparation	1	LT	$875,000	$875,000
Panel Modules & Support (1020 280 W Panels)	42	EA	$735,120	$30,875,000
500 kW Inverter	20	EA	$150,000	$3,000,000
Medium Voltage Electric Distribution	1	LT	$1,500,000	$1,500,000
10 MVA Substation	1	LT	$1,500,000	$1,500,000
			EPC Cost Subtotal	**$37,750,000**
Owner Cost				
Project Development	1	LT	$650,000	$650,000
Electric Transmission Interconnection	1	LT	$450,000	$450,000
Construction Power	1	LT	$50,000	$50,000
Owners Project Management	1	LT	$500,000	$500,000
Owners Engineer	1	LT	$170,000	$170,000
Owners Legal Counsel	1	LT	$250,000	$250,000
Land	1	LT	$500,000	$500,000
Electric Transmission Service (Firm Point to Point)	1	LT	$50,000	$50,000
Site Security	1	LT	$50,000	$50,000

Description	Qty	Unit	Unit Cost	Total Cost
Spare Parts	1	LT	$100,000	$100,000
AFUDC (KU Ownership Portion)	1	LT	$150,000	$150,000
Owners Contingency (15% of EPC Cost)	1	LT	$5,663,000	$5,663,000
Owner Cost Subtotal				**$8,583,000**
Total Project Cost				**$46,333,000**
Total Project Cost ($/KW AC)				**$4,633/kW**

The solar PV facility's project schedule from full notice to proceed [FNTP] to commercial operation date has been estimated to be 18 months. This duration includes construction of the 69 kV substation at the solar PV facility.

9.3 SOLAR PV COST OF GENERATION

A life cycle cost analysis was developed for the 10 MW PV plant. Were applicable, the same combined cycle plant economic inputs outlined in Section 7 of this report were applied to the PV plant. Additional economic inputs that were utilized include:

- Plant capacity factor of 18 percent as determined by PVWatts
- 1 percent plant degradation was applied per year
- O&M is estimated to be $0.006 per kWh (2012$)
- The 30 percent investment tax credit was not included as these are currently set to expire in 2016, one year before commercial operation for the PV plant. The investment tax credit has a substantial impact on the cost of generation for a PV plant. A 10 percent investment tax credit was included, as this is what the tax code will revert back to after 2016 if the credit is not extended. The full amount of the tax credit is applied in the first year of the project.
- A 5-year Modified Accelerated Cost-Recovery Depreciation (MACRS) schedule was applied based on current tax.

The electrical cost of generation for a 10 MW PV plant is summarized below in Table 8.3-1. The cost of generation is primarily a function of project capital costs. For comparison, the cost of generation was also evaluated under the assumption that the tax credit will be extended and the results are also included in Table 8.3-1. Under this assumption, a 30 percent investment credit is included, but only 85 percent of the project cost is depreciated over the 5-year MACRS schedule (per the current law). The remaining 15 percent of the project cost is depreciated over a 20-year MACRS schedule. As can be seen, the 30 percent investment tax credit provides a significant improvement in the cost of generation for the project by almost $63/MWHR.

Also, note that fixed O&M costs decrease over the life of the project due to decreasing property taxes as a result of book depreciation. The detailed life cycle cost analysis results are included in Appendix G.

Table 9.3-1. PV Electrical Cost of Generation Summary

		PV - No ITC	PV - w/ ITC
		10 MW PV Solar	10 MW PV Solar
Gross Output	(MW)		
Auxiliary Power	(MW)		
Net Output	(MW)	10.0	10.0
Net Cycle Heat Rate, HHV	(Btu/kWH)	0	0
Net Cycle Efficiency	(% HHV)	9.00%	9.00%
Capital Cost	($/kW net)	$4,633	$4,633
First Year Cost of Generation			
Capital Recovery	($/MWH)	$212.02	$149.68
Fixed O&M	($/MWH)	$6.87	$6.87
Variable O&M	($/MWH)	$0.96	$0.96
Consumables	($/MWH)	$0.01	$0.01
Fuel Costs	($/MWH)	$0.00	$0.00
Total COG	($/MWH)	$219.86	$157.52
Levelized Cost of Generation			
Capital Recovery	($/MWH)	$212.02	$149.68
Fixed O&M	($/MWH)	$5.92	$5.92
Variable O&M	($/MWH)	$1.41	$1.41
Consumables	($/MWH)	$0.01	$0.01
Fuel Costs	($/MWH)	$0.00	$0.00
Total Levelized COG	($/MWH)	$219.37	$157.02

APPENDICES

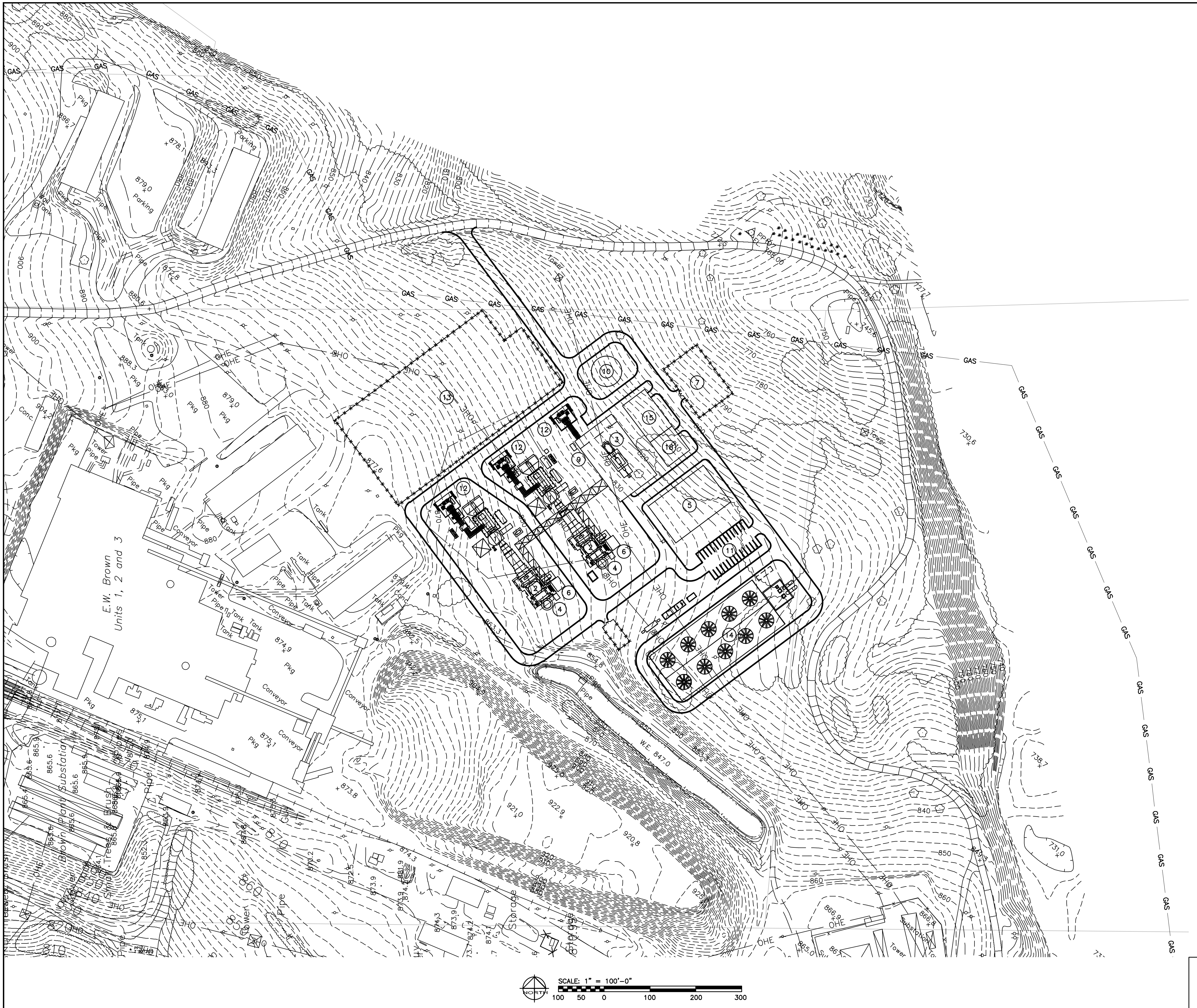
APPENDIX A

SITE ARRANGEMENTS

- 189895-CGA-S1004(A) EW Brown Combined Cycle Site Arrangement 2-on-1 F Class
- 189895-CGA-S1005(A) EW Brown Combined Cycle Site Arrangement 1-on-1 G Class
- 189895-CGA-S1006(A) EW Brown Combined Cycle Site Arrangement 1-on-1 F Class
- 189895-CGA-S1007(A) EW Brown Combined Cycle Site Arrangement 1-on-1 H Class
- 189895-CGA-S1008(A) EW Brown Combined Cycle Site Arrangement 2-on-1 H Class
- 189895-0GA-C2101(B) New Generation Options 10MW Solar PV Fixed Array Site Arrangement

EW Brown Station NGCC Facility Location Evaluation

- 189895-CGA-M1001(A) EW Brown General Arrangement Alternate 1
- 189895-CGA-M1002(A) EW Brown General Arrangement Alternate 2
- 189895-CGA-M1003(A) EW Brown General Arrangement Alternate 3
- EW Brown Station Power Block Location Incremental Cost Comparison



FACILITY LEGEND

①	COMBUSTION TURBINE
②	HEAT RECOVERY STEAM GENERATOR
③	STEAM TURBINE BUILDING
④	STACK *
⑤	ADMINISTRATION/CONTROL BUILDING
⑥	BOILER FEED PUMPS
⑦	GAS HANDLING EQUIPMENT
⑧	AUXILIARY BOILER BUILDING *
⑨	EMERGENCY GENERATOR *
⑩	DEMIN WATER STORAGE TANK
⑪	PARKING
⑫	GSU TRANSFORMER
⑬	SWITCHYARD RESERVED SPACE
⑭	COOLING TOWER
⑮	WAREHOUSE
*	INDICATES AIR PERMIT EMISSION SOURCE

Revisions

A Project:

REPORT ISSUE
HDR PROJECT #189895

Dwn: PVJ 02/22/13
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HDR Engineering, Inc.
PROJECT: 189895

Location and Unit: EW BROWN
Scale: AS NOTED
Contract No.
Engineering discipline: MECHANICAL
Drawing type: PLAN

Generation Services
LOUISVILLE GAS & ELECTRIC COMPANY
a PPL company

Drawn: PVJ
Checked:
Approved: OPEN
Released for: OPEN
Alternate Drawing No: S1004

Title
EW BROWN COMBINED CYCLE
SITE ARRANGEMENT
2-ON-1 F CLASS

Originator: HDR ENGINEERING, INC.
Job or Project No:
Drawing No: 189895-CGA-S1004
Rev. A

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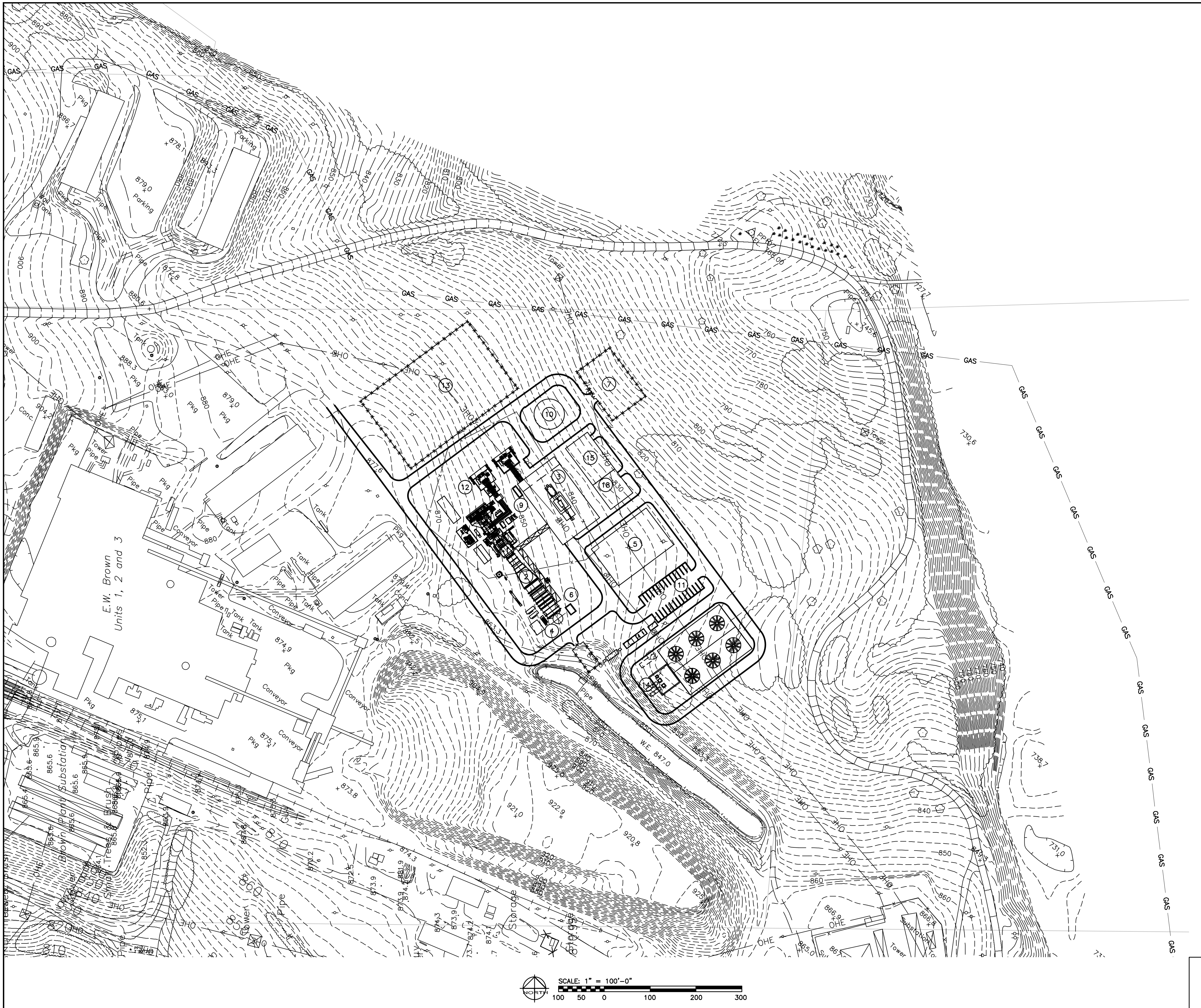

FACILITY LEGEND	
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PROJECT: 189895

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Contract No.
Engineering discipline: MECHANICAL
Drawing type: PLAN

LG&E Generation Services
LOUISVILLE GAS & ELECTRIC COMPANY
a PPL company

Title
EW BROWN COMBINED CYCLE
SITE ARRANGEMENT
1-ON-1 G CLASS

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Approved: OPEN
Released for: OPEN
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Originator: HDR ENGINEERING, INC.
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Drawing No: 189895-CGA-S1005
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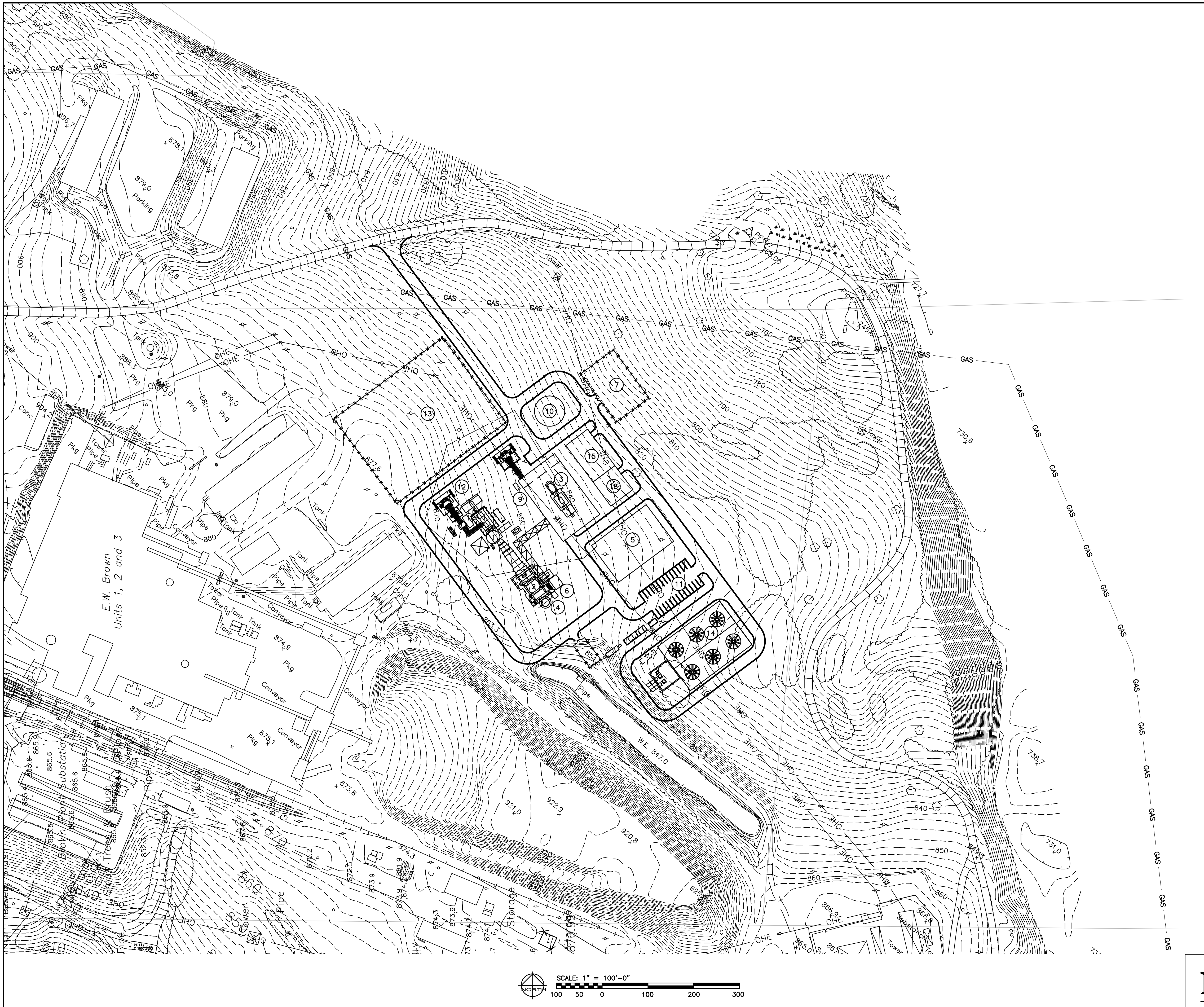

FACILITY LEGEND

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Scale: AS NOTED	Contract No.		Checked:
Engineering discipline: MECHANICAL	Drawing type: PLAN		Approved: OPEN
Title: EW BROWN COMBINED CYCLE SITE ARRANGEMENT 1-ON-1 F CLASS			Released for: OPEN
			Alternate Drawing No: S1006
Originator: HDR ENGINEERING, INC.	Job or Project No:	Drawing No: 189895-CGA-S1006	Rev. A

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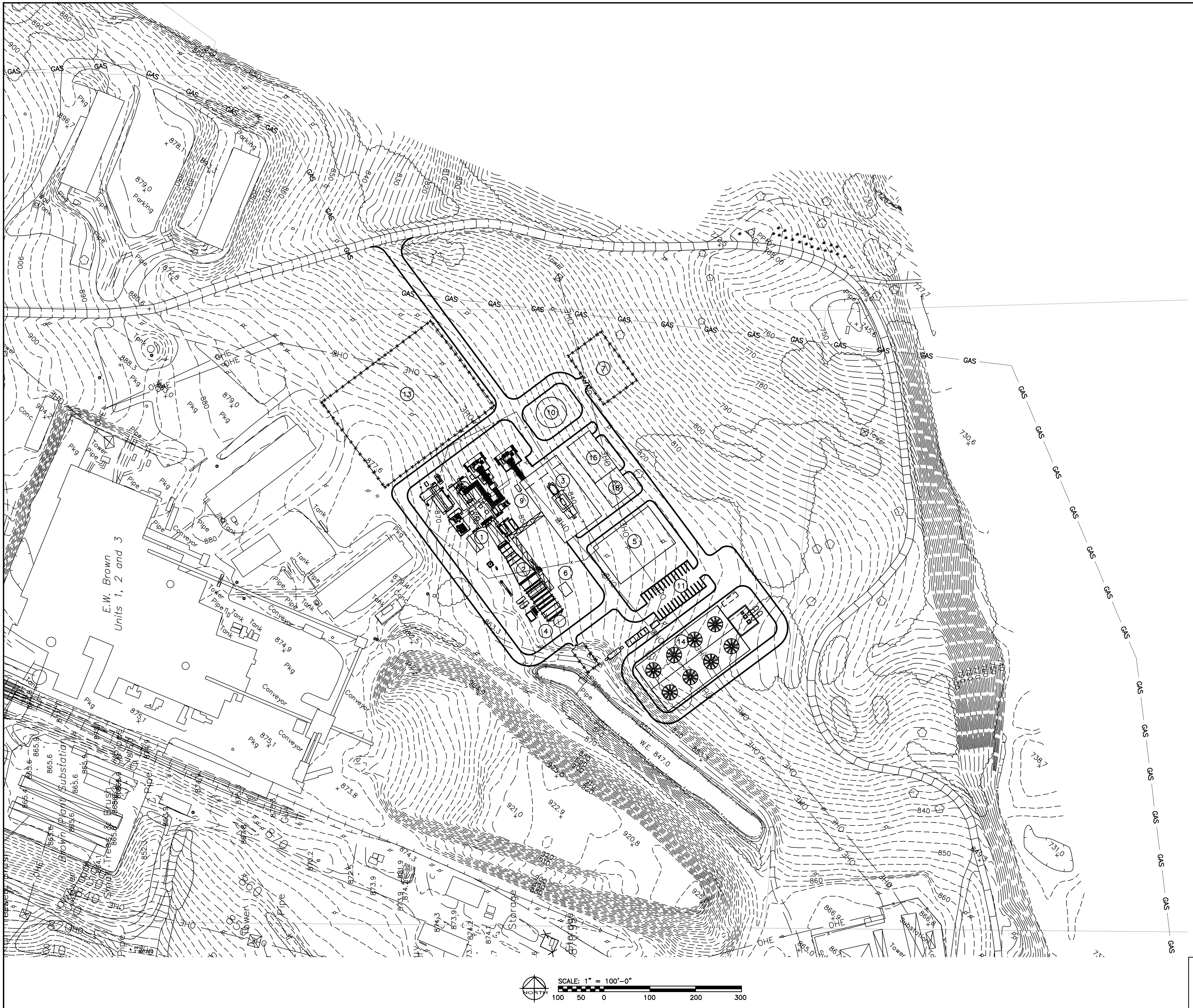

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Location and Unit: EW BROWN
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Contract No.
Engineering discipline: MECHANICAL
Drawing type: PLAN

LG&E Generation Services
LOUISVILLE GAS & ELECTRIC COMPANY
a PPL company

Title
EW BROWN COMBINED CYCLE
SITE ARRANGEMENT
1-ON-1 H CLASS

Drawn: PVJ
Checked:
Approved: OPEN
Released for: OPEN
Alternate Drawing No: S1007

Originator: HDR ENGINEERING, INC.
Job or Project No:
Drawing No: 189895-CGA-S1007
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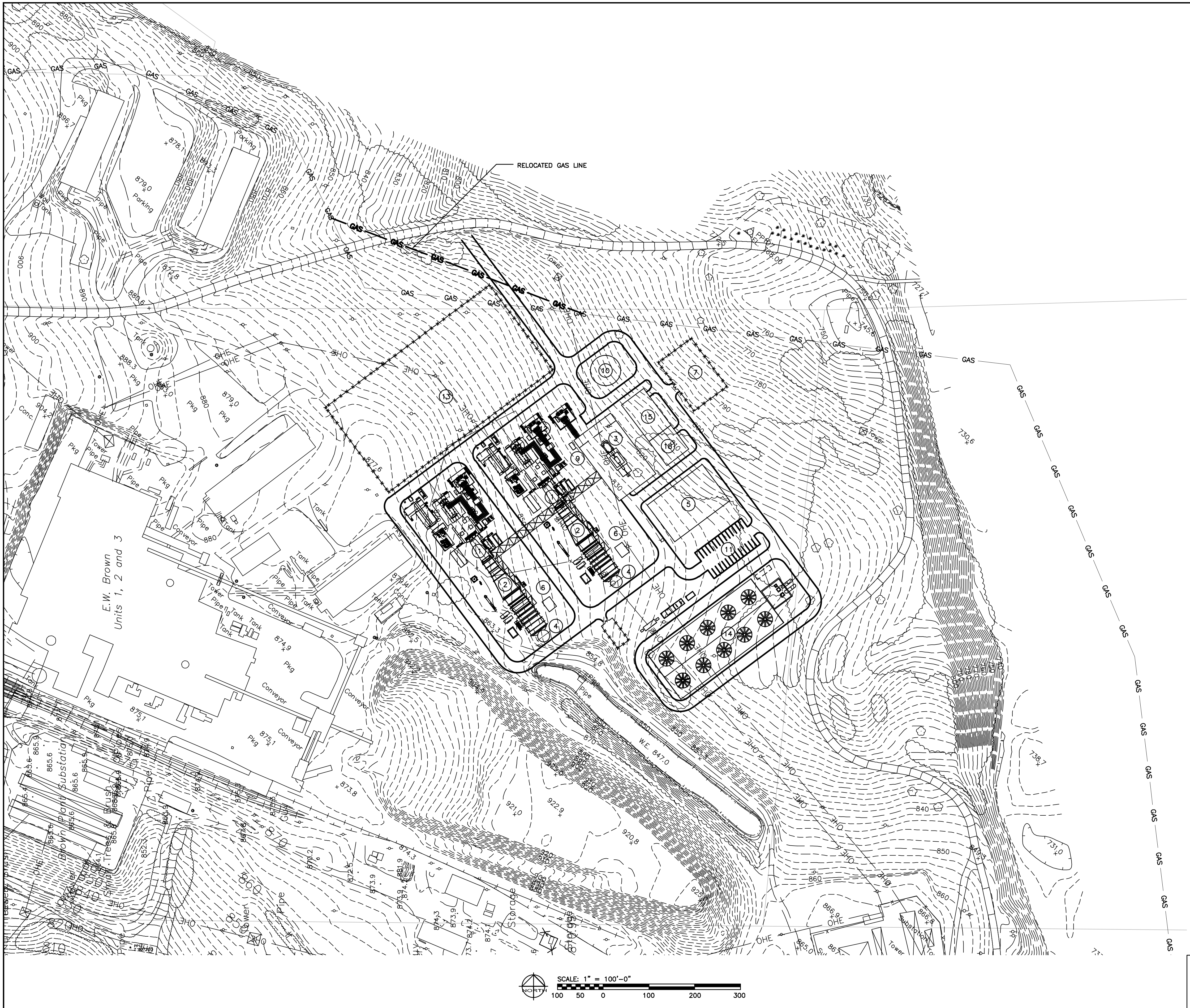

FACILITY LEGEND

1. COMBUSTION TURBINE
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3. STEAM TURBINE BUILDING
4. STACK *
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9. EMERGENCY GENERATOR *
10. DEMIN WATER STORAGE TANK
11. PARKING
12. GSU TRANSFORMER
13. SWITCHYARD RESERVED SPACE
14. COOLING TOWER
15. WAREHOUSE

* INDICATES AIR PERMIT EMISSION SOURCE

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HDR Engineering, Inc.
PROJECT: 189895

Location and Unit: EW BROWN
Scale: AS NOTED
Contract No.
Engineering discipline: MECHANICAL
Drawing type: PLAN

LG&E Generation Services
LOUISVILLE GAS & ELECTRIC COMPANY
a PPL company

Title
EW BROWN COMBINED CYCLE
SITE ARRANGEMENT
2-ON-1 H CLASS

Drawn: PVJ
Checked:
Approved: OPEN
Released for: OPEN
Alternate Drawing No: S1008

Originator: HDR ENGINEERING, INC.
Job or Project No:
Drawing No: 189895-CGA-S1008
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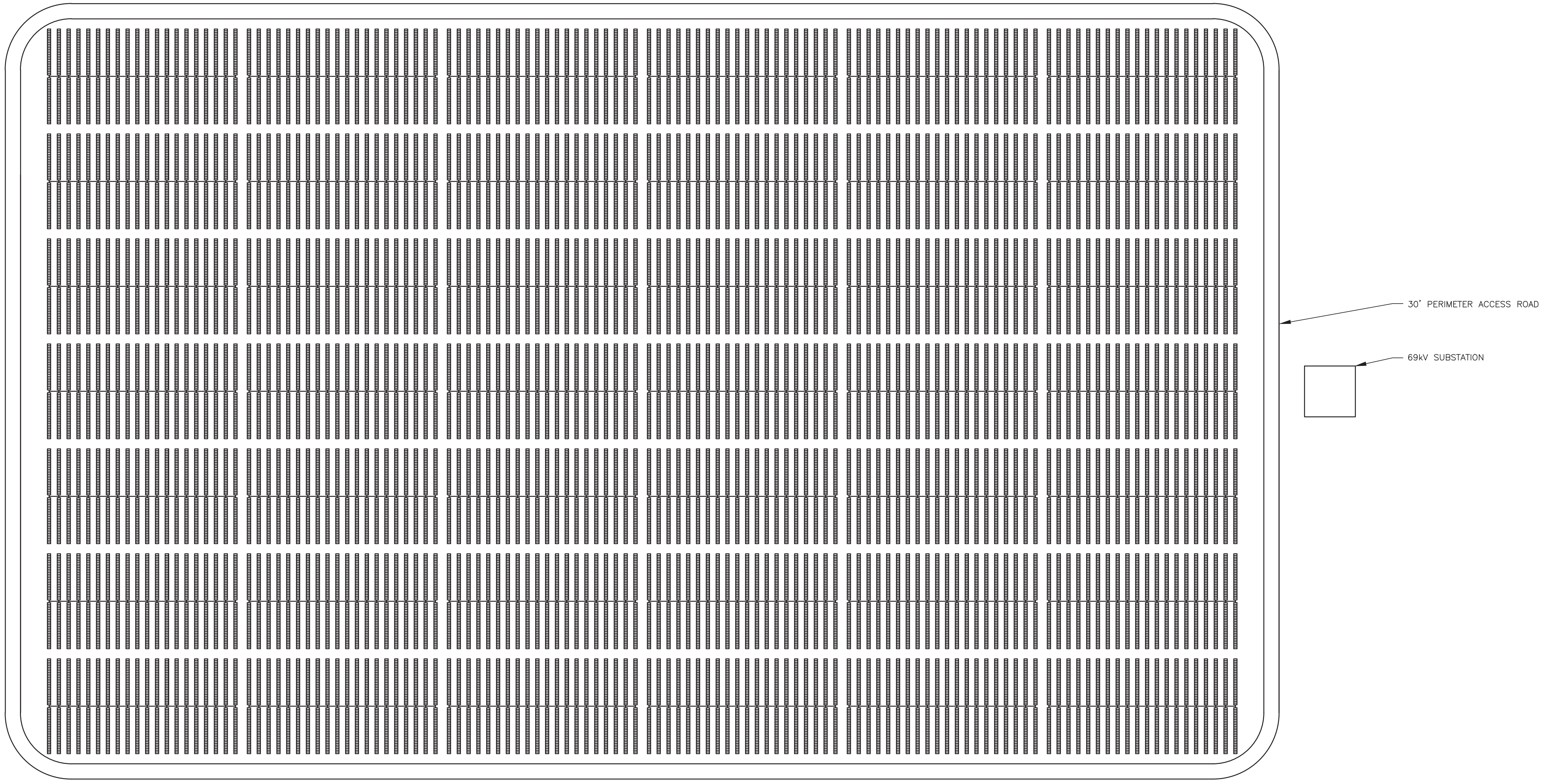
NOTES:

1. THE PV ARRAY FOOTPRINT INDICATED PROVIDES 42 BLOCKS, 45,360 TOTAL MODULES WITH A NOMINAL 10.16 MW AC OUTPUT.
2. THE LAND AREA IDENTIFIED INCLUDING THE LOOP ROAD IS 88 ACRES.

Revisions	
A	03 OCT 2012 INITIAL ISSUE
B	22 OCT 2012 REPORT ISSUE



SITE LAYOUT

SCALE: 1" = 100'–0"

NOT TO BE USED FOR CONSTRUCTION

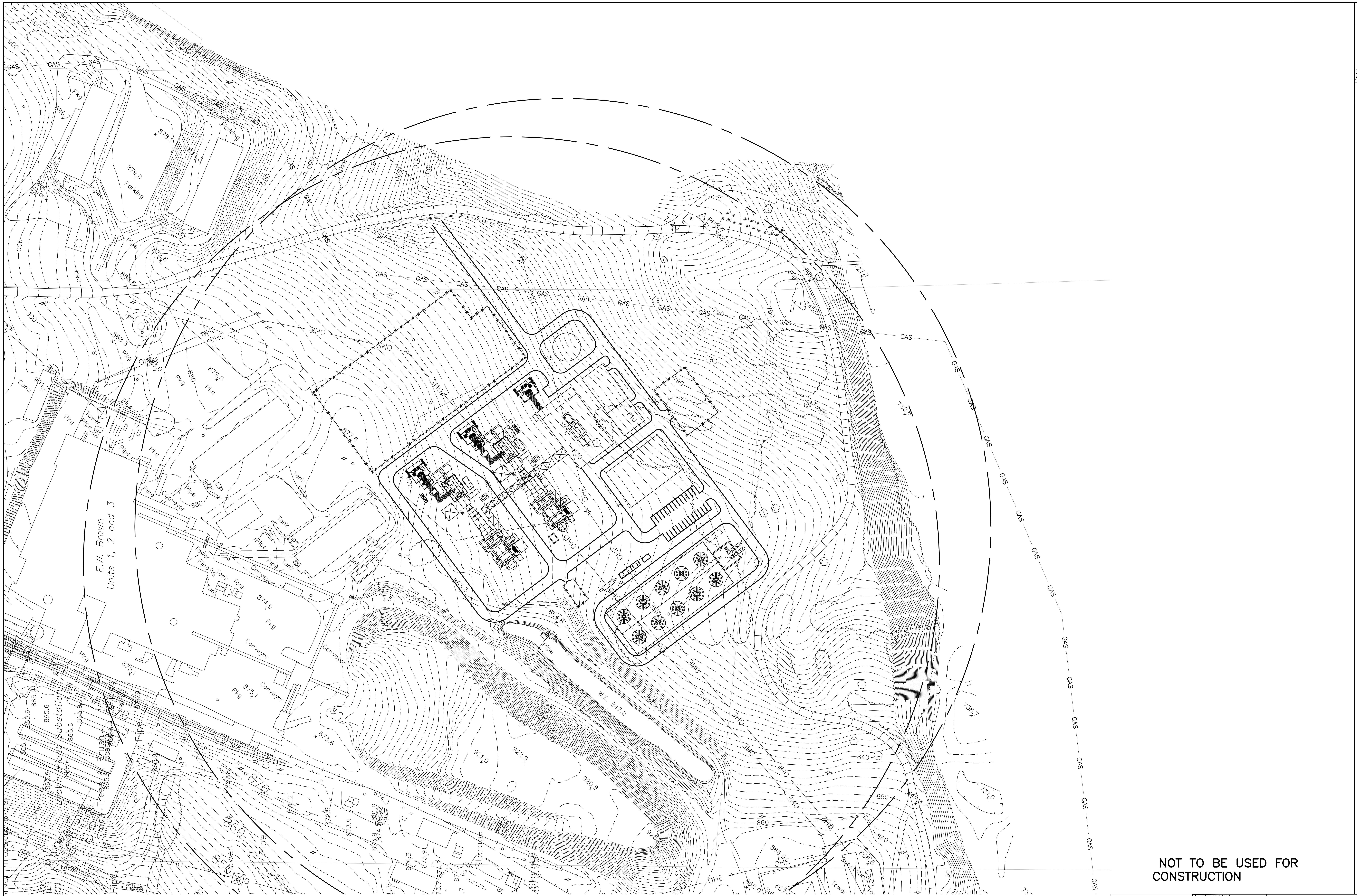
Location and Unit:
Scale: NONE
Contract No. n/a
Engineering discipline: CIVIL
Drawing type:

LOUISVILLE GAS & ELECTRIC COMPANY
Generation Services

Title
NEW GENERATION OPIONS
10MW SOLAR PV FIXED ARRAY
SITE ARRANGEMENT

Drawn: DCW 25 SEP 12
Checked:
Approved:
Released for: –
Alternate Drawing No: 0GA-C2101
Originator: HDR ENGINEERING
Job or Project No:
Drawing No: 189895-0GA-C2101
Rev.

DMS Version 2.0



GENERAL ARRANGEMENT PLAN ALTERNATE 1

SCALE: 1" = 100'-0"

100 50 0 100 200 300

NOT TO BE USED FOR CONSTRUCTION

Revisions

A Project:

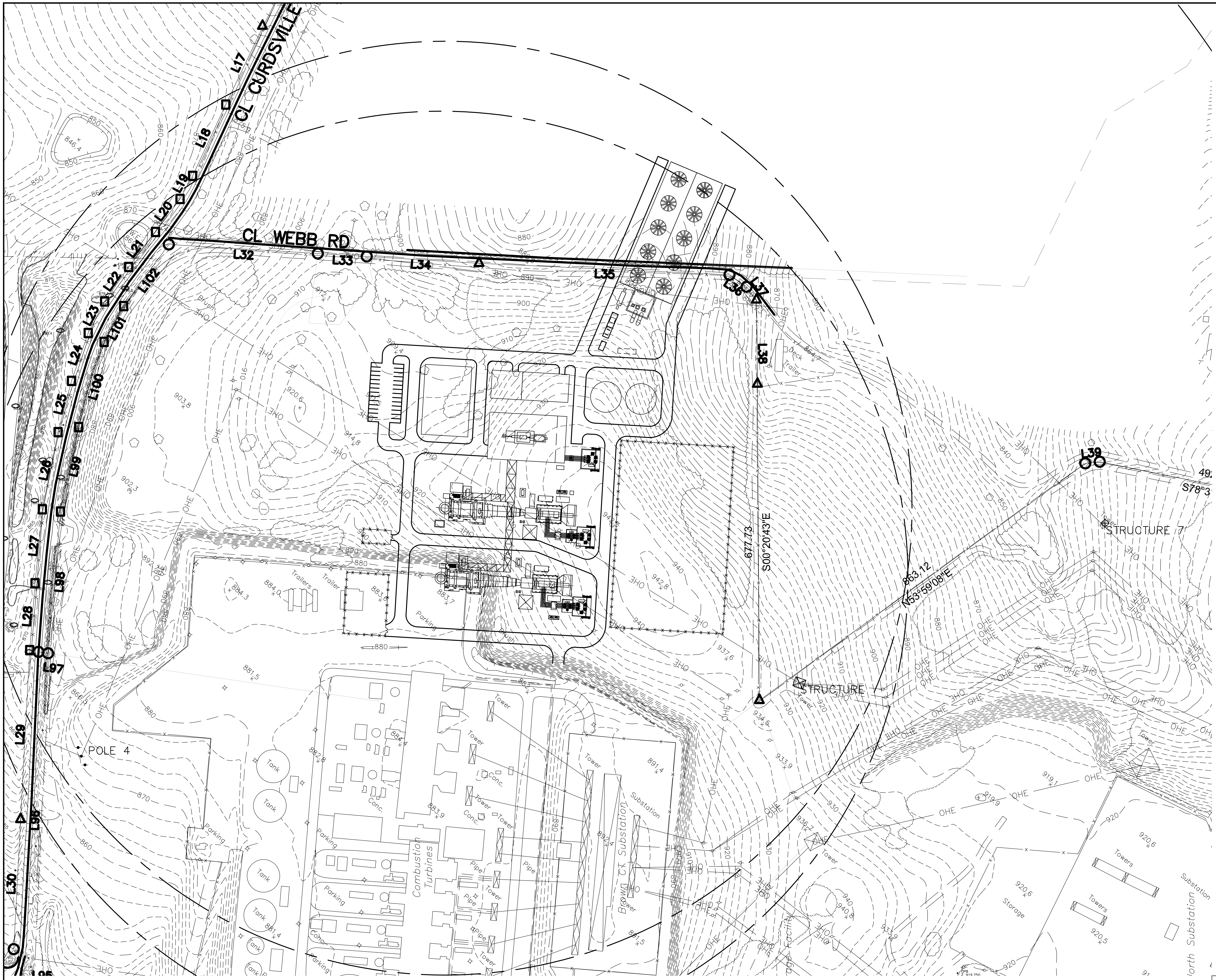
INITIAL ISSUE
HDR PROJECT #189895

Dwn: PVJ 01/31/13
Chkd: MAW 01/31/13
Appd:

HDR Engineering, Inc.
PROJECT: 189895

Location and Unit: EW BROWN		LG&E® Generation Services LOUISVILLE GAS & ELECTRIC COMPANY a PPL company	Drawn: PVJ
Scale: AS NOTED	Contract No.		Checked:
Engineering discipline: MECHANICAL	Drawing type: PLAN		Approved: OPEN
Title: GENERAL ARRANGEMENT PLAN ALTERNATE 1			Released for: OPEN
			Alternate Drawing No: M1001
Originator: HDR ENGINEERING, INC.	Job or Project No:	Drawing No: 189895-CGA-M1001	Rev. A

DMS Version 2.0



GENERAL ARRANGEMENT PLAN
ALTERNATE 2

SCALE: 1" = 100'-0"
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NOT TO BE USED FOR
CONSTRUCTION

Revisions

A Project: 189895

INITIAL ISSUE
HDR PROJECT #189895

Dwn: PVJ 01/31/13
Chkd: MAW 01/31/13
Appd:

HDR
HDR Engineering, Inc.
PROJECT: 189895

Location and Unit: EW BROWN
Scale: AS NOTED
Contract No.:
Engineering discipline: MECHANICAL
Drawing type: PLAN

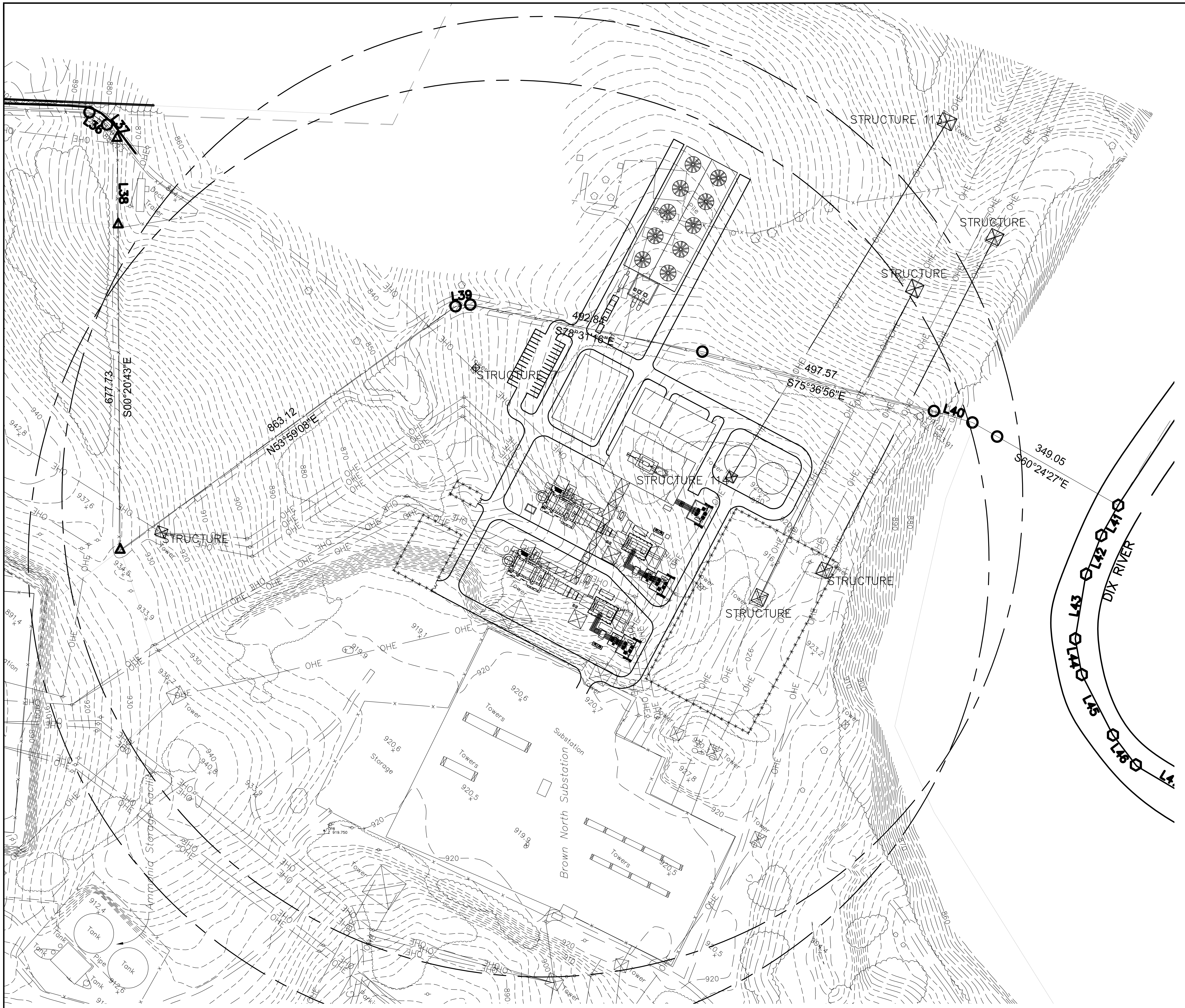
LG&E Generation Services
LOUISVILLE GAS & ELECTRIC COMPANY
a PPL company

Title
GENERAL ARRANGEMENT PLAN
ALTERNATE 2

Drawn: PVJ
Checked:
Approved: OPEN
Released for: OPEN
Alternate Drawing No: M1002

Originator: HDR ENGINEERING, INC.
Job or Project No:
Drawing No: 189895-CGA-M1002
Rev. A

DMS Version 2.0



GENERAL ARRANGEMENT PLAN
ALTERNATE 3

SCALE: 1" = 100'-0"

100 50 0 100 200 300

NORTH

NOT TO BE USED FOR CONSTRUCTION

Revisions

A Project:

OPEN
HDR PROJECT #189895

Dwn: PVJ 01/31/13
Chkd: MAW 01/31/13
Appd:

HDR
HDR Engineering, Inc.
PROJECT: 189895

Location and Unit: EW BROWN
Scale: AS NOTED
Contract No.:
Engineering discipline: MECHANICAL
Drawing type: PLAN

LG&E Generation Services
LOUISVILLE GAS & ELECTRIC COMPANY
a PPL company

Title
GENERAL ARRANGEMENT PLAN
ALTERNATE 3

Drawn: PVJ
Checked:
Approved: OPEN
Released for: OPEN
Alternate Drawing No: M1003

Originator: HDR ENGINEERING, INC.
Job or Project No:
Drawing No: 189895-CGA-M1003
Rev. A

DMS Version 2.0

2 x 1 F Class Combined Cycle Unit
EW Brown Station
Power Block Location Incremental Cost Comparion

ALTERNATE LOCATION 1 (COAL PILE AREA) SEE DRAWING 189895-CGA-M1001 PLANT ELEVATION 835'

DESCRIPTION	Qty	UM	Purchase or Unit Cost	PROJECT TOTAL $	BASIS NOTES
NGCC Project Site Excavation (Rock Excavation/Blasting/Mechanical)	300,000.0	CY	18.00	$5,400,000	
NGCC Project Site Incremental Fill/Grading	220,000.0	CY	25.00	$5,500,000	Imported Fill assumed necessary
MSE Retaining Wall	40,000.0	SF	7.25	$290,000	
Transmission Line Relocation	1.0	LS	1,750,000	$1,750,000	
Natural Gas Pipeline Interconnection	100.0	LF	350	$35,000	
Raw Water Supply/Waste Water Discharge Interconnecting Piping	250.0	LF	150	$37,500	Common trench 20" HDPE Supply 10" HDPE Discharge
Demineralized Water Supply Interconnecting Piping	500.0	LF	80	$40,000	4" HDPE Underground from existing facility
Fire Protection Supply Interconnecting Piping	500.0	LF	110	$55,000	12" HDPE Underground from Unit 3
Land	1.0	LS	0	$0	
Septic Field Relocation	1.0	LS	150,000	$150,000	
Total Alternate 1 Site Specific Costs				**$13,257,500**	

ALTERNATE LOCATION 2 (CT AREA) SEE DRAWING 189895-CGA-M1002 PLANT ELEVATION 880'

DESCRIPTION	Qty	UM	Purchase or Unit Cost	PROJECT TOTAL $	BASIS NOTES
NGCC Project Site Excavation (Rock Excavation/Blasting/Mechanical)	1,200,000.0	CY	18.00	$21,600,000	
NGCC Project Site Incremental Fill/Grading	0.0	CY	25.00	$0	Imported Fill assumed necessary
MSE Retaining Wall	0.0	SF	7.25	$0	
Transmission Line Relocation	1.0	LS	5,000,000	$5,000,000	
Natural Gas Pipeline Interconnection	200.0	LF	350	$70,000	
Raw Water Supply/Waste Water Discharge Interconnecting Piping	4,000.0	LF	150	$600,000	Common trench 20" HDPE Supply 10" HDPE Discharge
Demineralized Water Supply Interconnecting Piping	4,000.0	LF	80	$320,000	4" HDPE Underground from existing facility
Fire Protection Supply Interconnecting Piping	4,000.0	LF	110	$440,000	12" HDPE Underground from Unit 3
Land	1.0	LS	1,182,600	$1,182,600	Estimate to be provided by LG&E/KU
Total Alternate 2 Site Specific Costs				**$29,212,600**	

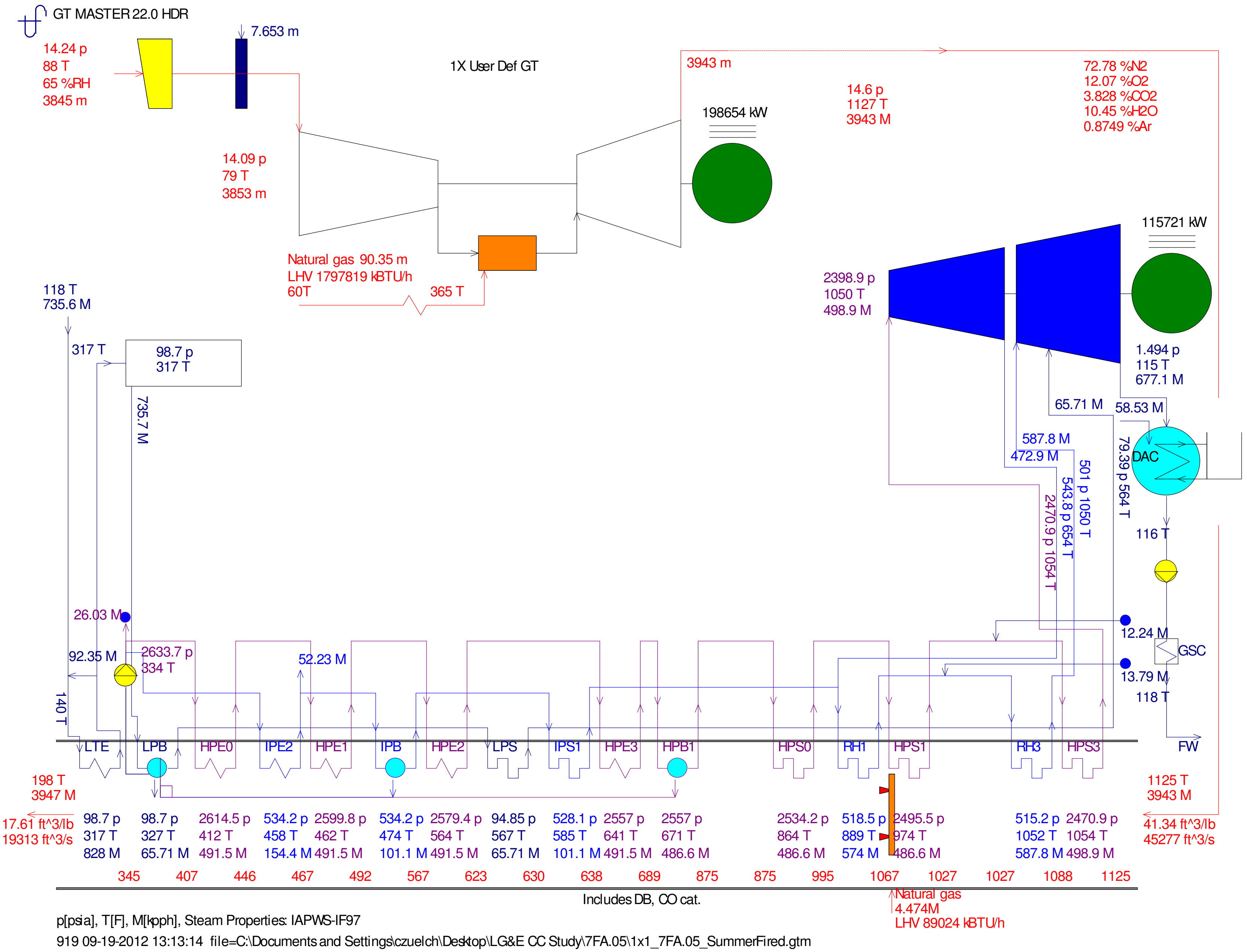
ALTERNATE LOCATION 3 (BROWN NORTH SUBSTATION AREA) SEE DRAWING 189895-CGA-M1003 PLANT ELEVATION 900'

DESCRIPTION	Qty	UM	Purchase or Unit Cost	PROJECT TOTAL $	BASIS NOTES
NGCC Project Site Excavation (Rock Excavation/Blasting/Mechanical)	225,000.0	CY	18.00	$4,050,000	
NGCC Project Site Incremental Fill/Grading	180,000.0	CY	25.00	$4,500,000	Imported Fill assumed necessary
MSE Retaining Wall	24,000.0	SF	7.25	$174,000	
Transmission Line Relocation	1.0	LS	10,000,000	$10,000,000	Estimate to be provided by LG&E/KU Transmission
Natural Gas Pipeline Interconnection	700.0	LF	350	$245,000	
Raw Water Supply/Waste Water Discharge Interconnecting Piping	2,000.0	LF	150	$300,000	Common trench 20" HDPE Supply 10" HDPE Discharge
Demineralized Water Supply Interconnecting Piping	2,000.0	LF	80	$160,000	4" HDPE Underground from existing facility
Fire Protection Supply Interconnecting Piping	2,000.0	LF	110	$220,000	12" HDPE Underground from Unit 3
Land	1.0	LS	996,200	$996,200	
Total Alternate 3 Site Specific Costs				**$20,645,200**	

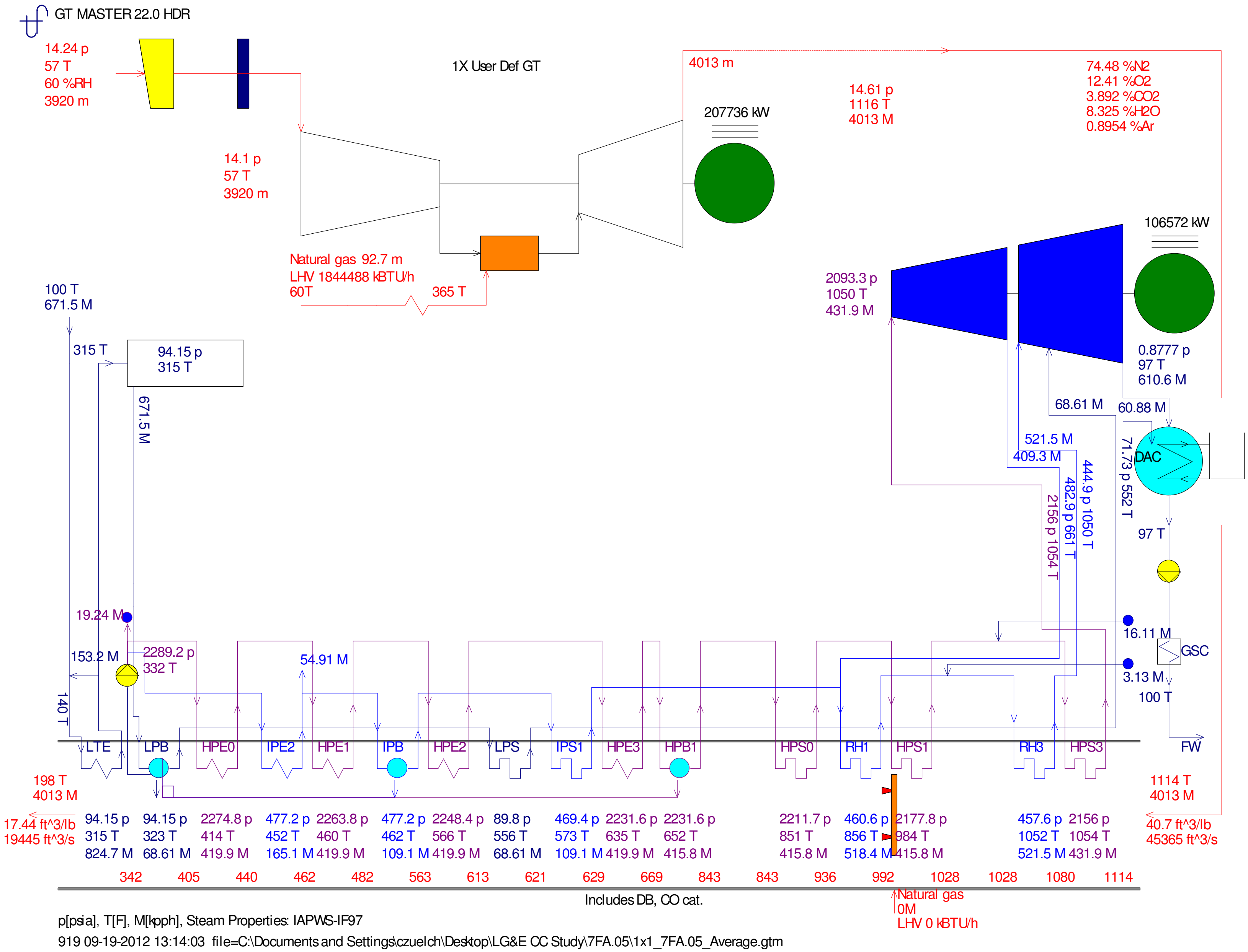
APPENDIX B

HEAT BALANCE DIAGRAM

- 1x1 GE F Class Heat Balance 1 Percent Summer Design Conditions with Duct Firing
- 1x1 GE F Class Heat Balance Average Design Conditions without Duct Firing
- 1x1 GE F Class Heat Balance 99 Percent Winter Design Conditions without Duct Firing
- 1x1 Siemens F Class Heat Balance 1 Percent Summer Design Conditions with Duct Firing
- 1x1 Siemens F Class Heat Balance Average Design Conditions without Duct Firing
- 1x1 Siemens F Class Heat Balance 99 Percent Winter Design Conditions without Duct Firing
- 1x1 MHI G Class Heat Balance 1 Percent Summer Design Conditions with Duct Firing
- 1x1 MHI G Class Heat Balance Average Design Conditions without Duct Firing
- 1x1 MHI G Class Heat Balance 99 Percent Winter Design Conditions without Duct Firing
- 1x1 Siemens H Class Heat Balance 1 Percent Summer Design Conditions with Duct Firing
- 1x1 Siemens H Class Heat Balance Average Design Conditions without Duct Firing
- 1x1 Siemens H Class Heat Balance 99 Percent Winter Design Conditions without Duct Firing
- 2x1 GE F Class Heat Balance 1 Percent Summer Design Conditions with Duct Firing
- 2x1 GE F Class Heat Balance Average Design Conditions without Duct Firing
- 2x1 GE F Class Heat Balance 99 Percent Winter Design Conditions without Duct Firing
- 2x1 Siemens F Class Heat Balance 1 Percent Summer Design Conditions with Duct Firing
- 2x1 Siemens F Class Heat Balance Average Design Conditions without Duct Firing
- 2x1 Siemens F Class Heat Balance 99 Percent Winter Design Conditions without Duct Firing
- 2x1 Siemens F Class Heat Balance 1 Percent Summer Design Conditions, Heavily Fired
- 2x1 Siemens F Class Heat Balance 1 Percent Summer Design Conditions, Unfired
- 2x1 Siemens F Class Heat Balance Average Design Conditions, Heavily Fired
- 2x1 Siemens F Class Heat Balance Average Design Conditions, Unfired
- 2x1 Siemens F Class Heat Balance 99 Percent Winter Design Conditions Heavily Fired
- 2x1 Siemens F Class Heat Balance 99 Percent Winter Design Conditions Unfired
- 2x1 GE 7F7 Heat Balance 1 Percent Summer Design Conditions, Heavily Fired
- 2x1 GE 7F7 Heat Balance 1 Percent Summer Design Conditions, Unfired
- 2x1 GE 7F7 Heat Balance Average Design Conditions, Heavily Fired
- 2x1 GE 7F7 Heat Balance Average Design Conditions, Unfired
- 2x1 GE 7F7 Heat Balance 99 Percent Winter Design Conditions, Heavily Fired
- 2x1 GE 7F7 Heat Balance 99 Percent Winter Design Conditions, Unfired
- 2x1 Siemens H Class Heat Balance 1 Percent Summer Design Conditions, Unfired
- 2x1 Siemens H Class Heat Balance Average Design Conditions, Unfired
- 2x1 Siemens HF Class Heat Balance 99 Percent Winter Design Conditions, Unfired



NGCC 1 – Summer Day Fired



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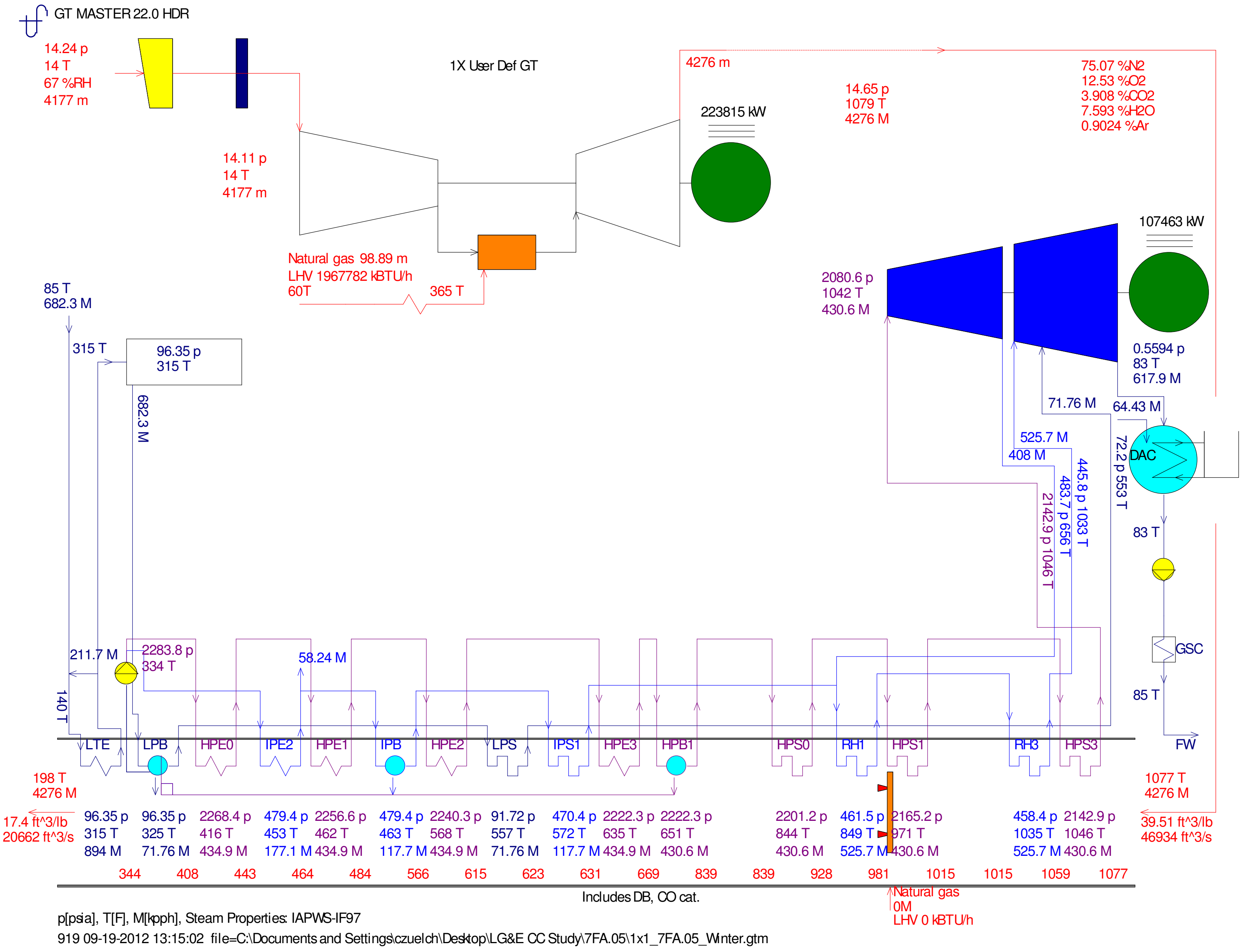
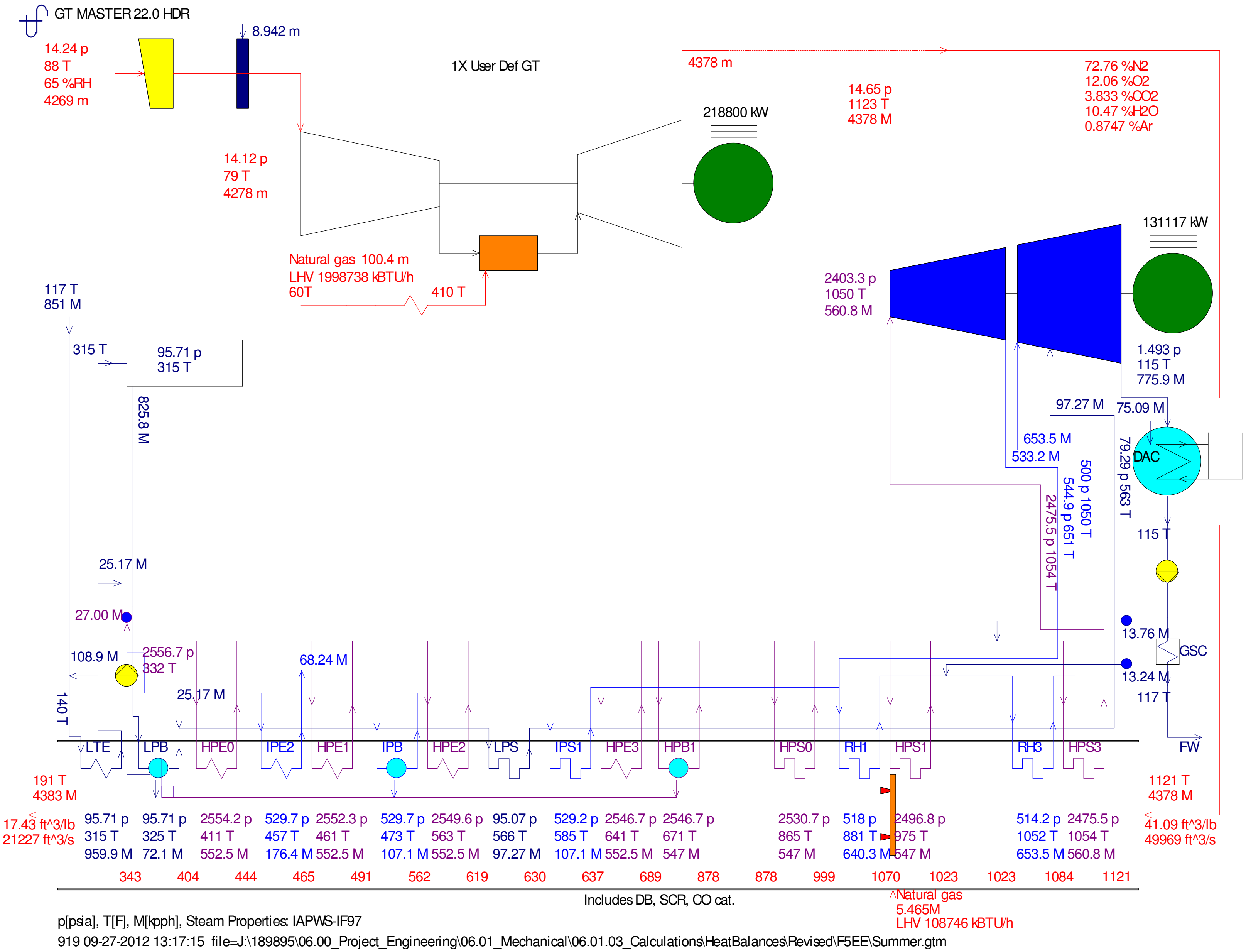


NGCC – Winter Day



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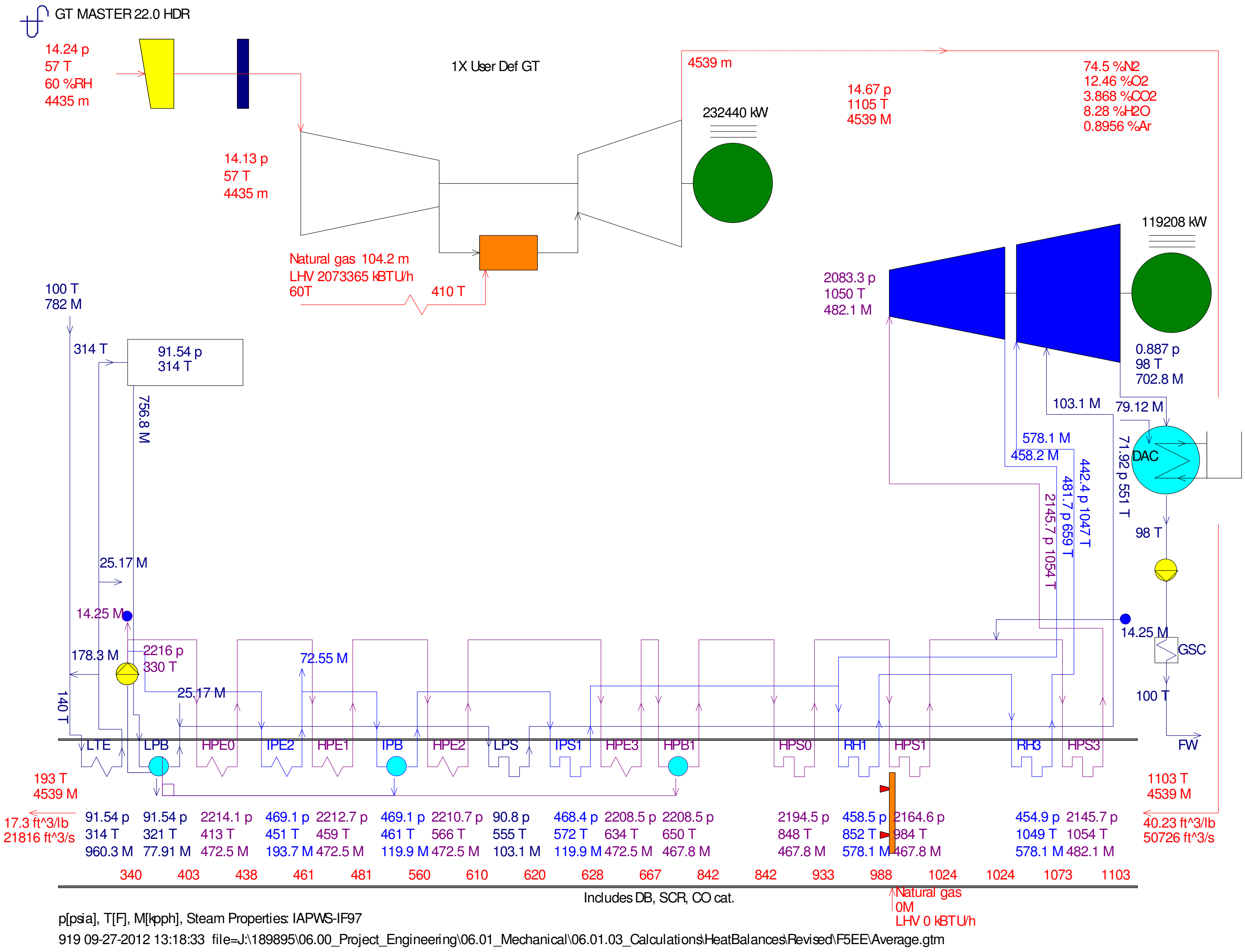

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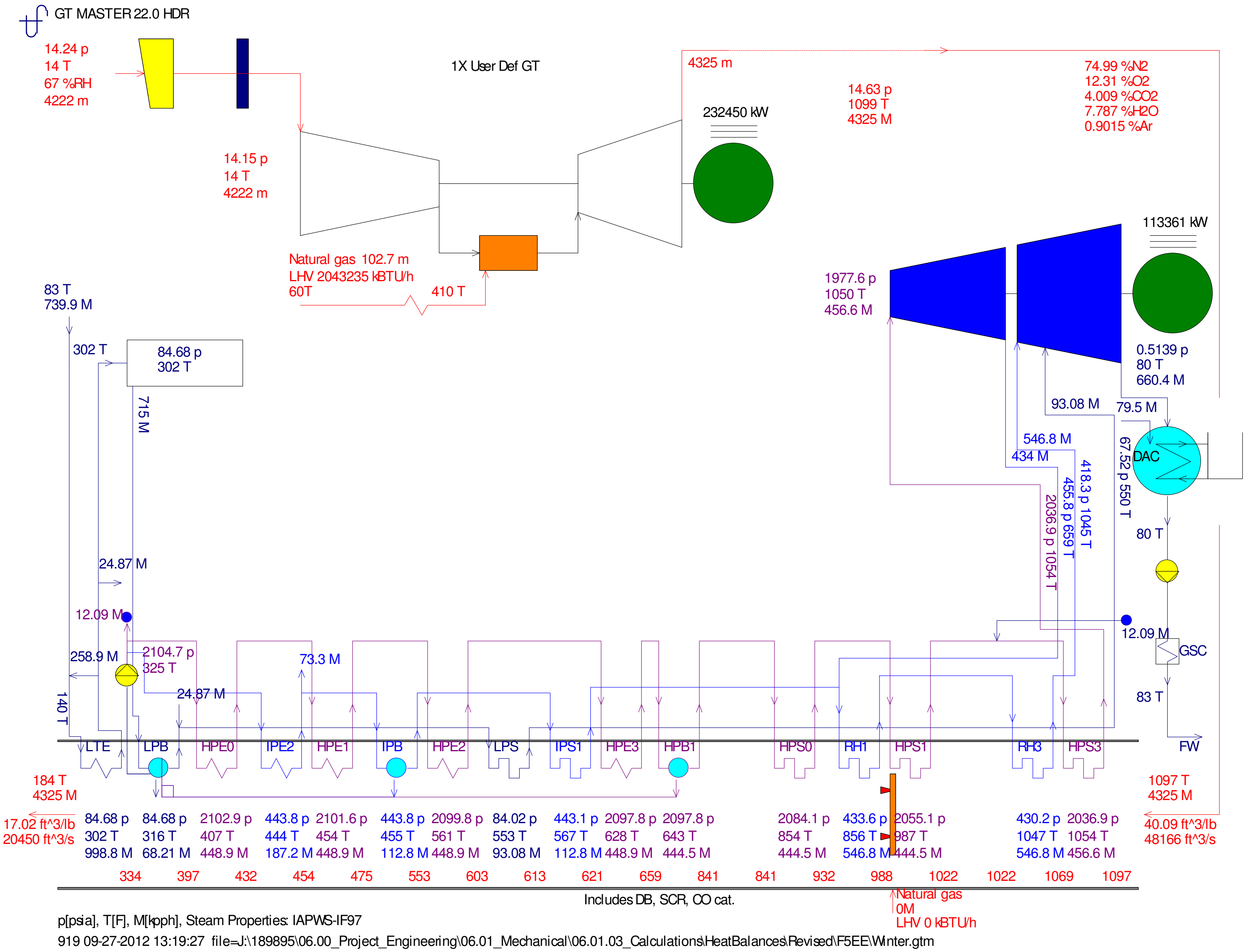

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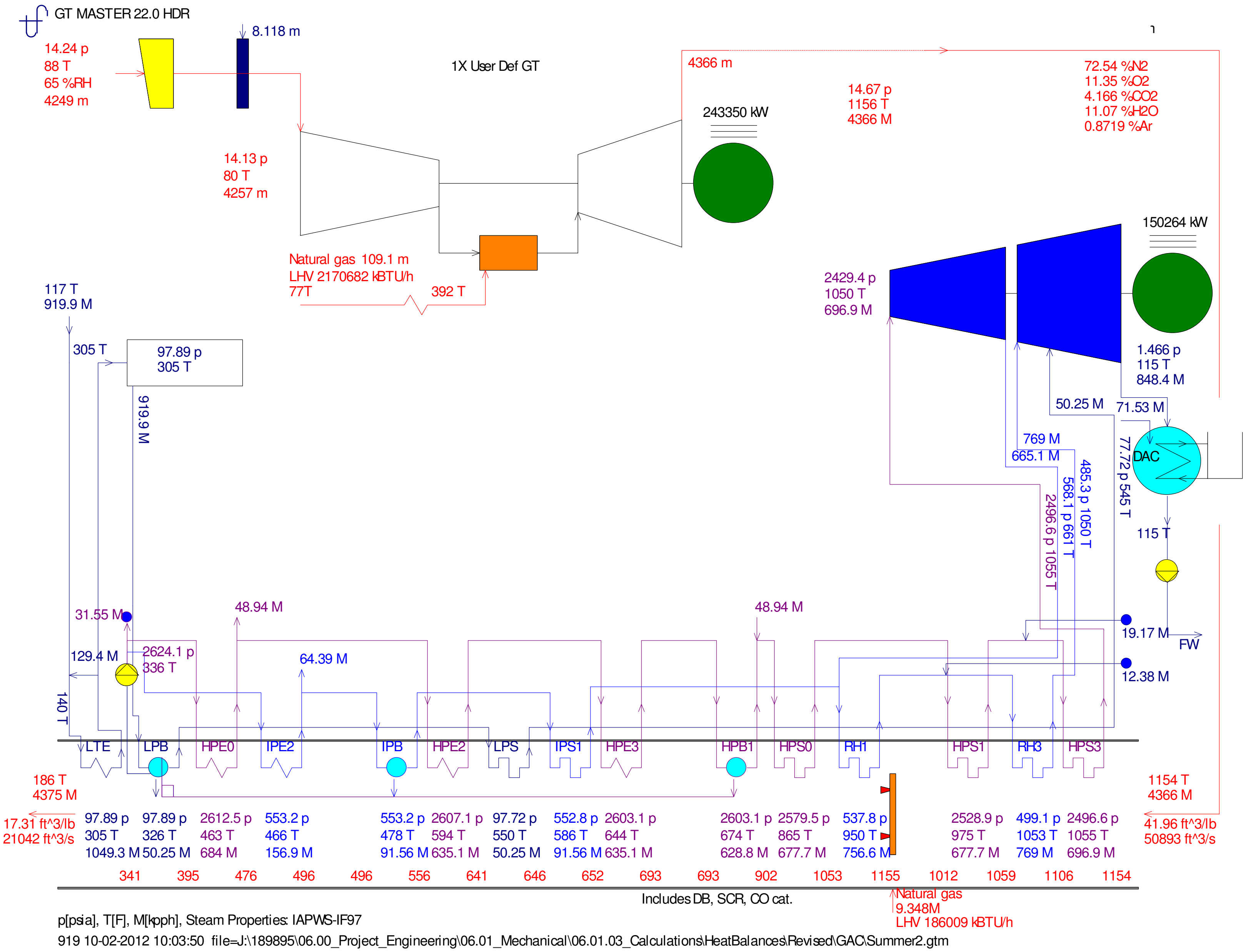

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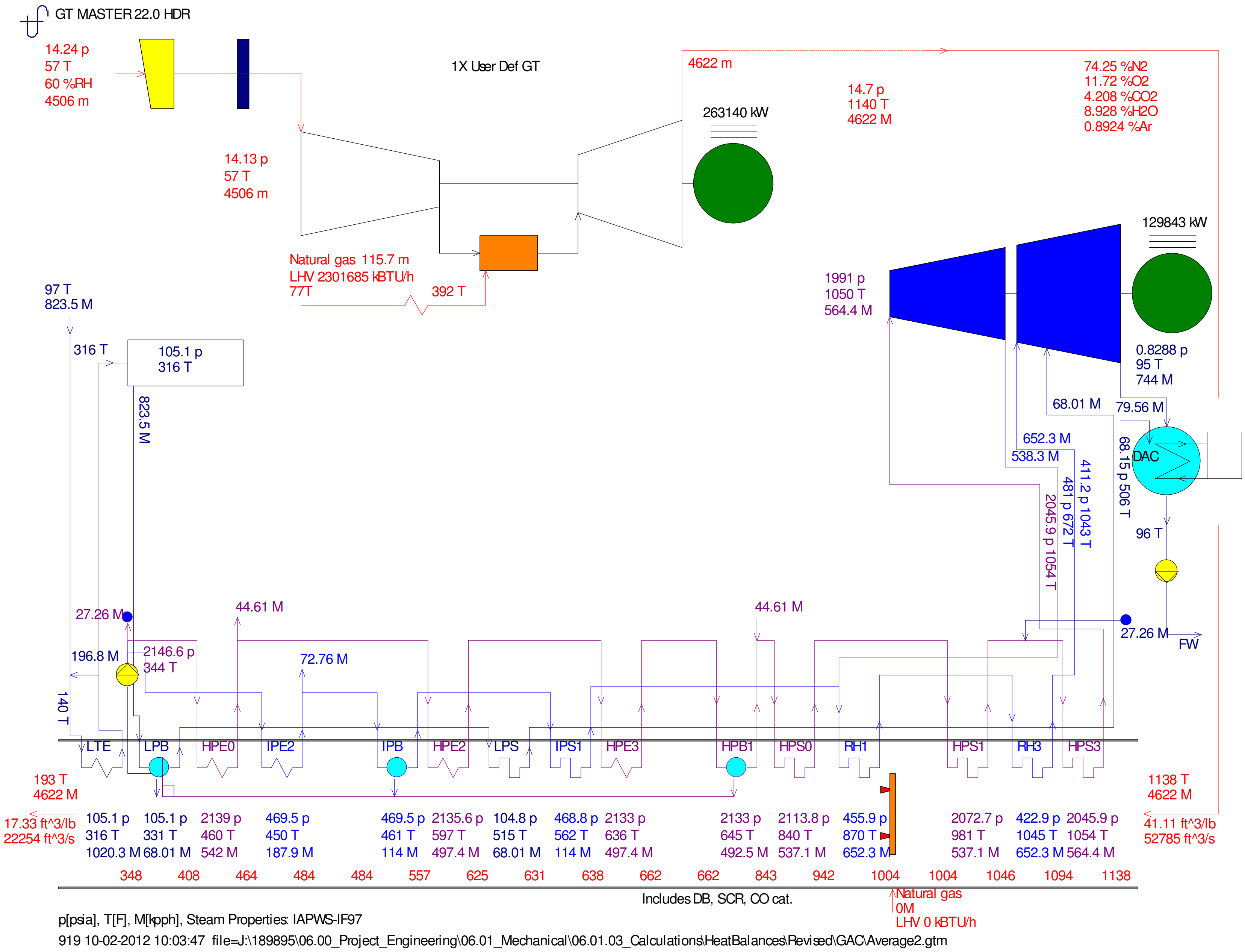

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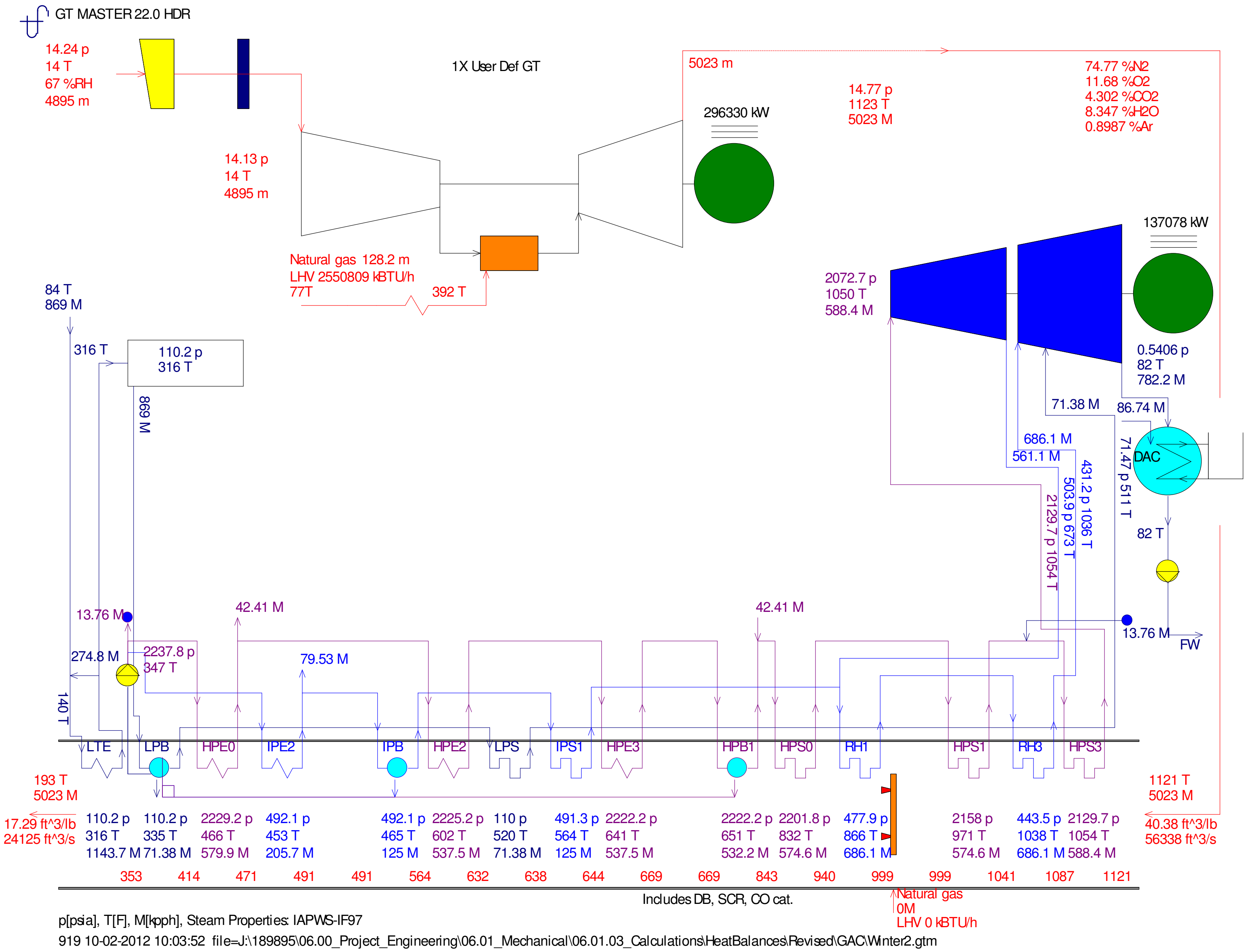
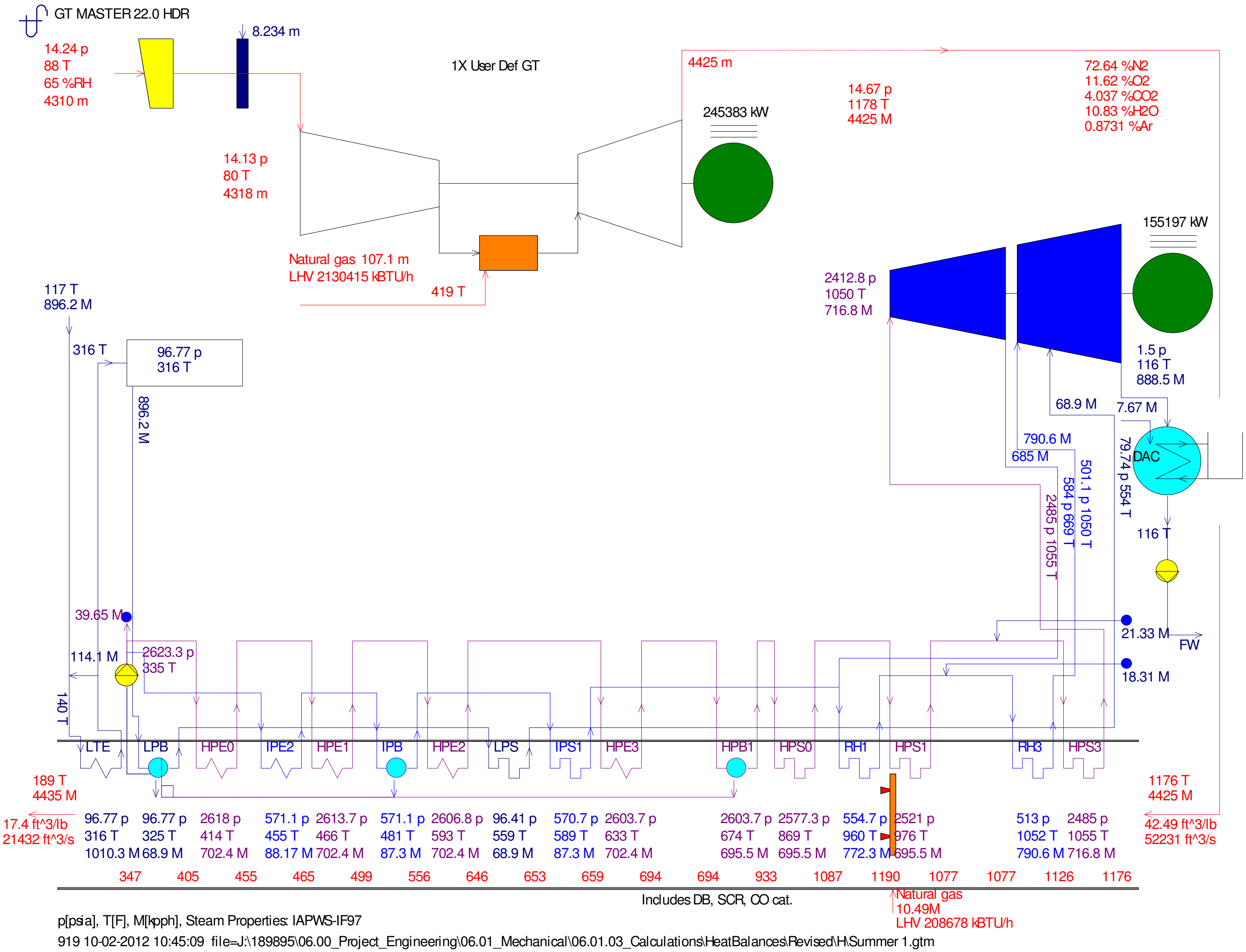


NGCC 3 – Winter Day



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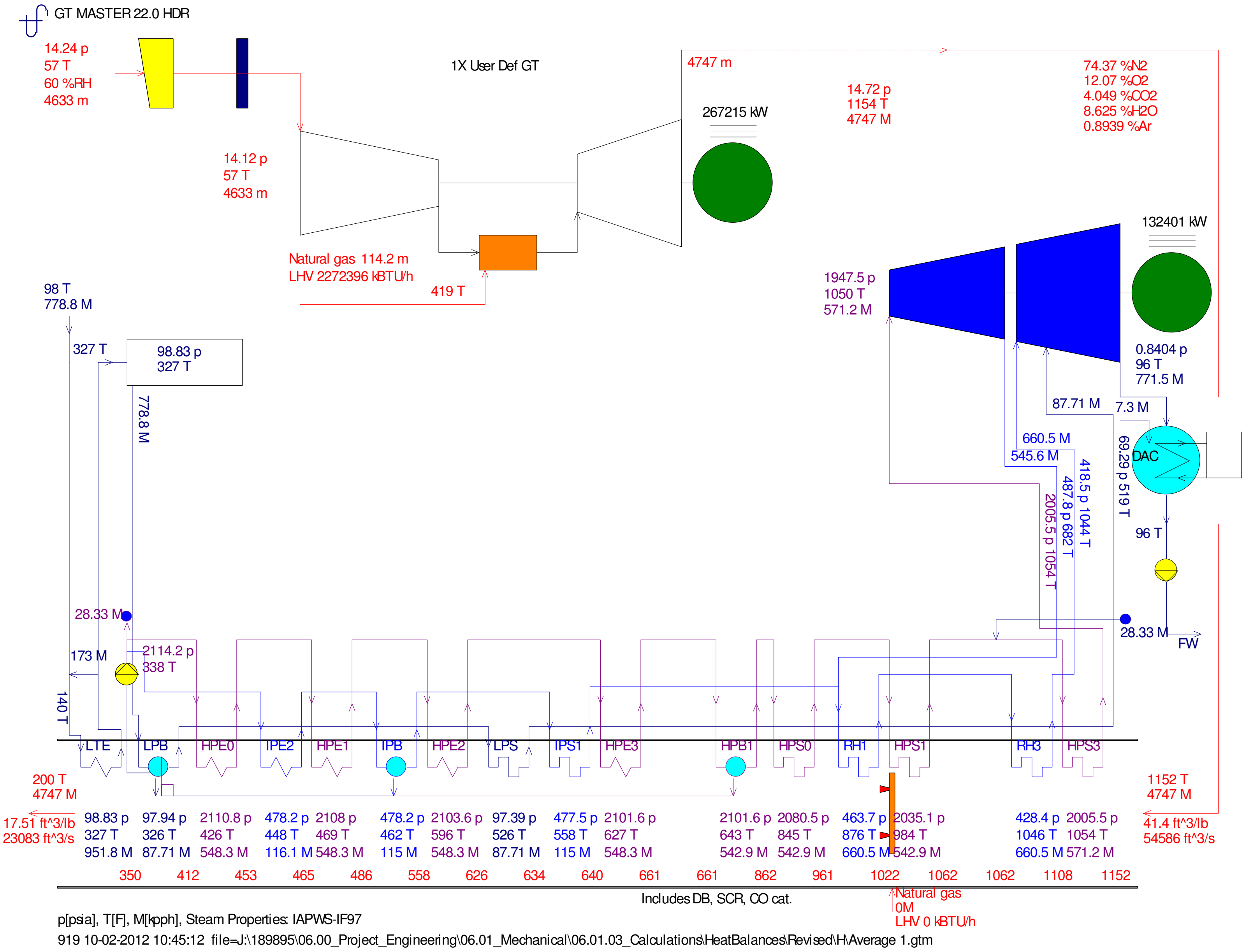

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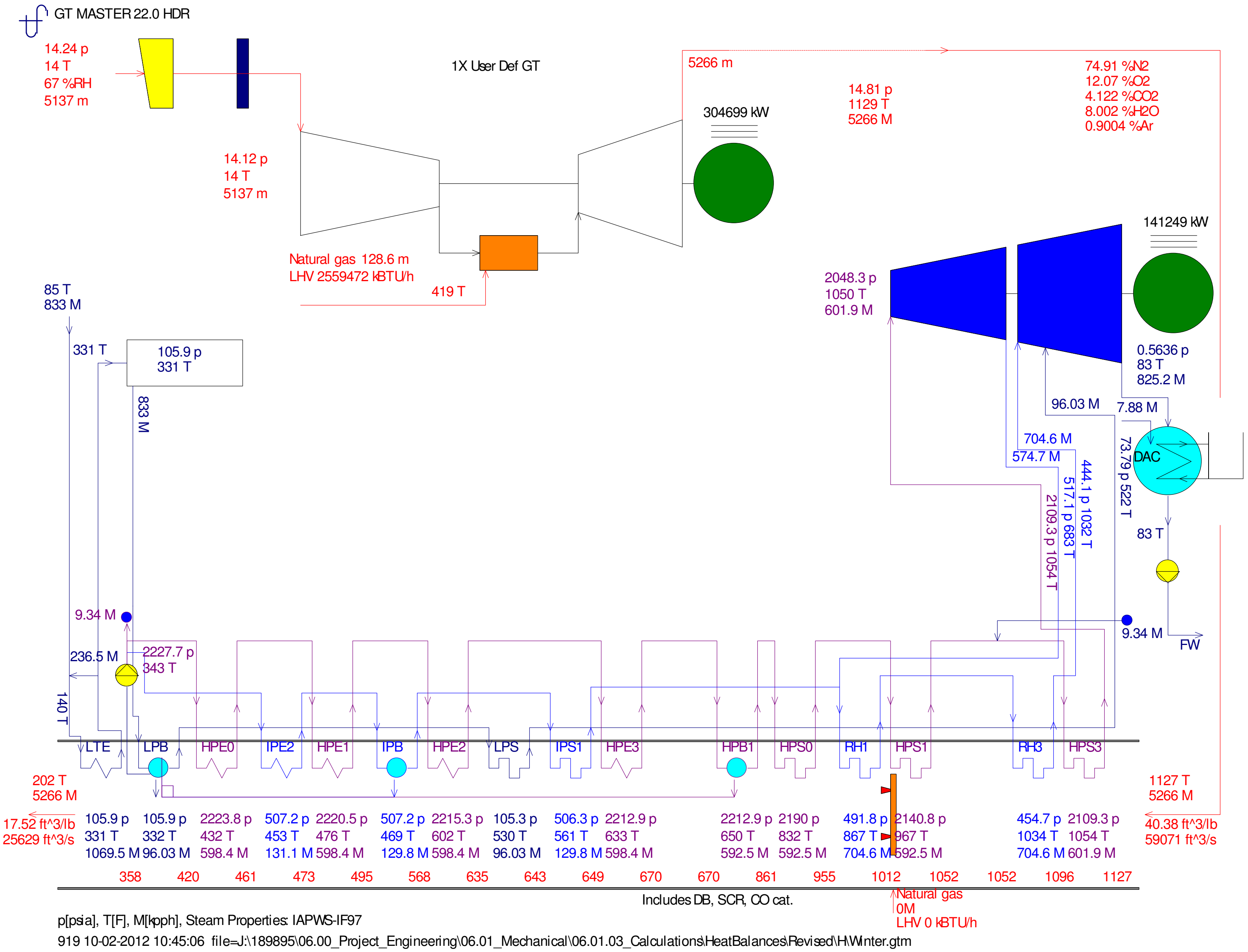

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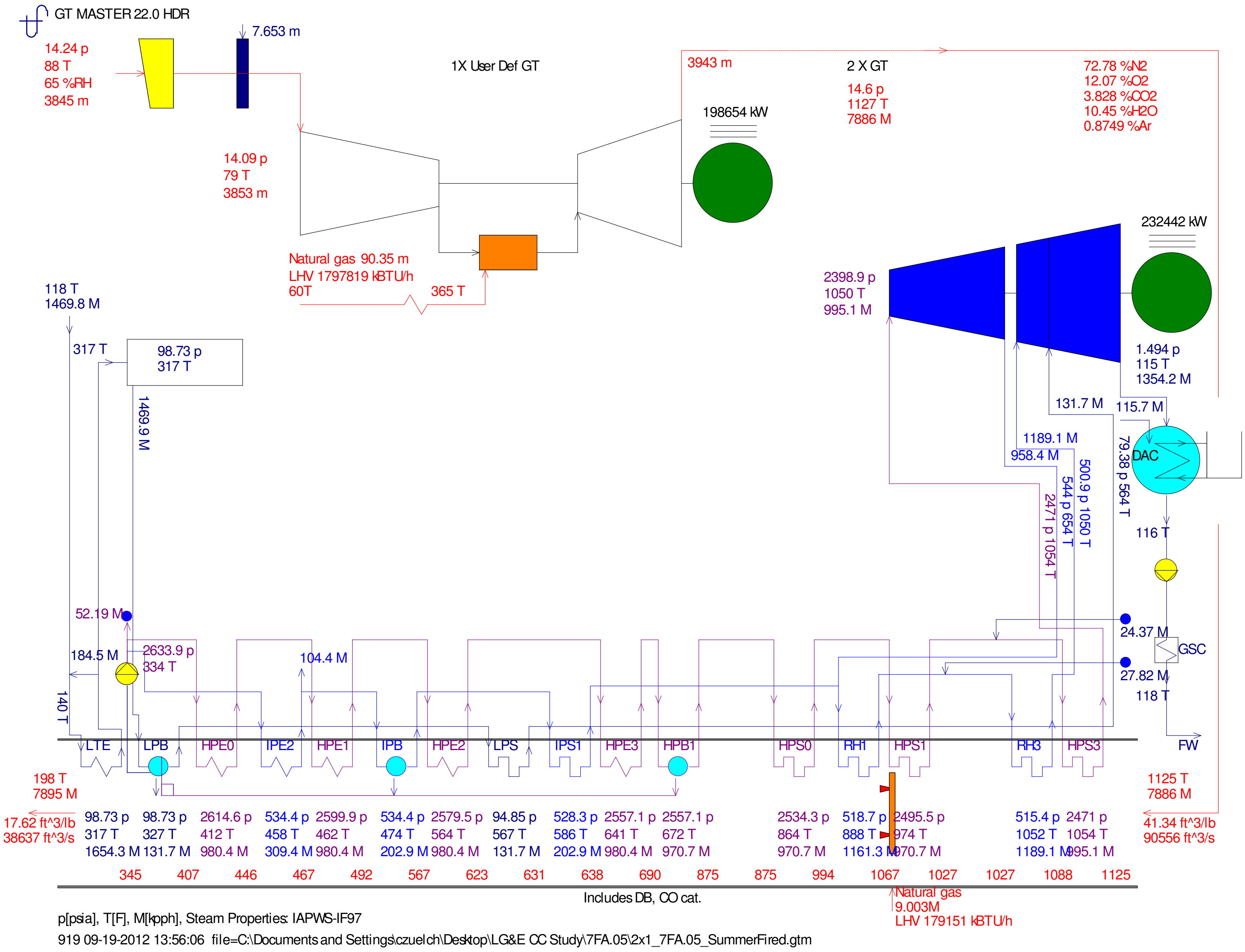

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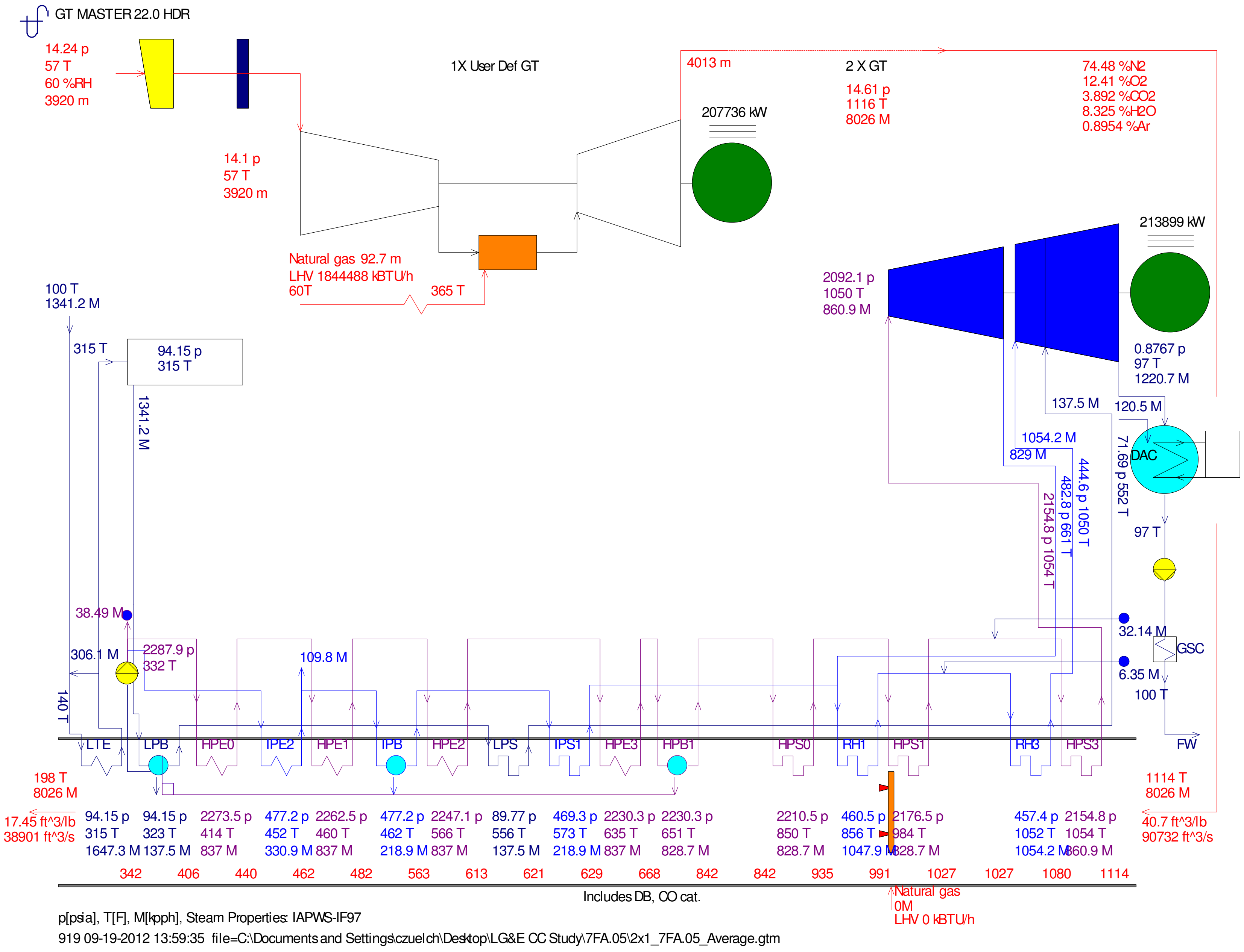

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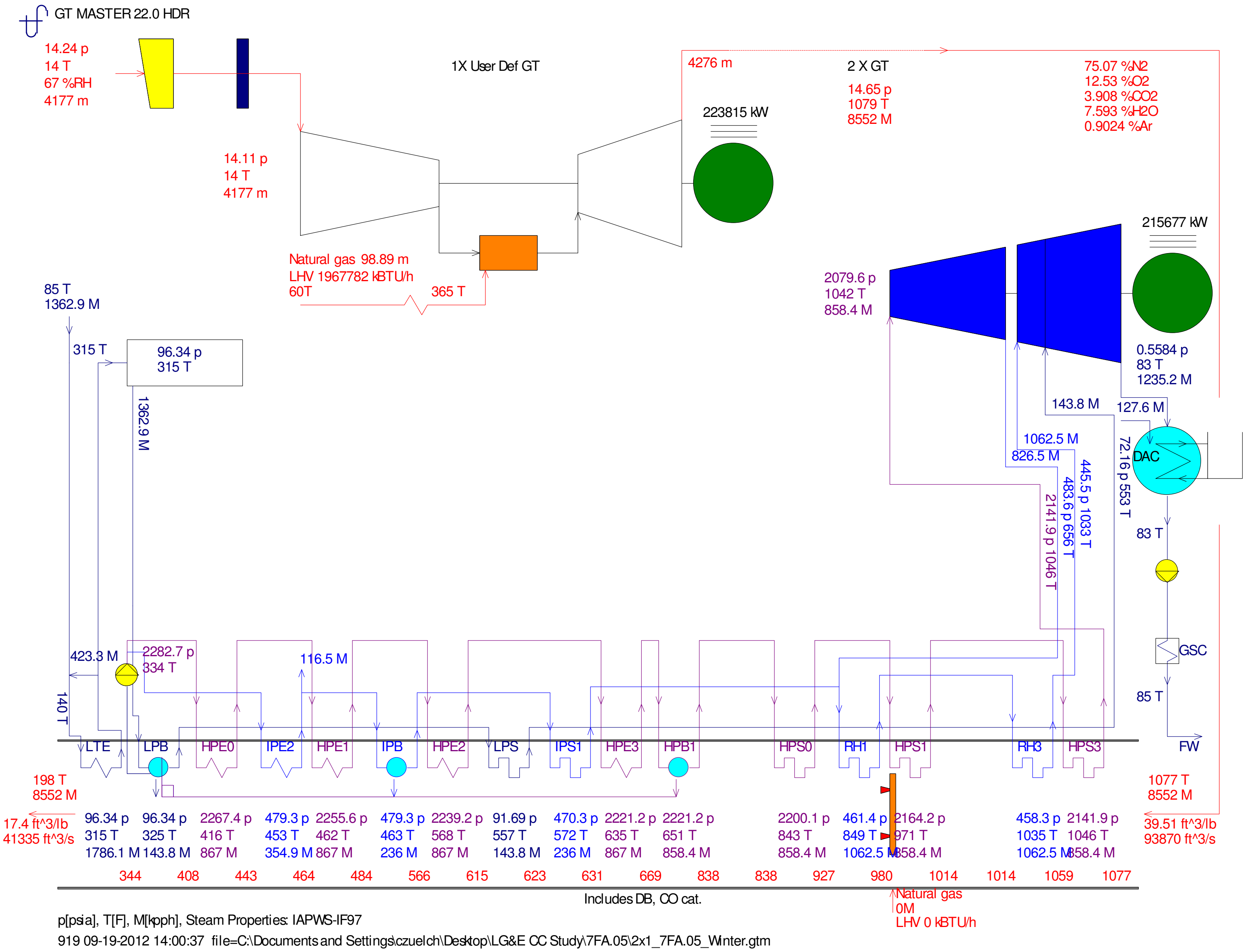

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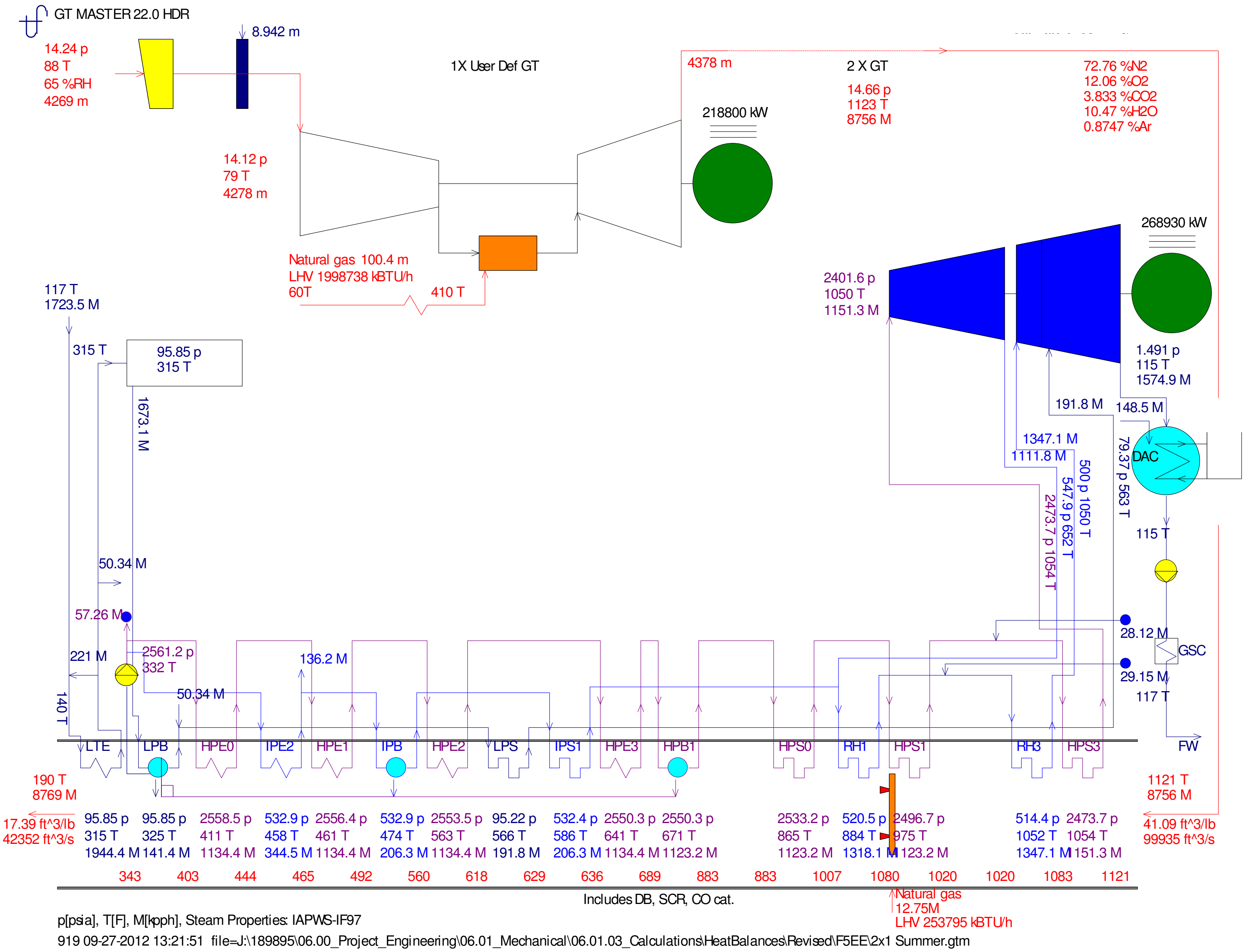

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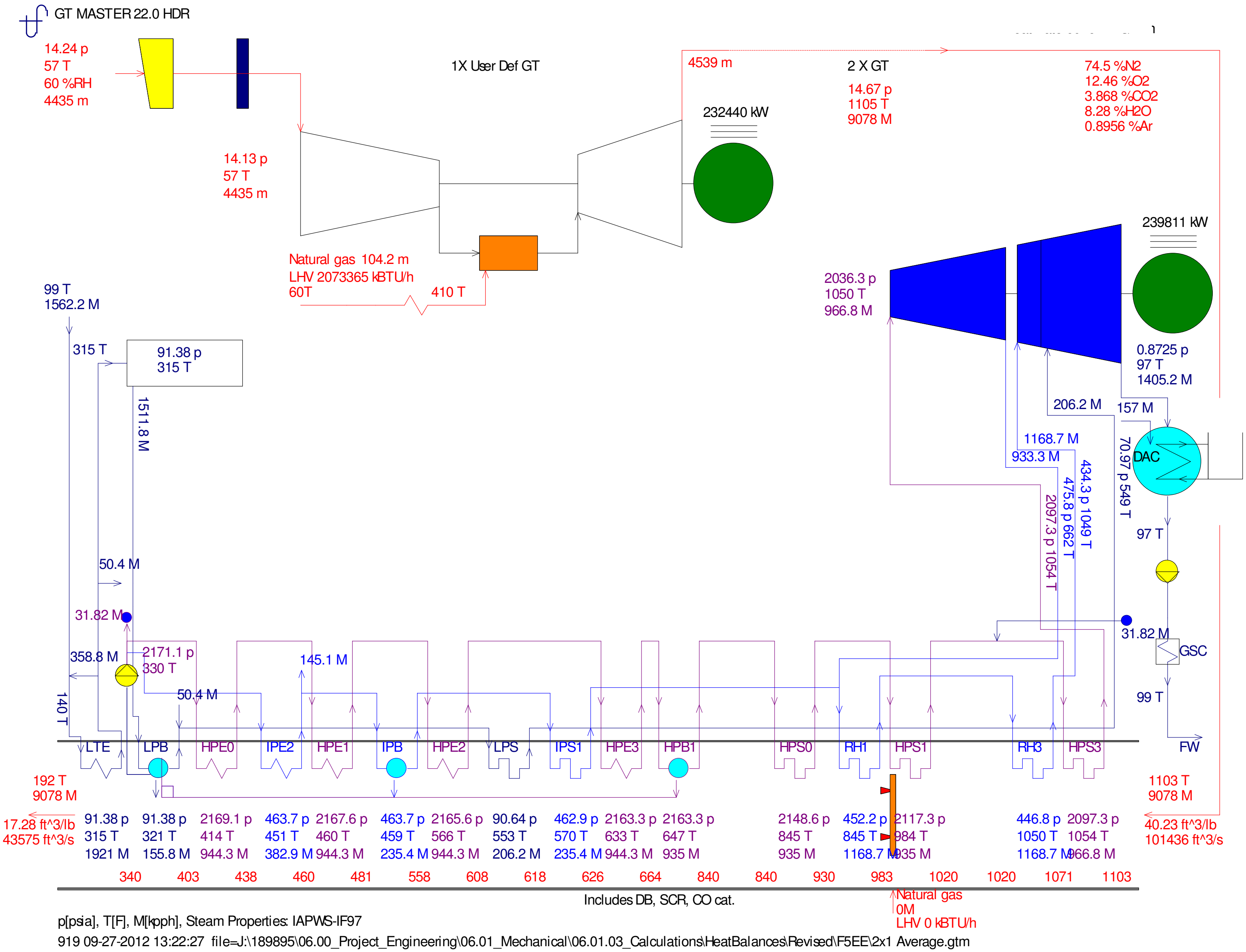

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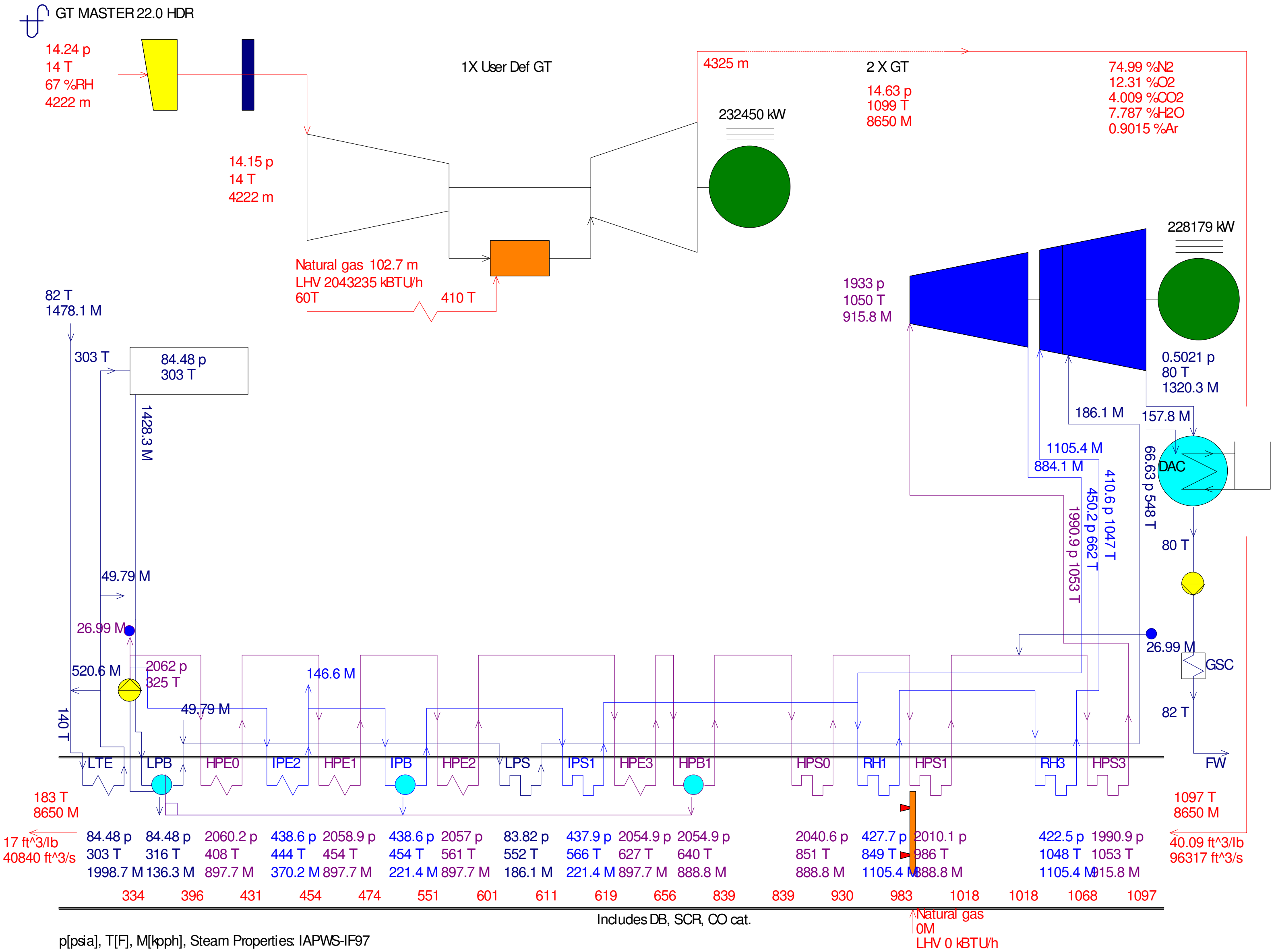

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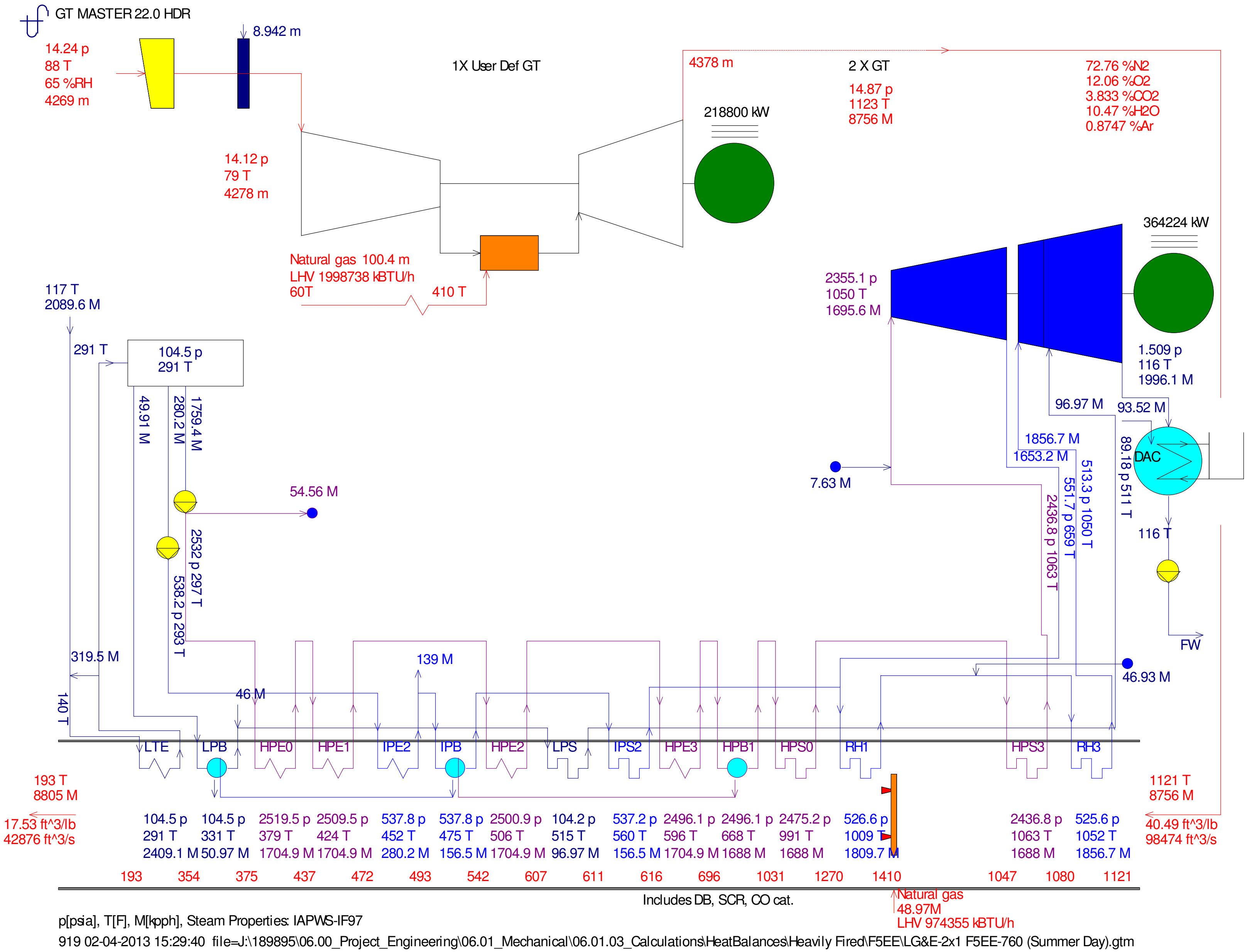
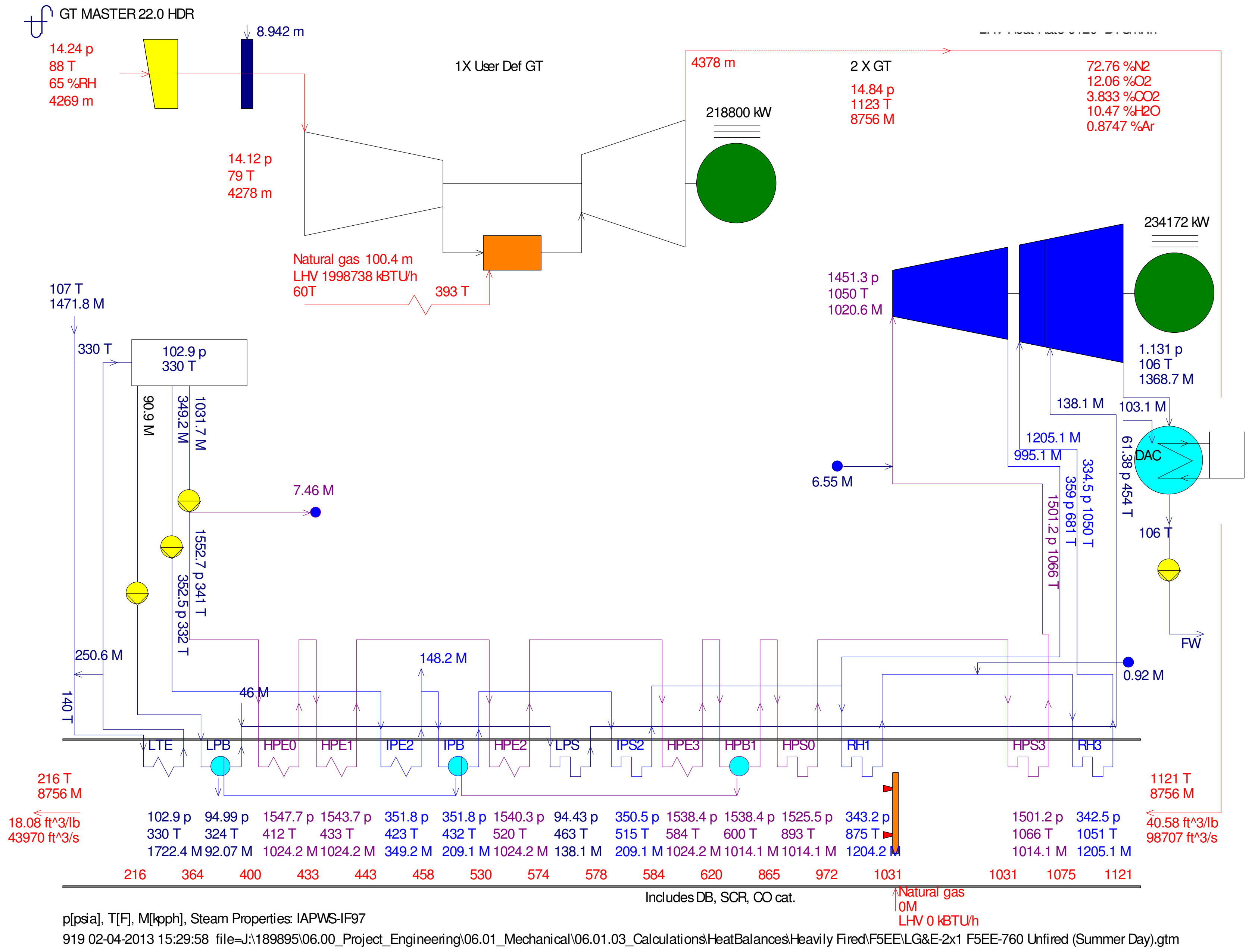
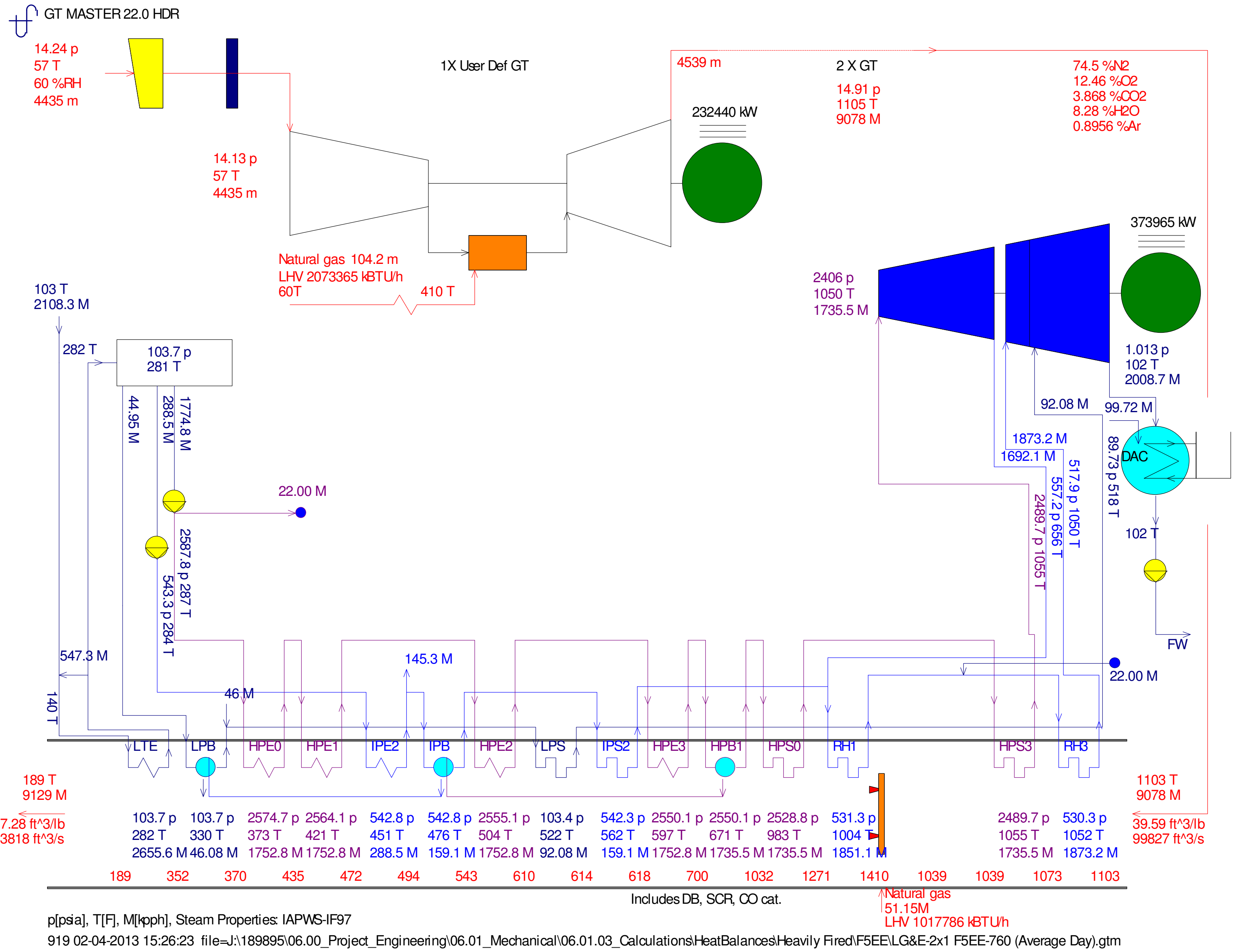


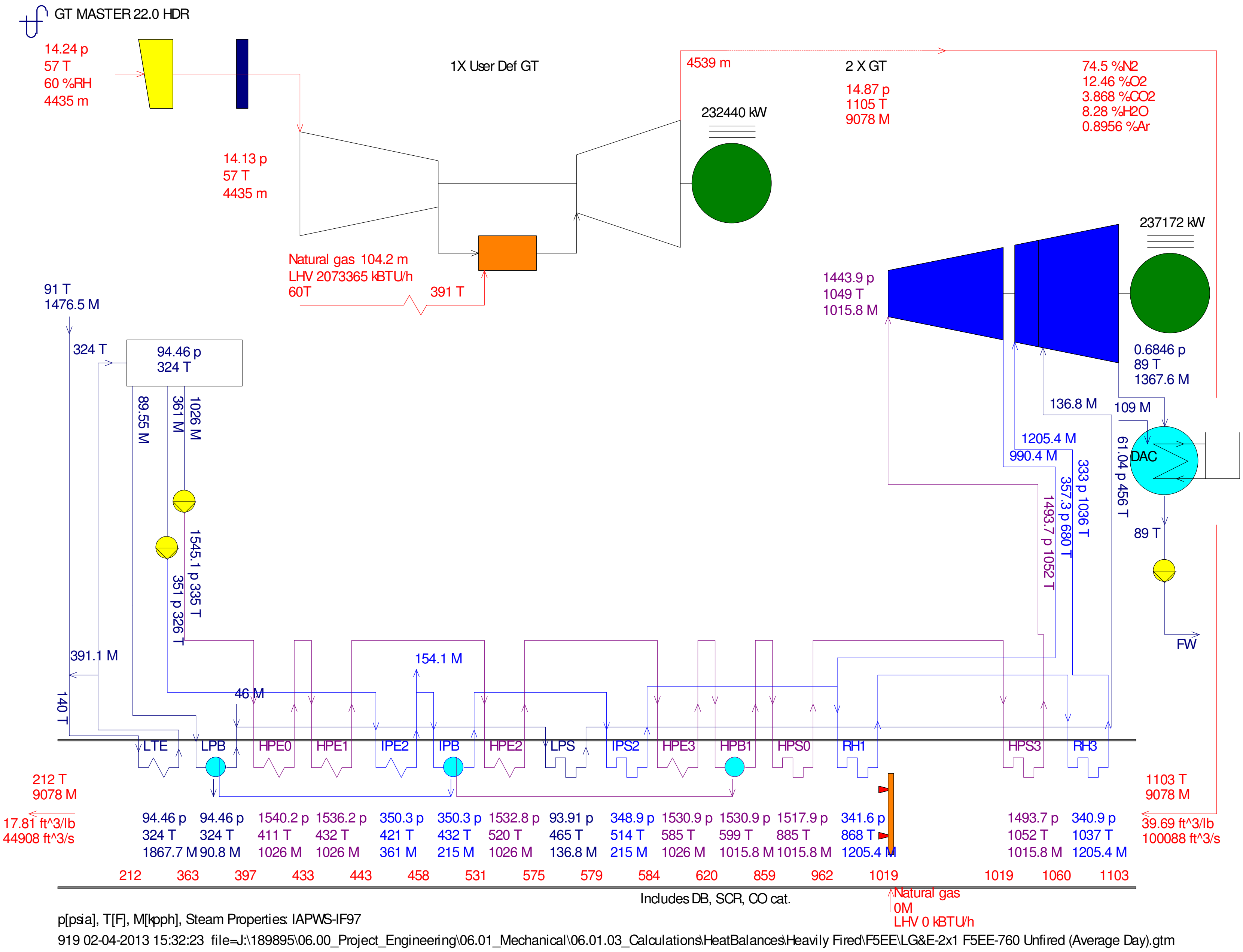
2 x 1 F(5)ee Summer Day, 760 MW Design - Fired



2 x 1 F(5)ee Summer Day, 760 MW Design - Unfired



2 x 1 F(5)ee Average Day, 760 MW Design - Fired



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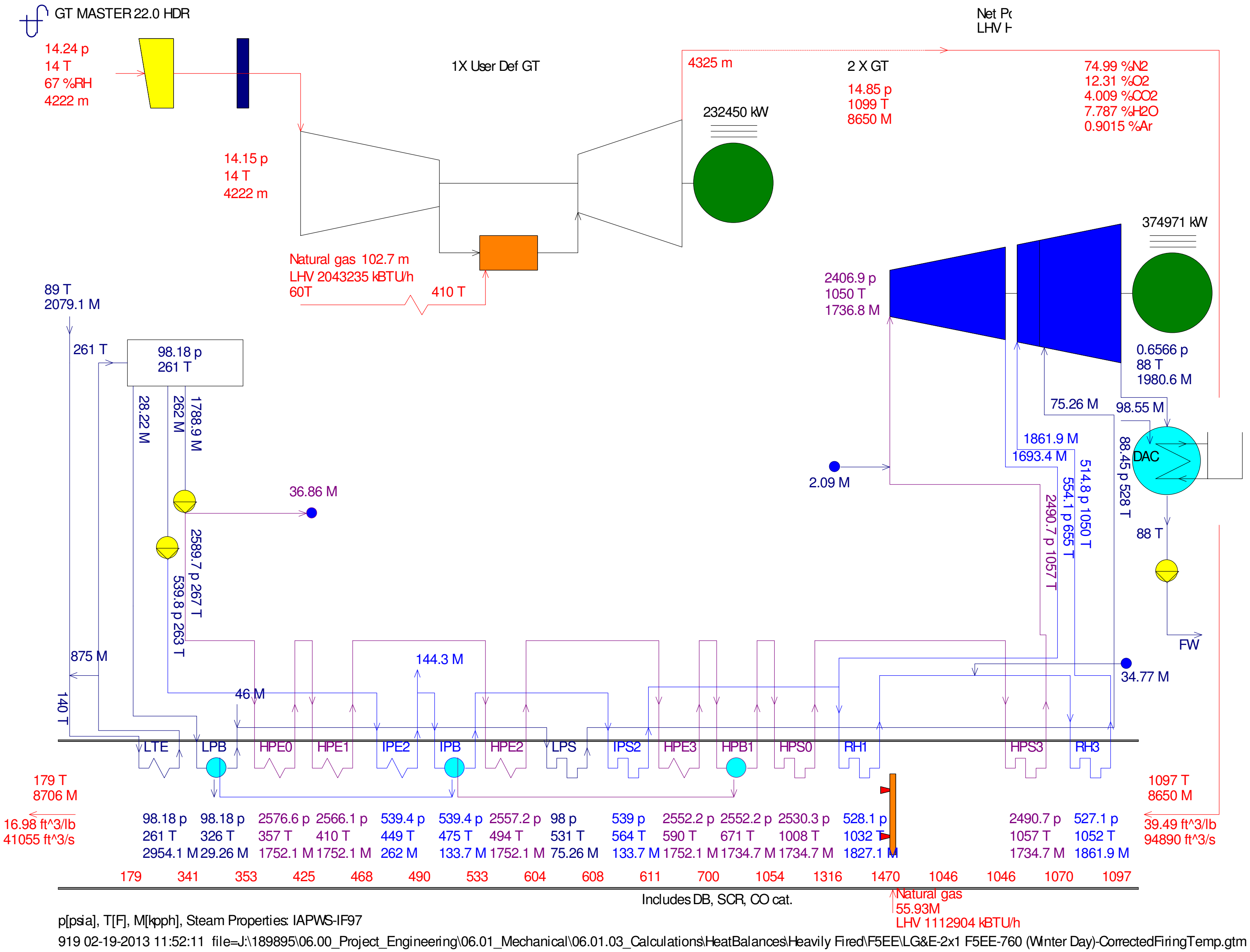
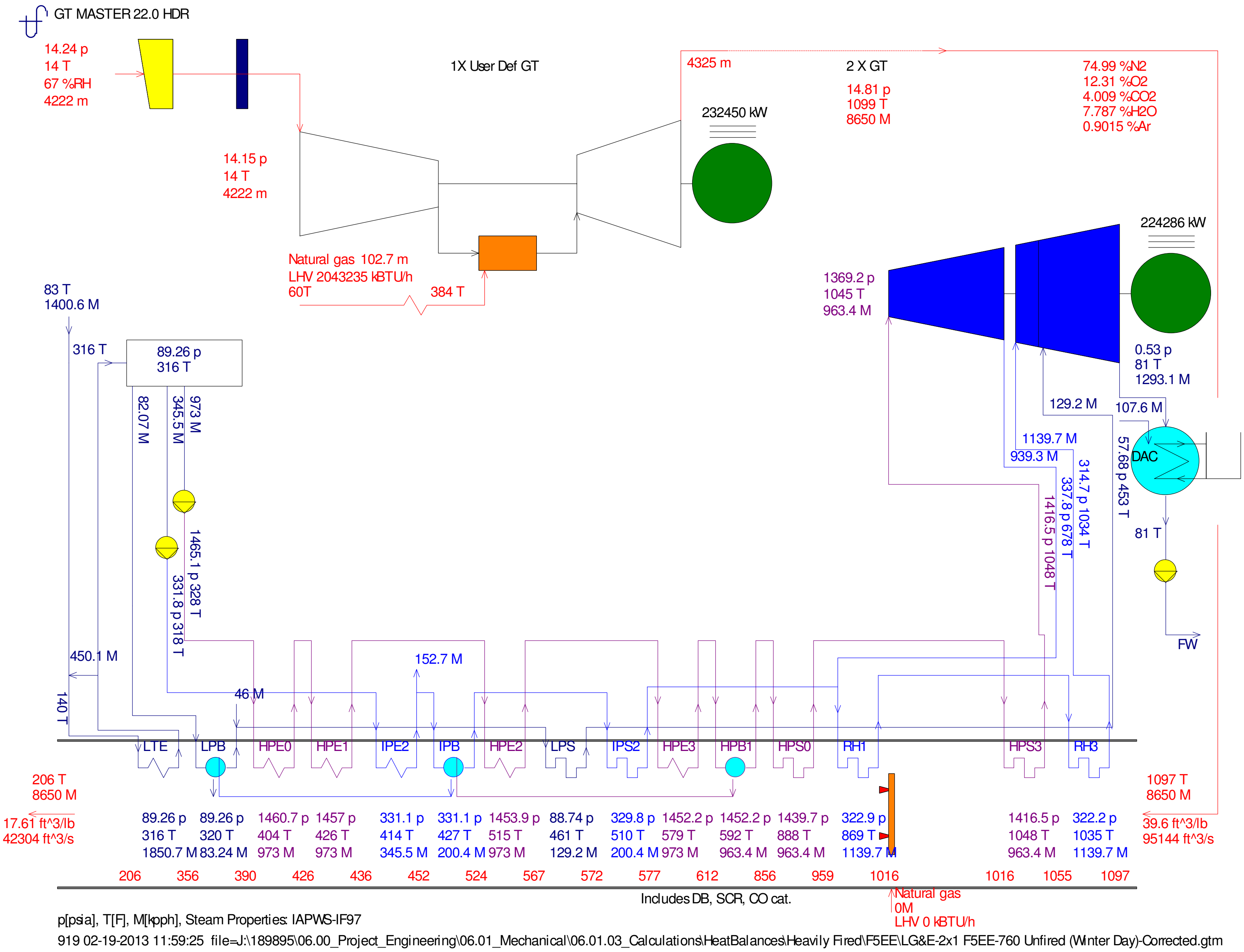


2 x 1 F(5)ee Winter Day, 760 MW Design - Fired



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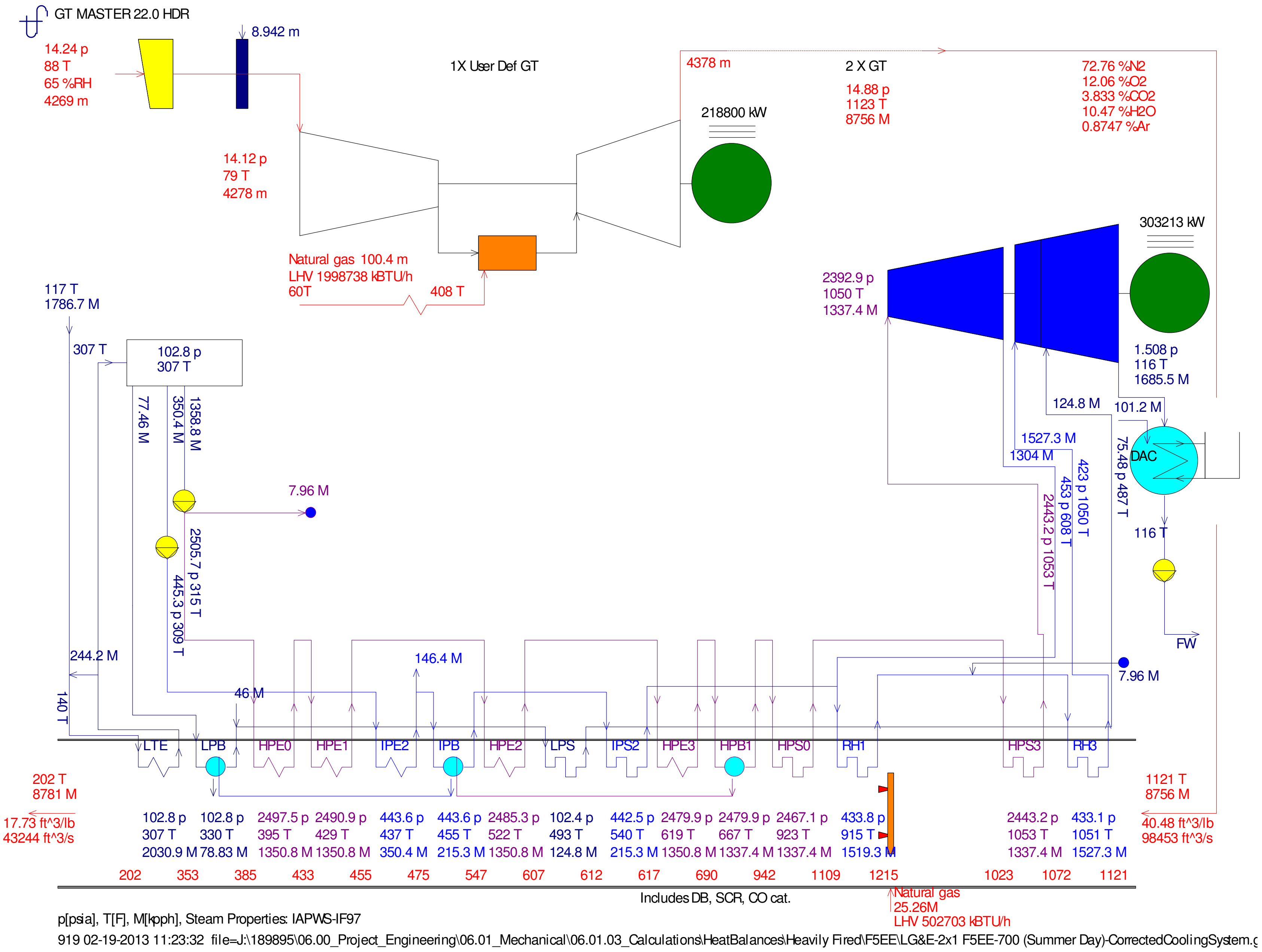
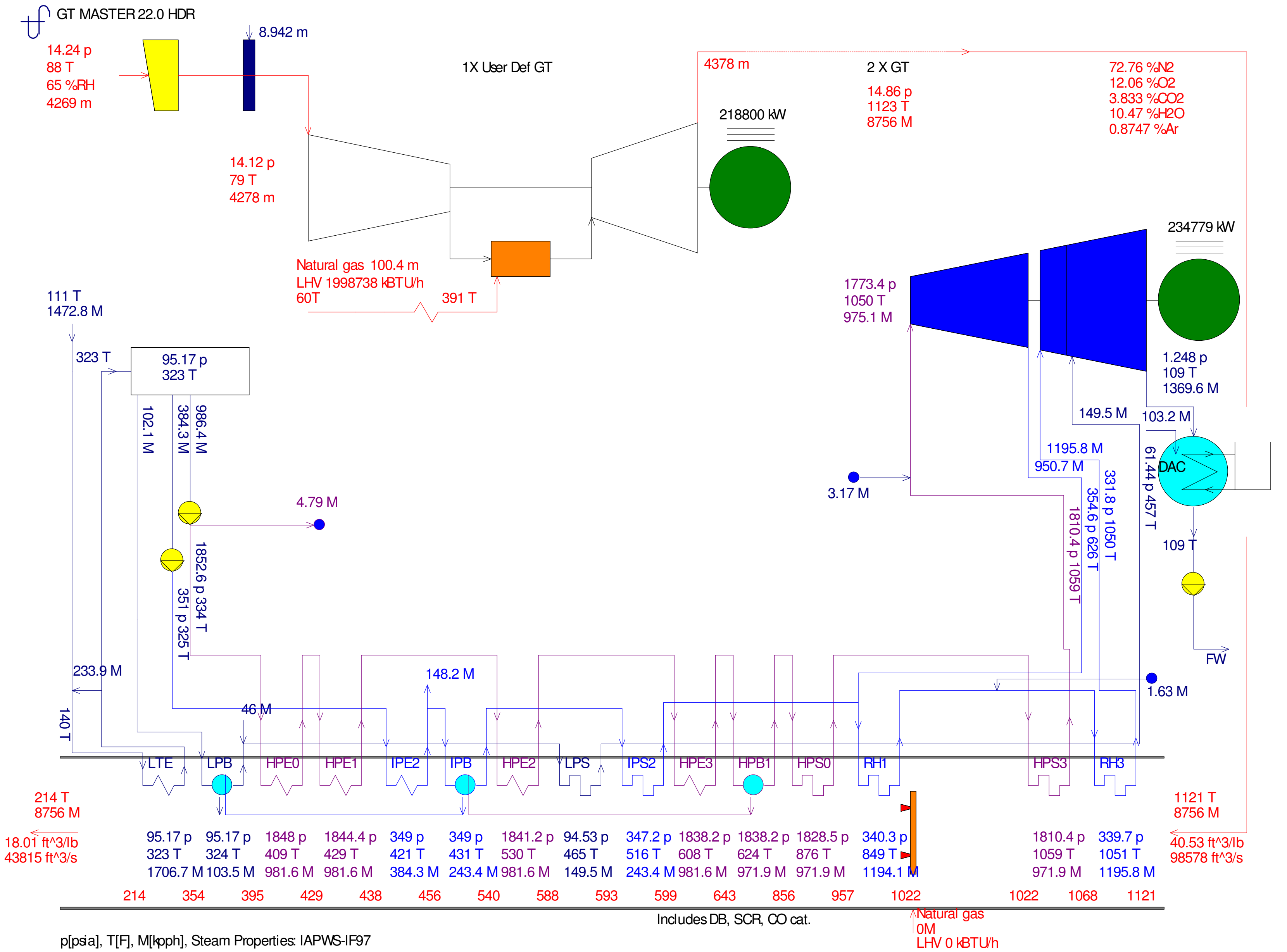


2 x 1 F(5)ee Summer Day, 700 MW Design - Fired



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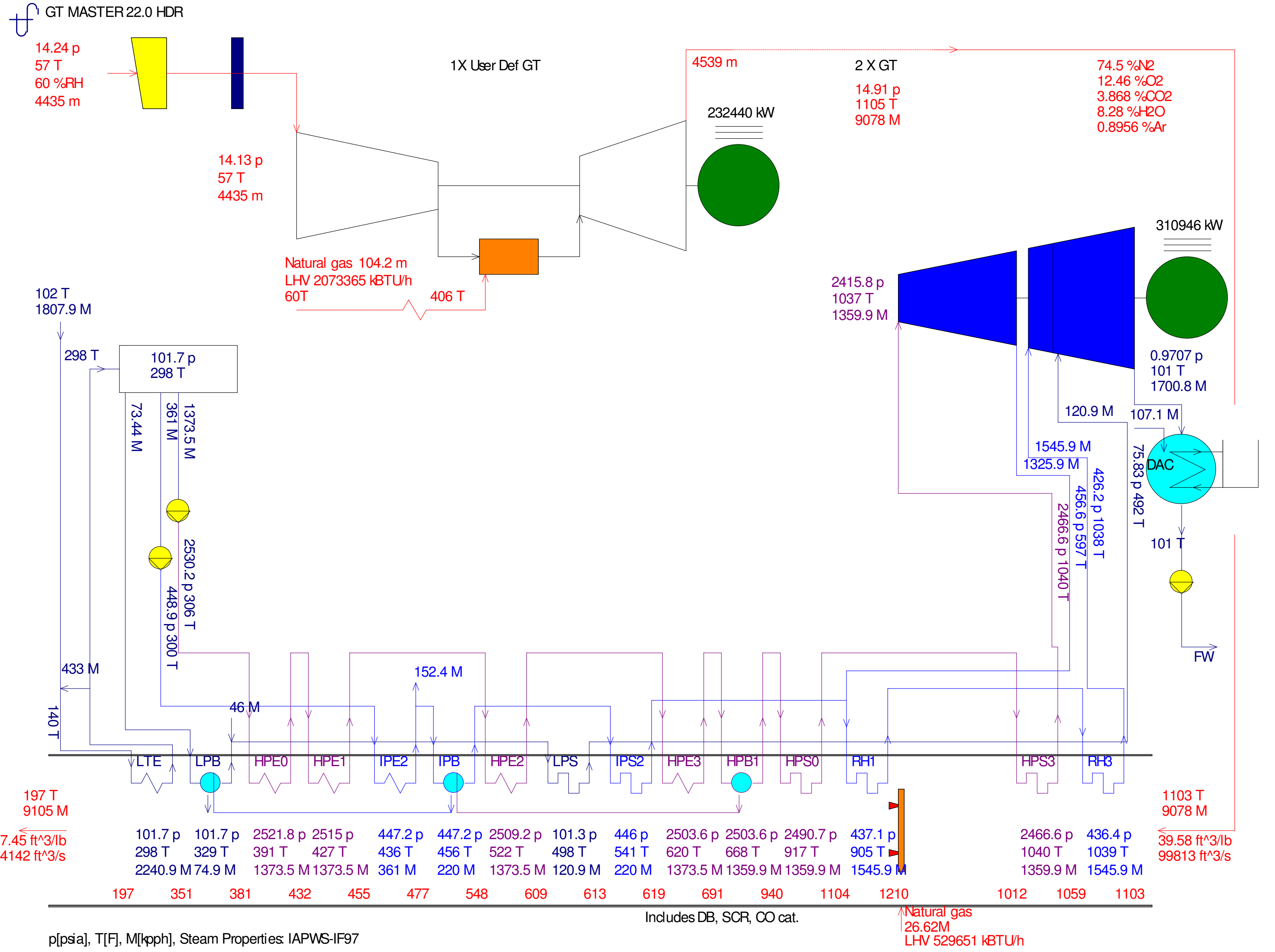
2 x 1 F(5)ee Summer Day, 700 MW Design - Unfired



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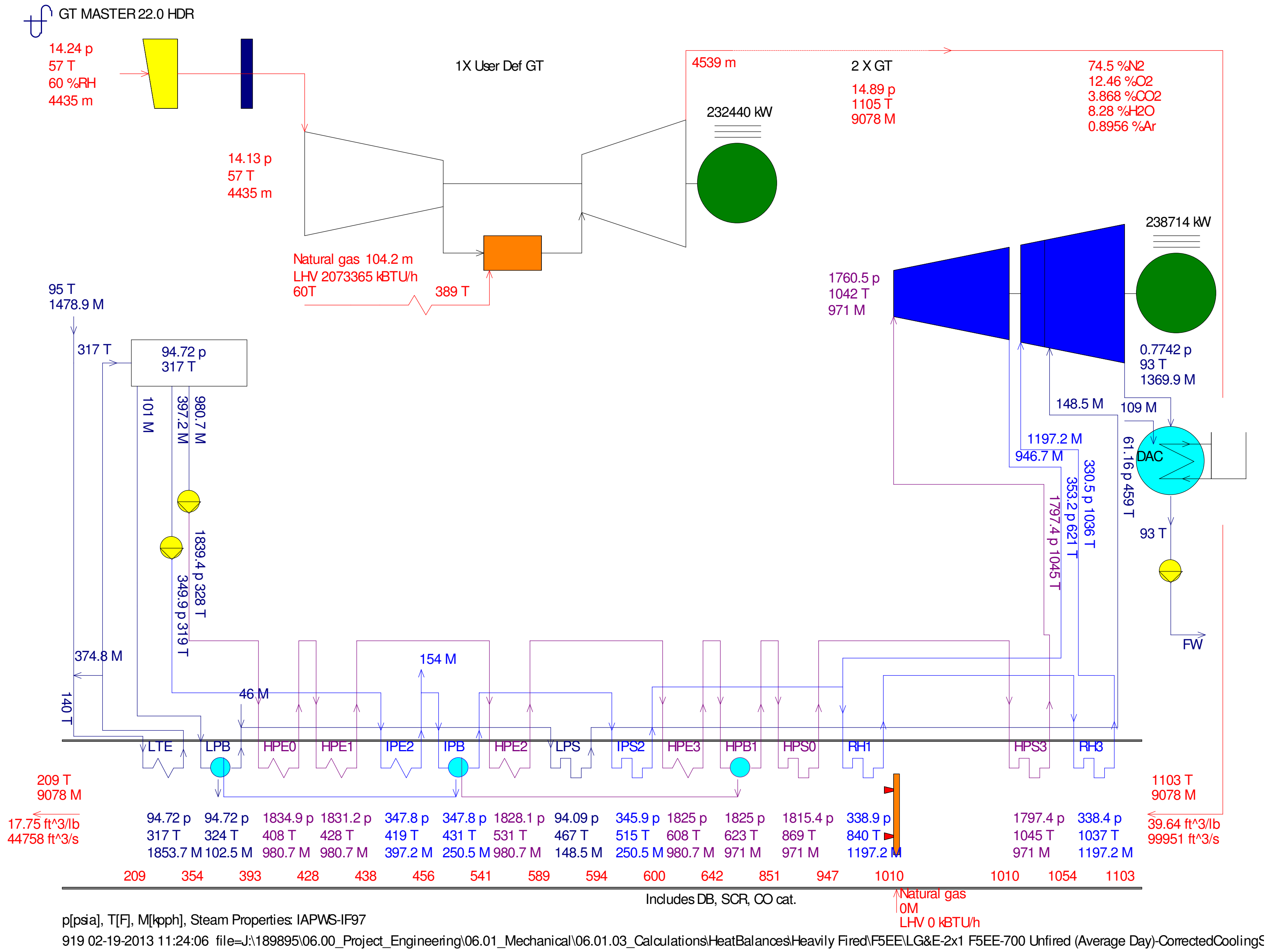
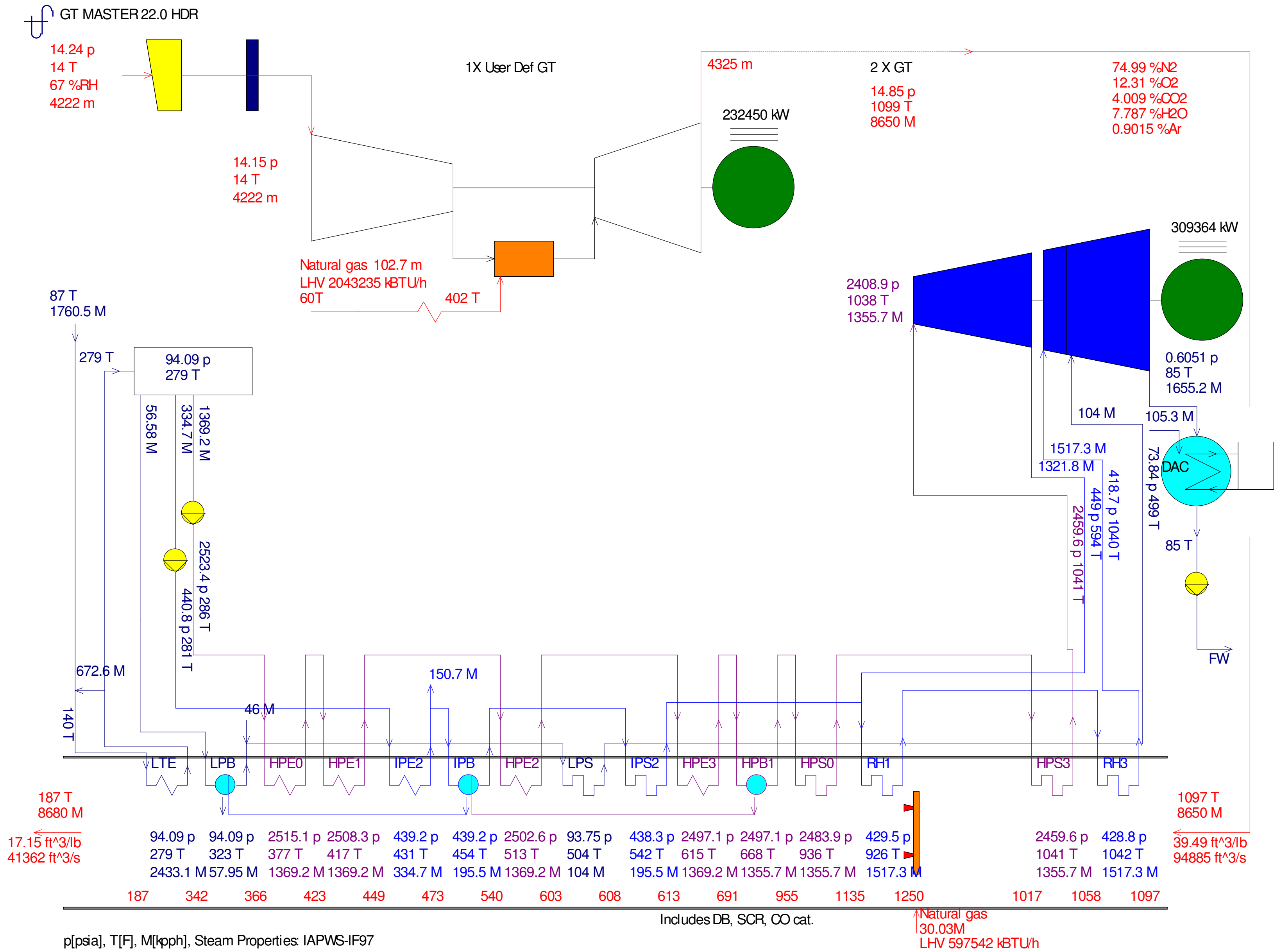
2 x 1 F(5)ee Average Day, 700 MW Design - Fired



2 x 1 F(5)ee Average Day, 700 MW Design - Unfired



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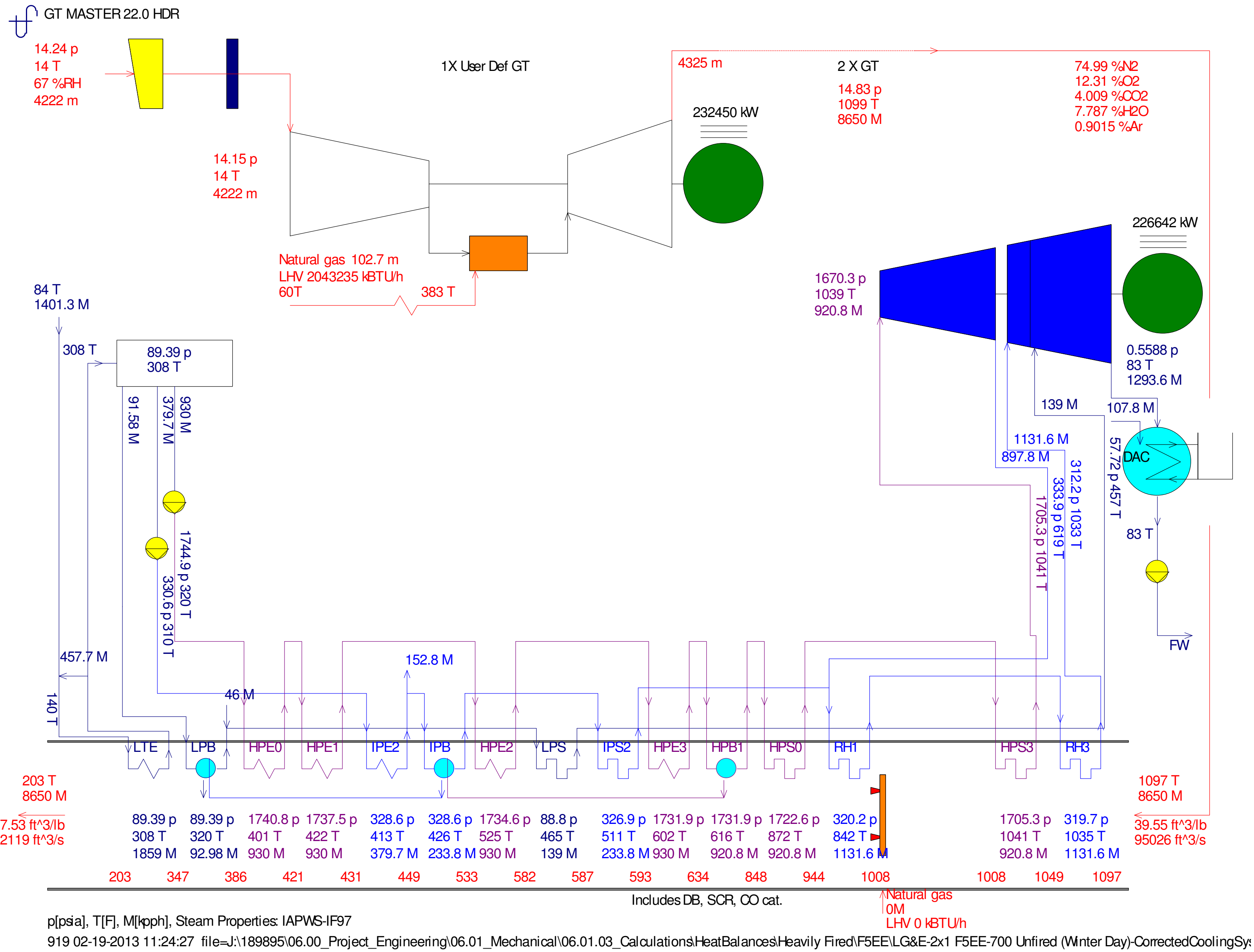
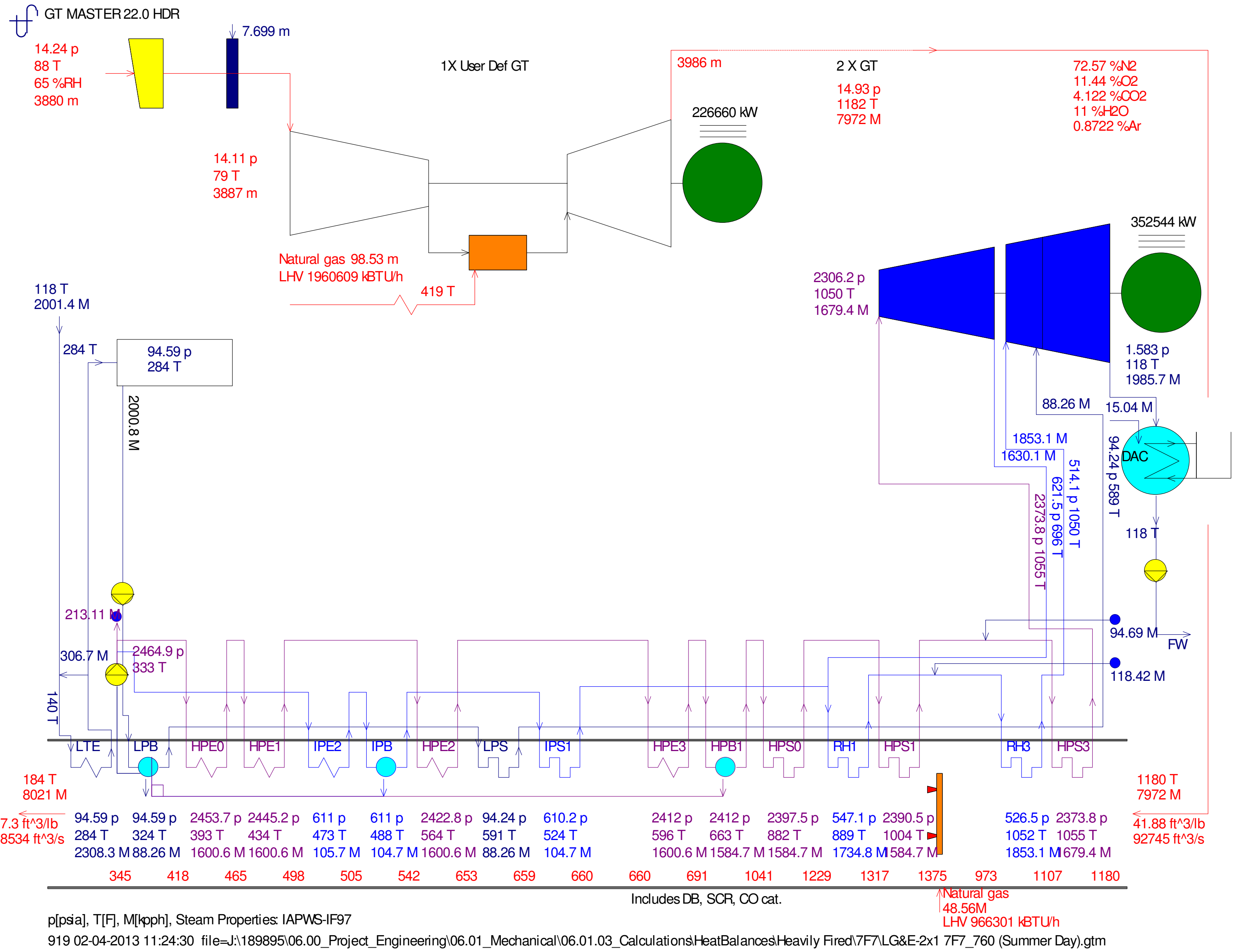
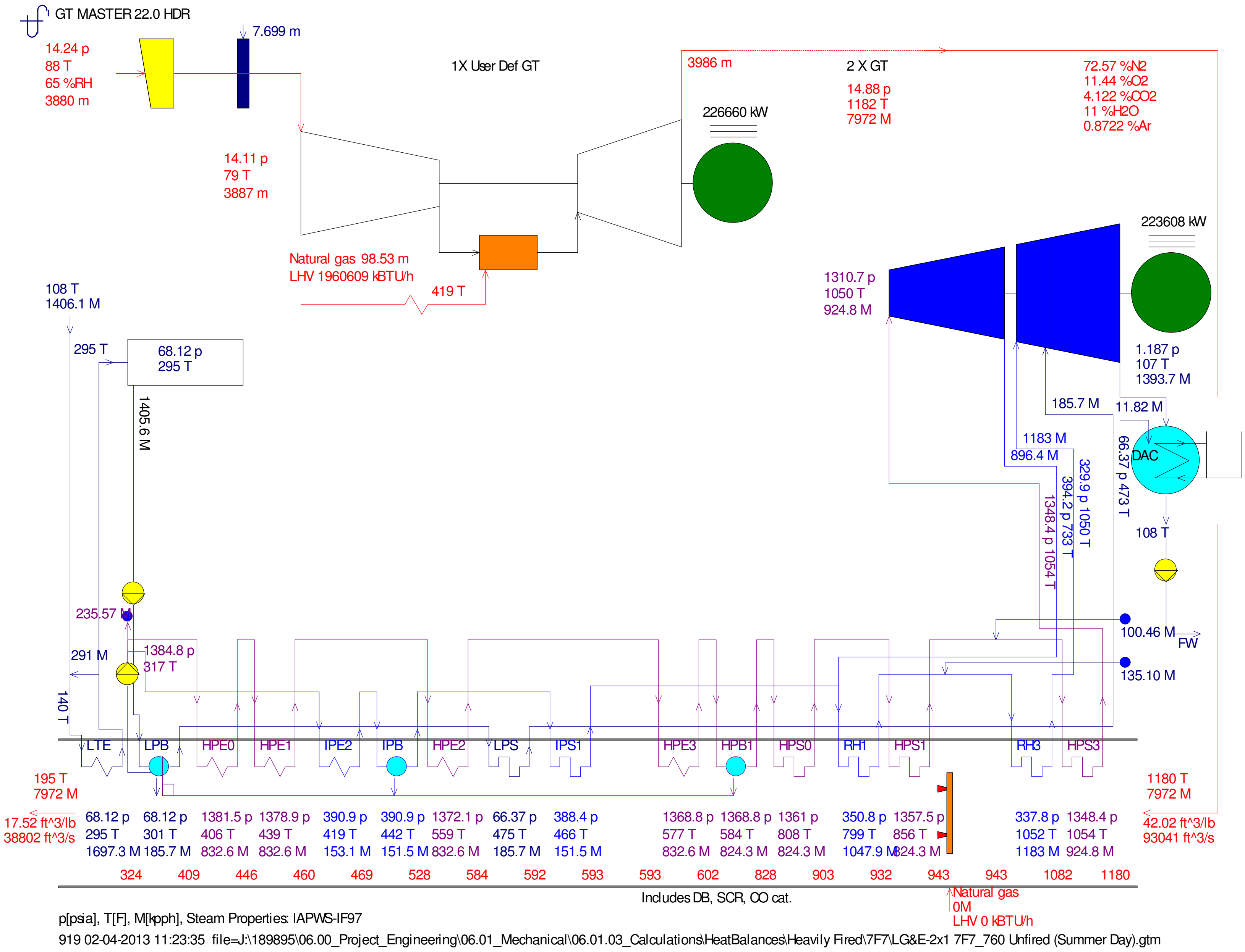
2 x 1 F(5)ee Winter Day, 700 MW Design - Fired



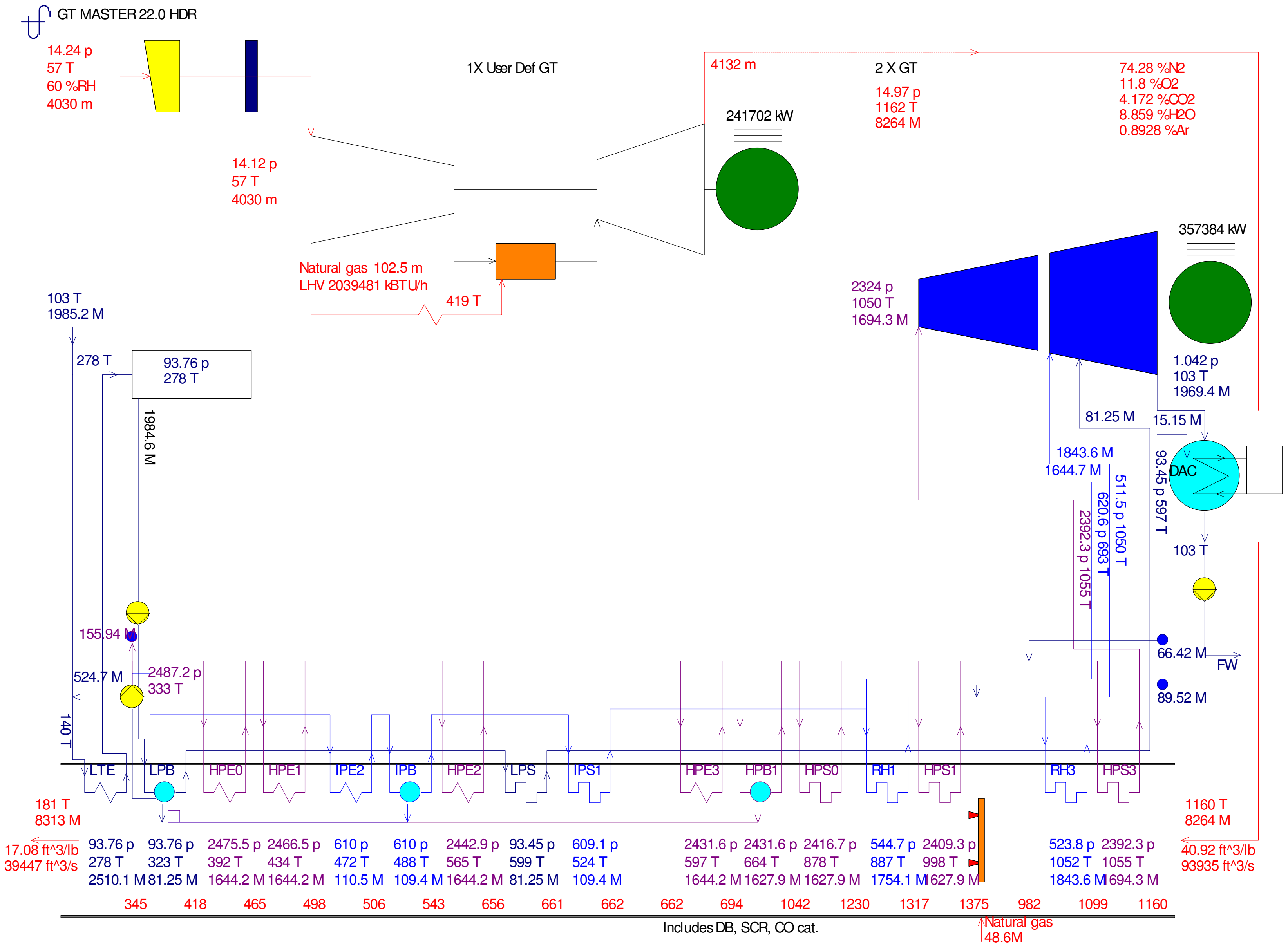
2 x 1 F(5)ee Winter Day, 700 MW Design - Unfired



2 x 1 7F7 Summer Day, 760 MW Design - Fired



2 x 1 7F7 Summer Day, 760 MW Design - Unfired



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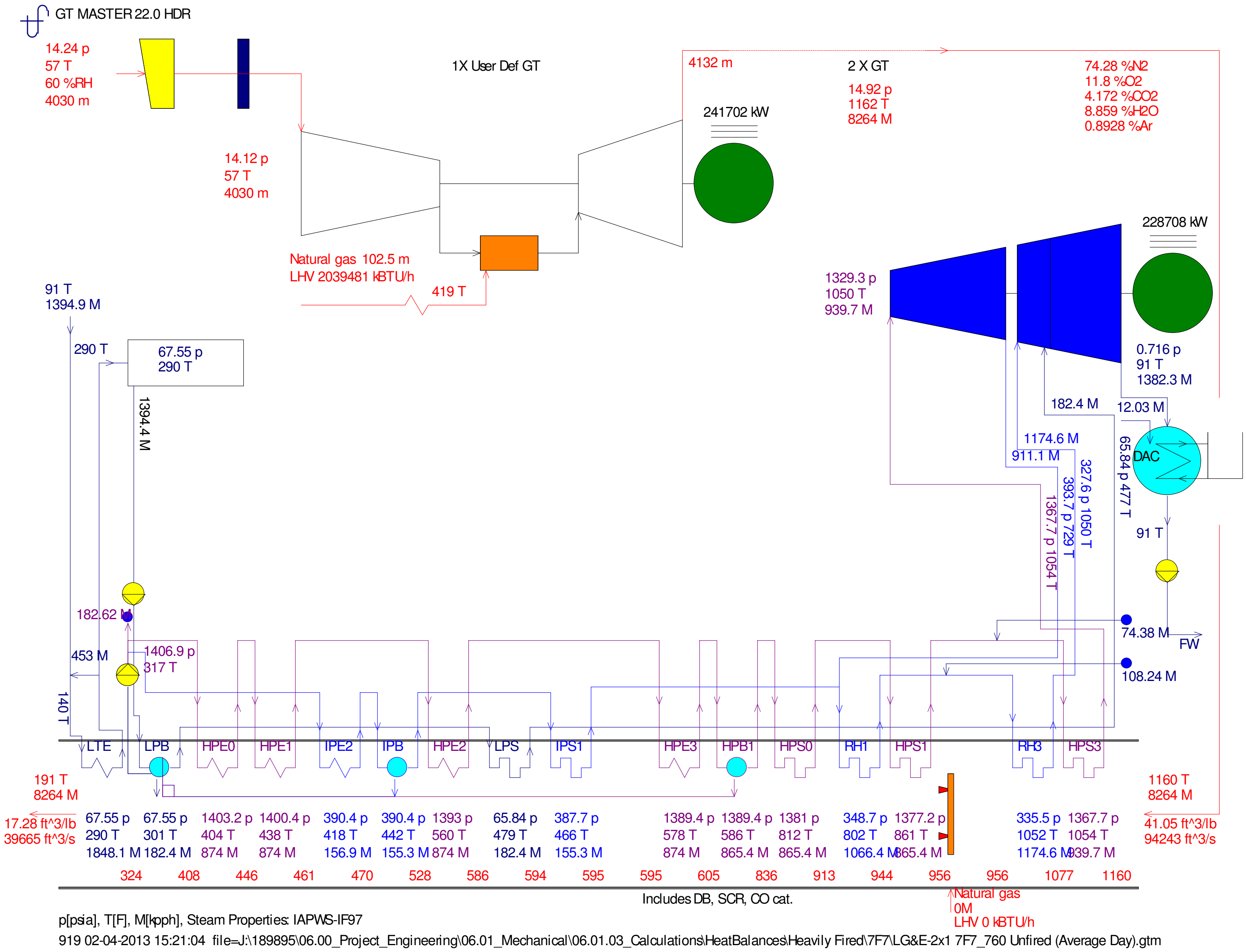
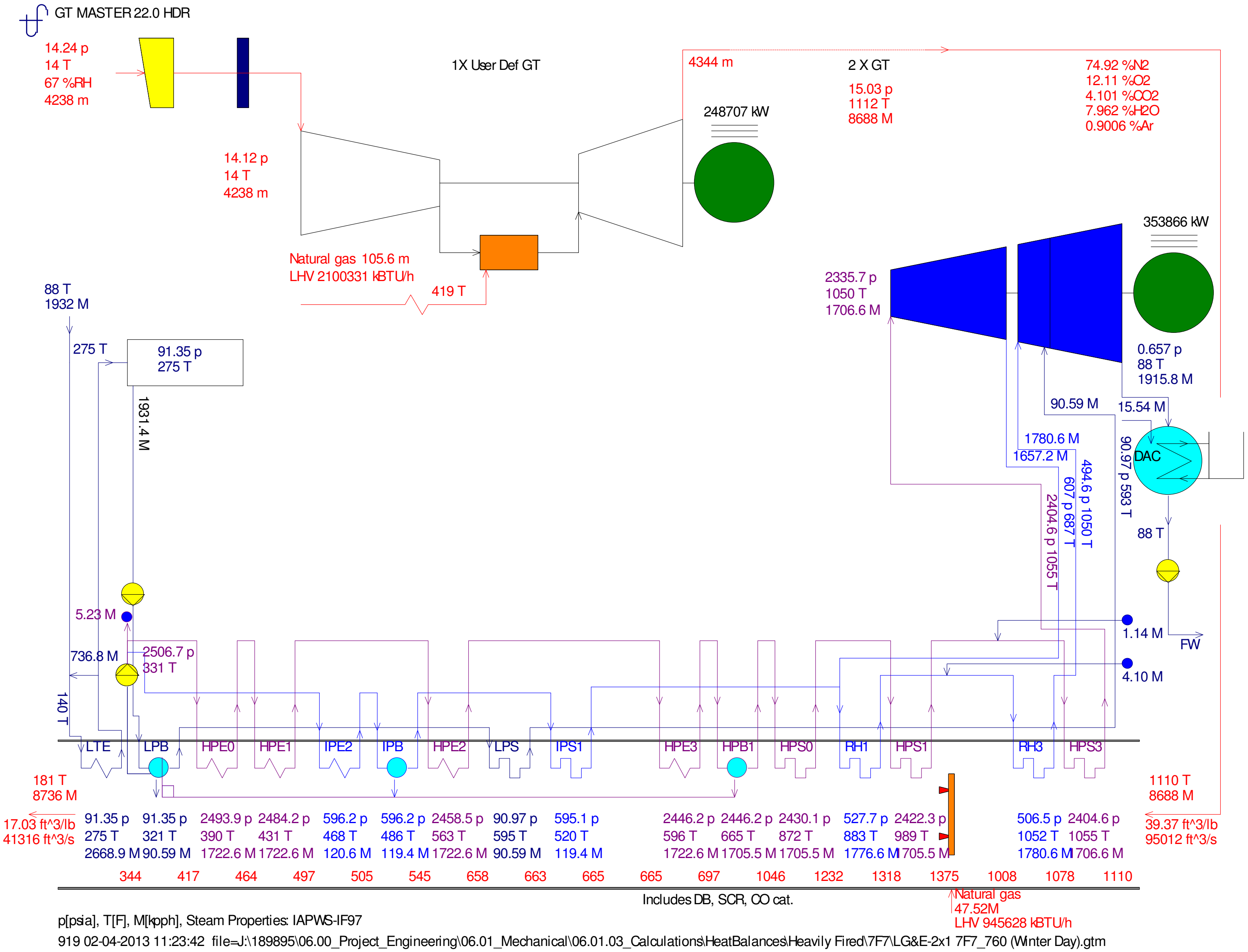
2 x 1 7F7 Average Day, 760 MW Design - Fired



2 x 1 7F7 Average Day, 760 MW Design - Unfired



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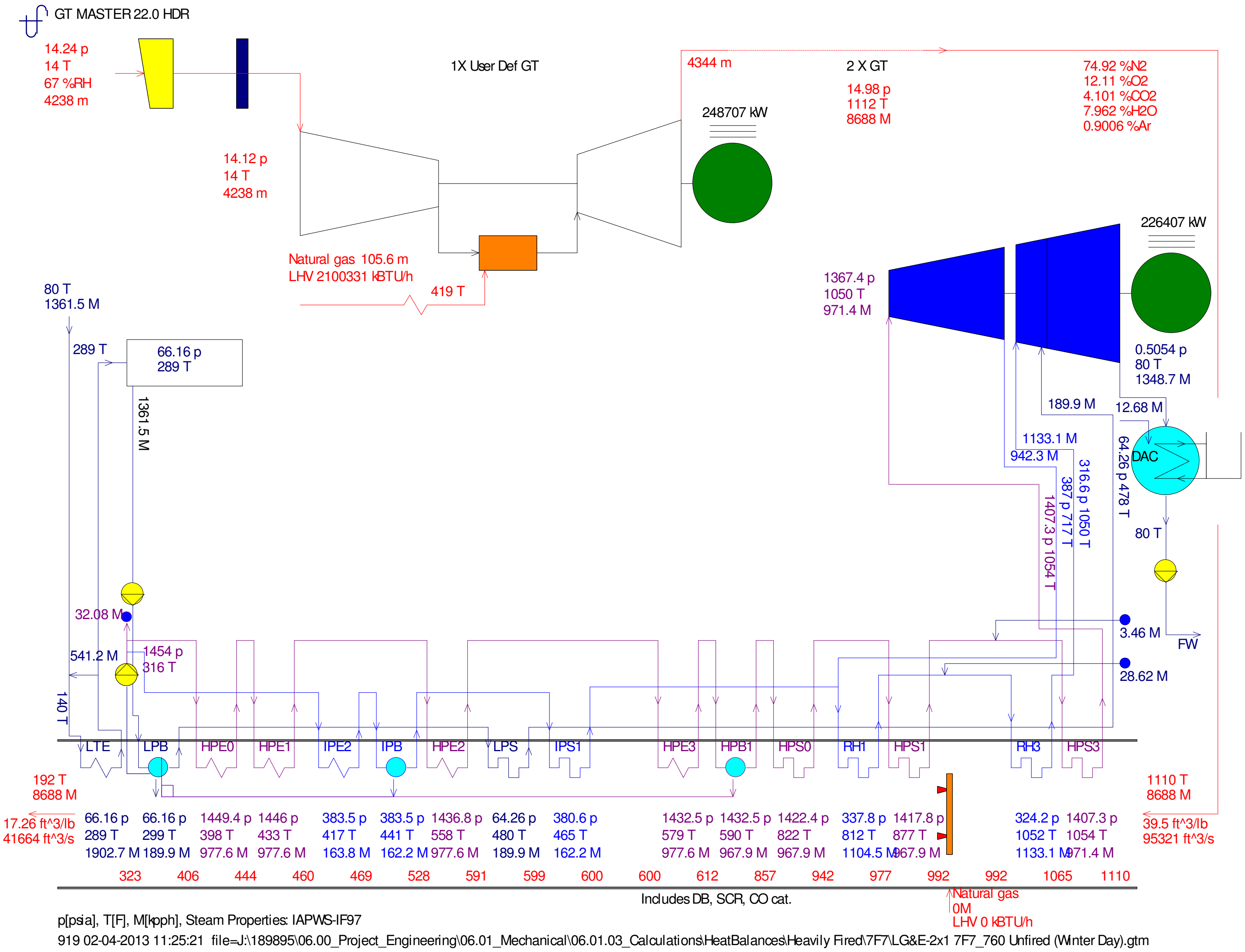
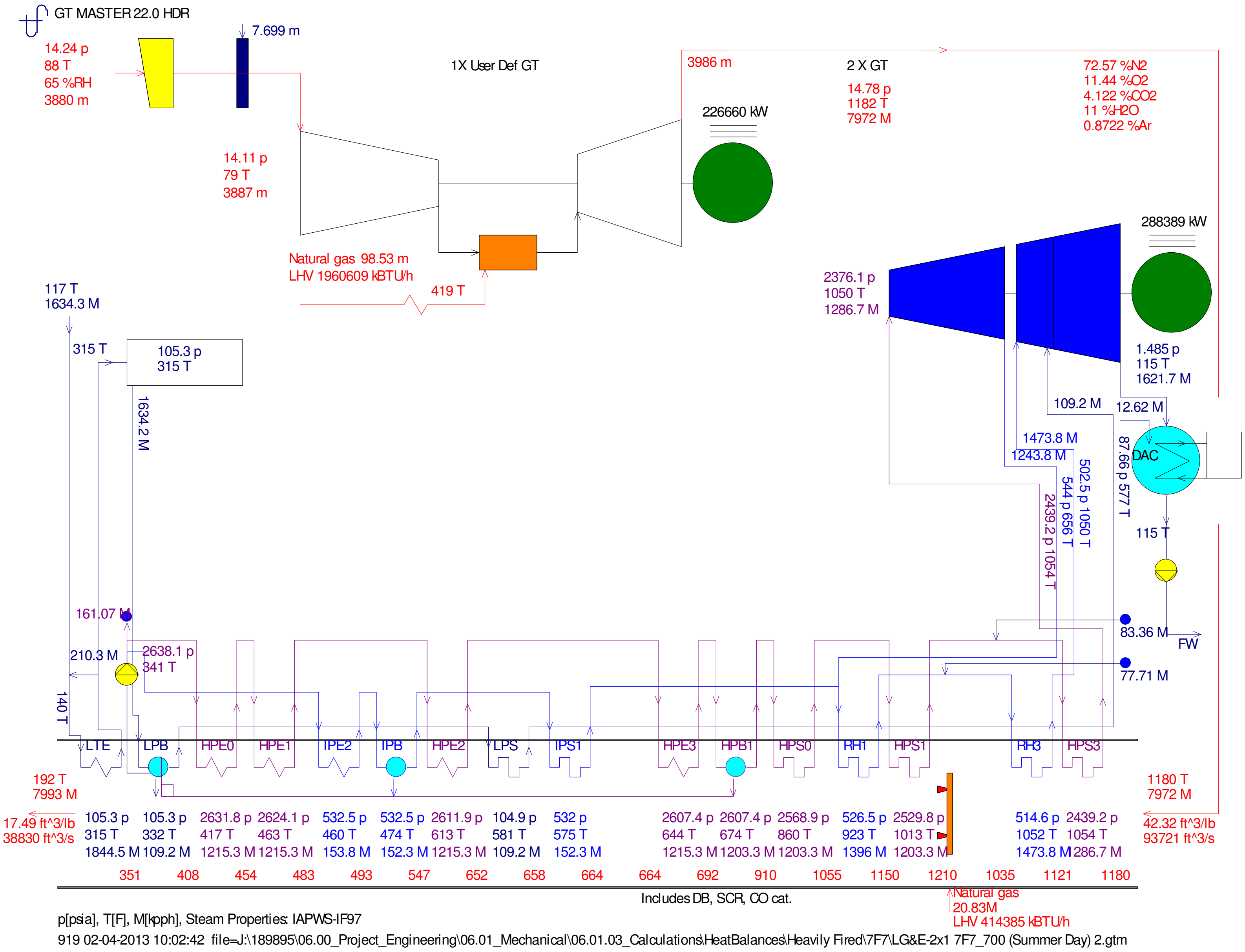


2 x 1 7F7 Winter Day, 760 MW Design - Unfired



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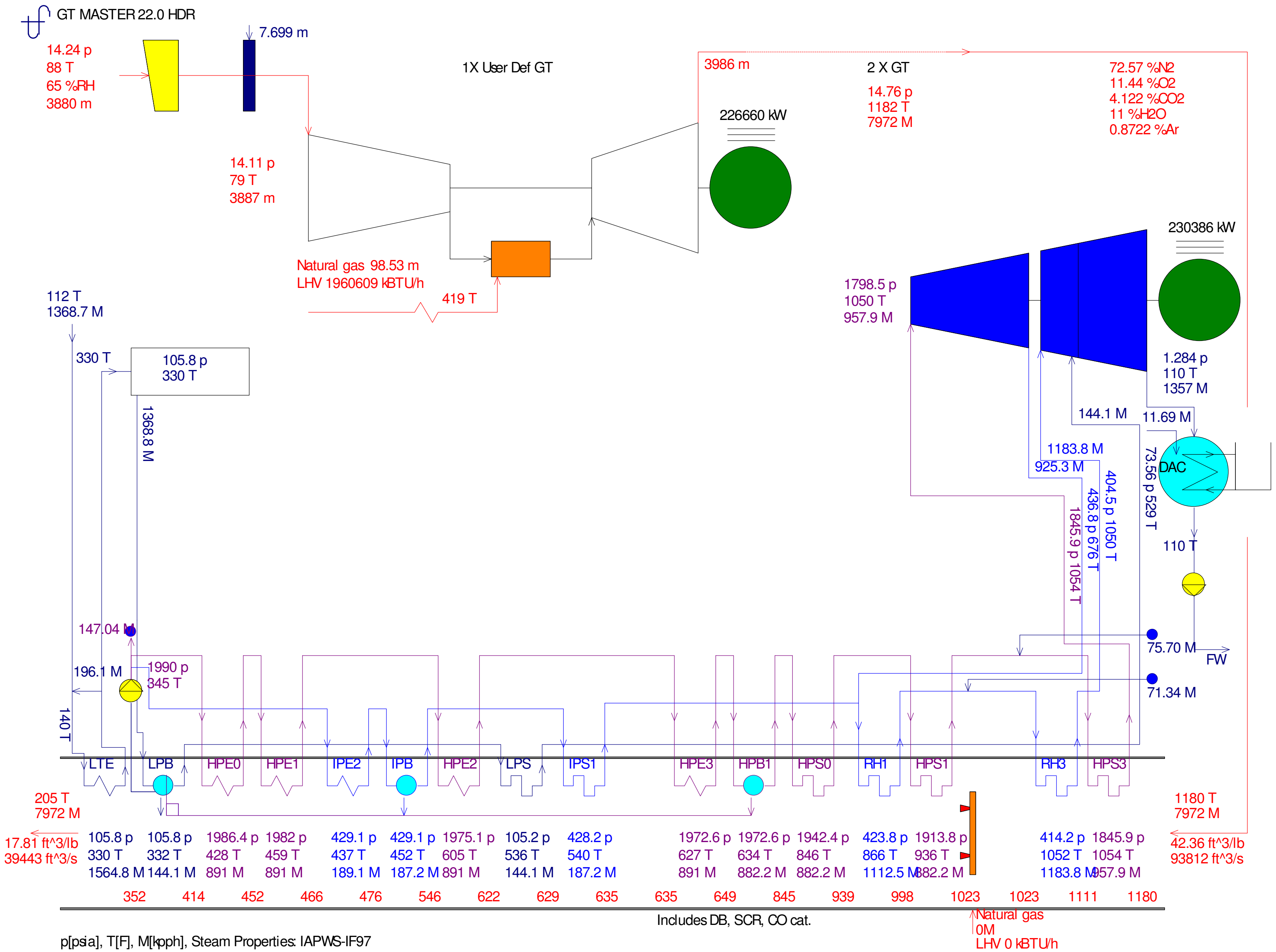

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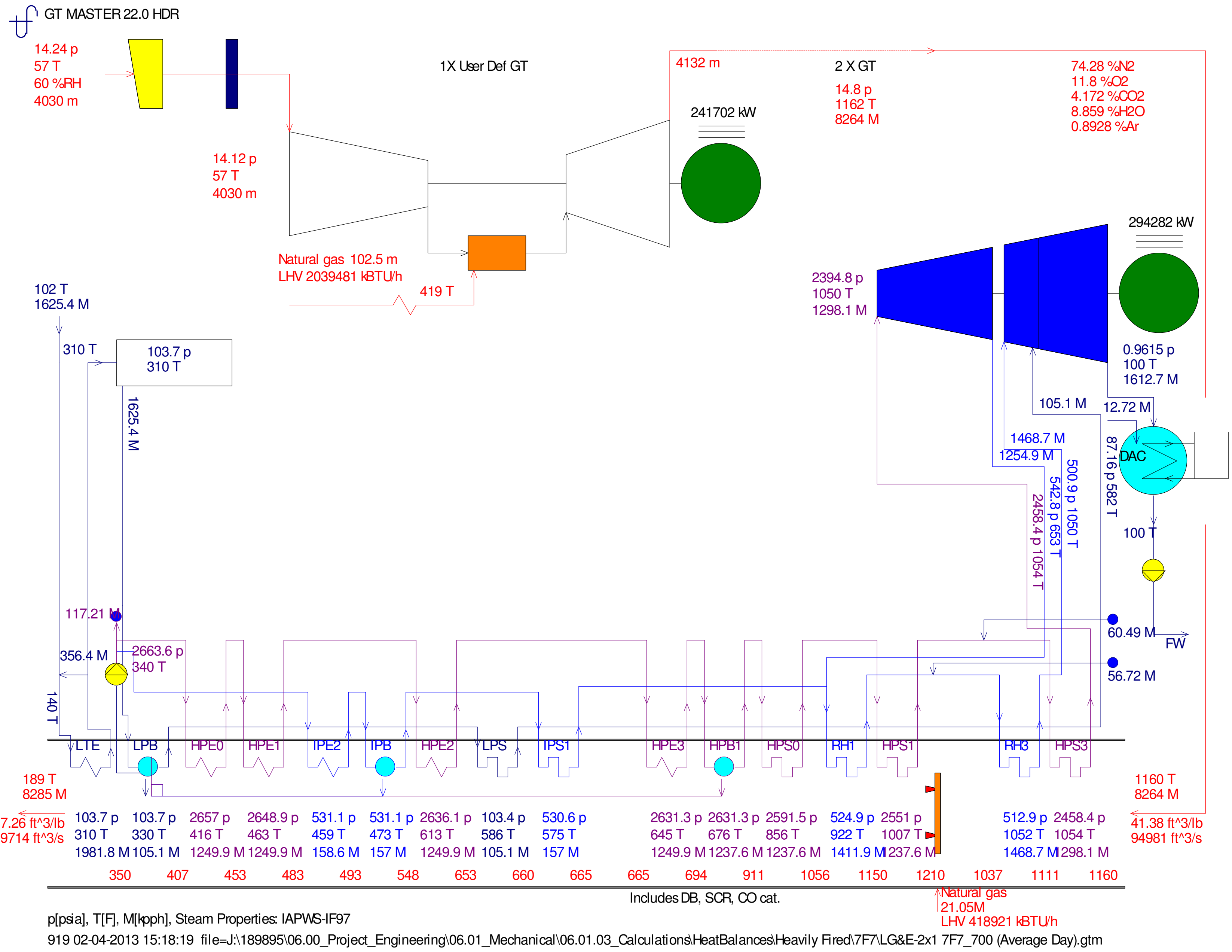

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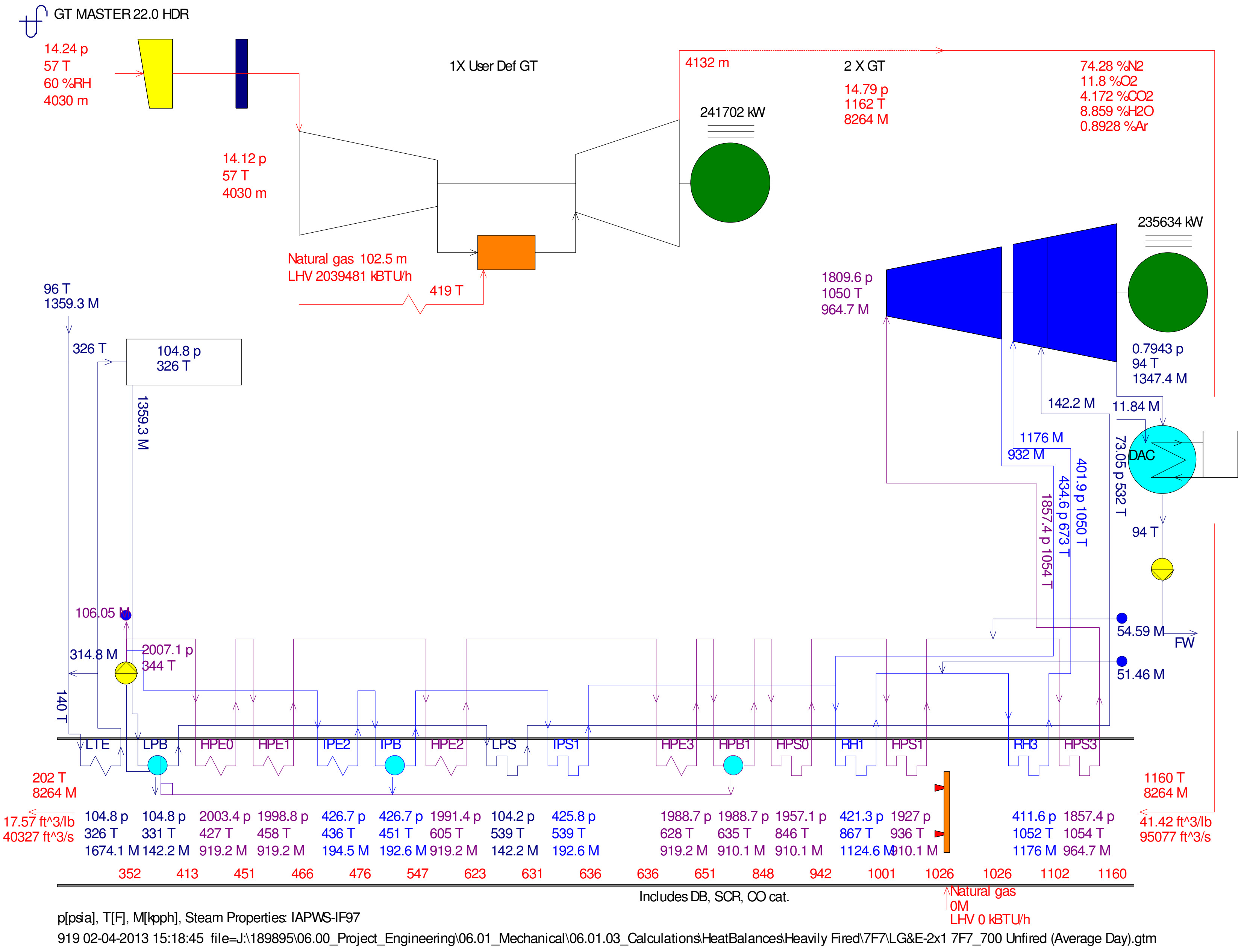

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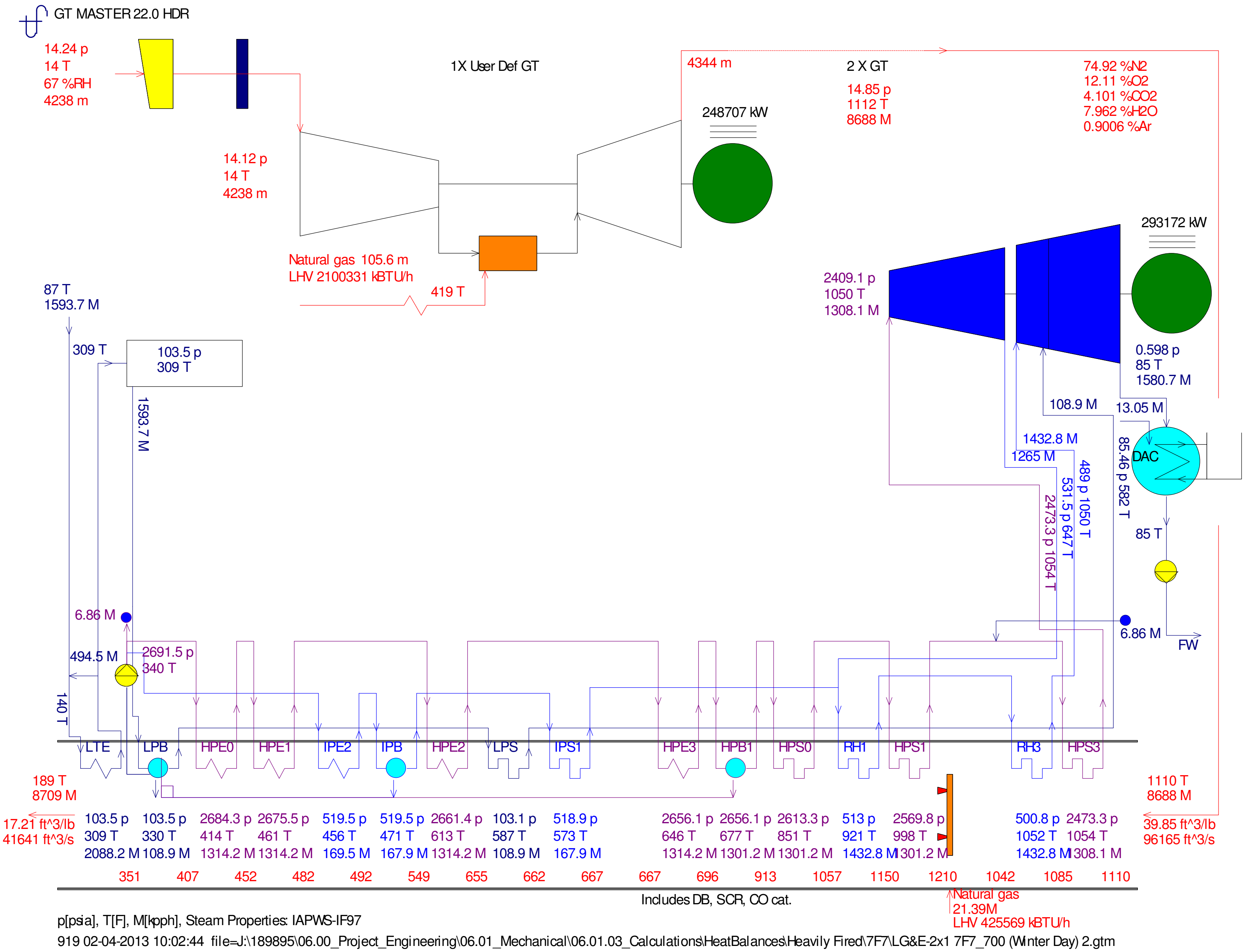

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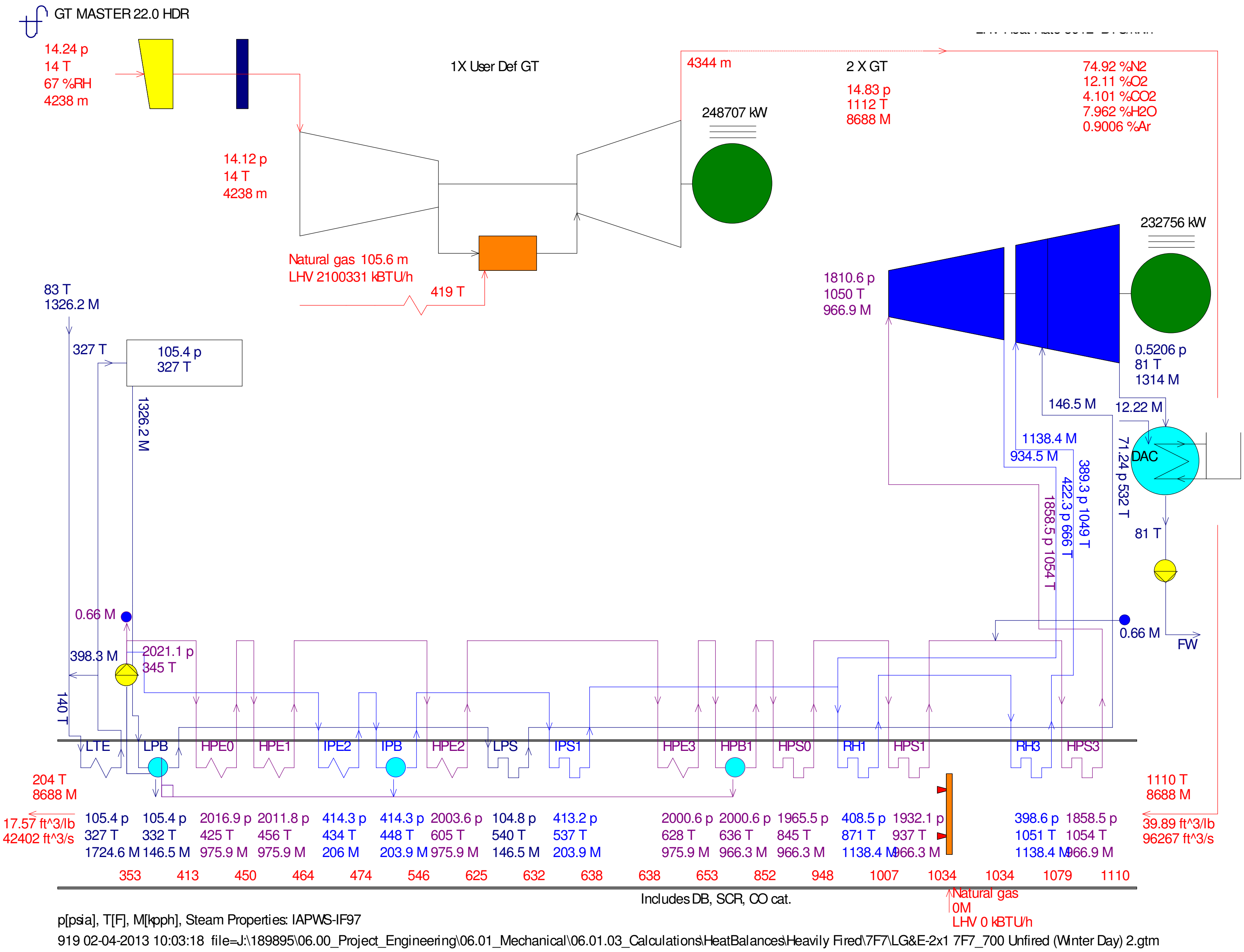

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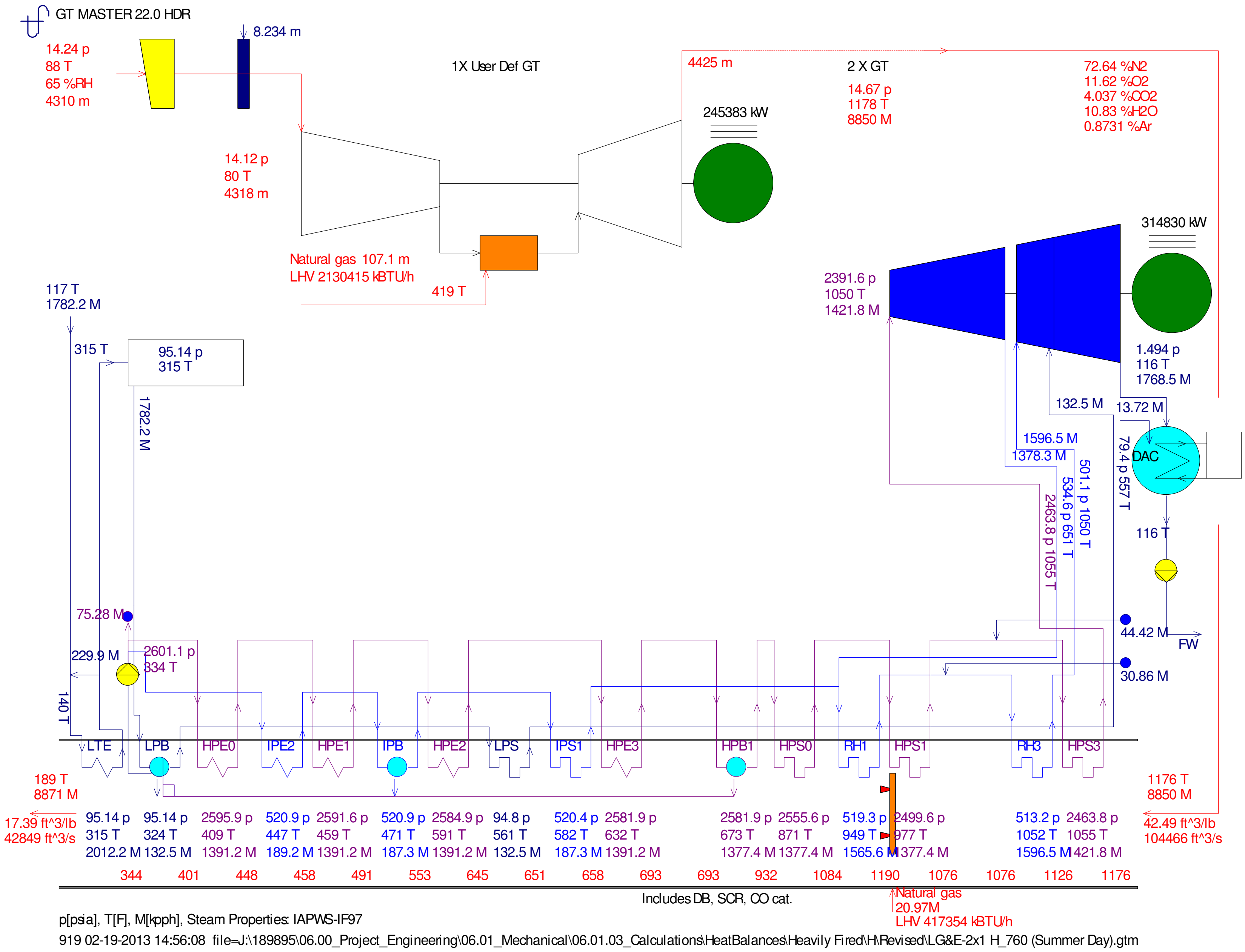

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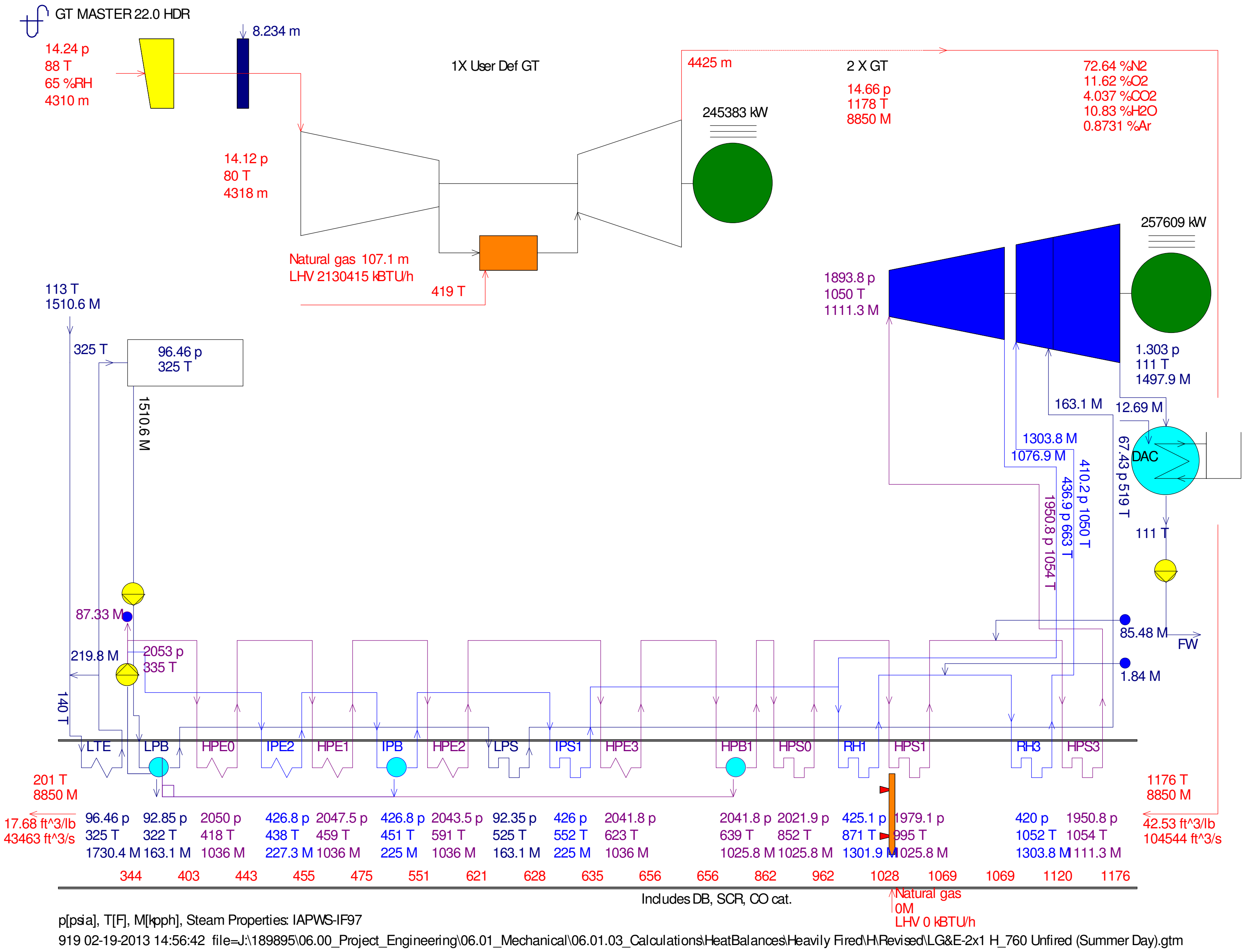

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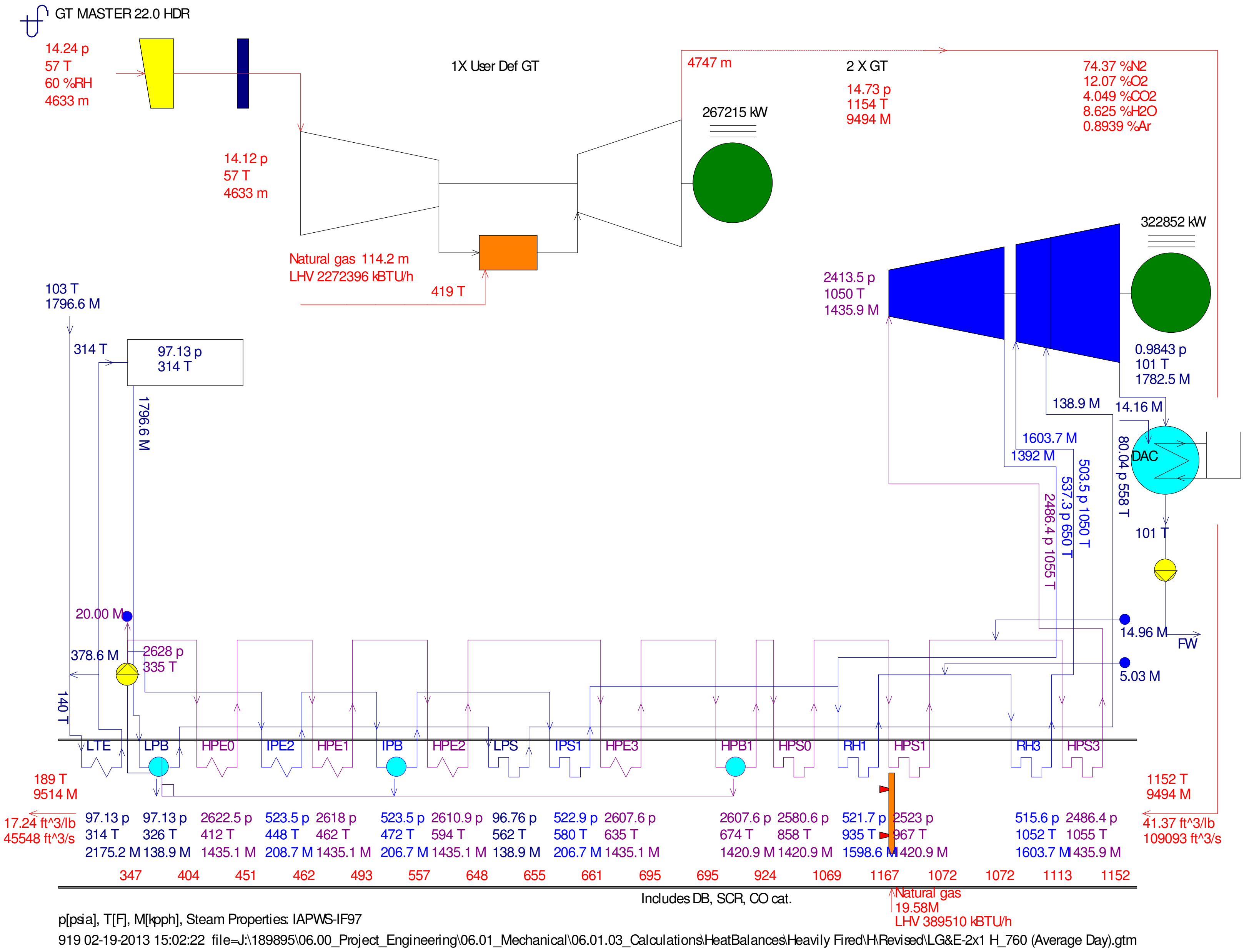

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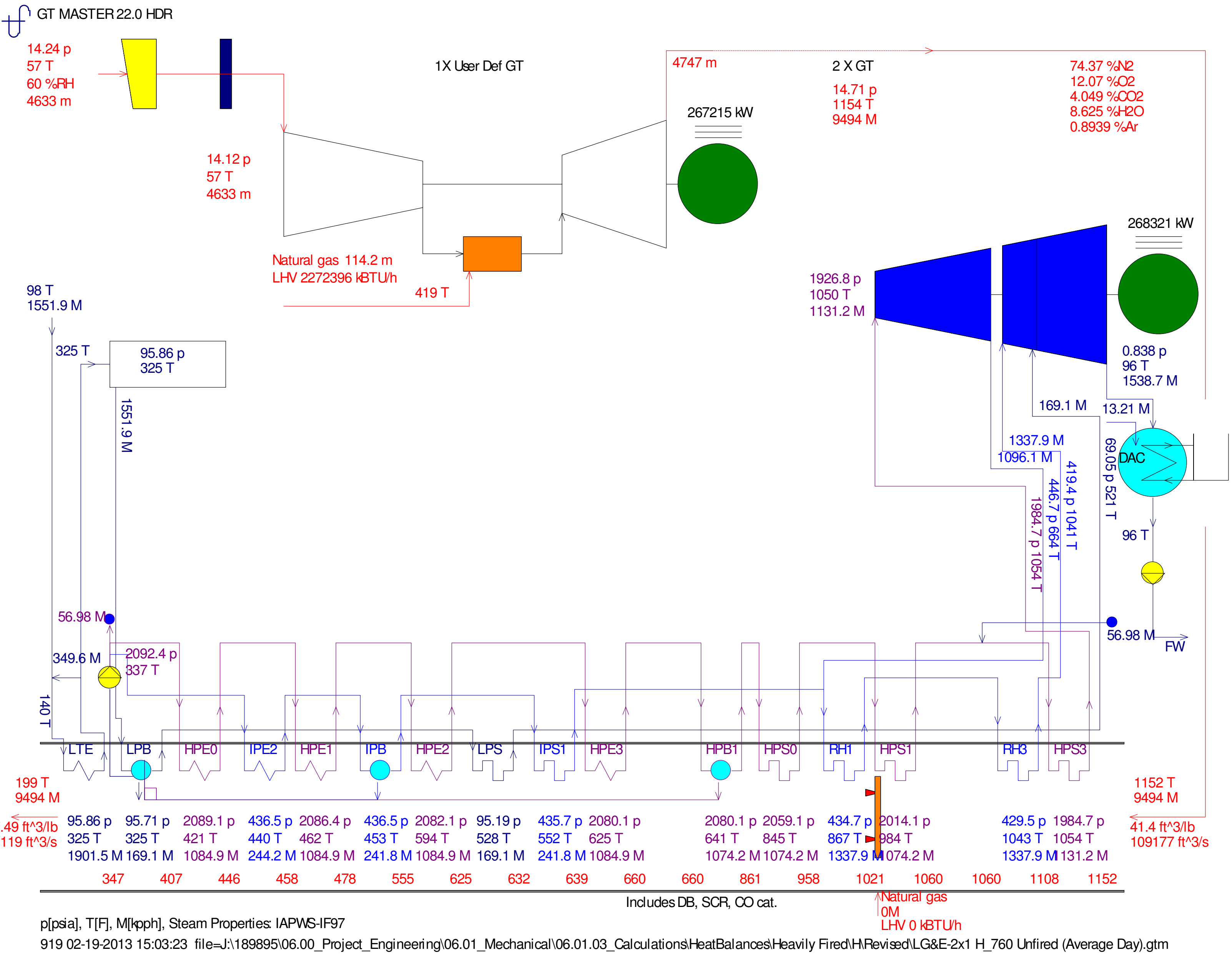

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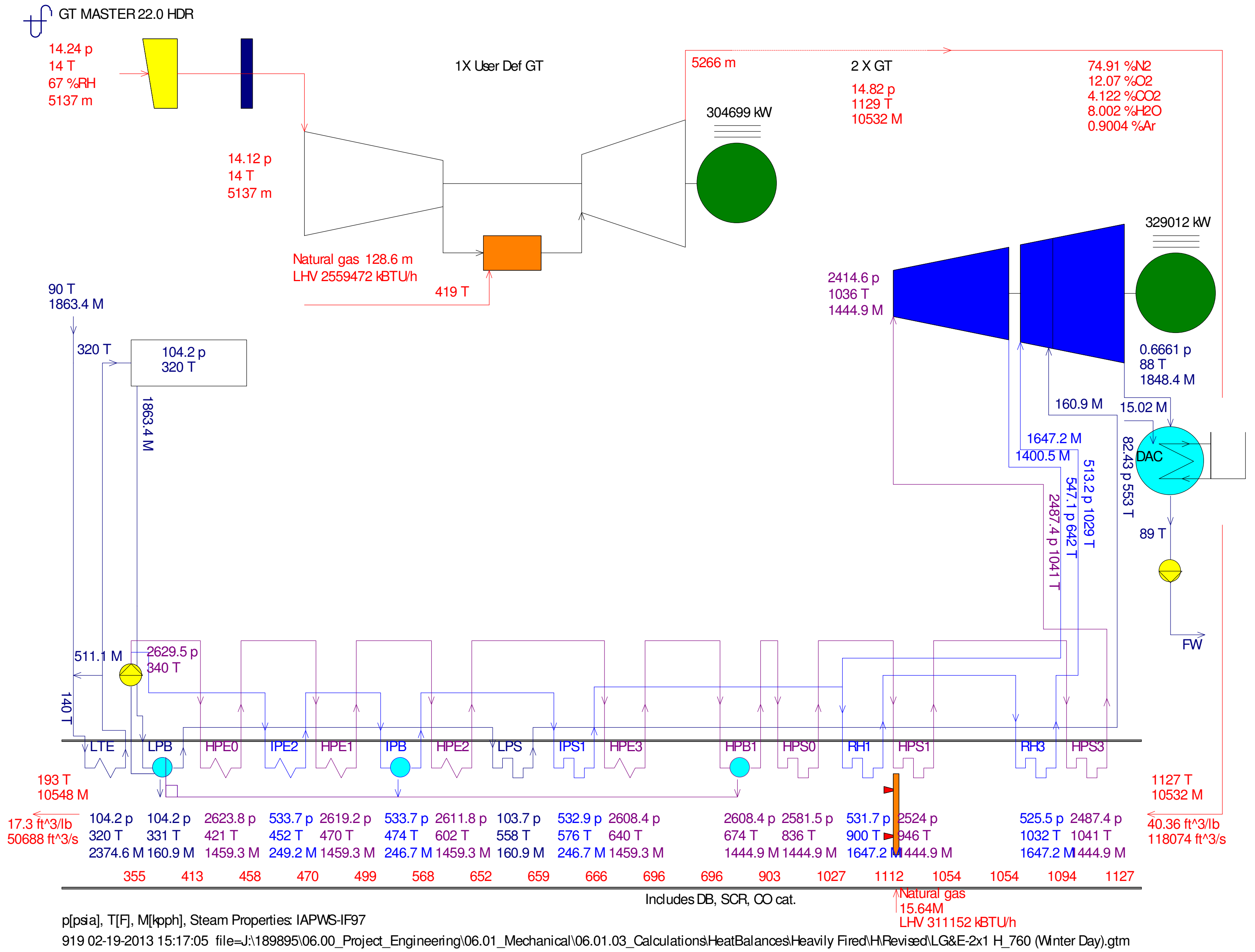

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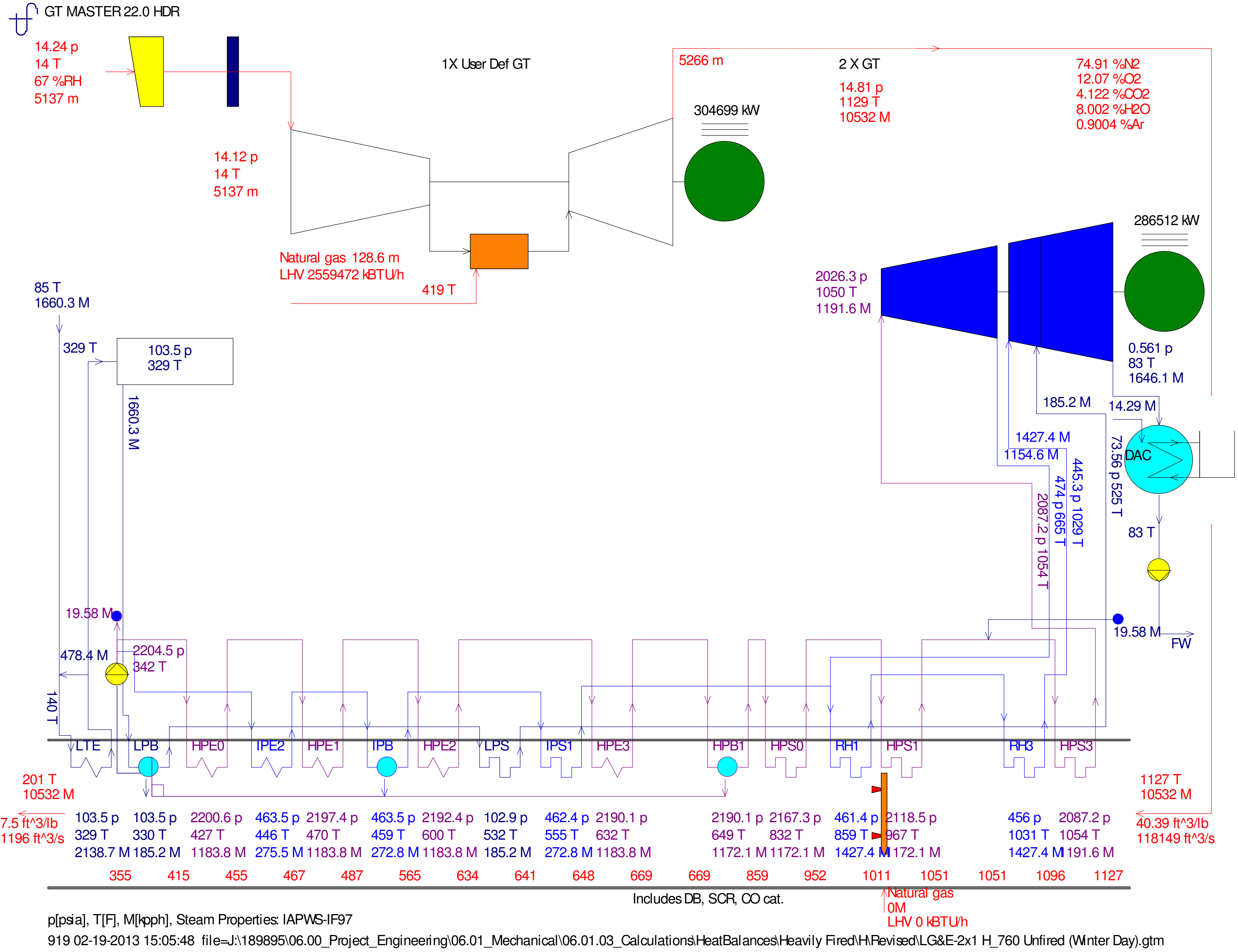

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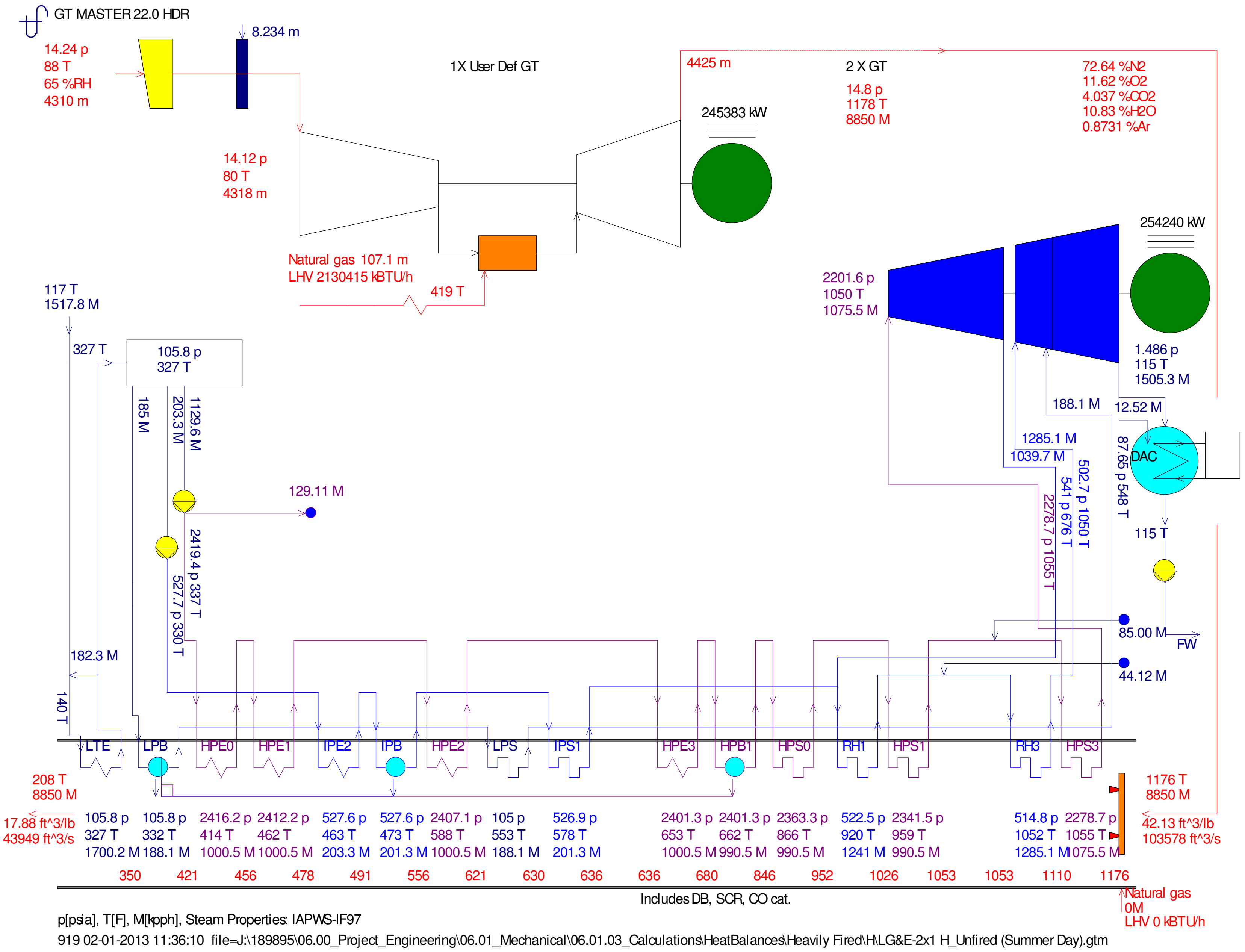

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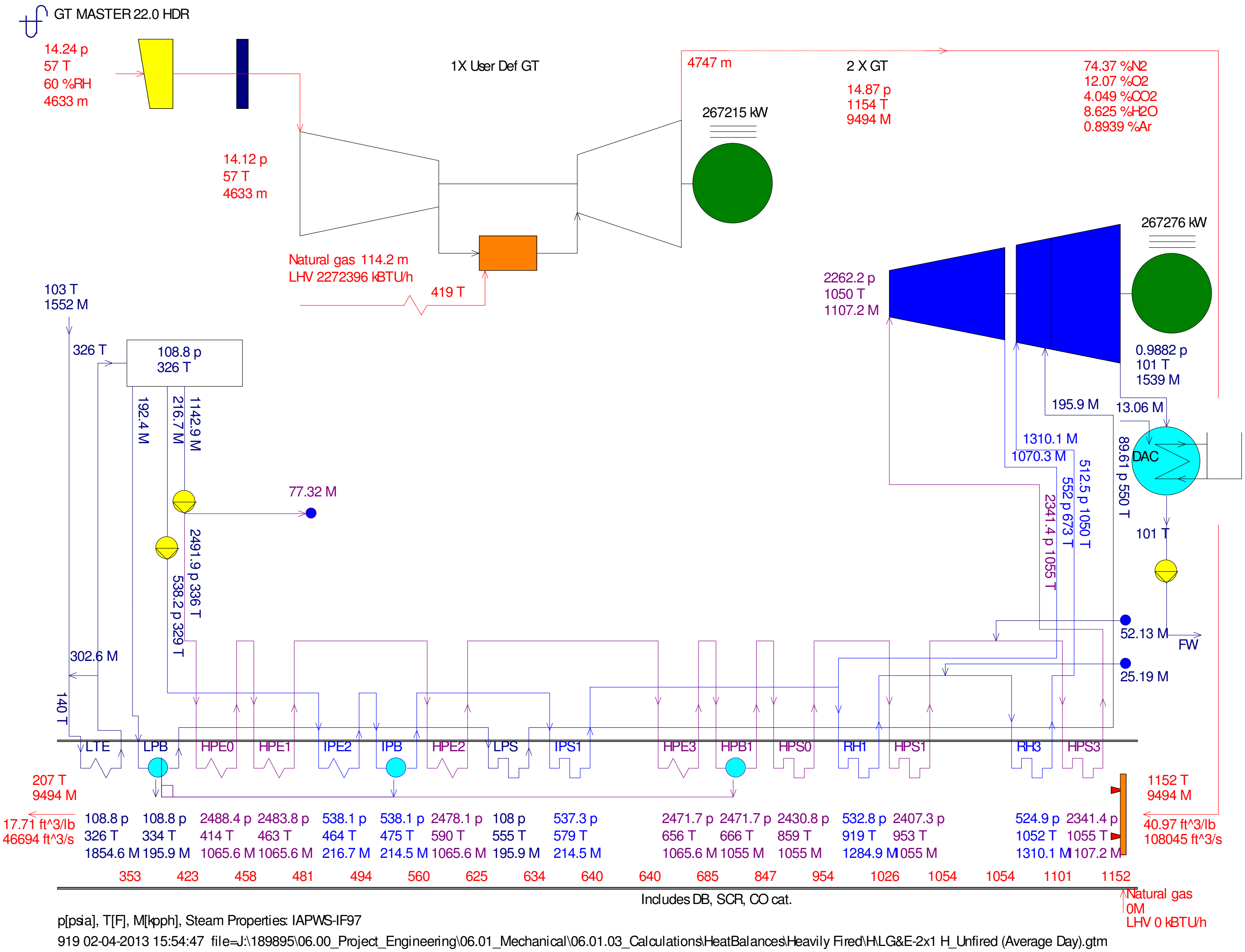

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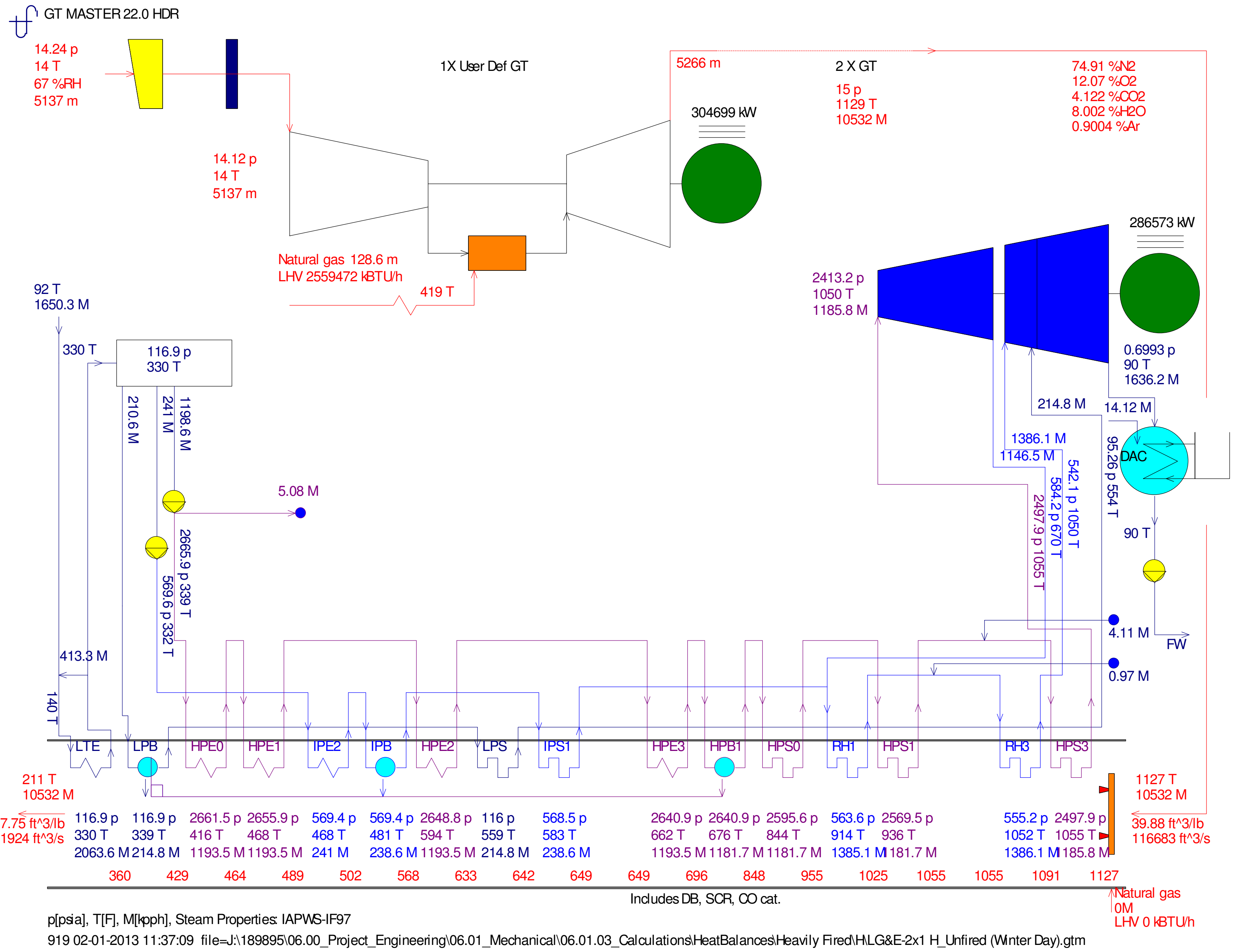
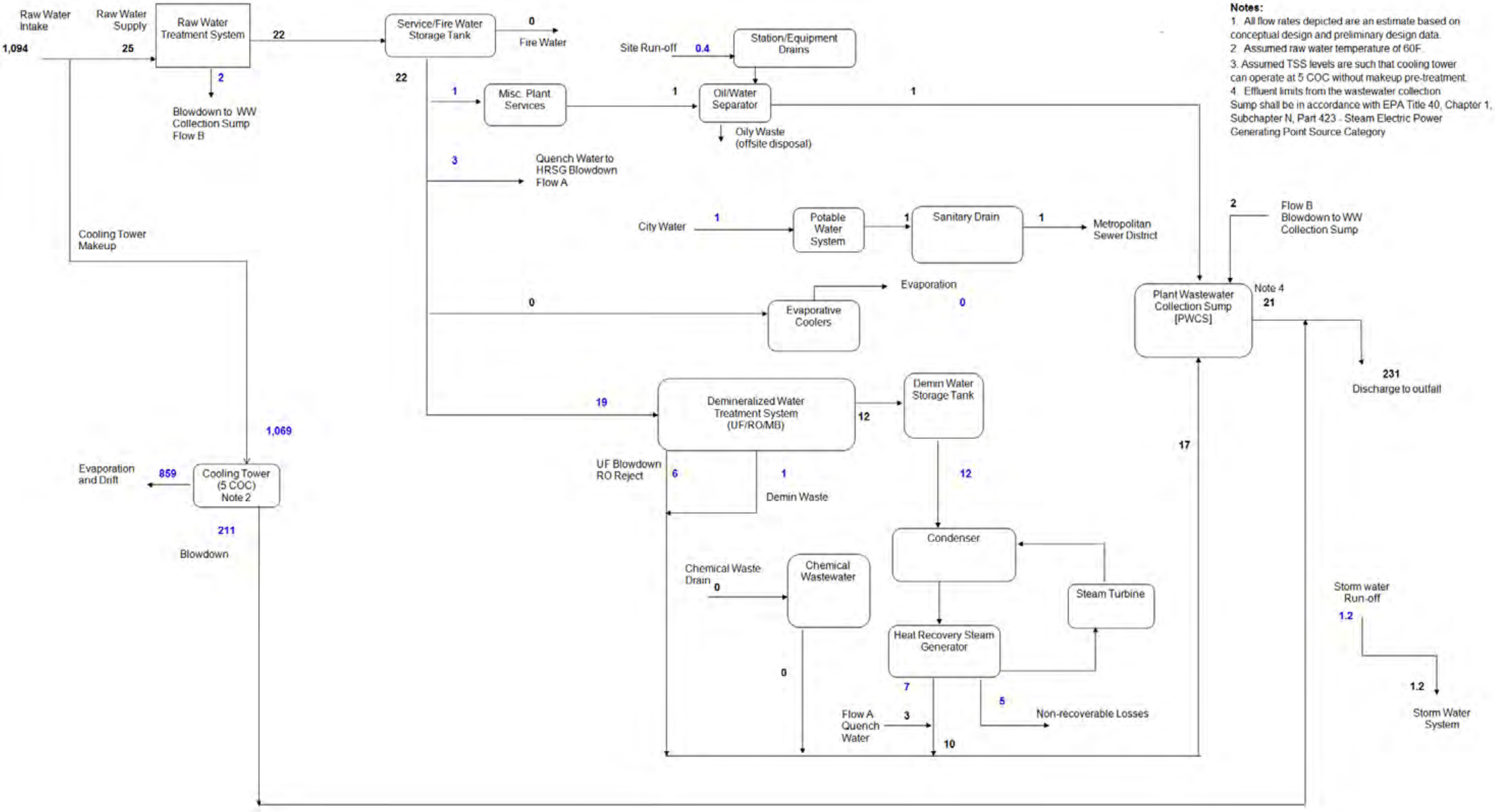


2 x 1 H Winter Day, 700 MW Design - Unfired

APPENDIX C

WATER BALANCES

- 1x1 GE 7F5 Average Day Water Mass Balance
- 1x1 Siemens F(5)ee Average Day Water Mass Balance
- 1x1 MHI G Class Average Day Water Mass Balance
- 1x1 Siemens H Class Average Day Water Mass Balance
- 2x1 GE 7F5 Average Day Water Mass Balance
- 2x1 Siemens F(5)ee Average Day Water Mass Balance
- 2x1 GE 7F7 700 MW Average Day Water Mass Balance
- 2x1 GE 7F7 760 MW Average Day Water Mass Balance
- 2x1 Siemens F(5)ee 700 MW Average Day Water Mass Balance
- 2x1 Siemens F(5) ee 760 MW Average Day Water Mass Balance
- 2x1 Siemens H Class 700 MW Average Day Water Mass Balance
- 2x1 Siemens H Class 760 MW Average Day Water Mass Balance



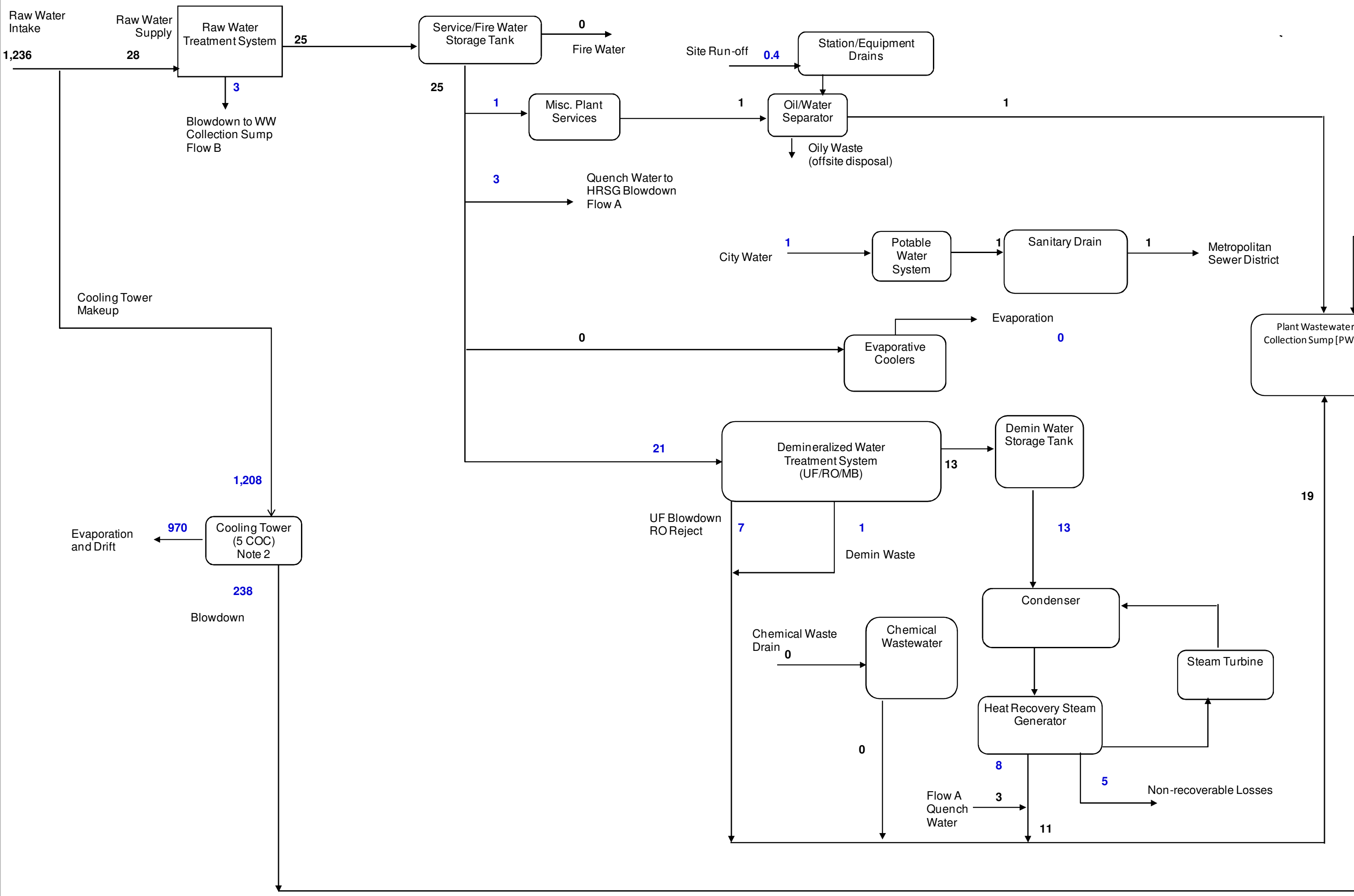
Notes:

1. All flow rates depicted are an estimate based on conceptual design and preliminary design data.
2. Assumed raw water temperature of 60F.
3. Assumed TSS levels are such that cooling tower can operate at 5 COC without makeup pre-treatment.
4. Effluent limits from the wastewater collection Sump shall be in accordance with EPA Title 40, Chapter 1, Subchapter N, Part 423 - Steam Electric Power Generating Point Source Category

Notes:

1. Flows are in gallons per minute (gpm)
2. Flow rates represent the daily average flow rates and do not represent instantaneous maximum demand

Demin Water Makeup	1% of Main Steam Flow		HDR		**LG&E** New Generation Options Feasibility Study	Project **189895**	Drawing **WMB-1**
Ion-Exchange Vessels	Off-site Regen		Eng: JRP	Dwg: JRP	**AVERAGE DAY CASE - WATER MASS BALANCE** **Traditional Cooling** **1 x 1 7FA**		Rev
			Check:	Date:		**SH 1/1**	**0**



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Demin Water Makeup	**1% of Main Steam Flow**
Ion-Exchange Vessels	**Off-site Regen**

HDR

Eng: JRP
Dwg: JRP
Check:
Date:

LG&E

New Generation Options Feasibility Study

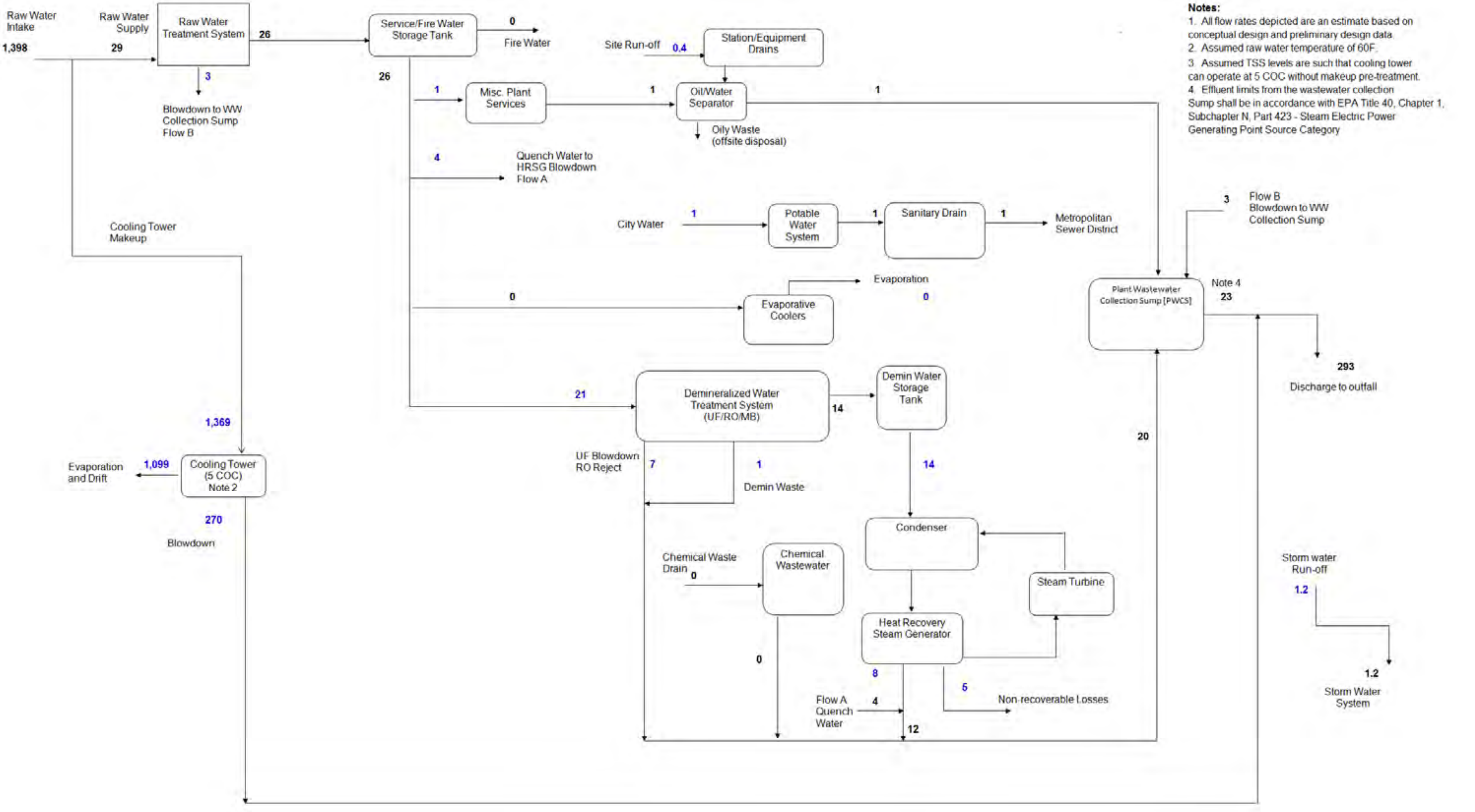
AVERAGE DAY CASE - WATER MASS BALANCE

Traditional Cooling

1 x 1 F(5)EE

Project
189895
SH 1/1

Drawing
WMB-2
Rev
0



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1. All flow rates depicted are an estimate based on conceptual design and preliminary design data.
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Demin Water Makeup	**1% of Main Steam Flow**
Ion-Exchange Vessels	**Off-site Regen**

HDR

Eng: JRP
Dwg: JRP
Check:
Date:

LG&E

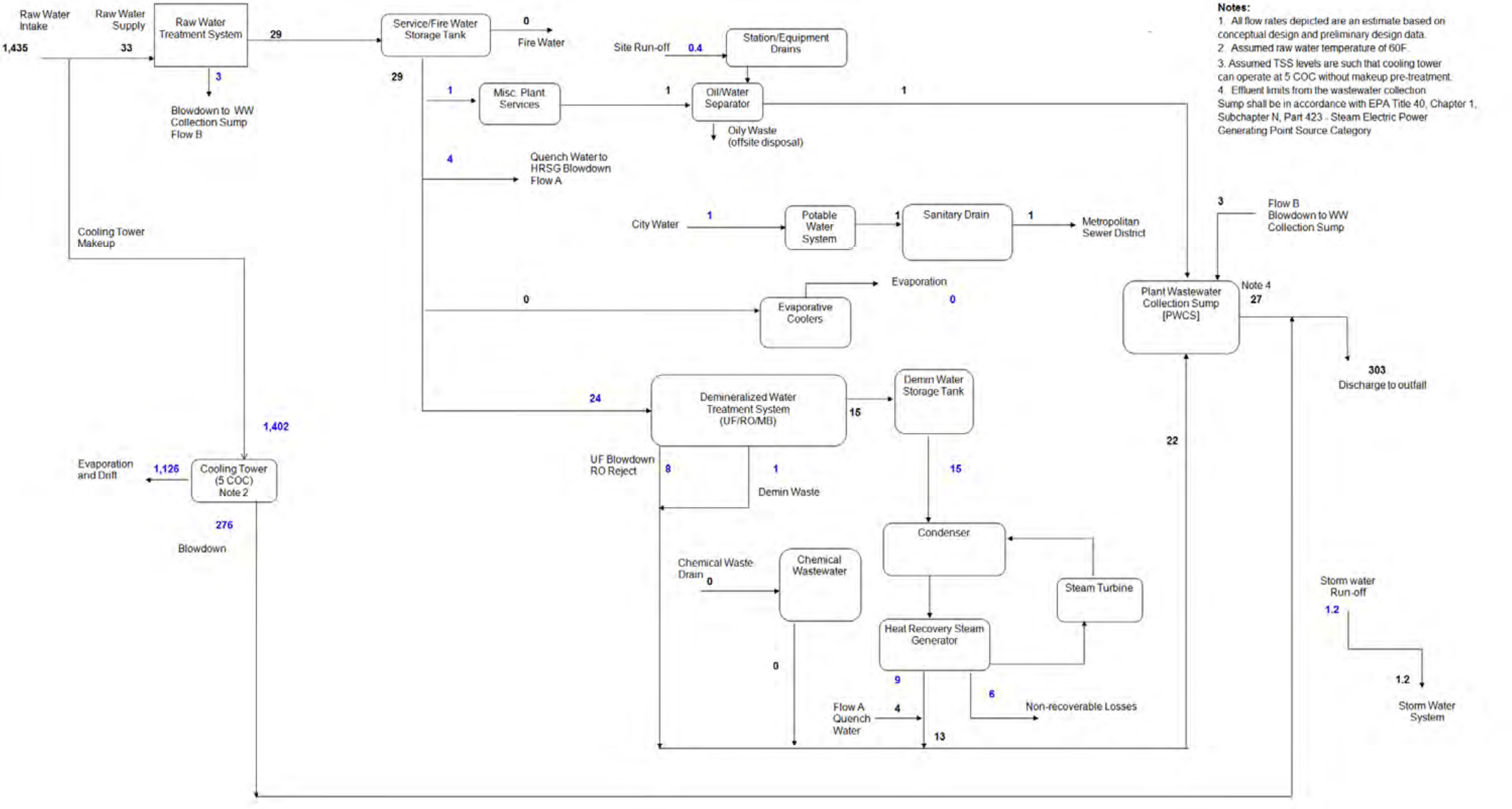
New Generation Options Feasibility Study

AVERAGE DAY CASE - WATER MASS BALANCE

Traditional Cooling

1 x 1 501GAC

Project	Drawing
189895	**WMB-3**
	Rev
SH 1/1	**0**



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Notes:

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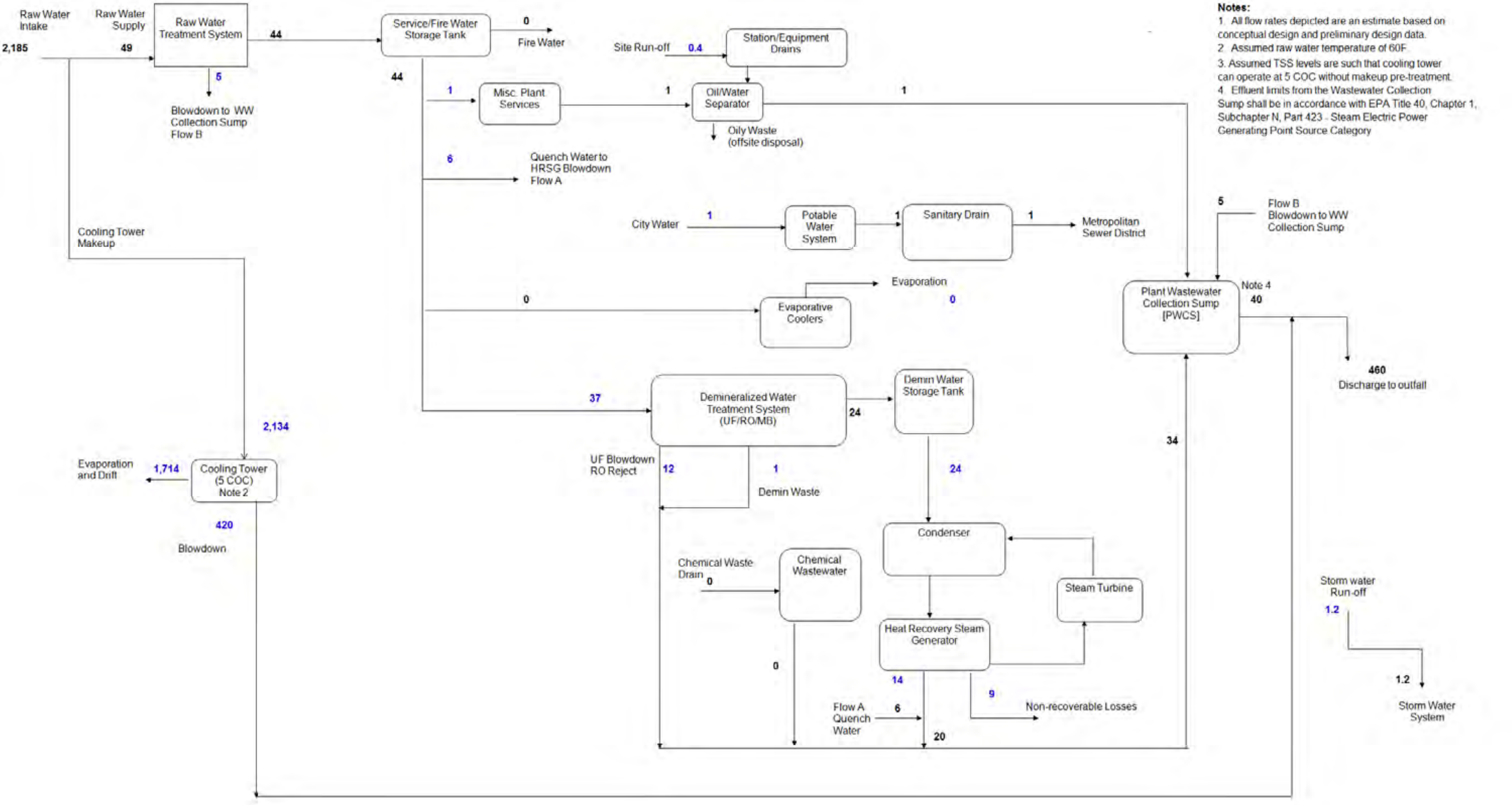
Demin Water Makeup	1% of Main Steam Flow
Ion-Exchange Vessels	Off-site Regen

HDR

Eng: JRP
Dwg: JRP
Check:
Date:

LG&E
New Generation Options Feasibility Study
AVERAGE DAY CASE - WATER MASS BALANCE
Traditional Cooling
1x1 8000H

Project	Drawing
189895	WMB-4
	Rev
SH 1/1	0



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Demin Water Makeup	1% of Main Steam Flow
Ion-Exchange Vessels	Off-site Regen

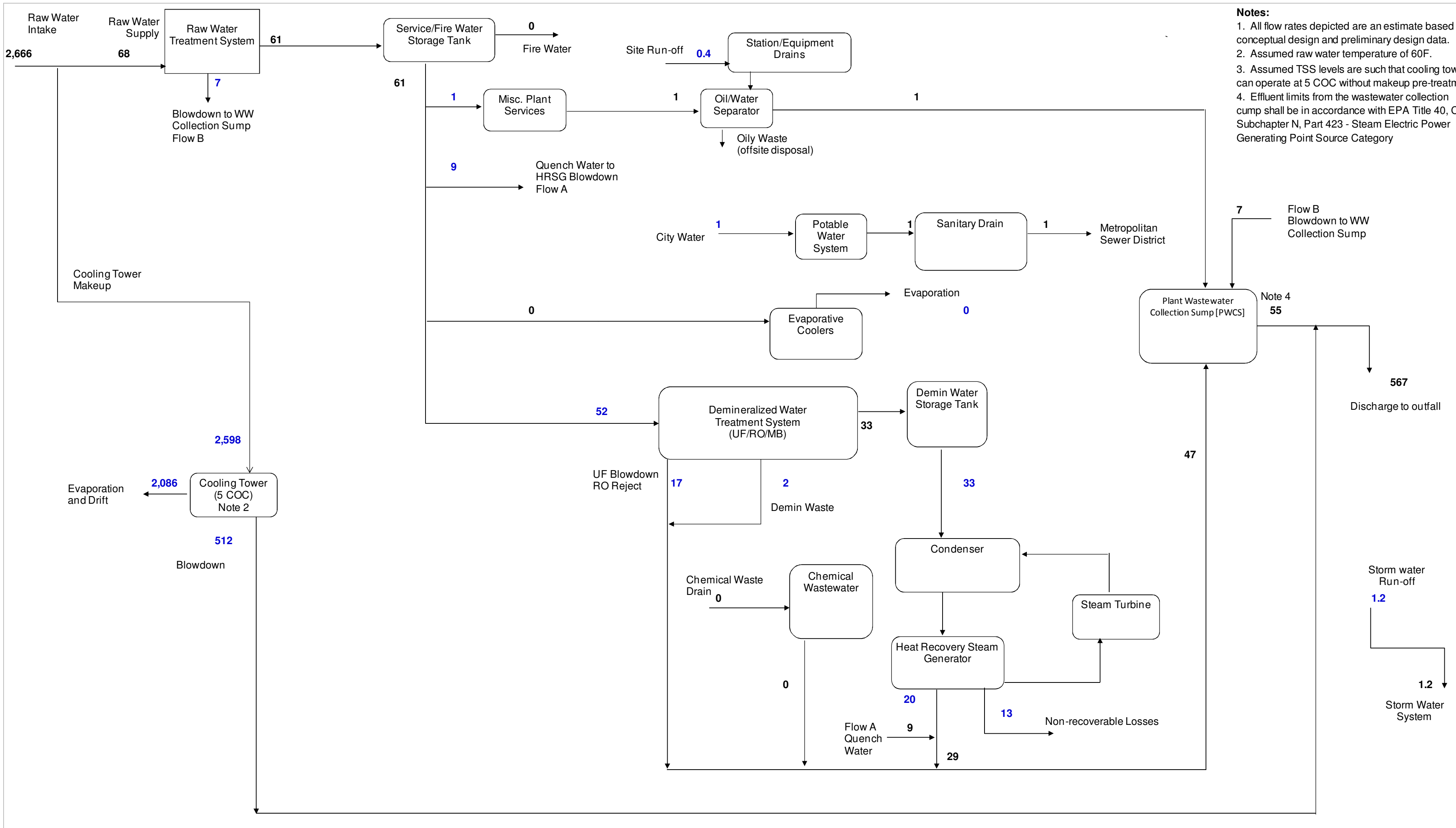
HDR

Eng: JRP
Dwg: JRP
Check:
Date:

LG&E
New Generation Options Feasibility Study
AVERAGE DAY CASE - WATER MASS BALANCE
Traditional Cooling
2 x 1 7FA

Project
189895
SH 1/1

Drawing
WMB-5
Rev
0



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Demin Water Makeup	**1% of Main Steam Flow**	
Ion-Exchange Vessels	**Off-site Regen**	

HDR

Eng: JRP
Dwg: JRP
Check:
Date:

LG&E
2017 NGCC Feasibility Study
AVERAGE DAY CASE - WATER MASS BALANCE
Traditional Cooling
2 x 1 F(5) ee 700 MW Design

Project	Drawing
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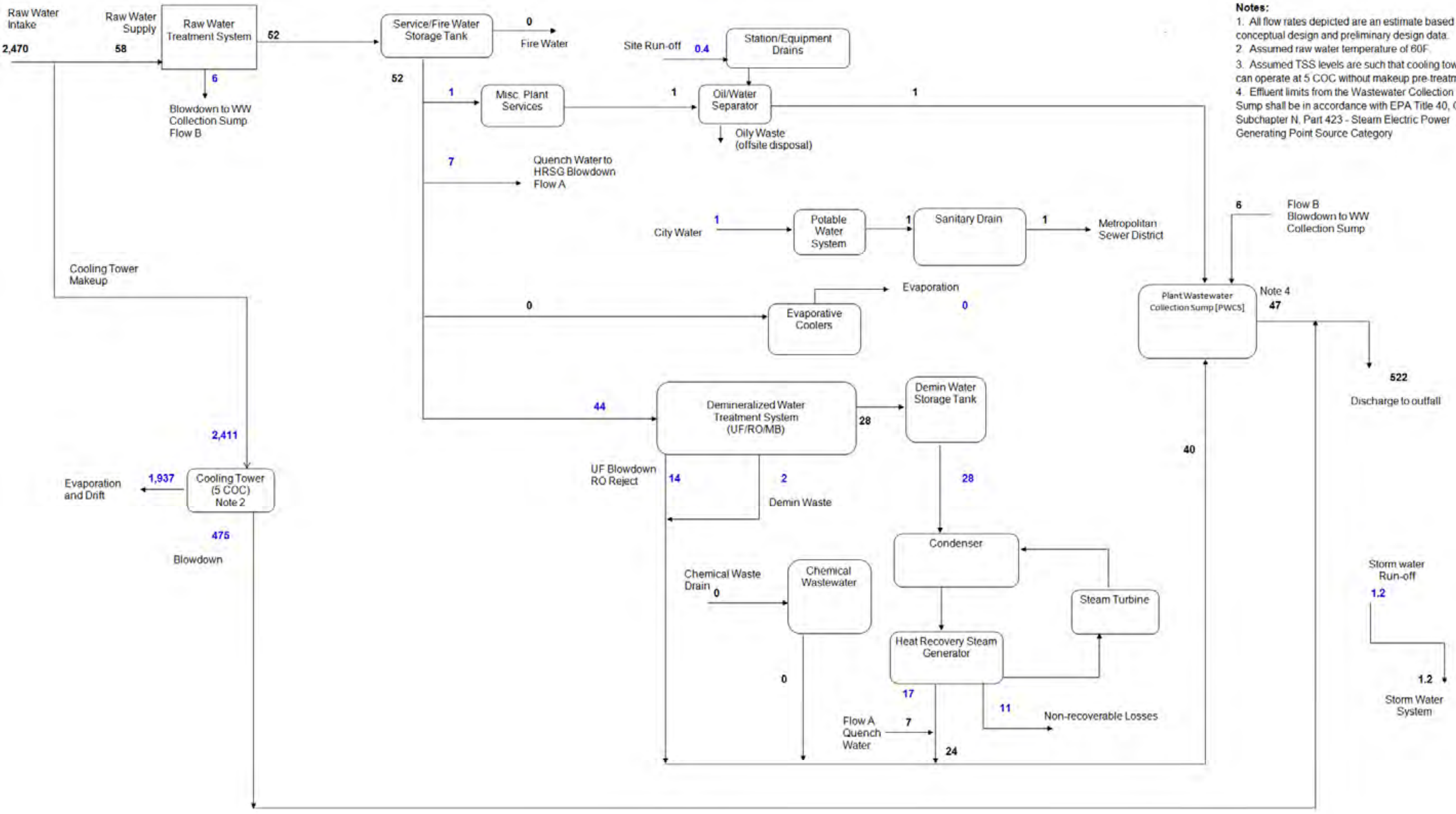
SH 1/1	**0**



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Demin Water Makeup	1% of Main Steam Flow	
Ion-Exchange Vessels	Off-site Regen	

HDR

Eng: JRP
Dwg: JRP
Check:
Date:

LG&E
New Generation Options Feasibility Study
AVERAGE DAY CASE - WATER MASS BALANCE
Traditional Cooling
2x1 F(5)EE

Project	Drawing
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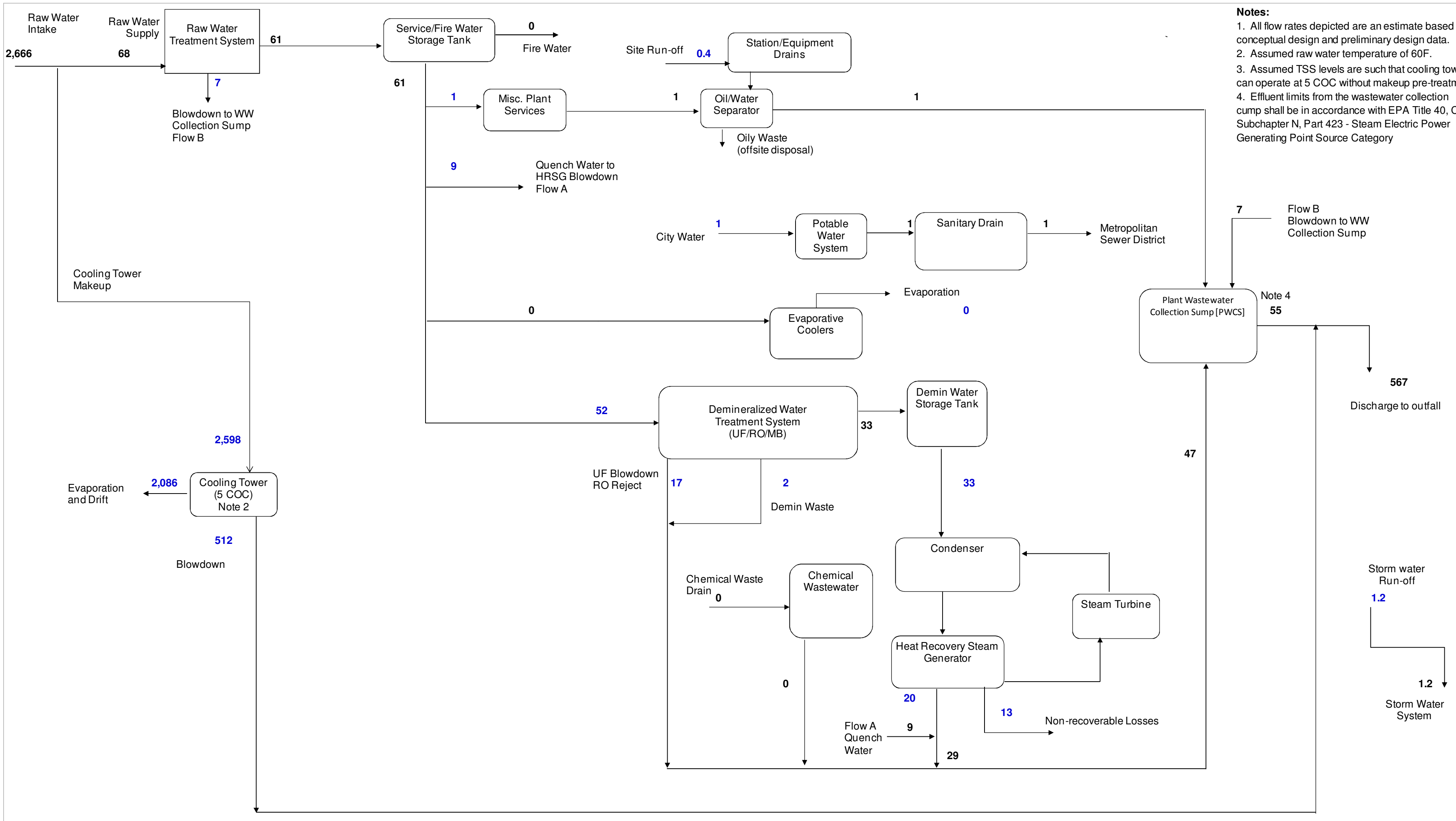
	Rev
SH 1/1	**0**



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Demin Water Makeup	**1% of Main Steam Flow**
Ion-Exchange Vessels	**Off-site Regen**

HDR

Eng: JRP
Dwg: JRP
Check:
Date:

LG&E

2017 NGCC Feasibility Study

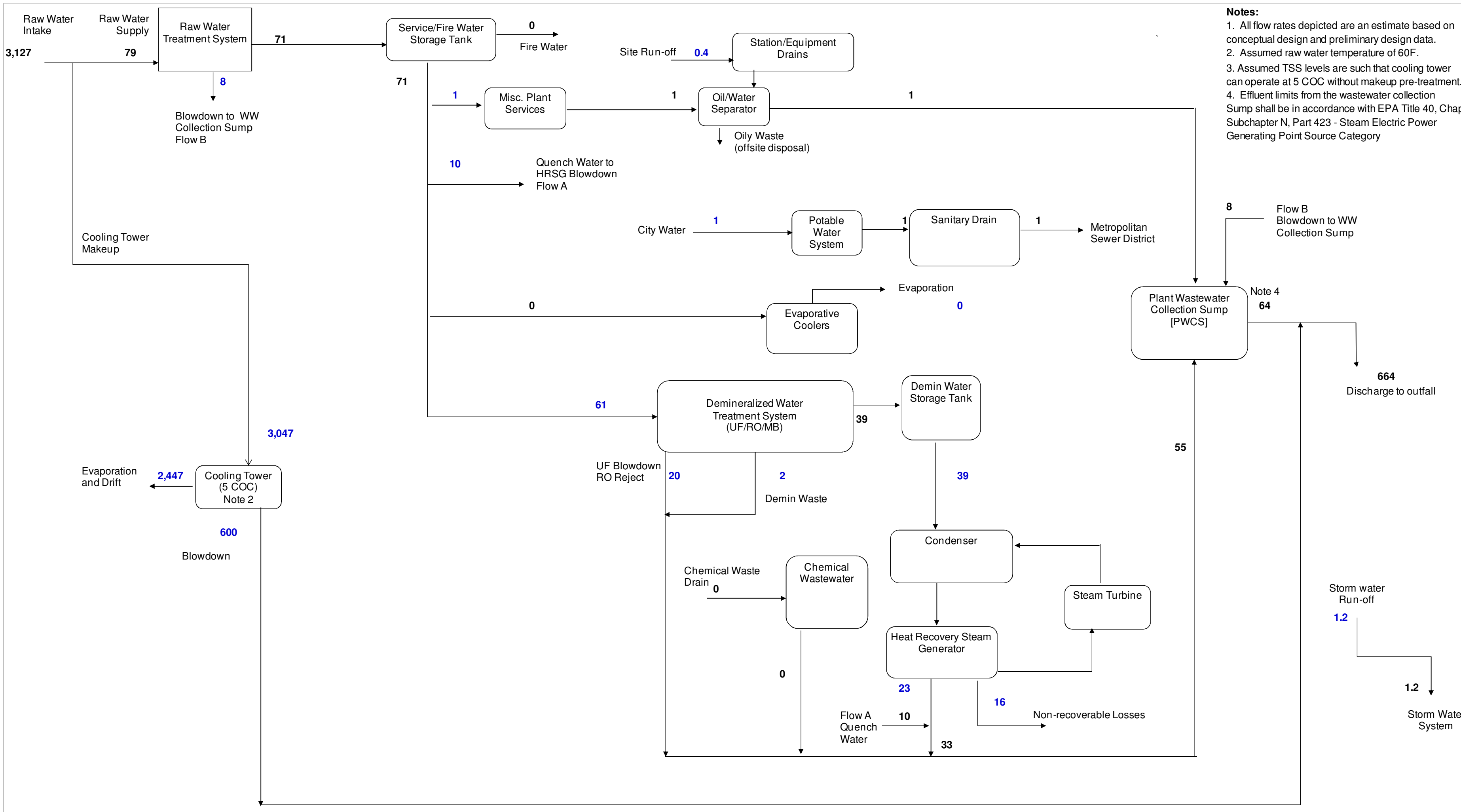
AVERAGE DAY CASE - WATER MASS BALANCE

Traditional Cooling

2 x 1 F(5) ee 700 MW Design

Project
189895
SH 1/1

Drawing
WMB-2
Rev
0



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Demin Water Makeup	1% of Main Steam Flow		
Ion-Exchange Vessels	Off-site Regen		

HDR

Eng: JRP	Dwg: JRP
Check:	Date:

LG&E

2017 NGCC Feasibility Study

AVERAGE DAY CASE - WATER MASS BALANCE

Traditional Cooling

2 x 1 F(5) ee 760 MW Design

Project	Drawing
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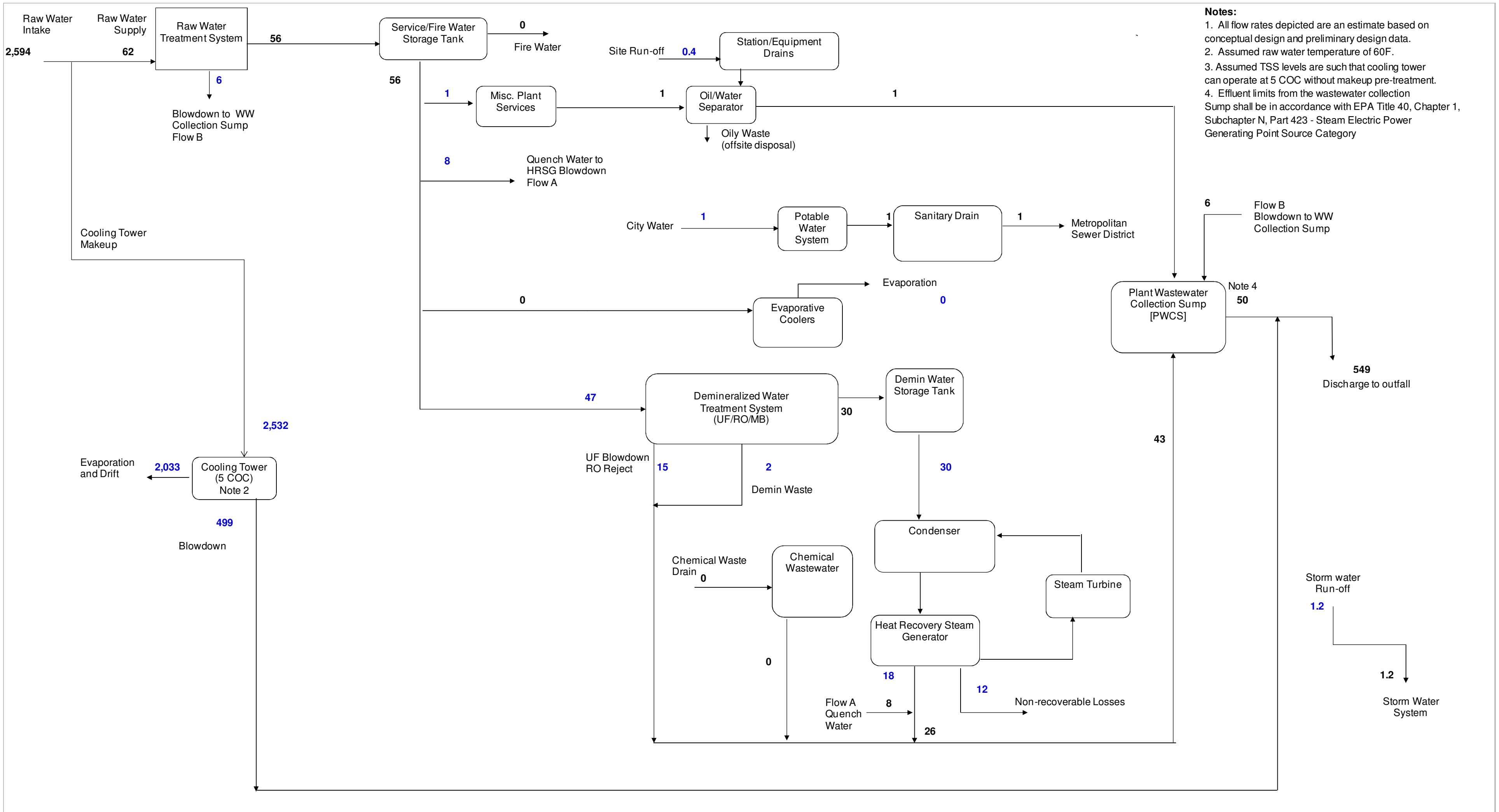
	Rev
SH 1/1	**0**



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Demin Water Makeup	**1% of Main Steam Flow**
Ion-Exchange Vessels	**Off-site Regen**

HDR

Eng: JRP
Dwg: JRP
Check:
Date:

LG&E
2017 NGCC Feasibility Study
AVERAGE DAY CASE - WATER MASS BALANCE
Traditional Cooling
2 x 1 7F7 700 MW Design

Project	Drawing
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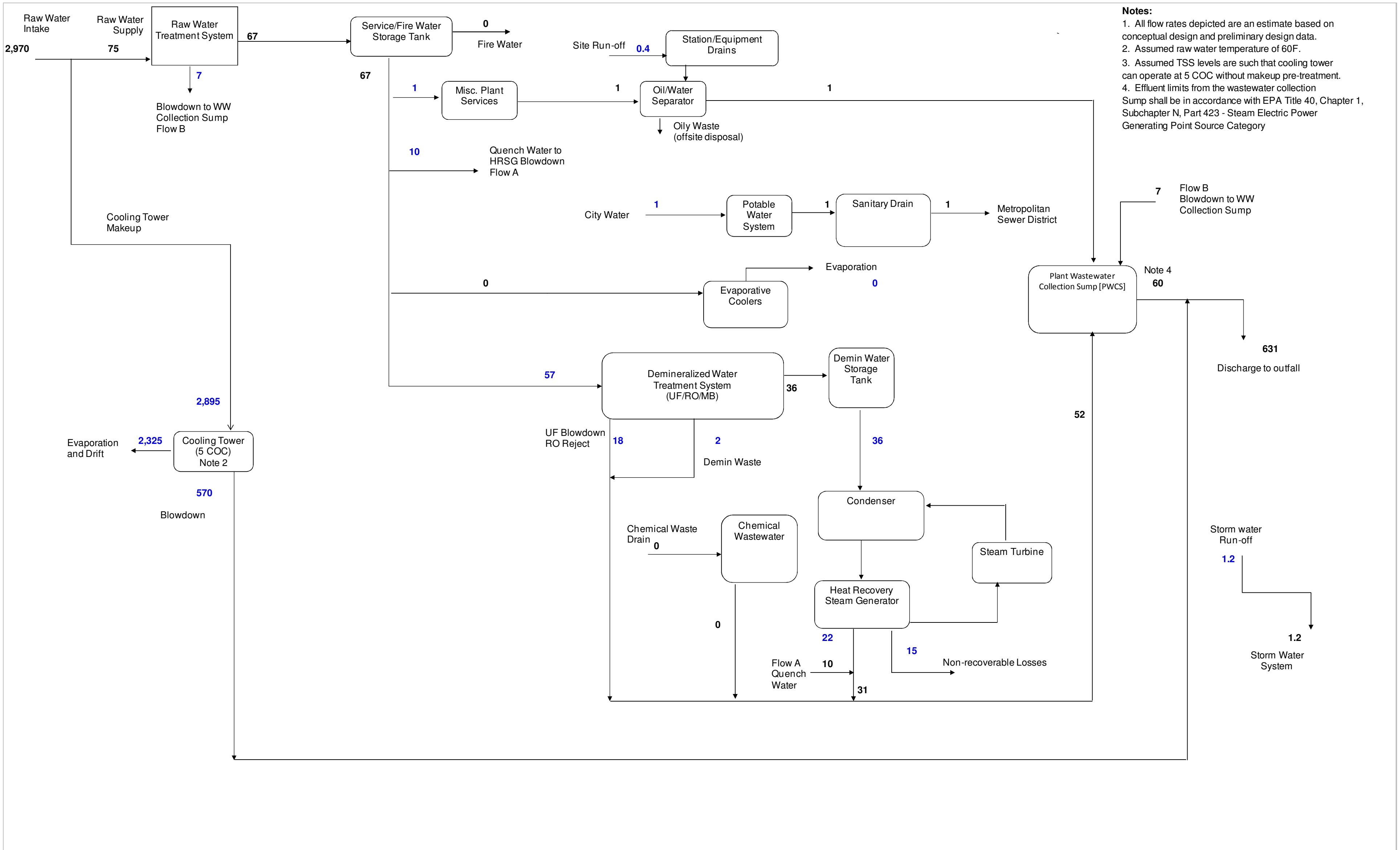
	Rev
SH 1/1	**0**



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Demin Water Makeup	**1% of Main Steam Flow**
Ion-Exchange Vessels	**Off-site Regen**

HDR

Eng: JRP
Dwg: JRP
Check:
Date:

LG&E
2017 NGCC Feasibility Study
AVERAGE DAY CASE - WATER MASS BALANCE
Traditional Cooling
2 x 1 7F7 760 MW Design

Project	Drawing
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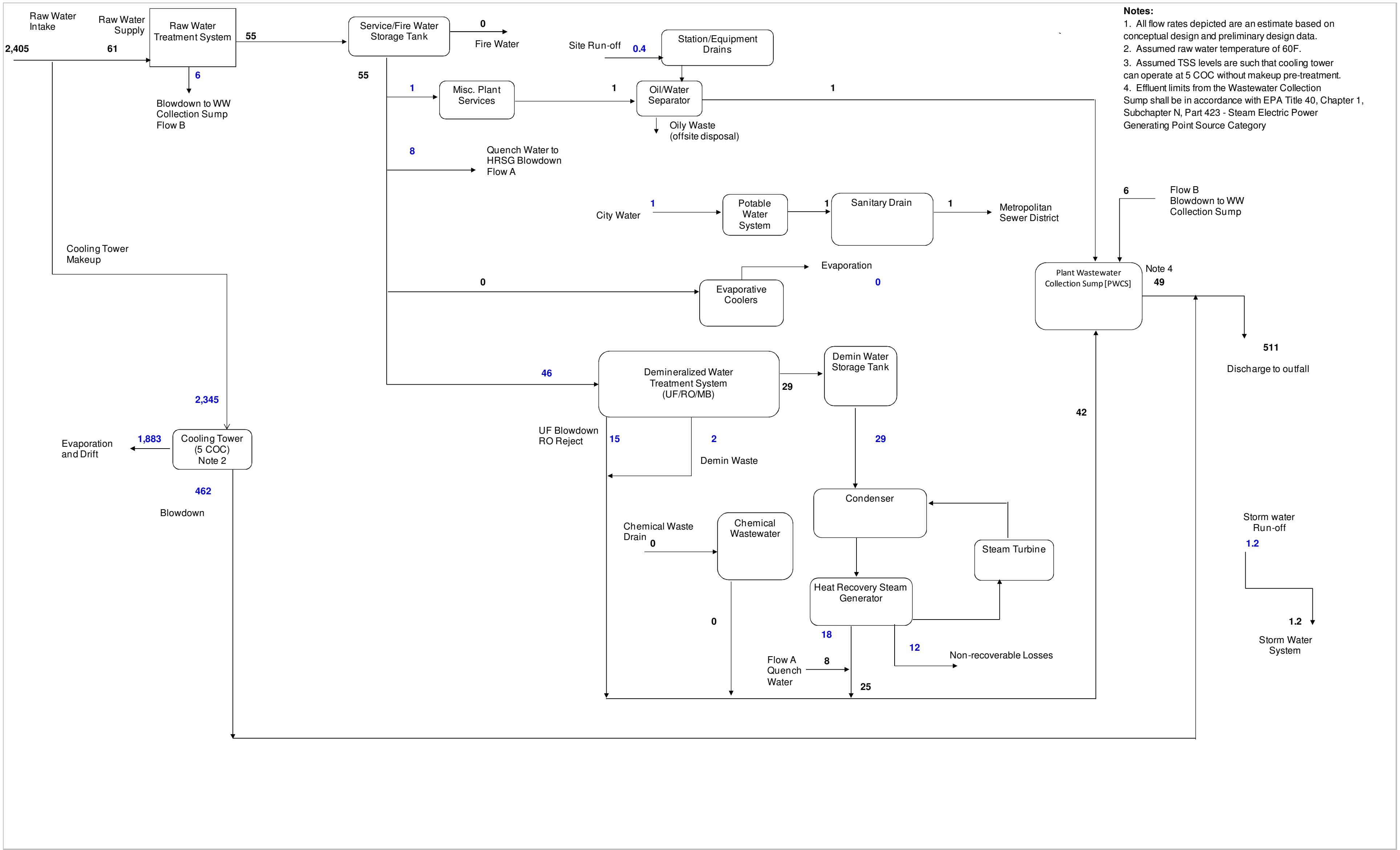
SH 1/1	**0**



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Ion-Exchange Vessels	**Off-site Regen**

HDR

Eng: JRP
Dwg: JRP
Check:
Date:

LG&E
2017 NGCC Feasibility Study
AVERAGE DAY CASE - WATER MASS BALANCE
Traditional Cooling
2 x 1 H 700 MW Design

Project	Drawing
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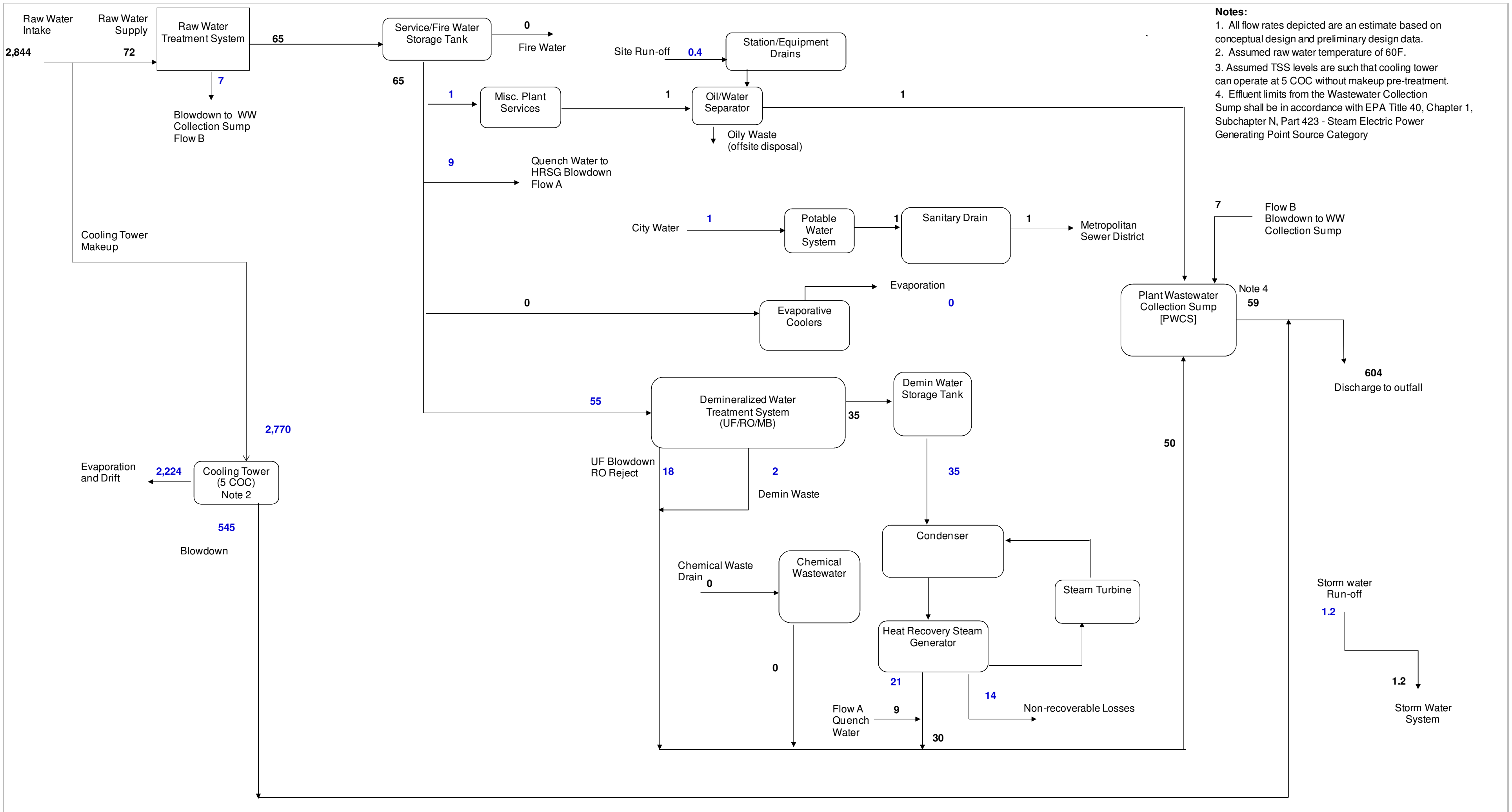
	Rev
SH 1/1	**0**



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Demin Water Makeup	**1% of Main Steam Flow**	
Ion-Exchange Vessels	**Off-site Regen**	

HDR

Eng: JRP
Dwg: JRP
Check:
Date:

LG&E

2017 NGCC Feasibility Study

AVERAGE DAY CASE - WATER MASS BALANCE

Traditional Cooling

2 x 1 H 760 MW Design

Project	Drawing
189895	**WMB-5**
	Rev
SH 1/1	**0**

APPENDIX D

ONE LINE DIAGRAMS

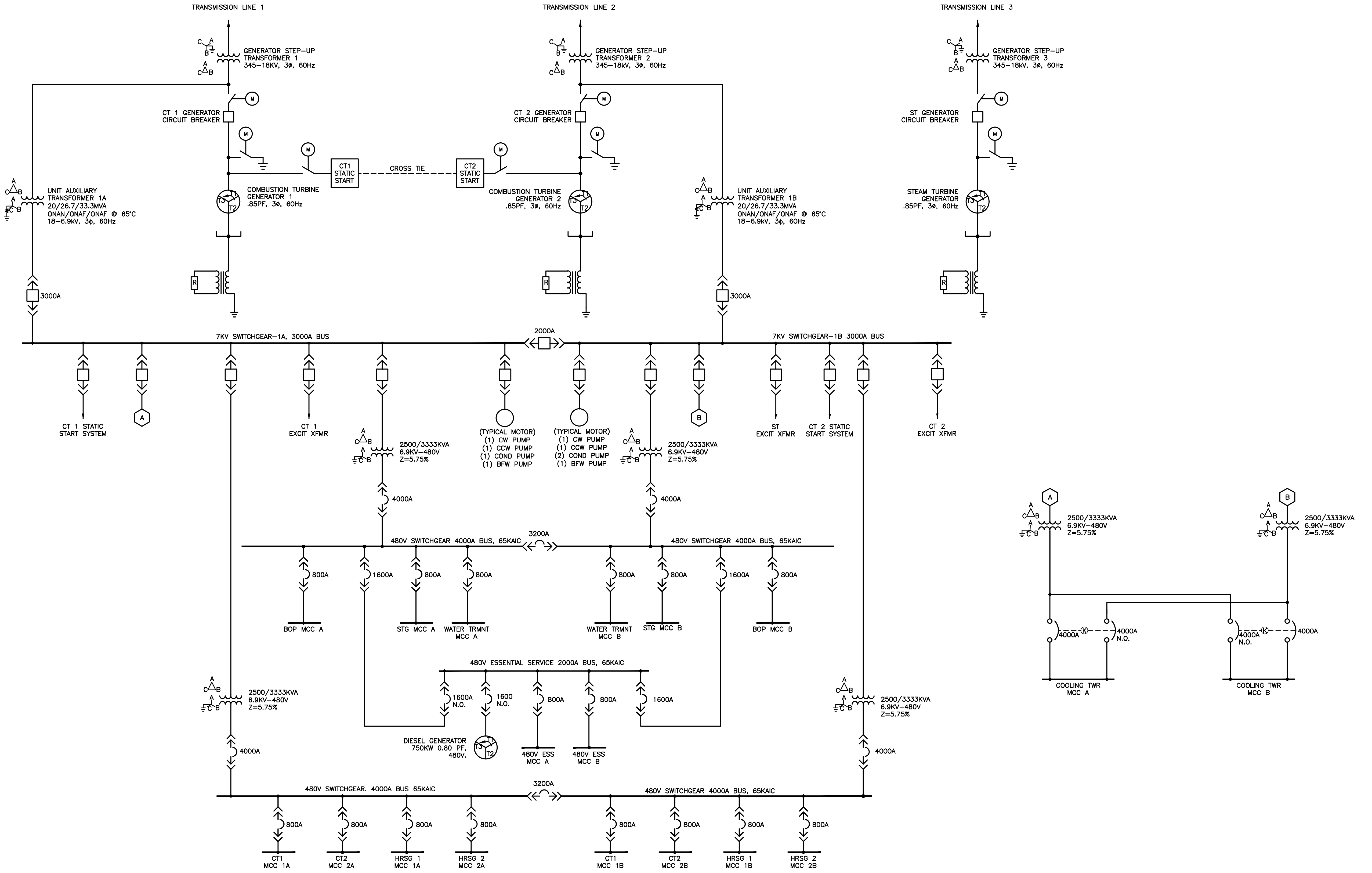
- 189895-0MP-E1001(C) New Generation Options 2-on-1 F or G Class Overall One Line Diagram
- 189895-0MP-E1002(B) New Generation Options 1-on-1 G Class Overall One Line Diagram
- 189895-0MP-E1003(B) New Generation Options 1-on-1 F Class Overall One Line Diagram
- 189895-0MP-E1004(B) New Generation Options 1-on-1 H Class Overall One Line Diagram

NOTES:

1. ALL EQUIPMENT RATINGS ARE ESTIMATED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL EQUIPMENT RATING SELECTION.

Revisions

A	28 SEP 2012 INITIAL ISSUE
B	22 OCT 2012 REPORT ISSUE
C	22 FEB 2013 REPORT UPDATEE



NOT TO BE USED FOR CONSTRUCTION

Location and Unit:
Scale: NONE
Contract No. n/a
Engineering discipline: ELECTRICAL
Drawing type:

LG&E®
Generation Services
LOUISVILLE GAS & ELECTRIC COMPANY

Title
NEW GENERATION OPTIONS
2–ON–1 F OR G CLASS
OVERALL ONE–LINE DIAGRAM

Originator: HDR ENGINEERING
Job or Project No:
Drawing No: 189895–0MP–E1001
Rev.

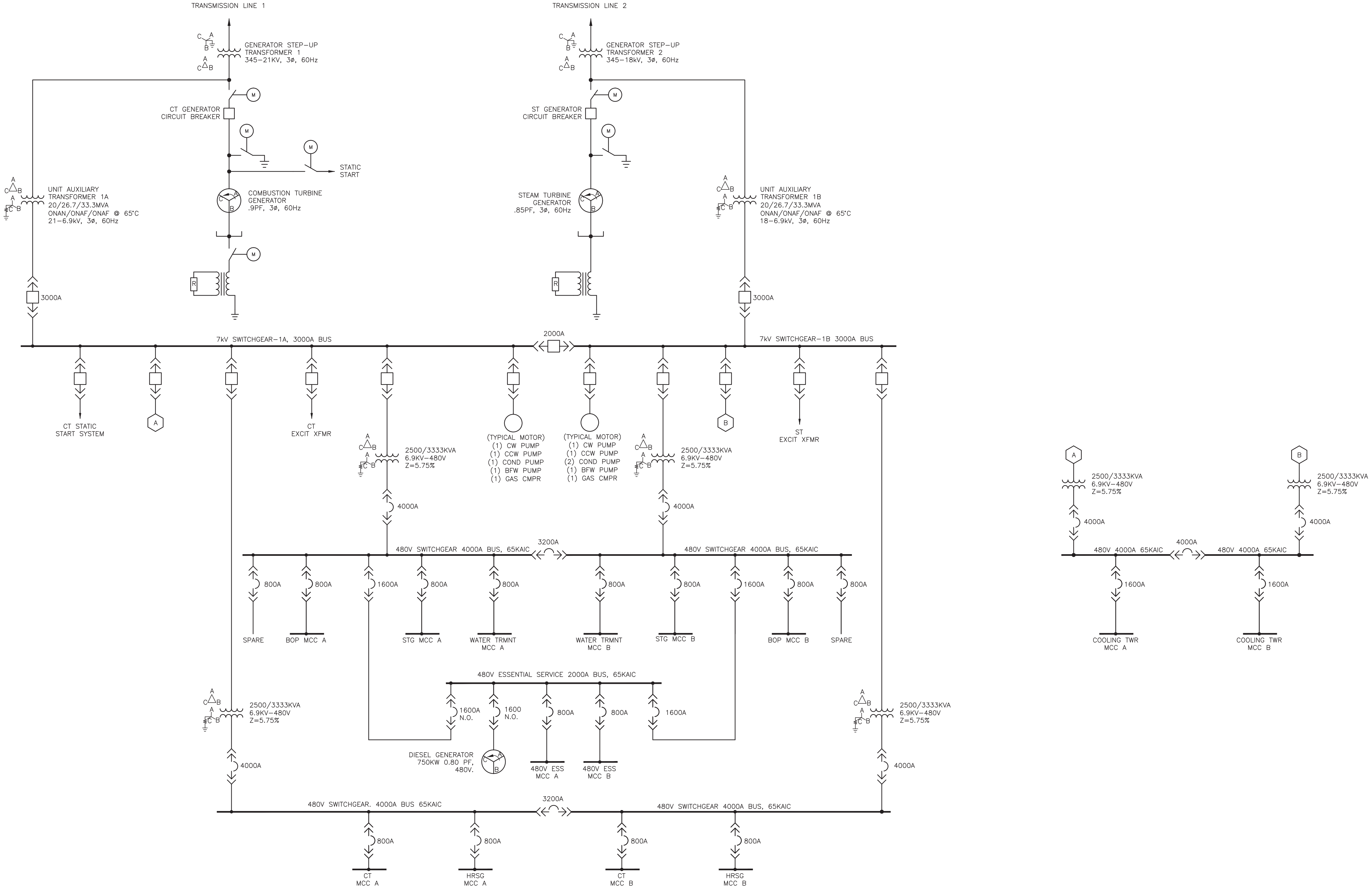
Drawn: DCW 25 SEP 12
Checked:
Approved:
Released for: –
Alternate Drawing No: 0MP–E1001

DMS Version2.0

NOTES:
1. ALL EQUIPMENT RATINGS ARE ESTIMATED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL EQUIPMENT RATING SELECTION.

Revisions

A	28 SEP 2012 INITIAL ISSUE
B	22 OCT 2012 REPORT ISSUE



NOT TO BE USED FOR CONSTRUCTION

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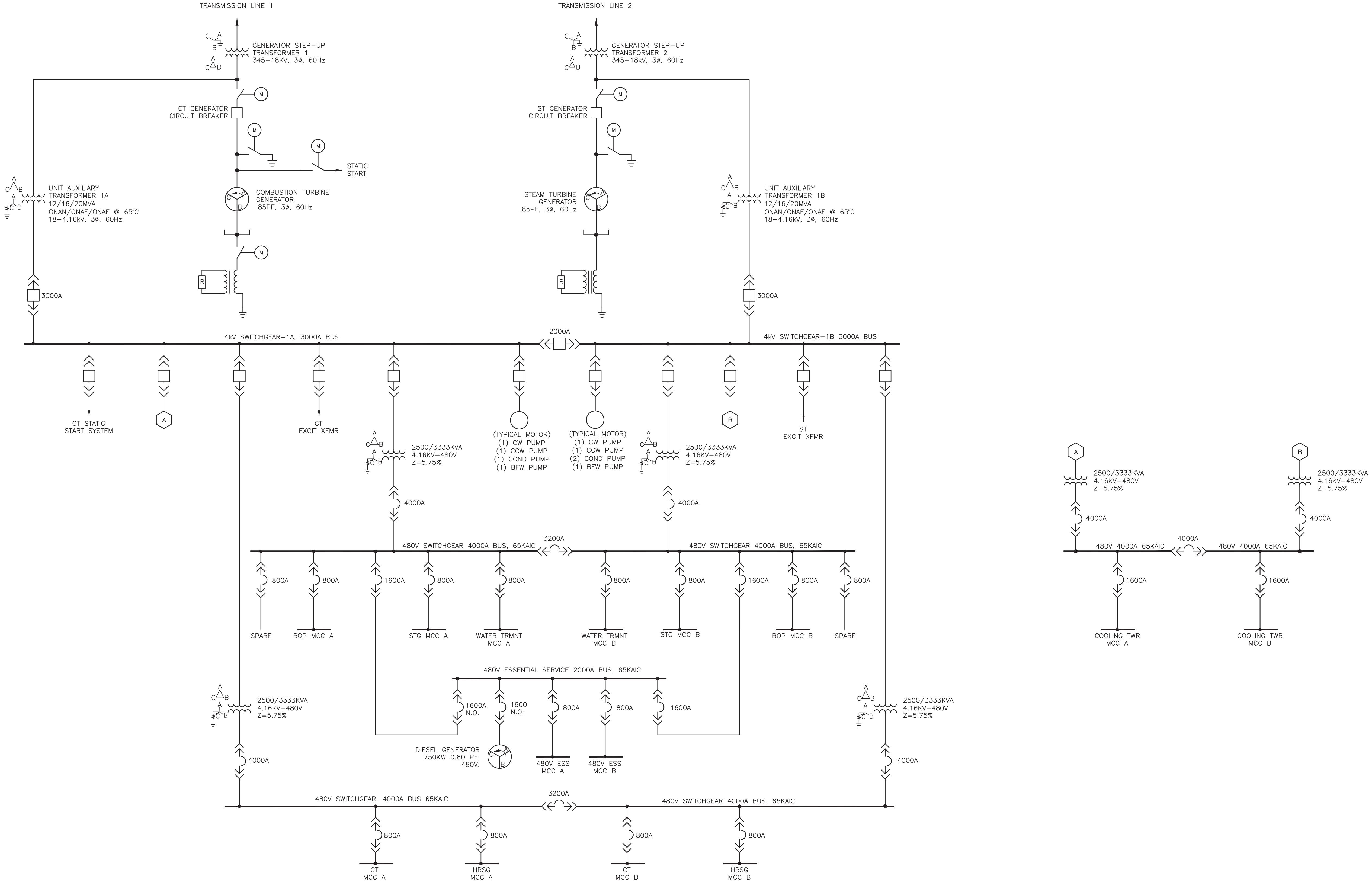
Scale: NONE	Contract No. n/a		Checked:
Engineering discipline: ELECTRICAL	Drawing type:		Approved:
Title NEW GENERATION OPTIONS 1-ON-1 G CLASS OVERALL ONE-LINE DIAGRAM			Released for: -
			Alternate Drawing No: 0MP-E1002
Originator: HDR ENGINEERING	Job or Project No:	Drawing No: 189895-0MP-E1002	Rev.

DMS Version 2.0

NOTES:

1. ALL EQUIPMENT RATINGS ARE ESTIMATED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL EQUIPMENT RATING SELECTION.

Revisions	
A	28 SEP 2012 INITIAL ISSUE
B	22 OCT 2012 REPORT ISSUE



NOT TO BE USED FOR CONSTRUCTION

Location and Unit:

Scale: NONE

Contract No. n/a

Engineering discipline: ELECTRICAL

Drawing type:

LG&E.. Generation Services
LOUISVILLE GAS & ELECTRIC COMPANY

Drawn: DCW 25 SEP 12

Checked:

Approved:

Released for: -

Alternate Drawing No: 0MP-E1003

Title
NEW GENERATION OPTIONS
1-ON-1 F CLASS
OVERALL ONE-LINE DIAGRAM

Originator: HDR ENGINEERING

Job or Project No:

Drawing No: 189895-0MP-E1003

Rev.

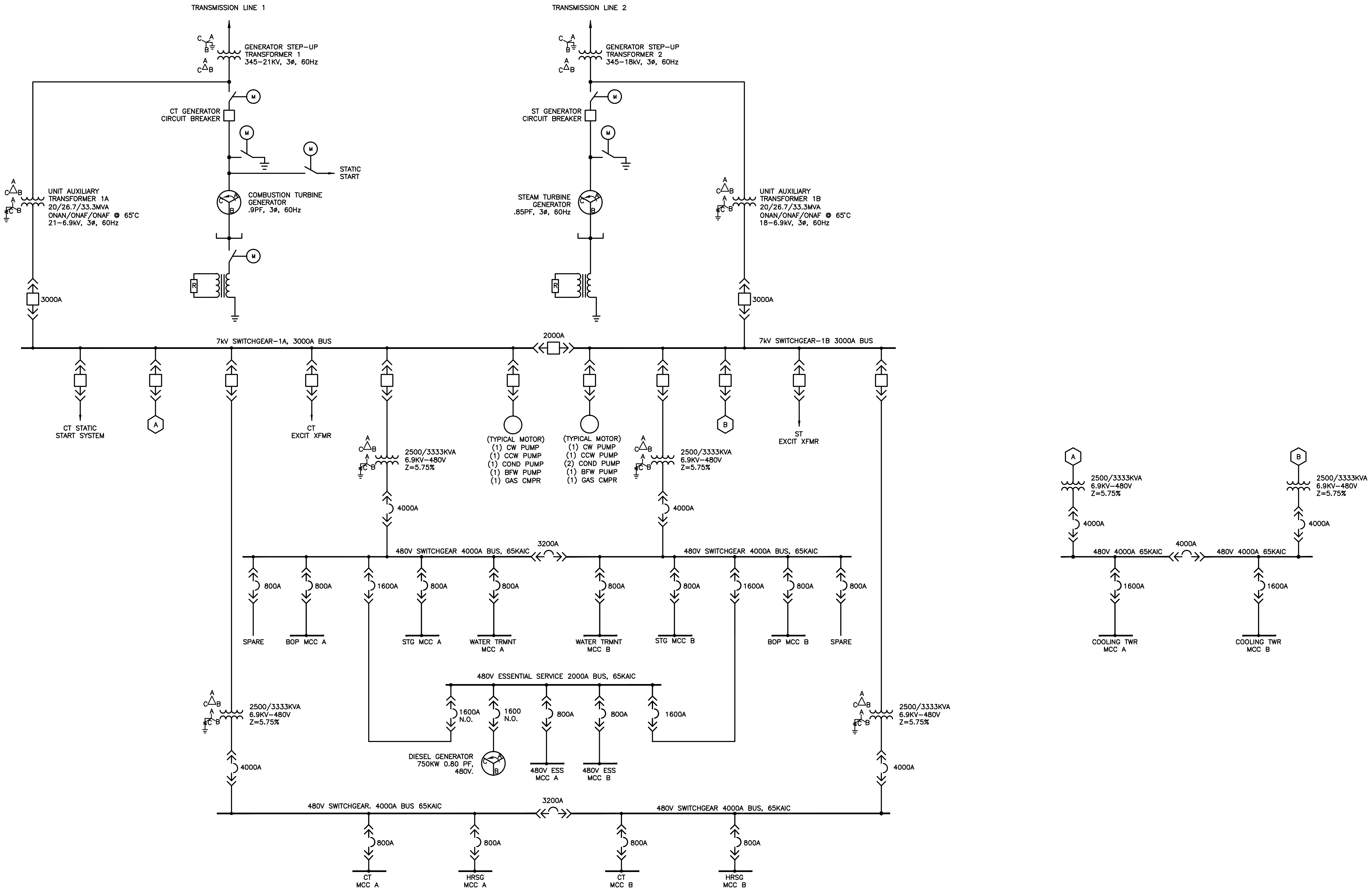
DMS Version 2.0

NOTES:

1. ALL EQUIPMENT RATINGS ARE ESTIMATED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL EQUIPMENT RATING SELECTION.

Revisions

A	28 SEP 2012 INITIAL ISSUE
B	22 OCT 2012 REPORT ISSUE



NOT TO BE USED FOR CONSTRUCTION

Location and Unit:

Scale: NONE

Contract No. n/a

Engineering discipline: ELECTRICAL

Drawing type:

LG&E® Generation Services
LOUISVILLE GAS & ELECTRIC COMPANY

Title
NEW GENERATION OPTIONS
1-ON-1 H CLASS
OVERALL ONE-LINE DIAGRAM

Drawn: DCW 25 SEP 12

Checked:

Approved:

Released for: -

Alternate Drawing No: 0MP-E1004

Originator: HDR ENGINEERING

Job or Project No:

Drawing No: 189895-0MP-E1004

Rev.

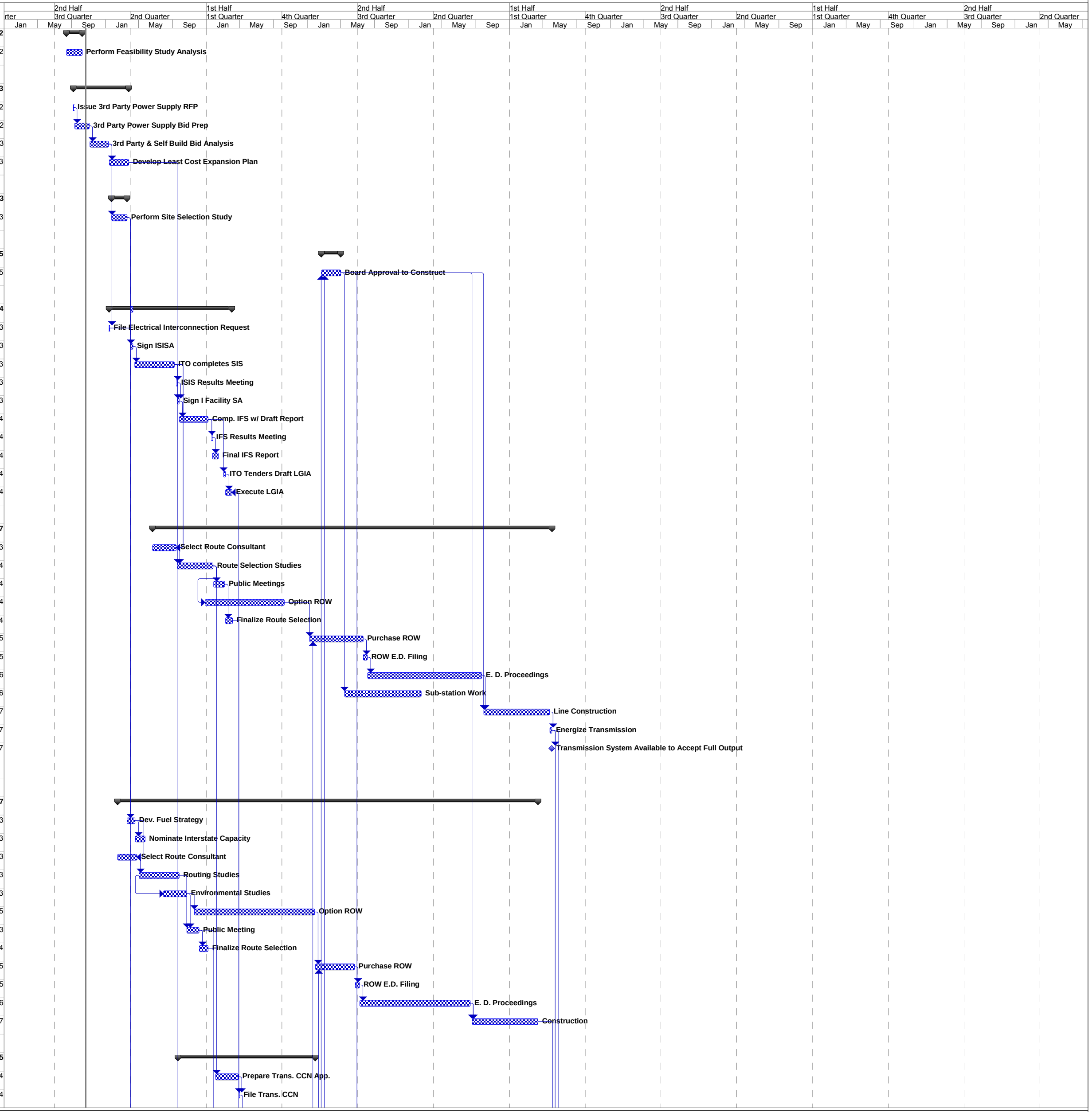
DMS Version2.0

APPENDIX E

PROJECT SCHEDULE

LG&E and KU Services
2018 Combined Cycle Project

ID	Task Name	Duration	Start	Finish
1	**Feasibility Study**	**40 days**	**Mon 8/13/12**	**Mon 10/8/12**
2	Perform Feasibility Study Analysis	40 days	Mon 8/13/12	Mon 10/8/12
3				
4	**Generation Planning**	**138 days**	**Fri 9/7/12**	**Mon 3/25/13**
5	Issue 3rd Party Power Supply RFP	1 day	Fri 9/7/12	Fri 9/7/12
6	3rd Party Power Supply Bid Prep	38 days	Wed 9/12/12	Fri 11/2/12
7	3rd Party & Self Build Bid Analysis	45 days	Tue 11/6/12	Fri 1/11/13
8	Develop Least Cost Expansion Plan	50 days	Tue 1/15/13	Mon 3/25/13
9				
10	**Site Selection/ Evaluation**	**40 days**	**Wed 1/23/13**	**Tue 3/19/13**
11	Perform Site Selection Study	40 days	Wed 1/23/13	Tue 3/19/13
12				
13	**Management Approvals**	**50 days**	**Fri 2/20/15**	**Thu 4/30/15**
14	Board Approval to Construct	50 days	Fri 2/20/15	Thu 4/30/15
15				
16	**Plant Electrical Interconnection**	**311 days**	**Mon 1/14/13**	**Wed 4/2/14**
17	File Electrical Interconnection Request	2 days	Mon 1/14/13	Tue 1/15/13
18	Sign ISISA	5 days	Wed 4/3/13	Tue 4/9/13
19	ITO completes SIS	100 days	Wed 4/17/13	Fri 9/6/13
20	ISIS Results Meeting	1 day	Mon 9/16/13	Mon 9/16/13
21	Sign I Facility SA	5 days	Tue 9/17/13	Mon 9/23/13
22	Comp. IFS w/ Draft Report	70 days	Wed 9/25/13	Mon 1/6/14
23	IFS Results Meeting	1 day	Tue 1/21/14	Tue 1/21/14
24	Final IFS Report	15 days	Thu 1/23/14	Wed 2/12/14
25	ITO Tenders Draft LGIA	5 days	Tue 3/4/14	Mon 3/10/14
26	Execute LGIA	17 days	Tue 3/11/14	Wed 4/2/14
27				
28	**Electric Transmission**	**1012 days**	**Thu 6/20/13**	**Fri 6/2/17**
29	Select Route Consultant	60 days	Thu 6/20/13	Fri 9/13/13
30	Route Selection Studies	90 days	Tue 9/17/13	Fri 1/24/14
31	Public Meetings	30 days	Mon 1/27/14	Fri 3/7/14
32	Option ROW	200 days	Fri 12/27/13	Wed 10/8/14
33	Finalize Route Selection	19 days	Tue 3/11/14	Fri 4/4/14
34	Purchase ROW	135 days	Fri 1/9/15	Mon 7/20/15
35	ROW E.D. Filing	10 days	Wed 7/22/15	Tue 8/4/15
36	E. D. Proceedings	290 days	Thu 8/6/15	Wed 9/21/16
37	Sub-station Work	190 days	Fri 5/15/15	Mon 2/15/16
38	Line Construction	170 days	Thu 9/29/16	Wed 5/24/17
39	Energize Transmission	5 days	Fri 5/26/17	Thu 6/1/17
40	Transmission System Available to Accept Full Output	1 day	Fri 6/2/17	Fri 6/2/17
41				
42	**Natural Gas Pipeline**	**1064 days**	**Thu 2/14/13**	**Wed 4/12/17**
43	Dev. Fuel Strategy	21 days	Wed 3/20/13	Wed 4/17/13
44	Nominate Interstate Capacity	25 days	Fri 4/19/13	Thu 5/23/13
45	Select Route Consultant	50 days	Thu 2/14/13	Wed 4/24/13
46	Routing Studies	100 days	Thu 5/2/13	Mon 9/23/13
47	Environmental Studies	60 days	Mon 7/29/13	Mon 10/21/13
48	Option ROW	300 days	Mon 11/18/13	Mon 1/26/15
49	Public Meeting	30 days	Tue 10/22/13	Wed 12/4/13
50	Finalize Route Selection	20 days	Fri 12/6/13	Mon 1/6/14
51	Purchase ROW	100 days	Fri 1/30/15	Fri 6/19/15
52	ROW E.D. Filing	10 days	Tue 6/23/15	Tue 7/7/15
53	E. D. Proceedings	280 days	Thu 7/9/15	Wed 8/10/16
54	Construction	170 days	Thu 8/18/16	Wed 4/12/17
55				
56	**Regulatory**	**343 days**	**Fri 9/20/13**	**Wed 1/28/15**
57	Prepare Trans. CCN App.	60 days	Mon 2/3/14	Fri 4/25/14
58	File Trans. CCN	1 day	Tue 4/29/14	Tue 4/29/14

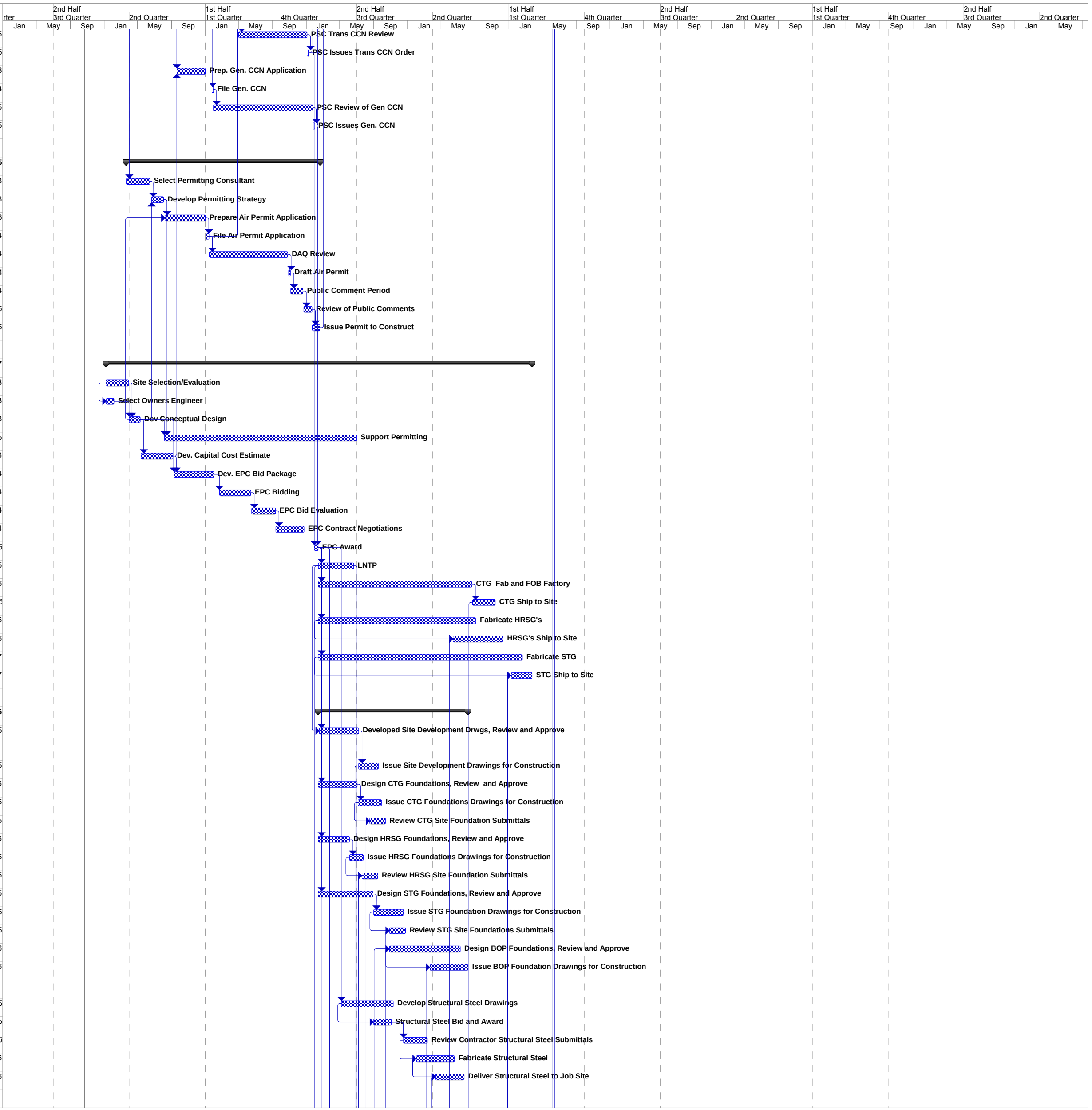


Project: 2018 Combined Cycle Project Schedule
Date: Tue 10/23/12

Task ▨
Split
Milestone ◆
Summary
Project Summary
External Tasks
External Milestone ◆
Inactive Task
Inactive Task
Inactive Milestone ◇
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Progress
Deadline ⇩

LG&E and KU Services
2018 Combined Cycle Project

ID	Task Name	Duration	Start	Finish
59	PSC Trans CCN Review	170 days	Thu 5/1/14	Fri 1/2/15
60	PSC Issues Trans CCN Order	2 days	Tue 1/6/15	Wed 1/7/15
61	Prep. Gen. CCN Application	70 days	Fri 9/20/13	Tue 12/31/13
62	File Gen. CCN	1 day	Tue 1/28/14	Tue 1/28/14
63	PSC Review of Gen CCN	250 days	Thu 1/30/14	Fri 1/23/15
64	PSC Issues Gen. CCN	1 day	Wed 1/28/15	Wed 1/28/15
65				
66	**Environmental**	**486 days**	**Thu 3/21/13**	**Wed 2/18/15**
67	Select Permitting Consultant	60 days	Thu 3/21/13	Thu 6/13/13
68	Develop Permitting Strategy	30 days	Fri 6/21/13	Fri 8/2/13
69	Prepare Air Permit Application	100 days	Thu 8/8/13	Tue 12/31/13
70	File Air Permit Application	7 days	Fri 1/3/14	Mon 1/13/14
71	DAQ Review	200 days	Wed 1/15/14	Fri 10/24/14
72	Draft Air Permit	5 days	Tue 10/28/14	Mon 11/3/14
73	Public Comment Period	30 days	Wed 11/5/14	Thu 12/18/14
74	Review of Public Comments	20 days	Mon 12/22/14	Tue 1/20/15
75	Issue Permit to Construct	20 days	Thu 1/22/15	Wed 2/18/15
76				
77	**Project Engineering**	**1079 days**	**Mon 1/7/13**	**Fri 3/24/17**
78	Site Selection/Evaluation	60 days	Mon 1/7/13	Fri 3/29/13
79	Select Owners Engineer	20 days	Tue 1/8/13	Mon 2/4/13
80	Dev Conceptual Design	30 days	Mon 4/1/13	Fri 5/10/13
81	Support Permitting	483 days	Tue 8/6/13	Tue 6/30/15
82	Dev. Capital Cost Estimate	80 days	Tue 5/14/13	Thu 9/5/13
83	Dev. EPC Bid Package	100 days	Mon 9/9/13	Thu 1/30/14
84	EPC Bidding	80 days	Fri 2/21/14	Fri 6/13/14
85	EPC Bid Evaluation	60 days	Tue 6/17/14	Wed 9/10/14
86	EPC Contract Negotiations	70 days	Fri 9/12/14	Mon 12/22/14
87	EPC Award	10 days	Thu 1/29/15	Wed 2/11/15
88	LNTP	90 days	Fri 2/13/15	Fri 6/19/15
89	CTG Fab and FOB Factory	390 days	Thu 2/12/15	Fri 8/19/16
90	CTG Ship to Site	60 days	Mon 8/22/16	Fri 11/11/16
91	Fabricate HRSG's	400 days	Thu 2/12/15	Fri 9/2/16
92	HRSG's Ship to Site	130 days	Mon 6/13/16	Fri 12/9/16
93	Fabricate STG	520 days	Thu 2/12/15	Fri 2/17/17
94	STG Ship to Site	55 days	Mon 1/9/17	Fri 3/24/17
95				
96	**Civil Engineering**	**380 days**	**Thu 2/12/15**	**Fri 8/5/16**
97	Developed Site Development Drwgs, Review and Approve	100 days	Mon 2/16/15	Tue 7/7/15
98	Issue Site Development Drawings for Construction	50 days	Wed 7/8/15	Wed 9/16/15
99	Design CTG Foundations, Review and Approve	100 days	Thu 2/12/15	Thu 7/2/15
100	Issue CTG Foundations Drawings for Construction	60 days	Mon 7/6/15	Mon 9/28/15
101	Review CTG Site Foundation Submittals	40 days	Mon 8/17/15	Mon 10/12/15
102	Design HRSG Foundations, Review and Approve	80 days	Thu 2/12/15	Thu 6/4/15
103	Issue HRSG Foundations Drawings for Construction	35 days	Fri 6/5/15	Fri 7/24/15
104	Review HRSG Site Foundation Submittals	40 days	Mon 7/20/15	Mon 9/14/15
105	Design STG Foundations, Review and Approve	140 days	Thu 2/12/15	Fri 8/28/15
106	Issue STG Foundation Drawings for Construction	75 days	Mon 8/31/15	Wed 12/16/15
107	Review STG Site Foundations Submittals	40 days	Tue 10/27/15	Wed 12/23/15
108	Design BOP Foundations, Review and Approve	180 days	Tue 10/27/15	Fri 7/8/16
109	Issue BOP Foundation Drawings for Construction	100 days	Mon 3/21/16	Fri 8/5/16
110				
111	Develop Structural Steel Drawings	130 days	Thu 5/7/15	Mon 11/9/15
112	Structural Steel Bid and Award	45 days	Mon 8/31/15	Mon 11/2/15
113	Review Contractor Structural Steel Submittals	60 days	Thu 12/17/15	Fri 3/11/16
114	Fabricate Structural Steel	100 days	Mon 2/1/16	Fri 6/17/16
115	Deliver Structural Steel to Job Site	75 days	Mon 4/11/16	Fri 7/22/16
116				

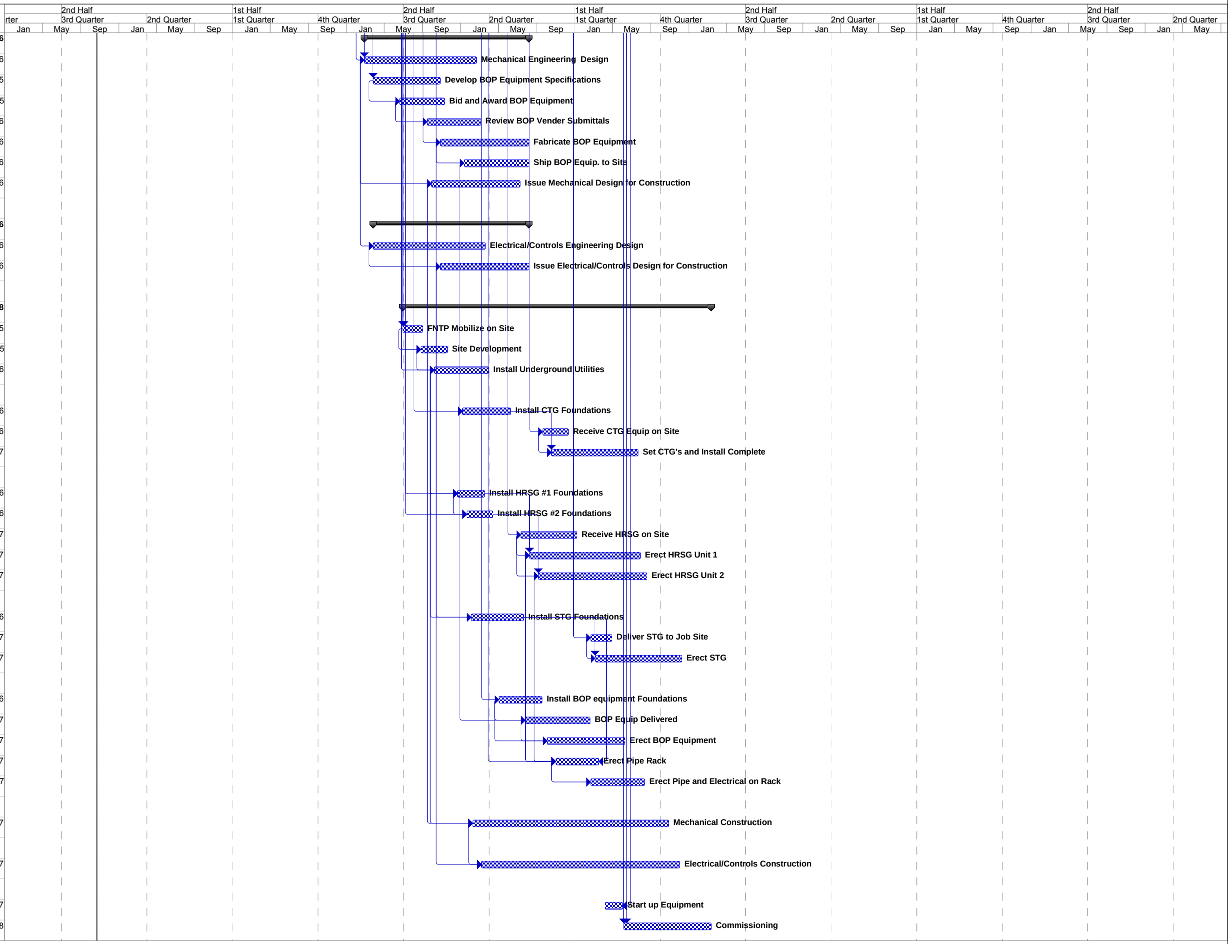


Project: 2018 Combined Cycle Project Schedule
Date: Tue 10/23/12

Task	▨	Summary	▬	External Milestone	◆	Inactive Milestone	◇	Duration-only	▬	Start-only	[	Deadline	⇩
Split	······	Project Summary	▬	Inactive Task	▭	Inactive Summary	▭	Manual Summary Rollup	▬	Finish-only	]		
Milestone	◆	External Tasks	▨	Inactive Task	▭	Manual Task	▬	Manual Summary	▬	Progress	▬		

LG&E and KU Services
2018 Combined Cycle Project

ID	Task Name	Duration	Start	Finish
117	**Mechanical Engineering**	**370 days**	**Thu 2/26/15**	**Fri 8/5/16**
118	Mechanical Engineering Design	250 days	Thu 2/26/15	Fri 2/19/16
119	Develop BOP Equipment Specifications	150 days	Thu 3/26/15	Mon 10/26/15
120	Bid and Award BOP Equipment	100 days	Fri 6/19/15	Mon 11/9/15
121	Review BOP Vender Submittals	120 days	Tue 9/15/15	Fri 3/4/16
122	Fabricate BOP Equipment	200 days	Tue 10/27/15	Fri 8/5/16
123	Ship BOP Equip. to Site	150 days	Mon 1/11/16	Fri 8/5/16
124	Issue Mechanical Design for Construction	200 days	Tue 9/29/15	Fri 7/8/16
125				
126	**Electrical and Controls Engineering**	**350 days**	**Thu 3/26/15**	**Fri 8/5/16**
127	Electrical/Controls Engineering Design	250 days	Thu 3/26/15	Fri 3/18/16
128	Issue Electrical/Controls Design for Construction	200 days	Tue 10/27/15	Fri 8/5/16
129				
130	**Construction FNTP to COD**	**700 days**	**Mon 6/29/15**	**Mon 3/12/18**
131	FNTP Mobilize on Site	45 days	Mon 6/29/15	Mon 8/31/15
132	Site Development	60 days	Wed 8/26/15	Wed 11/18/15
133	Install Underground Utilities	120 days	Thu 10/8/15	Tue 3/29/16
134				
135	Install CTG Foundations	110 days	Wed 1/6/16	Tue 6/7/16
136	Receive CTG Equip on Site	60 days	Mon 9/19/16	Fri 12/9/16
137	Set CTG's and Install Complete	200 days	Mon 10/17/16	Fri 7/21/17
138				
139	Install HRSG #1 Foundations	61 days	Mon 12/21/15	Wed 3/16/16
140	Install HRSG #2 Foundations	60 days	Wed 1/20/16	Tue 4/12/16
141	Receive HRSG on Site	130 days	Mon 7/11/16	Fri 1/6/17
142	Erect HRSG Unit 1	255 days	Mon 8/8/16	Fri 7/28/17
143	Erect HRSG Unit 2	250 days	Mon 9/5/16	Fri 8/18/17
144				
145	Install STG Foundations	120 days	Wed 2/3/16	Tue 7/19/16
146	Deliver STG to Job Site	50 days	Mon 2/20/17	Fri 4/28/17
147	Erect STG	200 days	Mon 3/6/17	Fri 12/8/17
148				
149	Install BOP equipment Foundations	100 days	Mon 5/2/16	Fri 9/16/16
150	BOP Equip Delivered	150 days	Mon 7/25/16	Fri 2/17/17
151	Erect BOP Equipment	180 days	Mon 10/3/16	Fri 6/9/17
152	Erect Pipe Rack	100 days	Mon 10/31/16	Fri 3/17/17
153	Erect Pipe and Electrical on Rack	125 days	Mon 2/20/17	Fri 8/11/17
154				
155	Mechanical Construction	450 days	Mon 2/8/16	Fri 10/27/17
156				
157	Electrical/Controls Construction	455 days	Mon 3/7/16	Fri 12/1/17
158				
159	Start up Equipment	40 days	Fri 4/7/17	Thu 6/1/17
160	Commissioning	200 days	Tue 6/6/17	Mon 3/12/18



Project: 2018 Combined Cycle Project Schedule
Date: Tue 10/23/12

Task	▨	Summary	▬	External Milestone	◆	Inactive Milestone	◇	Duration-only	▬	Start-only	[	Deadline	⇩
Split	....	Project Summary	▬	Inactive Task	▭	Inactive Summary	▭	Manual Summary Rollup	▬	Finish-only	]		
Milestone	◆	External Tasks	▨	Inactive Task	▭	Manual Task	▬	Manual Summary	▬	Progress	▬		

APPENDIX F

PROJECT COST ESTIMATES

- 1x1 GE 7F5 Class Project Cost Estimate
- 1x1 Siemens F Class Project Cost Estimate
- 1x1 MHI G Class Project Cost Estimate
- 1x1 Siemens H Class Project Cost Estimate
- 2x1 GE 7F5 Class Project Cost Estimate
- 2x1 Siemens F Class Project Cost Estimate
- 2x1 Siemens F Class 760 MW Project Cost Estimate
- 2x1 Siemens F Class 700 MW Project Cost Estimate
- 2x1 GE 7F7 760 MW Class Project Cost Estimate
- 2x1 GE 7F7 700 MW Class Project Cost Estimate
- 2x1 Siemens H Class 760 MW Project Cost Estimate
- 2x1 Siemens H Class 700 MW Project Cost Estimate

1 x 1 GE 7F5 Combined Cycle Unit

BUDGET ESTIMATE

5 x 10 Work Week

February 22, 2013

Rev 3

CONFIDENTIAL

1 x 1 GE 7F5 Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
TECHNOLOGY: CT with HRSG & STG
NTP PERIOD:
NET MW RATING: 298.5
BOILER: Fired
CONSTRUCTION NTP - Mob:
NO. OF UNITS: 1
STEAM TURBINE: Condensing
COMMERCIAL OPERATION DATE: 1-Jun-2018
FUEL TYPE: Nat Gas
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
Site Development	**$0**	**$1,615,475**	**$1,394,611**	**33,400**	**224,000**	**$3,234,086**	**1.0%**
Raw Water Intake/Discharge Facilities	**$0**	**$500,000**	**$578,649**	**10,850**	**0**	**$1,078,649**	**0.3%**
Foundations & Concrete	**$0**	**$3,559,575**	**$2,705,186**	**69,911**	**8,432,500**	**$14,697,261**	**4.5%**
Architectural & Metals	**$0**	**$3,618,060**	**$1,699,789**	**33,768**	**5,366,400**	**$10,684,249**	**3.3%**
Piping, Valves, Support, Accessories	**$0**	**$10,086,940**	**$9,380,802**	**173,848**	**225,000**	**$19,692,742**	**6.0%**
HRSG Equipment	**$0**	**$24,761,194**	**$4,981,680**	**72,153**	**0**	**$29,742,874**	**9.1%**
Steam Turbine Island Equipment	**$0**	**$28,500,000**	**$1,157,299**	**21,700**	**0**	**$29,657,299**	**9.1%**
Combustion Turbine Equipment	**$0**	**$51,200,000**	**$1,678,083**	**31,465**	**0**	**$52,878,083**	**16.1%**
Mechanical Draft Cooling Tower	**$0**	**$0**	**$0**	**0**	**3,100,000**	**$3,100,000**	**0.9%**
BOP Mechanical Equipment	**$0**	**$14,007,900**	**$1,381,013**	**23,388**	**1,000,000**	**$16,388,913**	**5.0%**
Electrical Equipment	**$0**	**$10,861,280**	**$1,451,631**	**28,978**	**0**	**$12,312,911**	**3.8%**
Electrical Commodities	**$0**	**$6,887,174**	**$7,397,341**	**147,669**	**0**	**$14,284,514**	**4.4%**
High Voltage Switchyard	**$0**	**$265,000**	**$227,500**	**4,021**	**0**	**$492,500**	**0.2%**
Instrumentation & Controls	**$0**	**$4,390,200**	**$1,485,591**	**28,825**	**0**	**$5,875,791**	**1.8%**
Sub-Total Direct Costs:	**$0**	**$160,252,797**	**$35,519,175**	**679,975**	**$18,347,900**	**$214,119,872**	**65.3%**
State Sales Tax (Non-Production Material Only)					**329,927**	**$329,927**	**0.1%**
Total Direct Cost	**$0**	**$160,252,797**	**$35,519,175**	**679,975**	**$18,677,827**	**$214,449,800**	**65.4%**
Construction Indirects & Services							
- Construction Field Staff			**$0**	**0**	**$11,522,855**	**$11,522,855**	**3.5%**
- Construction Field Staff Expenses			**$0**	**0**	**$1,870,168**	**$1,870,168**	**0.6%**
- Construction Equipment			**$0**	**0**	**$11,145,203**	**$11,145,203**	**3.4%**
- Small Tools			**$0**	**0**	**$1,359,951**	**$1,359,951**	**0.4%**
- Consumable Materials & Safety Supplies			**$0**	**0**	**$1,359,951**	**$1,359,951**	**0.4%**
- Field Office Expense		**$1,033,370**	**$65,849**	**1,485**	**$22,373**	**$1,121,592**	**0.3%**
- Temporary Facilities		**$2,336,753**	**$863,403**	**19,472**	**$82,500**	**$3,282,657**	**1.0%**
- Temporary Utilities		**$747,600**	**$1,396,697**	**31,500**	**$0**	**$2,144,297**	**0.7%**
- Support Craft & Site Services		**$459,400**	**$2,008,704**	**45,302**	**$775,014**	**$3,243,118**	**1.0%**
- Site Safety		**$658,040**	**$375,008**	**8,224**	**$0**	**$1,033,048**	**0.3%**
- Construction Permits		**$51,450**	**$0**	**0**	**$0**	**$51,450**	**0.0%**
- Construction Testing		**$117,000**	**$0**	**0**	**$0**	**$117,000**	**0.0%**
- Performance Testing		**$304,400**	**$0**	**0**	**$0**	**$304,400**	**0.1%**
- Start-up Supervision		**$0**	**$0**	**0**	**$1,296,911**	**$1,296,911**	**0.4%**
- Preop Testing, Start-up		**$1,113,000**	**$752,767**	**23,534**	**$0**	**$1,865,767**	**0.6%**
Sub-Total Construction Indirects and Services		**$6,821,013**	**$5,462,428**	**129,518**	**$29,434,926**	**$41,718,368**	**12.7%**
Total Construction Cost	**$0**	**$167,073,811**	**$40,981,603**	**809,493**	**$48,112,753**	**$256,168,167**	**78.2%**
Estimated Subcontract Labor Hours				**144,852**			
Project Indirects							
- Project Engineering (Eng, PM, CM & Procurement)					**$15,370,090**	**$15,370,090**	**4.7%**
Sub-Total Project Indirects	**$0**	**$0**	**$0**	**0**	**$15,370,090**	**$15,370,090**	**4.7%**
EPC Contractor Insurance & Misc Costs							
- Builders Risk					**$1,280,841**	**$1,280,841**	**0.4%**
- Comprehensive General Liability (CGL) Insurance					**$1,280,841**	**$1,280,841**	**0.4%**

1 x 1 GE 7F5 Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 298.5
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
- Warranty Reserve					**$500,000**	**$500,000**	**0.2%**
Sub-Total EPC Contractor Insur. & Misc. Co	**$0**	**$0**	**$0**	**0**	**$3,061,682**	**$3,061,682**	**0.9%**
Total EPC Contractor Project Indirect Cost	**$0**	**$0**	**$0**	**0**	**$18,431,772**	**$18,431,772**	**5.6%**
- Escalation (Eqt, Materials & Labor)	**$0**	**$5,356,444**	**$6,630,172**		**$8,409,302**	**$20,395,918**	**6.2%**
Sub-Total	**0**	**172,430,255**	**47,611,776**	**954,345**	**74,953,827**	**294,995,857**	**90.0%**
- EPC Contractor Contingency	**$0**	**$3,130,631**	**$2,380,589**		**$3,562,691**	**$9,073,911**	**2.8%**
- EPC Contractor G&A and Profit	**$0**	**$13,794,420**	**$3,808,942**		**$5,996,306**	**$23,599,669**	**7.2%**
TOTAL EPC PROJECT COST	**$0**	**$189,355,306**	**$53,801,307**	**954,345**	**$84,512,824**	**$327,669,437**	**100.0%**
EPC Price per kW						**$1,098**	
Owner Indirect Costs							
- Total Owner Indirects						**$63,774,952**	
- Owner Contingency						**$32,766,944**	
TOTAL PROJECT COST						**$424,211,333**	
Total Project Cost per kW						**$1,421**	
Estimate Options (include 25 % markup for indirects)							
Fuel Oil System						**$4,625,000**	
Bypass Stack and Diverter Damper						**$5,625,000**	
Gas Compression						**Not Required**	
SCR System to meet 12 ppm NOx						**Not Required**	
Optional SCR System						**$2,500,000**	

Total Craft Labor Hours	**954,345**	**erformance Guarantees:**		**Executive-in-Charge:**	**WHD**
Ave. Craft Wage without Escalation	**$51.75**	**Liquidated Damages:**		**Project Manager:**	**JPS**
Field Labor Type	**TBD**	**Special Insurance:**		**Construction Manager:**	**SMP**
Labor Productivity Factor	**1.084**	**Performance Bond:**		**Lead Estimator:**	**CDF**

Estimate Details

1 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
1	**Division #1.0 - Sitework**																				
2	Sitework	Roads - Asphalt paving main site rds & Parking lots	7,200.0	sy	Sub	Contr	20.00		44.43		1.09	0	0	YES	4,320	0	0	0	144,000	$144,000	HDR|CB Estimated Quantity
3	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Powerblock Ar	1,740.0	sy	Contr	Contr	5.00	0.055	44.43	96	1.09	0	8,700	YES	522	4,613	104	13,313	0	$13,313	HDR|CB Estimated Quantity
4	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Secondary Are	6,945.0	sy	Contr	Contr	5.00	0.055	44.43	382	1.09	0	34,725	YES	2,084	18,412	414	53,137	0	$53,137	HDR|CB Estimated Quantity
5	Sitework	Roads - Haul/Construction Roads Treated Gravel	29,700.0	sy	Contr	Contr	8.00	0.1	44.43	2,970	1.09	0	237,600	YES	14,256	143,162	3,222	380,762	0	$380,762	HDR|CB Estimated Quantity
6	Sitework	Roads - Main Roads Crushed stone Base Course	8,500.0	sy	Contr	Contr	12.00	0.1	44.43	850	1.09	0	102,000	YES	6,120	40,972	922	142,972	0	$142,972	HDR|CB Estimated Quantity
7	Sitework	Roads - Drainage and culverts	80,000.0	sy	Contr	Contr	2.00	0.05	44.43	4,000	1.09	0	160,000	YES	9,600	192,810	4,340	352,810	0	$352,810	HDR|CB Estimated Quantity
8	Sitework	Soil Erosion Control Measures	2,000	lf	Contr	Contr	1	0.027	44.43	54	1.09	0	2,000	YES	120	2,603	54	4,603	0	4,603	HDR|CB Estimated Quantity
9	Sitework	Site - Topsoil stripping/stockpiling	10,000	cy	Contr	Contr		0.030	44.43	300	1.09	0	0	YES	0	14,461	300	14,461	0	$14,461	HDR|CB Estimated Quantity
10	Sitework	Site - Drainage - Pipe Culverts (Assume 12" dia)	3,000	lf	Contr	Contr	9.00	0.12	44.43	360	1.09	0	27,000	YES	1,620	17,353	360	44,353	0	$44,353	HDR|CB Estimated Quantity
11	Sitework	Site - Drainage - Manholes	20	ea	Contr	Contr	1,500	16	44.43	320	1.09	0	30,000	YES	1,800	15,425	320	45,425	0	$45,425	HDR|CB Estimated Quantity
14	Sitework	Site - Fire Protection hydrants, valve boxes, ductile iron	24.0	ea	Contr	Contr	3,000.00	20	39.54	480	1.09	0	72,000	YES	4,320	20,591	521	92,591	0	$92,591	HDR|CB Estimated Quantity
15	Sitework	Site - Fire Protection U/G piping, DI	4,000.0	lf	Contr	Contr	41.00	0.5	39.54	2,000	1.09	0	164,000	YES	9,840	85,796	2,170	249,796	0	$249,796	HDR|CB Estimated Quantity
16	Sitework	Pipe Utility Trench Excavation	10,000	cy	Contr	Contr		0.2	39.54	2,000	1.09	0	0	YES	0	85,796	2,000	85,796	0	$85,796	HDR|CB Estimated Quantity
17	Sitework	Pipe Utility Trench Backfill (including bedding)	8,500	cy	Contr	Contr		0.2	39.54	1,700	1.09	0	0	YES	0	72,927	1,700	72,927	0	$72,927	HDR|CB Estimated Quantity
20	Sitework	Spoil Disposal	10,000	cy	Contr	Contr		0.1	44.43	1,000	1.09	0	0	YES	0	48,203	1,000	48,203	0	$48,203	HDR|CB Estimated Quantity
21	Sitework	Site - Sanitary sewer lift stations	1.0	ea	Contr	Contr	11,700.00	40	39.54	40	1.09	0	11,700	YES	702	1,716	43	13,416	0	$13,416	HDR|CB Estimated Quantity
22	Sitework	Site - Sanitary waste piping and manholes	2,000.0	lf	Contr	Contr	20.00	1	39.54	2,000	1.09	0	40,000	YES	2,400	85,796	2,170	125,796	0	$125,796	HDR|CB Estimated Quantity
23	Sitework	Site - Storm drain piping and culverts	20,000.0	lf	Contr	Contr	12.00	0.25	39.54	5,000	1.09	0	240,000	YES	14,400	214,490	5,425	454,490	0	$454,490	HDR|CB Estimated Quantity
24	Sitework	Site Finishing - Seed Site Earthwork	5.0	ac	Contr	Contr	10,000.00	0.54	39.54	3	1.09	0	50,000	YES	3,000	116	3	50,116	0	$50,116	HDR|CB Estimated Quantity
25	Sitework	Site Finishing - Grading around foundations	5,000.0	sy	Contr	Contr		0.02	39.54	100	1.09	0	0	YES	0	4,290	109	4,290	0	$4,290	HDR|CB Estimated Quantity
26	Sitework	Site Finishing - Stone Surfacing	6,000.0	sy	Contr	Contr	10.00	0.015	39.54	90	1.09	0	60,000	YES	3,600	3,861	98	63,861	0	$63,861	HDR|CB Estimated Quantity
27	Sitework	Site Improvements - landscaping at admin building	1.0	ls	Contr	Contr	30,000.00	360	39.54	360	1.09	0	30,000	YES	1,800	15,443	391	45,443	0	$45,443	HDR|CB Estimated Quantity
28	Sitework	Site Improvements - Main Gate Security Facilities	1.0	lot	Contr	Contr	150,000.00	3600	39.54	3,600	1.09	0	150,000	YES	9,000	154,433	3,906	304,433	0	$304,433	HDR|CB Estimated Quantity
29	Sitework	Site Improvements - Site Entrance Sign and Landscaping	1.0	ls	Contr	Contr	18,750.00	240	39.54	240	1.09	0	18,750	YES	1,125	10,296	260	29,046	0	$29,046	HDR|CB Estimated Quantity
30	Sitework	Site Improvements - Site Security Boundary Fencing	15,000.0	lf	Contr	Contr	11.00	0.2	39.54	3,000	1.09	0	165,000	YES	9,900	128,694	3,255	293,694	0	$293,694	HDR|CB Estimated Quantity
31	Sitework	Site Improvements - Fencing Active gates	6.0	ea	Contr	Contr	2,000.00	48	39.54	288	1.09	0	12,000	YES	720	12,355	312	24,355	0	$24,355	HDR|CB Estimated Quantity
32	Sitework	Site Surveying	1.0	lot	Sub	Contr	80,000.00		44.43	0	1.09	0	0	YES	2,400	0	0	0	80,000	$80,000	HDR|CB Estimated Quantity
33																					
34		**Division #1 - Sitework Sub-Total**								**31,232**		**0**	**1,615,475**		**103,649**	**1,394,611**	**33,400**	**3,010,086**	**224,000**	**3,234,086**	
35																					
36	**Division #1.3 - Raw Water Intake and Discharge Facilities**																				HDR Allowance for Interconnection and Updgrage of
37		Raw Water River Intake and Discharge Facilities	1.0	ea	Contr	Contr	500,000.00	10,000	53.33	10,000	1.09	0	500,000	NO	0	578,649	10,850	1,078,649	0	$1,078,649	existing Unit 1 and 2 Intake Structure
38																					
39		**Division #1.3 - Raw Water Intake Clarification and Discharge Facilities Sub-Total**								**10,000**		**0**	**500,000**		**0**	**578,649**	**10,850**	**1,078,649**	**0**	**$1,078,649**	
40																					
41																					
42	**Division #2.0 - Earthwork and Concrete**																				
43	**Division #2.1 - Earthwork**																				
44	Earthwork	Structural Backfill Power Block (using excavated material)	155,000.0	cy	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	3,875,000	$3,875,000	HDR|CB Estimated Quantity
45	Earthwork	Retaining Wall (MSE)	27,500.0	sf	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	687,500	$687,500	HDR|CB Estimated Quantity
46	Earthwork	Structural Excavation Main Power Block - Earth/Rock	215,000.0	cy	Sub	Contr	18.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	3,870,000	$3,870,000	HDR|CB Estimated Quantity
47																					
48										0		0	0		0	0	0	0	8,432,500	8,432,500	
49	**Division # 2.2 - Concrete Main Power Block Area**																				
50																					
51		Includes Forms, Rebar, Placement, Finishing, Embeds																			
52	Concrete	HRSG and Stack	3,750	cy	Contr	Contr	250	4.5	38.69	16,875	1.09	0	937,500	NO	0	708,477	18,309	1,645,977	0	$1,645,977	HDR|CB Estimated Quantity
53	Concrete	Gas Turbine Foundation	2,000	cy	Contr	Contr	300	4.5	38.69	9,000	1.09	0	600,000	NO	0	377,854	9,765	977,854	0	$977,854	HDR|CB Estimated Quantity
54	Concrete	Steam Turbine building	600	cy	Contr	Contr	250	4.5	38.69	2,700	1.09	0	150,000	NO	0	113,356	2,930	263,356	0	$263,356	HDR|CB Estimated Quantity
55	Concrete	Spread Footings & Piers Pipe/Tray Trestle/Racks	300.0	cy	Contr	Contr	250	4.5	38.69	1,350	1.09	0	75,000	NO	0	56,678	1,465	131,678	0	$131,678	HDR|CB Estimated Quantity
56	Concrete	Steam Turbine Bldg fill slab	200.0	cy	Contr	Contr	210.00	4.5	38.69	900	1.09	0	42,000	NO	0	37,785	977	79,785	0	$79,785	HDR|CB Estimated Quantity
57	Concrete	Steam Turbine Bldg Mat Foundation	900.0	cy	Contr	Contr	250	4.5	38.69	4,050	1.09	0	225,000	NO	0	170,035	4,394	395,035	0	$395,035	HDR|CB Estimated Quantity
58	Concrete	Steam Turbine Bldg Elevated Slab	400.0	cy	Contr	Contr	250	4.5	38.69	1,800	1.09	0	100,000	NO	0	75,571	1,953	175,571	0	$175,571	HDR|CB Estimated Quantity
59	Concrete	Steam Turbine Bldg sumps foundation	300.0	cy	Contr	Contr	250	4.5	38.69	1,350	1.09	0	75,000	NO	0	56,678	1,465	131,678	0	$131,678	HDR|CB Estimated Quantity
60	Concrete	Steam Turbine Pedestal FDN (Columns & Tabletop, Mat)	750.0	cy	Contr	Contr	350.00	8	38.69	6,000	1.09	0	262,500	NO	0	251,903	6,510	514,403	0	$514,403	HDR|CB Estimated Quantity
61	Concrete	Aux. Equipment Foundations	300	cy	Contr	Contr	250	4.5	38.69	1,350	1.09	0	75,000	YES	4,500	56,678	1,465	131,678	0	$131,678	HDR|CB Estimated Quantity
62	Concrete	Equip Fdn - Generator Breaker	30	cy	Contr	Contr	250	4.5	38.69	135	1.09	0	7,500	YES	450	5,668	146	13,168	0	$13,168	HDR|CB Estimated Quantity
63	Concrete	Equip Fdn - CT PEEC	30	cy	Contr	Contr	250	4.5	38.69	135	1.09	0	7,500	YES	450	5,668	146	13,168	0	$13,168	HDR|CB Estimated Quantity
64	Concrete	Equip Fdn - Power Distribution Center	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
65	Concrete	Equip Fdn - CEMS	20	cy	Contr	Contr	250	4.5	38.69	90	1.09	0	5,000	YES	300	3,779	98	8,779	0	$8,779	HDR|CB Estimated Quantity
66	Concrete	Equip Fdn - Boiler Feed Pump	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
67	Concrete	Equip Fdn - Main Step-up Transformer Fdn/Walls	60.0	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	NO	0	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
68	Concrete	Equip Fdn - Plant Aux Power Transformers Fnd/Walls	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
69	Concrete	Equip Fdn - Misc off Base Equip fnds	60.0	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	NO	0	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
70	Concrete	Elec. Ductbank (Tubes, Conc., Forms, Rebar) 12 Tubes	400.0	lf	Contr	Contr	125	0.57	38.69	228	1.09	0	50,000	NO	0	9,572	247	59,572	0	$59,572	HDR|CB Estimated Quantity
71	Concrete	Elec. Ductbank to Cooling Tower (Tubes, Conc., Forms, Rebar) 6 Tub	750.0	lf	Contr	Contr	100	0.45	38.69	338	1.09	0	75,000	NO	0	14,170	366	89,170	0	$89,170	HDR|CB Estimated Quantity
72	Concrete	Equip Fdn - Pumps & misc equipment	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
73	Concrete	Electrical Building Foundation	80.0	cy	Contr	Contr	250	4.5	38.69	360	1.09	0	20,000	NO	0	15,114	391	35,114	0	$35,114	HDR|CB Estimated Quantity
74	Concrete	Cooling Tower Basin	1,200.0	cy	Contr	Contr	250	5.5	38.69	6,600	1.09	0	300,000	NO	0	277,093	7,161	577,093	0	$577,093	HDR|CB Estimated Quantity
75	Concrete	Administration Building foundation	1,100.0	cy	Contr	Contr	250	4.5	38.69	4,950	1.09	0	275,000	YES	16,500	207,820	5,371	482,820	0	$482,820	HDR|CB Estimated Quantity
76	Concrete	Auxilary Boiler Building floor slab & foundation	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	NO	0	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
77	Concrete	Demineralized Water Tank Foundations	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
78	Concrete	Service water storage tank foundations	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	YES	3,000	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
79	Concrete	Main Gate Guard House	3.0	cy	Contr	Contr	250	4.5	38.69	14	1.09	0	750	YES	45	567	15	1,317	0	$1,317	HDR|CB Estimated Quantity
80	Concrete	Water Treatment Buildings, enclosures and tank fdns	0.0	cy	Contr	Contr	250	4.5	38.69	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
81	Concrete	Grouting (equipment & steel)	30.0	cy	Contr	Contr	2,227.50	81	38.69	2,430	1.09	0	66,825	NO	0	102,021	2,637	168,846	0	$168,846	HDR|CB Estimated Quantity
82																					
83		Sub Total Concrete	**13,983**				AVG MH/CY	4.81		64,434			3,559,575		27,045	2,705,186	69,911	6,264,761	0	6,264,761	
84																					
85		**Division #2 - Earthwork & Concrete Sub-Total**								**64,434**		**0**	**3,559,575**		**27,045**	**2,705,186**	**69,911**	**6,264,761**	**8,432,500**	**14,697,261**	
86																					
87	**Division #3.0 - Architectural**												-								
88																					
89	rchitectura	Exterior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
90	rchitectura	Fire extinguishers	24.0	ea	Contr	Contr	500.00	3	53.33	72	1.09	0	12,000	YES	720	4,166	78	16,166	0	$16,166	HDR|CB Estimated Quantity
91	rchitectura	Fire hose cabinets	26.0	ea	Contr	Contr	1,200.00	20	53.33	520	1.09	0	31,200	YES	1,872	30,090	564	61,290	0	$61,290	HDR|CB Estimated Quantity
92	rchitectura	Fire hydrants w/monitor nozzles	6.0	ea	Contr	Contr	2,550.00	12	54.96	72	1.09	0	15,300	YES	918	4,294	78	19,594	0	$19,594	HDR|CB Estimated Quantity
93	rchitectura	Fire protection control room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
94	rchitectura	Fire Protection Elect Equip & Cable Spreading Room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
95	rchitectura	Fire Protection GSU and Aux Transformers	1.0	ls	Sub	Contr	200,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	200,000	$200,000	HDR|CB Estimated Quantity
96	rchitectura	Fire Protection Turbine Building	1.0	ls	Sub	Contr	600,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity

Estimate Details

1 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
TE BASIS	**ISCIPLIN**	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
Line #																					
97	Architectura	Fire Detection/Alarm	1.0	lot	Contr	Contr	350,000.00	1000	50.09	1,000	1.09	0	350,000	NO	0	54,352	1,085	404,352	0	$404,352	HDR|CB Estimated Quantity
98	Architectura	HVAC System Allowance	1.0	ls	Sub	Contr	650,000.00		54.96	0	1.09	0	0	YES	19,500	0	0	0	650,000	$650,000	HDR|CB Estimated Quantity
99	Architectura	Interior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
100	Architectura	Masonry Walls 8" CMU	15,000.0	sf	Contr	Contr	4.00	0.15	32.95	2,250	1.09	0	60,000	yes	3,600	80,450	2,441	140,450	0	$140,450	HDR|CB Estimated Quantity
101	Architectura	Overhead Rolling Doors - steel	4.0	ea	Contr	Contr	5,000.00	40	38.68	160	1.09	0	20,000	yes	1,200	6,715	174	26,715	0	$26,715	HDR|CB Estimated Quantity
102	Architectura	Painting - equipment and piping	1.0	lot	Contr	Contr	80,000.00	3600	36.36	3,600	1.09	0	80,000	yes	4,800	142,016	3,906	222,016	0	$222,016	HDR|CB Estimated Quantity
103	Architectura	Painting - structural steel, grating, handrail touch-up	200,000.0	sf	Contr	Contr	0.30	0.010	36.36	2,000	1.09	0	60,000	yes	3,600	78,898	2,170	138,898	0	$138,898	HDR|CB Estimated Quantity
104	Architectura	Painting - turbine room floor epoxy finish	30,000.0	sf	Contr	Contr	0.80	0.045	36.36	1,354	1.09	0	24,000	yes	1,440	53,398	1,469	77,398	0	$77,398	HDR|CB Estimated Quantity
105	Architectura	Restrooms, showers, locker rooms	1.0	lot	Contr	Contr	125,000.00	1200	53.33	1,200	1.09	0	125,000	YES	7,500	69,438	1,302	194,438	0	$194,438	HDR|CB Estimated Quantity
106	Architectura	Roof Drains	1,200.0	lf	Contr	Contr	32.50	2.0	54.96	2,400	1.09	0	39,000	yes	2,340	143,123	2,604	182,123	0	$182,123	HDR|CB Estimated Quantity
107	Architectura	Structural Steel - Misc Building Steel	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	yes	3,840	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
108	Architectura	Structural Steel - Pipe Rack	300.0	ton	Contr	Contr	3,400.00	20	60.25	6,000	1.09	0	1,020,000	NO	0	392,204	6,510	1,412,204	0	$1,412,204	HDR|CB Estimated Quantity
109	Architectura	Structural Steel - Misc Platforms	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	NO	0	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
110	Architectura	Structural Steel - Turbine Building Framing	350.0	ton	Contr	Contr	2,850.00	15	60.25	5,250	1.09	0	997,500	NO	0	343,179	5,696	1,340,679	0	$1,340,679	HDR|CB Estimated Quantity
111	Architectura	Trench Floor Drain Cover	1,800.0	lf	Contr	Contr	60.45	0.4	54.96	720	1.09	0	108,810	yes	6,529	42,937	781	151,747	0	$151,747	HDR|CB Estimated Quantity
112	Architectura	Turbine Building Built-up Roof	15,000.0	sf	Contr	Contr	0.75	0.035	35.31	525	1.09	0	11,250	NO	0	20,115	570	31,365	0	$31,365	HDR|CB Estimated Quantity
113	Architectura	Turbine Building Metal Siding	40,000.0	sf	Contr	Contr	10.40	0.05	56.41	2,000	1.09	0	416,000	NO	0	122,401	2,170	538,401	0	$538,401	HDR|CB Estimated Quantity
114	Architectura	Administration/Control/Maintenance Building	16,000.0	sf	Sub	Contr	140.00		38.68	0	1.09	0	0	YES	0	0	0	0	2,240,000	$2,240,000	HDR|CB Estimated Quantity
115	Architectura	Cooling Tower, pre-engineered - Elect, Chem feed, I&C Bldg	3,000.0	sf	Sub	Contr	80.00		59.59	0	1.09	0	0	NO	0	0	0	0	240,000	$240,000	HDR|CB Estimated Quantity
116	Architectura	Main Gate Guard House	80.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	YES	0	0	0	0	6,400	$6,400	HDR|CB Estimated Quantity
117	Architectura	Auxilary Boiler Building	4,000.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	440,000	$440,000	HDR|CB Estimated Quantity
118	Architectura	Water Treatment Building	0.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
119	Architectura	Warehouse	8,000.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	NO	0	0	0	0	640,000	$640,000	HDR|CB Estimated Quantity
120	Architectura	Boiler Feed Pump Building	1.0	ea	sub	Contr	300,000.00		38.68	0	1.09	0	0	NO	0	0	0	0	300,000	$300,000	HDR|CB Estimated Quantity
121																					
122		**Division #3 - Architectural Sub-Total**								**31,123**	**1.05**	**0**	**3,618,060**		**65,059**	**1,699,789**	**33,768**	**5,317,849**	**5,366,400**	**$10,684,249**	
123																					
124	**Division #4.0 - Mechanical Piping**																				
125	**Division #4.1 - Mechanical Piping**																				
126																					
127	chanical Pip	Pipe - MS, HR, CR, BFW, LPS	**1,720.0**	lf																	
128	chanical Pip	- System - Cold Reheat (Carbon)	400.0	lf	Contr	Contr	2,400.00	7.2	54.96	2,895	1.09	0	960,000	NO	0	172,654	3,141	1,132,654	0	$1,132,654	HDR|CB Estimated Quantity
129	chanical Pip	- System - Feedwater (Carbon)	320.0	lf	Contr	Contr	700.00	5.6	54.96	1,805	1.09	0	224,000	NO	0	107,628	1,958	331,628	0	$331,628	HDR|CB Estimated Quantity
130	chanical Pip	- System - Hot Reheat (Alloy)	300.0	lf	Contr	Contr	2,500.00	14.4	54.96	4,315	1.09	0	750,000	NO	0	257,299	4,681	1,007,299	0	$1,007,299	HDR|CB Estimated Quantity
131	chanical Pip	- System - Main Steam (Alloy)	300.0	lf	Contr	Contr	3,000.00	14.4	54.96	4,315	1.09	0	900,000	NO	0	257,299	4,681	1,157,299	0	$1,157,299	HDR|CB Estimated Quantity
132	chanical Pip	- System - Low Pressure Steam Steam (Alloy)	400.0	lf	Contr	Contr	234.00	7.5	54.96	3,008	1.09	0	93,600	NO	0	179,381	3,264	272,981	0	$272,981	HDR|CB Estimated Quantity
133	chanical Pip	Pipe - Above Ground - Large Bore Average "	**26,250.0**	lf																	
134	chanical Pip	- System - Boilers, Vents and Drains	400.0	lf	Contr	Contr	300.00	4.14	54.96	1,654	1.09	0	120,000	NO	0	98,659	1,795	218,659	0	$218,659	HDR|CB Estimated Quantity
135	chanical Pip	- System - Aux steam drain returns	2,500.0	lf	Contr	Contr	30.00	1.22	54.96	3,055	1.09	0	75,000	NO	0	182,184	3,315	257,184	0	$257,184	HDR|CB Estimated Quantity
136	chanical Pip	- System - Building drains	1,200.0	lf	Contr	Contr	30.00	1.22	54.96	1,466	1.09	0	36,000	YES	2,160	87,448	1,591	123,448	0	$123,448	HDR|CB Estimated Quantity
137	chanical Pip	- System - Building fire protection	5,000.0	lf	Contr	Contr	18.00	1.50	54.96	7,520	1.09	0	90,000	YES	5,400	448,452	8,159	538,452	0	$538,452	HDR|CB Estimated Quantity
138	chanical Pip	- System - Building sump pumps	800.0	lf	Contr	Contr	47.00	1.55	54.96	1,241	1.09	0	37,600	YES	2,256	73,995	1,346	111,595	0	$111,595	HDR|CB Estimated Quantity
139	chanical Pip	- System - Circulating Water	1,000.0	lf	Contr	Contr	300.00	4.10	54.96	4,100	1.09	0	300,000	NO	0	244,502	4,449	544,502	0	$544,502	HDR|CB Estimated Quantity
140	chanical Pip	- System - Condensate	1,350.0	lf	Contr	Contr	150.00	2.35	54.96	3,173	1.09	0	202,500	NO	0	189,191	3,442	391,691	0	$391,691	HDR|CB Estimated Quantity
141	chanical Pip	- System - Condenser Air Extraction	300.0	lf	Contr	Contr	184.00	2.35	54.96	705	1.09	0	55,200	NO	0	42,042	765	97,242	0	$97,242	HDR|CB Estimated Quantity
142	chanical Pip	- System - Cooling water	600.0	lf	Contr	Contr	280.00	2.63	54.96	1,579	1.09	0	168,000	NO	0	94,175	1,713	262,175	0	$262,175	HDR|CB Estimated Quantity
143	chanical Pip	- System - Demineralized water	400.0	lf	Contr	Contr	27.00	0.39	54.96	154	1.09	0	10,800	NO	0	9,193	167	19,993	0	$19,993	HDR|CB Estimated Quantity
144	chanical Pip	- System - Fire Protection	300.0	lf	Contr	Contr	150.00	2.35	54.96	705	1.09	0	45,000	YES	2,700	42,042	765	87,042	0	$87,042	HDR|CB Estimated Quantity
145	chanical Pip	- System - Natural Gas High Pressure - SS	150.0	lf	Contr	Contr	52.40	0.85	54.96	127	1.09	0	7,860	YES	472	7,568	138	15,428	0	$15,428	HDR|CB Estimated Quantity
146	chanical Pip	- System - Potable water	1,000.0	lf	Contr	Contr	18.00	1.50	54.96	1,504	1.09	0	18,000	YES	1,080	89,690	1,632	107,690	0	$107,690	HDR|CB Estimated Quantity
147	chanical Pip	- System - Sanitary waste	3,000.0	lf	Contr	Contr	47.00	1.55	54.96	4,653	1.09	0	141,000	YES	8,460	277,480	5,049	418,480	0	$418,480	HDR|CB Estimated Quantity
148	chanical Pip	- System - Service Water	1,000.0	lf	Contr	Contr	184.00	1.97	54.96	1,974	1.09	0	184,000	YES	11,040	117,719	2,142	301,719	0	$301,719	HDR|CB Estimated Quantity
149	chanical Pip	- System - STG lube oil	200.0	lf	Contr	Contr	32.00	1.11	54.96	222	1.09	0	6,400	NO	0	13,239	241	19,639	0	$19,639	HDR|CB Estimated Quantity
150	chanical Pip	- System - STG oil purification	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
151	chanical Pip	- System - STG Seal Oil	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
152	chanical Pip	- System - STG Stator cooling	0.0	lf	Contr	Contr	32.00	1.11	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
153	chanical Pip	- System - STG Steam Seal	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
154	chanical Pip	- System - Turbine drains	690.0	lf	Contr	Contr	47.00	1.55	54.96	1,070	1.09	0	32,430	NO	0	63,820	1,161	96,250	0	$96,250	HDR|CB Estimated Quantity
155	chanical Pip	- System - HRSG Blowdown	100.0	lf	Contr	Contr	18.00	1.50	54.96	150	1.09	0	1,800	NO	0	8,969	163	10,769	0	$10,769	HDR|CB Estimated Quantity
156	chanical Pip	- System - Cycle Makeup	360.0	lf	Contr	Contr	47.00	1.55	54.96	558	1.09	0	16,920	NO	0	33,298	606	50,218	0	$50,218	HDR|CB Estimated Quantity
157	chanical Pip	- System - Miscellaneous Systems Piping CS)	5,000.0	lf	Contr	Contr	47.00	1.55	54.96	7,755	1.09	0	235,000	YES	14,100	462,466	8,414	697,466	0	$697,466	HDR|CB Estimated Quantity
158	chanical Pip	Pipe - Above Ground - Small Bore	**22,290.0**	lf																	
159	chanical Pip	- System - Water Cycle Sample - Alloy	150.0	lf	Contr	Contr	13.00	0.85	54.96	127	1.09	0	1,950	NO	0	7,568	138	9,518	0	$9,518	HDR|CB Estimated Quantity
160	chanical Pip	- System - STG lube oil	300.0	lf	Contr	Contr	11.60	0.62	54.96	186	1.09	0	3,480	NO	0	11,092	202	14,572	0	$14,572	HDR|CB Estimated Quantity
161	chanical Pip	- System - CT Auxilaries	900.0	lf	Contr	Contr	18.00	1.13	54.96	1,015	1.09	0	16,200	NO	0	60,541	1,101	76,741	0	$76,741	HDR|CB Estimated Quantity
162	chanical Pip	- System - Instrument Air	2,750.0	lf	Contr	Contr	8.00	0.14	54.96	388	1.09	0	22,000	NO	0	23,123	421	45,123	0	$45,123	HDR|CB Estimated Quantity
163	chanical Pip	- System - Instrument Air supply	2,500.0	lf	Contr	Contr	35.00	0.28	54.96	705	1.09	0	87,500	NO	0	42,042	765	129,542	0	$129,542	HDR|CB Estimated Quantity
164	chanical Pip	- System - Service Air piping	1,000.0	lf	Contr	Contr	12.00	0.22	54.96	216	1.09	0	12,000	YES	720	12,893	235	24,893	0	$24,893	HDR|CB Estimated Quantity
165	chanical Pip	- System - Instrument Air	1,800.0	lf	Contr	Contr	11.50	0.52	54.96	931	1.09	0	20,700	YES	1,242	55,496	1,010	76,196	0	$76,196	HDR|CB Estimated Quantity
166	chanical Pip	- System - Service Water	800.0	lf	Contr	Contr	20.00	1.32	54.96	1,053	1.09	0	16,000	YES	960	62,783	1,142	78,783	0	$78,783	HDR|CB Estimated Quantity
167	chanical Pip	- System - Cycle Chemical Feed	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
168	chanical Pip	- System - Boiler Vents & Drains - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
169	chanical Pip	- System - (HP) Main Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
170	chanical Pip	- System - (LP) Steam - Carbon	1,000.0	lf	Contr	Contr	18.00	1.13	54.96	1,128	1.09	0	18,000	YES	1,080	67,268	1,224	85,268	0	$85,268	HDR|CB Estimated Quantity
171	chanical Pip	- System - Hot Reheat Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
172	chanical Pip	- System - Cold Reheat Steam - Alloy	300.0	lf	Contr	Contr	20.00	1.32	54.96	395	1.09	0	6,000	YES	360	23,544	428	29,544	0	$29,544	HDR|CB Estimated Quantity
173	chanical Pip	- System - Cycle Makeup	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
174	chanical Pip	- System - Aux Steam - Carbon	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
175	chanical Pip	- System - STG Seals and Drains - Alloy	1,400.0	lf	Contr	Contr	20.00	1.32	54.96	1,842	1.09	0	28,000	YES	1,680	109,871	1,999	137,871	0	$137,871	HDR|CB Estimated Quantity
176	chanical Pip	- System - CT System - Carbon	120.0	lf	Contr	Contr	18.00	1.13	54.96	135	1.09	0	2,160	YES	130	8,072	147	10,232	0	$10,232	HDR|CB Estimated Quantity
177	chanical Pip	- System - Hydrogen - Carbon	350.0	lf	Contr	Contr	12.35	1.03	54.96	362	1.09	0	4,323	YES	259	21,582	393	25,904	0	$25,904	HDR|CB Estimated Quantity
178	chanical Pip	- System - Carbon Dioxide - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
179	chanical Pip	- System - Miscellaneous	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
180	chanical Pip	- System - Condensate - Carbon	400.0	lf	Contr	Contr	18.00	1.13	54.96	451	1.09	0	7,200	YES	432	26,907	490	34,107	0	$34,107	HDR|CB Estimated Quantity
181	chanical Pip	- System - Closed Cycle Cooling Water - Carbon	900.0	lf	Contr	Contr	12.35	1.03	54.96	931	1.09	0	11,115	YES	667	55,496	1,010	66,611	0	$66,611	HDR|CB Estimated Quantity
182	chanical Pip	- System - Fuel Gas - Carbon	500.0	lf	Contr	Contr	18.00	1.13	54.96	564	1.09	0	9,000	YES	540	33,634	612	42,634	0	$42,634	HDR|CB Estimated Quantity
183	chanical Pip	- System - Condensed Air Extraction - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
184	chanical Pip	- System - CW Chemical Feed - Carbon	20.0	lf	Contr	Contr	18.00	1.13	54.96	23	1.09	0	360	YES	22	1,345	24	1,705	0	$1,705	HDR|CB Estimated Quantity
185	chanical Pip	- System - Nitrogen Gas System	100.0	lf	Contr	Contr	19.00	0.19	54.96	19	1.09	0	1,900	YES	114	1,121	20	3,021	0	$3,021	HDR|CB Estimated Quantity
186	chanical Pip	- System - Waste Water Coll & Treatment - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
187	chanical Pip	- System - Chemical Waste Treatment	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
188	chanical Pip	- System - Miscellaneous Systems Piping	4,400.0	lf	Contr	Contr	12.35	1.03	54.96	4,550	1.09	0	54,340	YES	3,260	271,313	4,936	325,653	0	$325,653	HDR|CB Estimated Quantity
189	chanical Pip	Pipe - Below Ground - Large Bore	**20,275.0**	lf																	

Estimate Details

1 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

														CONSTRUCTION PROJECT TOTALS CONTRACTOR								
TE BASIS		ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																						
190		chanical Pip	- System - Hydrogen	470.0	lf	Contr	Contr	20.00	0.71	54.96	331	1.09	0	9,400	NO	0	19,760	360	29,160	0	$29,160	HDR|CB Estimated Quantity
191		chanical Pip	- System - Fuel Gas	400.0	lf	Contr	Contr	170.00	1.97	54.96	790	1.09	0	68,000	NO	0	47,087	857	115,087	0	$115,087	HDR|CB Estimated Quantity
192		chanical Pip	- System - Main Circ. - HDPE	300.0	lf	Contr	Contr	15.00	1.13	54.96	338	1.09	0	4,500	NO	0	20,180	367	24,680	0	$24,680	HDR|CB Estimated Quantity
192		chanical Pip	- System - Miscellaneous Systems Piping - HDPE	6,500.0	lf	Contr	Contr	15.00	1.13	54.96	7,332	1.09	0	97,500	NO	0	437,241	7,955	534,741	0	$534,741	HDR|CB Estimated Quantity
193		chanical Pip	- System - Waste Water Treatment Piping - HDPE (Sch 17)	2,565.0	lf	Contr	Contr	6.00	0.66	54.96	1,688	1.09	0	15,390	NO	0	100,649	1,831	116,039	0	$116,039	HDR|CB Estimated Quantity
193		chanical Pip	- System - Sanitary Sewer	3,000.0	lf	Contr	Contr	15.00	1.13	54.96	3,384	1.09	0	45,000	NO	0	201,803	3,672	246,803	0	$246,803	HDR|CB Estimated Quantity
194		chanical Pip	- System - Natural Gas Low Pressure - CS	500.0	lf	Contr	Contr	30.00	1.22	54.96	611	1.09	0	15,000	NO	0	36,437	663	51,437	0	$51,437	HDR|CB Estimated Quantity
195		chanical Pip	- System - Natural Gas High Pressure - CS	300.0	lf	Contr	Contr	30.00	1.22	54.96	367	1.09	0	9,000	NO	0	21,862	398	30,862	0	$30,862	HDR|CB Estimated Quantity
196		chanical Pip	- System - Potable Water to site facilities	500.0	lf	Contr	Contr	47.00	1.55	54.96	776	1.09	0	23,500	NO	0	46,247	841	69,747	0	$69,747	HDR|CB Estimated Quantity
197		chanical Pip	- System - Cooling tower blowdown	1,160.0	lf	Contr	Contr	115.00	1.69	54.96	1,963	1.09	0	133,400	NO	0	117,046	2,130	250,446	0	$250,446	HDR|CB Estimated Quantity
198		chanical Pip	- System - Cooling tower makeup water Pipe	1,000.0	lf	Contr	Contr	115.00	1.69	39.54	1,692	1.09	0	115,000	NO	0	72,583	1,836	187,583	0	$187,583	HDR|CB Estimated Quantity
199		chanical Pip	Pipe - Below Ground - Small Bore	**790.0**	lf																	
200		chanical Pip	- System - Miscellaneous Systems Piping	790.0	lf	Contr	Contr	12.35	1.03	54.96	817	1.09	0	9,757	NO	0	48,713	886	58,470	0	$58,470	HDR|CB Estimated Quantity
201		chanical Pip	Circulating water 72" RCP	2,000.0	lf	Contr	Contr	480.00	7.00	54.96	14,000	1.09	0	960,000	NO	0	834,884	15,190	1,794,884	0	$1,794,884	HDR|CB Estimated Quantity
202		chanical Pip	Piping Non Destructive Examination	1.0	lot	Sub	Contr	75,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	75,000	$75,000	HDR|CB Estimated Quantity
203		chanical Pip	Steam Blows	1.0	lot	Sub	Contr	150,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	150,000	$150,000	HDR|CB Estimated Quantity
204		chanical Pip	Stress relieving LB Alloy	50.0	ea	Contr	Contr	1,500.00	80.00	54.96	4,000	1.09	0	75,000	NO	0	238,538	4,340	313,538	0	$313,538	HDR|CB Estimated Quantity
205																						
206			**Division #4.1 - Mechanical Piping Sub-Total**	**71,325.0**	**LF**						116,815		0	6,672,387		61,426	6,937,875	126,744	13,610,261	225,000	$13,835,261	
207																						
208	**Division #4.2 - Mechanical Valves**																					
209																						
210		chanical Va	Valves - Large Bore General Service	375.0	ea	Contr	Contr	636.00	16.92	54.96	6,345	1.09	0	238,500	NO	0	378,381	6,884	616,881	0	$616,881	HDR|CB Estimated Quantity
211		chanical Va	Valves - Large Bore HP 900# to 3800#	50.0	ea	Contr	Contr	6,750.00	56.4	54.96	2,820	1.09	0	337,500	NO	0	168,169	3,060	505,669	0	$505,669	HDR|CB Estimated Quantity
212		chanical Va	Valves - Large Bore LP Circ Water	2.0	ea	Contr	Contr	197,500.00	112.8	54.96	226	1.09	0	395,000	NO	0	13,454	245	408,454	0	$408,454	HDR|CB Estimated Quantity
213		chanical Va	Valves - Small Bore - I/A supply	50.0	ea	Contr	Contr	17.50	1.88	54.96	94	1.09	0	875	NO	0	5,606	102	6,481	0	$6,481	HDR|CB Estimated Quantity
214		chanical Va	Valves - Small Bore - Instrument piping	375.0	ea	Contr	Contr	270.00	1.88	54.96	705	1.09	0	101,250	NO	0	42,042	765	143,292	0	$143,292	HDR|CB Estimated Quantity
215		chanical Va	Valves - Small Bore Bronze	30.0	ea	Contr	Contr	480.00	2.82	54.96	85	1.09	0	14,400	NO	0	5,045	92	19,445	0	$19,445	HDR|CB Estimated Quantity
216		chanical Va	Valves - Small Bore Class 800	175.0	ea	Contr	Contr	305.00	2.82	54.96	494	1.09	0	53,375	NO	0	29,430	535	82,805	0	$82,805	HDR|CB Estimated Quantity
217		chanical Va	Valves - Small Bore HP 1500# Alloy & CS	75.0	ea	Contr	Contr	670.00	15.04	54.96	1,128	1.09	0	50,250	NO	0	67,268	1,224	117,518	0	$117,518	HDR|CB Estimated Quantity
218		chanical Va	Valves - Small Bore HP 3800# Alloy	15.0	ea	Contr	Contr	3,050.00	22.56	54.96	338	1.09	0	45,750	NO	0	20,180	367	65,930	0	$65,930	HDR|CB Estimated Quantity
219		chanical Va	Valves - By Pass	1.0	ea	Contr	Contr	600,000.00	75.2	54.96	75	1.09	0	600,000	NO	0	4,485	82	604,485	0	$604,485	HDR|CB Estimated Quantity
220																						
221																						
222			**Division #4.2 - Mechanical Valves Sub-Total**	**1,148.0**	**ea**						12,309		$0	1,836,900		0	734,060	13,356	2,570,960	0	$2,570,960	
223																						
224	**Division #4.3 - Mechanical Insulation & Coatings**																					
225																						
226		Insulation	Insulation - BOP Equipment	11,200.0	sf	Contr	Contr	15.00	0.5	46.60	5,600	1.09	0	168,000	NO	0	283,123	6,076	451,123	0	$451,123	HDR|CB Estimated Quantity
227		Insulation	Insulation - Piping Freeze Protection	1,500.0	lf	Contr	Contr	3.50	0.2	46.60	300	1.09	0	5,250	NO	0	15,167	326	20,417	0	$20,417	HDR|CB Estimated Quantity
228		Insulation	Insulation - Piping Large Bore BOP	6,250.0	lf	Contr	Contr	15.00	0.5	46.60	3,125	1.09	0	93,750	NO	0	157,993	3,391	251,743	0	$251,743	HDR|CB Estimated Quantity
229		Insulation	Insulation - Piping Large Bore High Temp	1,720.0	lf	Contr	Contr	50.00	1.5	46.60	2,580	1.09	0	86,000	NO	0	130,439	2,799	216,439	0	$216,439	HDR|CB Estimated Quantity
230		Insulation	Insulation - Piping Small Bore	19,490.0	lf	Contr	Contr	8.00	0.23	46.60	4,483	1.09	0	155,920	NO	0	226,635	4,864	382,555	0	$382,555	HDR|CB Estimated Quantity
231																						
232																						
233			**Division #4.3 - Mechanical Insulation & Coatings Sub-Total**								16,088		0	508,920		0	813,357	17,455	1,322,277	0	$1,322,277	
234																						
235																						
236	**Division #4.4 - Mechanical Engineered Pipe Hangers (Including Supplemental Support Steel)**																					
237																						
238		hanical Pipe H	Hangers & Supports - (Large Bore Engineered)	90	ea	Contr	Contr	1,760.00	12.5	54.96	1,127	1.09	0	158,711	NO	0	67,220	1,223	225,931	0	$225,931	HDR|CB Estimated Quantity
239		hanical Pipe H	Hangers & Supports - (Large Bore Rigid)	1382	ea	Contr	Contr	192.50	7.1	54.96	9,809	1.09	0	265,954	NO	0	584,968	10,643	850,922	0	$850,922	HDR|CB Estimated Quantity
240		hanical Pipe H	Hangers & Supports - (Small Bore Rigid)	1592	ea	Contr	Contr	88.00	1.5	54.96	2,388	1.09	0	140,109	NO	0	142,420	2,591	282,529	0	$282,529	HDR|CB Estimated Quantity
241																						
242			**Division #4.4 - Mechanical Engineered Pipe Hangers Sub-Total**								13,325		0	564,773		0	794,609	14,457	1,359,382	0	$1,359,382	
243																						
244	**Division #4.5 - Mechanical Accessories**																					
245																						
246		nical Acces	Instr. Air Supply filter regulators	30.0	ea	Contr	Contr	132.00	2.4	54.96	72	1.09	0	3,960	NO	0	4,294	78	8,254	0	$8,254	HDR|CB Estimated Quantity
247		nical Acces	Expansion Joints - Circ Water	2.0	ea	Contr	Contr	75,000.00	210	54.96	420	1.09	0	150,000	NO	0	25,047	456	175,047	0	$175,047	HDR|CB Estimated Quantity
248		nical Acces	Miscellaneous Specialties	1.0	lot	Contr	Contr	75,000.00	600	54.96	600	1.09	0	75,000	NO	0	35,781	651	110,781	0	$110,781	HDR|CB Estimated Quantity
249		nical Acces	Miscellaneous Strainers, traps, Exp Joints	1.0	ls	Contr	Contr	125,000.00	120	54.96	120	1.09	0	125,000	NO	0	7,156	130	132,156	0	$132,156	HDR|CB Estimated Quantity
250		nical Acces	Miscellaneous Trolleys & Hoists	1.0	ls	Contr	Contr	150,000.00	480	54.96	480	1.09	0	150,000	NO	0	28,625	521	178,625	0	$178,625	HDR|CB Estimated Quantity
251																						
252			**Division #4.5 - Mechanical Accessories Sub-Total**								1,692		0	503,960		0	100,902	1,836	604,862	0	$604,862	
253																						
254			**Division #4 - Mechanical Piping**								**160,228**		**0**	**10,086,940**		**61,426**	**9,380,802**	**173,848**	**19,467,742**	**225,000**	**$19,692,742**	
255																						
256	**Division #5.0 - Mechanical Equipment**																					
257																						
258	**Division #5.1 - Boiler Equipment**																					
259																						
260		HRSG	Heat Recovery Steam Generator with Duct Burner/CO/Penthouse	1.0	ea	Contr	Contr	24,761,193.82		69.04	0	1.09	0	24,761,194	NO	0	0	0	24,761,194	0	$24,761,194	OEM Budget Proposal
261		HRSG	Steam Generator Erection	1.0	ea	Contr	Contr		66,500	69.04	66,500	1.09	0	0	NO	0	4,981,680	72,153	4,981,680	0	$4,981,680	HDR|CB Estimated cost
262																						
263			**Division #5.1 - Boiler Equipment Sub-Total**								**66,500**		**0**	**24,761,194**		**0**	**4,981,680**	**72,153**	**29,742,874**	**0**	**$29,742,874**	
264																						
265	**Division #5.2 - Turbine Equipment**																					
266																						
267		STG	Steam Turbine Generator	1.0	ea	Contr	Contr	28,500,000.00		53.33	0	1.09	0	28,500,000	NO	0	0	0	28,500,000	0	$28,500,000	Recent Vender quote
268		STG	Steam Turbine Generator, Erection	1.0	ea	Contr	Contr		20,000	53.33	20,000	1.09	0	0	NO	0	1,157,299	21,700	1,157,299	0	$1,157,299	HDR|CB Estimated cost
269																						
270			**Division #5.2 - Turbine Equipment Sub-Total**								**20,000**		**0**	**28,500,000**		**0**	**1,157,299**	**21,700**	**29,657,299**	**0**	**29,657,299**	
271																						
272	**Division #5.3 - Not Used**																					
273																						
274	**Division #5.4 - Mechanical Draft Cooling Tower**																					
275																						
276		Cooling Tw	Cooling Tower - Mechanical Draft (F&E)	1.0	ls	Sub	Contr	3,100,000.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	3,100,000	$3,100,000	Recent Vender quote
277																						
278			**Division #5.4 - Mechanical Draft Cooling Tower Sub-Total**								**0**		**0**	**0**		**0**	**0**	**0**	**0**	**3,100,000**	**3,100,000**	

Estimate Details

1 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS		ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																						
279																						
280	**Division #5.5 - Combustion Turbine Equipment**																					
281																						
282		CT	Combustion Turbine	1.0	ea	Contr	Contr	51,200,000.00		53.33	0	1.09	0	51,200,000	NO	0	0	0	51,200,000	0	$51,200,000	OEM Budget Proposal
283		CT	Combustion Turbine, Installation	1.0	ea	Contr	Contr		29,000	53.33	29,000	1.09	0	0	NO	0	1,678,083	31,465	1,678,083	0	$1,678,083	HDR|CB Estimated cost
284																						
285																						
286			**Division #5.4 - Combustion Turbine Equipment Sub-Total**								**29,000**		**0**	**51,200,000**		**0**	**1,678,083**	**31,465**	**52,878,083**	**0**	**52,878,083**	
287																						
288	**Division #5.6 - BOP Mechanical Equipment**																					
289																						
290		Equipment	Blowdown Tank	2.0	ea	Contr	Contr	16,600.00	20	54.96	40	1.09	0	33,200	NO	0	2,385	43	35,585	0	$35,585	HDR|CB Estimated cost
291		Equipment	Closed Cooling Water Exchanger	2.0	ea	Contr	Contr	600,000.00	200	54.96	400	1.09	0	1,200,000	NO	0	23,854	434	1,223,854	0	$1,223,854	HDR|CB Estimated cost
292		Equipment	Closed Cooling Water Inhibitor Mixing Pot	1.0	ea	Contr	Contr	3,000.00	8	54.96	8	1.09	0	3,000	NO	0	477	9	3,477	0	$3,477	HDR|CB Estimated cost
293		Equipment	Closed Cooling Water (CCW) Heat Exchanger Strainer (Shell & Tube)	2.0	ea	Contr	Contr	34,000.00	10	54.96	20	1.09	0	68,000	NO	0	1,193	22	69,193	0	$69,193	HDR|CB Estimated cost
294		Equipment	Instrument Air Receivers	2.0	ea	Contr	Contr	5,000.00	44	54.96	88	1.09	0	10,000	NO	0	5,248	95	15,248	0	$15,248	HDR|CB Estimated cost
295		Equipment	Main Condenser	1.0	ea	Contr	Contr	2,700,000.00	9000	65.52	9,000	1.09	0	2,700,000	NO	0	639,756	9,765	3,339,756	0	$3,339,756	Recent Vender quote
296		Equipment	Oil/Water Separator	1.0	ea	Contr	Contr	50,000.00	244	54.96	244	1.09	0	50,000	NO	0	14,551	265	64,551	0	$64,551	HDR|CB Estimated cost
297		Equipment	Plant Air Compressors	2.0	ea	Contr	Contr	140,000.00	100	54.96	200	1.09	0	280,000	NO	0	11,927	217	291,927	0	$291,927	HDR|CB Estimated cost
298		Equipment	Plant Air Dryers	2.0	ea	Contr	Contr	30,000.00	100	54.96	200	1.09	0	60,000	NO	0	11,927	217	71,927	0	$71,927	HDR|CB Estimated cost
299		Equipment	Plant Air Receivers	2.0	ea	Contr	Contr	5,000.00	20	54.96	40	1.09	0	10,000	NO	0	2,385	43	12,385	0	$12,385	HDR|CB Estimated cost
302		Equipment	Pumps - Circulating Water	2.0	ea	Contr	Contr	500,000.00	500	54.96	1,000	1.09	0	1,000,000	NO	0	59,635	1,085	1,059,635	0	$1,059,635	HDR|CB Estimated cost
303		Equipment	Pumps - Auxiliary Cooling Water	1.0	ea	Contr	Contr	120,000.00	96	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
304		Equipment	Pumps - Closed Cooling Water	2.0	ea	Contr	Contr	134,000.00	200	53.33	400	1.09	0	268,000	NO	0	23,146	434	291,146	0	$291,146	HDR|CB Estimated cost
306		Equipment	Pumps - Boiler Feed	1.0	ea	Contr	Contr	663,000.00	1200	53.33	1,200	1.09	0	663,000	NO	0	69,438	1,302	732,438	0	$732,438	HDR|CB Estimated cost
307		Equipment	Pumps - Condensate	2.0	ea	Contr	Contr	130,000.00	200	53.33	400	1.09	0	260,000	NO	0	23,146	434	283,146	0	$283,146	HDR|CB Estimated cost
308		Equipment	Pumps - Service water	2.0	ea	Contr	Contr	160,000.00	210	53.33	420	1.09	0	320,000	NO	0	24,303	456	344,303	0	$344,303	HDR|CB Estimated cost
309		Equipment	Pumps - Fire Water (Electric and Diesel)	0.0	lt	Contr	Contr	500,000.00	310	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
310		Equipment	Pumps - Sump - Blowdown, Waste Water	2.0	ea	Contr	Contr	30,000.00	24	53.33	48	1.09	0	60,000	NO	0	2,778	52	62,778	0	$62,778	HDR|CB Estimated cost
311		Equipment	Pumps - Sump - Power Island Misc Building Sumps	4.0	ea	Contr	Contr	30,000.00	24	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
314		Equipment	Pumps - Demin Water Transfer	2.0	ea	Contr	Contr	66,000.00	48	53.33	96	1.09	0	132,000	NO	0	5,555	104	137,555	0	$137,555	HDR|CB Estimated cost
318		Equipment	Pumps - Treated Water Transfer to Serv Water Tank	2.0	ea	Contr	Contr	40,000.00	80	53.33	160	1.09	0	80,000	NO	0	9,258	174	89,258	0	$89,258	HDR|CB Estimated cost
319		Equipment	Pumps - Waste Water	2.0	ea	Contr	Contr	80,000.00	125	53.33	250	1.09	0	160,000	NO	0	14,466	271	174,466	0	$174,466	HDR|CB Estimated cost
320		Equipment	Pumps - Evaporative Cooling Water	2.0	ea	Contr	Contr	37,000.00	80	53.33	160	1.09	0	74,000	NO	0	9,258	174	83,258	0	$83,258	HDR|CB Estimated cost
321		Equipment	Sample Analysis Panel (water)	2.0	ea	Contr	Contr	200,000.00	139	54.96	278	1.09	0	400,000	NO	0	16,578	302	416,578	0	$416,578	HDR|CB Estimated cost
322		Equipment	Tank - 200,000 gal treated water/service water - (F&E)	0.0	ea	Sub	Contr	540,000.00	0		0	1.09	0	0	yes	0	0	0	0	0	$0	Furnish and Erect price
323		Equipment	Tank - Demin Water Storage 200,000 gal. (F&E)	1.0	ea	Sub	Contr	600,000.00	0		0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	Furnish and Erect Price
324		Equipment	Tank - Turbine Drains	2.0	ea	Contr	Contr	75,000.00	200	53.33	400	1.09	0	150,000	NO	0	23,146	434	173,146	0	$173,146	HDR|CB Estimated cost
325		Equipment	Tank - Closed Cooling Water Dispersant 10,000 gal.	1.0	ea	Contr	Contr	36,500.00	100	54.96	100	1.09	0	36,500	NO	0	5,963	109	42,463	0	$42,463	HDR|CB Estimated cost
326		Equipment	Tank - Closed Cooling Water Accumulator	1.0	ea	Contr	Contr	20,600.00	44	54.96	44	1.09	0	20,600	NO	0	2,624	48	23,224	0	$23,224	HDR|CB Estimated cost
329		Equipment	Aqueous Ammonia System Unloading, Storage Tank, Forwarding Pum	0.0	ea	Contr	Contr	0.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
331		Equipment	Auxiliary Boiler System	1.0	ea	Contr	Contr	1,200,000.00	400	53.33	400	1.09	0	1,200,000	NO	0	23,146	434	1,223,146	0	$1,223,146	HDR|CB Estimated cost
332		Equipment	Compressed Gas Storage System (CO2)	1.0	ea	Contr	Contr	40,000.00	475	54.96	475	1.09	0	40,000	NO	0	28,326	515	68,326	0	$68,326	HDR|CB Estimated cost
333		Equipment	Compressed Gas Storage System (H2)	1.0	ea	Contr	Contr	40,000.00	198	54.96	198	1.09	0	40,000	NO	0	11,808	215	51,808	0	$51,808	HDR|CB Estimated cost
334		Equipment	Compressed Gas Storage System (N2)	2.0	ea	Contr	Contr	20,000.00	370	54.96	740	1.09	0	40,000	NO	0	44,130	803	84,130	0	$84,130	HDR|CB Estimated cost
335		Equipment	Demineralized Water Treatment System Dual 100% Trains	0.0	ea	Contr	Contr	800,000.00	3500	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
336		Equipment	Condensate Polisher and Related	1.0	ea	Contr	Contr	800,000.00	3000	54.96	3,000	1.09	0	800,000	NO	0	178,904	3,255	978,904	0	$978,904	HDR|CB Estimated cost
337		Equipment	Fuel Gas Filter Separators	1.0	ea	Contr	Contr	210,000.00	200	54.96	200	1.09	0	210,000	NO	0	11,927	217	221,927	0	$221,927	Sub Budgetary Quote
338		Equipment	Fuel Gas Performance Heater	1.0	ea	Contr	Contr	761,600.00	300	54.96	300	1.09	0	761,600	NO	0	17,890	326	779,490	0	$779,490	Sub Budgetary Quote
339		Equipment	Fuel Gas Electric Startup Heater	1.0	ea	Contr	Contr	84,000.00	40	54.96	40	1.09	0	84,000	NO	0	2,385	43	86,385	0	$86,385	HDR|CB Estimated cost
340		Equipment	Fuel Gas Drain Tank	1.0	ea	Contr	Contr	2,000.00	15	54.96	15	1.09	0	2,000	NO	0	895	16	2,895	0	$2,895	HDR|CB Estimated cost
341		Equipment	Fuel Gas Dewpoint Heater	1.0	ea	Contr	Contr	476,000.00	80	54.96	80	1.09	0	476,000	NO	0	4,771	87	480,771	0	$480,771	HDR|CB Estimated cost
342		Equipment	Fuel Gas Scrubber	1.0	ea	Contr	Contr	392,000.00	60	54.96	60	1.09	0	392,000	NO	0	3,578	65	395,578	0	$395,578	HDR|CB Estimated cost
343		Equipment	Hydrogen Generator	1.0	ea	Contr	Contr	194,000.00	40	54.96	40	1.09	0	194,000	NO	0	2,385	43	196,385	0	$196,385	HDR|CB Estimated cost
344		Equipment	Steam Silencers	1.0	ea	Contr	Contr	150,000.00	20	54.96	20	1.09	0	150,000	NO	0	1,193	22	151,193	0	$151,193	HDR|CB Estimated cost
345		Equipment	Condensate Water Strainer	1.0	ea	Contr	Contr	150,000.00	40	54.96	40	1.09	0	150,000	NO	0	2,385	43	152,385	0	$152,385	HDR|CB Estimated cost
346		Equipment	Cycle Chem Feed	1.0	ea	Contr	Contr	200,000.00	100	54.96	100	1.09	0	200,000	NO	0	5,963	109	205,963	0	$205,963	HDR|CB Estimated cost
347		Equipment	Cooling Tower Chemical Feed	1.0	ea	Contr	Contr	250,000.00	300	54.96	300	1.09	0	250,000	NO	0	17,890	326	267,890	0	$267,890	HDR|CB Estimated cost
348		Equipment	Condeser Vaccum Pump/Air Removal Equipment	1.0	ea	Contr	Contr	350,000.00	40	54.96	40	1.09	0	350,000	NO	0	2,385	43	352,385	0	$352,385	HDR|CB Estimated cost
349		Equipment	Turbine Room Bridge Crane - 60T	1.0	ea	Contr	Contr	390,000.00	120	53.33	120	1.09	0	390,000	NO	0	6,944	130	396,944	0	$396,944	HDR|CB Estimated cost
350		Equipment	Elevator for HRSG	1.0	ea	sub	contr	400,000.00	0		0	1.09	0	0	NO	0	0	0	0	400,000	$400,000	HDR|CB Estimated cost
351																						
352			**Division #5.6 BOP Mechanical Equipment Sub-Total**								**21,556**		**0**	**14,007,900**		**0**	**1,381,013**	**23,388**	**15,388,913**	**1,000,000**	**16,388,913**	
353																						
354	**Division #6.0 - Electrical Equipment**																					
355																						
356		Electrical	Eqpt - 24kv Bus Isolated Phase, 8000A	300.0	lf	Contr	Contr	750.00	16.75	50.09	5,025	1.09	0	225,000	NO	0	273,119	5,452	498,119	0	$498,119	HDR|CB Estimated cost
357		Electrical	Eqpt - 24kv Bus Isolated Phase, 5000A	300.0	lf	Contr	Contr	600.00	12	50.09	3,600	1.09	0	180,000	NO	0	195,667	3,906	375,667	0	$375,667	HDR|CB Estimated cost
358		Electrical	Eqpt - Bus 4.16kV non-seg	600.0	lf	Contr	Contr	400.00	4	50.09	2,400	1.09	0	240,000	NO	0	130,445	2,604	370,445	0	$370,445	HDR|CB Estimated cost
359		Electrical	Eqpt - Bus Duct 480V, 2500A	360.0	lf	Contr	Contr	610.00	3.2	50.09	1,152	1.09	0	219,600	NO	0	62,614	1,250	282,214	0	$282,214	HDR|CB Estimated cost
360		Electrical	Eqpt - Generator Breaker, 8000A, 24kV	2.0	ea	Contr	Contr	420,000.00	396	50.09	792	1.09	0	840,000	NO	0	43,047	859	883,047	0	$883,047	HDR|CB Estimated cost
361		Electrical	Eqpt - LV Switchgear - 480V, 4000A EO Main Ckt Bkr	6.0	ea	Contr	Contr	35,000.00	56	50.09	336	1.09	0	210,000	NO	0	18,262	365	228,262	0	$228,262	HDR|CB Estimated cost
362		Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Main Ckt Bkr.	2.0	ea	Contr	Contr	15,400.00	30	50.09	60	1.09	0	30,800	NO	0	3,261	65	34,061	0	$34,061	HDR|CB Estimated cost
363		Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Tie Ckt Bkr.	3.0	ea	Contr	Contr	15,400.00	30	50.09	90	1.09	0	46,200	NO	0	4,892	98	51,092	0	$51,092	HDR|CB Estimated cost
364		Electrical	Eqpt - LV Switchgear - 480V, 1200A EO Tie Ckt Bkr.	1.0	ea	Contr	Contr	10,780.00	26	50.09	26	1.09	0	10,780	NO	0	1,413	28	12,193	0	$12,193	HDR|CB Estimated cost
365		Electrical	Eqpt - LV Switchgear - 480V, 800A MO Fdr Ckt Bkr.	16.0	ea	Contr	Contr	4,575.00	22	50.09	352	1.09	0	73,200	NO	0	19,132	382	92,332	0	$92,332	HDR|CB Estimated cost
366		Electrical	Eqpt - LV Switchgear - 480V, 800A Equipped Space	6.0	ea	Contr	Contr	1,090.00	13.2	50.09	79	1.09	0	6,540	NO	0	4,305	86	10,845	0	$10,845	HDR|CB Estimated cost
367		Electrical	Eqpt - Motor Control Centers - 480V	16.0	ea	Contr	Contr	46,000.00	132	50.09	2,112	1.09	0	736,000	NO	0	114,792	2,292	850,792	0	$850,792	HDR|CB Estimated cost
368		Electrical	Eqpt - MV Switchgear - 4kV, 3000A Main Ckt Bkr.	2.00	ea	Contr	Contr	79,640.00	76	50.09	152	1.09	0	159,280	NO	0	8,262	165	167,542	0	$167,542	HDR|CB Estimated cost
369		Electrical	Eqpt - MV Switchgear - 4kV, 2000A Fdr Ckt Bkr.	3.00	ea	Contr	Contr	42,870.00	72	50.09	216	1.09	0	128,610	NO	0	11,740	234	140,350	0	$140,350	HDR|CB Estimated cost
370		Electrical	Eqpt - MV Switchgear - 4kV, 1200A Fdr Ckt Bkr.	20.00	ea	Contr	Contr	36,360.00	48	50.09	960	1.09	0	727,200	NO	0	52,178	1,042	779,378	0	$779,378	HDR|CB Estimated cost
371		Electrical	Eqpt - Relay panels and Metering	2.0	ea	Contr	Contr	34,500.00	120.00	50.09	240	1.09	0	69,000	NO	0	13,044	260	82,044	0	$82,044	HDR|CB Estimated cost
372		Electrical	Eqpt - Station Batteries 125 Volt DC	1.0	lot	Contr	Contr	165,140.00	635	50.09	635	1.09	0	165,140	NO	0	34,514	689	199,654	0	$199,654	HDR|CB Estimated cost
373		Electrical	Eqpt - Transformer GSU - 283 MVA, 18kV-345kV	1.0	ea	Contr	Contr	2,100,000.00	950	50.09	950	1.09	0	2,100,000	NO	0	51,634	1,031	2,151,634	0	$2,151,634	HDR|CB Estimated cost
374		Electrical	Eqpt - Transformer GSU - 142 MVA, 18kV-345kV	1.0	ea	Contr	Contr	1,500,000.00	950	50.09	950	1.09	0	1,500,000	NO	0	51,634	1,031	1,551,634	0	$1,551,634	HDR|CB Estimated cost
375		Electrical	Eqpt - Transformer UAT 20 MVA, 18kV/4.16kV	2.0	ea	Contr	Contr	800,000.00	650	50.09	1,300	1.09	0	1,600,000	NO	0	70,658	1,411	1,670,658	0	$1,670,658	HDR|CB Estimated cost
376		Electrical	Eqpt - Emergency Diesel Gnerator packaged 750kW	1.0	ea	Contr	Contr	200,000.00	100	50.09	100	1.09	0	200,000	NO	0	5,435	109	205,435	0	$205,435	HDR|CB Estimated cost
377		Electrical	Eqpt - UPS (120VAC)	1.0	ea	Contr	Contr	300,000.00	528	50.09	528	1.09	0	300,000	NO	0	28,698	573	328,698	0	$328,698	HDR|CB Estimated cost
378		Electrical	Eqpt - Transformer Aux Power 2.5/3.3MVA, 7kV-480V	6.0	ea	Contr	Contr	104,500.00	210	50.09	1,260	1.09	0	627,000	NO	0	68,484	1,367	695,484	0	$695,484	HDR|CB Estimated cost
379		Electrical	Eqpt - Lighting Transformers	8.0	ea	Contr	Contr	916.27	9.09	50.09	73	1.09	0	7,330	YES	440	3,953	79	11,283	0	$11,283	HDR|CB Estimated cost

Estimate Details

1 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS		DISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																						
380		Electrical	Eqpt - Panelboards 480/120 & 480/277/120	8.0	ea	Contr	Contr	1,200.00	40.00	50.09	320	1.09	0	9,600	YES	576	17,393	347	26,993	0	$26,993	HDR|CB Estimated cost
381		Electrical	Eqpt - Plant Network System	1.0	ea	Contr	Contr	100,000.00	300	50.09	300	1.09	0	100,000	YES	6,000	16,306	326	116,306	0	$116,306	HDR|CB Estimated cost
382		Electrical	Eqpt - Plant Security System	1.0	lot	Contr	Contr	250,000.00	1800	50.09	1,800	1.09	0	250,000	YES	15,000	97,834	1,953	347,834	0	$347,834	HDR|CB Estimated cost
383		Electrical	Eqpt - Plant Telephone System	1.0	ea	Contr	Contr	100,000.00	900	50.09	900	1.09	0	100,000	YES	6,000	48,917	977	148,917	0	$148,917	HDR|CB Estimated cost
384																						
385			**Division #6.0 - Electrical Equipment Sub-Total**								**26,708**		**0**	**10,861,280**		**28,016**	**1,451,631**	**28,978**	**12,312,911**	**0**	**12,312,911**	
386																						
387	**Division #6.1 - Electrical/Control Commodities**																					
388																						
389		Electrical	Grounding - Buried Ground Conductor	28,000.0	lf	Contr	Contr	4.79	0.054	50.09	1,512	1.09	0	134,120	NO	0	82,180	1,641	216,300	0	$216,300	HDR|CB Estimated Quantity & Cost
390		Electrical	Grounding - Above Ground Conductor	28,000.0	lf	Contr	Contr	4.79	0.054	50.09	1,512	1.09	0	134,120	NO	0	82,180	1,641	216,300	0	$216,300	HDR|CB Estimated Quantity & Cost
391		Electrical	Grounding - Ground Rods Copper	96.0	ea	Contr	Contr	22.95	1.74	50.09	167	1.09	0	2,204	NO	0	9,079	181	11,283	0	$11,283	HDR|CB Estimated Quantity & Cost
392		Electrical	Grounding - Exothermic Connections	2,200.0	ea	Contr	Contr	9.75	1.14	50.09	2,508	1.09	0	21,450	NO	0	136,315	2,721	157,765	0	$157,765	HDR|CB Estimated Quantity & Cost
393		Electrical	Grounding - Servit Post	1,000.0	ea	Contr	Contr	30.00	1	50.09	833	1.09	0	30,000	NO	0	45,263	904	75,263	0	$75,263	HDR|CB Estimated Quantity & Cost
394		Electrical	Conduit A/G 5" RGS	800.0	lf	Contr	Contr	58.00	1.00	50.09	800	1.09	0	46,400	NO	0	43,482	868	89,882	0	$89,882	HDR|CB Estimated Quantity & Cost
395		Electrical	Conduit A/G 2" ave RGS	60,000.0	lf	Contr	Contr	8.50	0.30	50.09	18,000	1.09	0	510,000	NO	0	978,337	19,530	1,488,337	0	$1,488,337	HDR|CB Estimated Quantity & Cost
396		Electrical	Conduit U/G - 4 x 6 PVC 5"	6,000.0	lf	Contr	Contr	240.00	2.00	50.09	12,000	1.09	0	1,440,000	NO	0	652,225	13,020	2,092,225	0	$2,092,225	HDR|CB Estimated Quantity & Cost
397		Electrical	Conduit U/G - 8 x 8 PVC 5"	700.0	lf	Contr	Contr	530.00	5.00	50.09	3,500	1.09	0	371,000	NO	0	190,232	3,798	561,232	0	$561,232	HDR|CB Estimated Quantity & Cost
398		Electrical	Cable Tray, Raceway 24" Aluminum	4,000.0	lf	Contr	Contr	17.00	0.84	50.09	3,360	1.09	0	68,000	NO	0	182,623	3,646	250,623	0	$250,623	HDR|CB Estimated Quantity & Cost
399		Electrical	Cable Tray, Raceway 36" Aluminum	1,650.0	lf	Contr	Contr	20.00	1.05	50.09	1,733	1.09	0	33,000	NO	0	94,165	1,880	127,165	0	$127,165	HDR|CB Estimated Quantity & Cost
400		Electrical	Cable - Overhead Conductor to Substation	1,000.0	lf	Contr	Contr	8.50	0.50	50.09	500	1.09	0	8,500	NO	0	27,176	543	35,676	0	$35,676	HDR|CB Estimated Quantity & Cost
401		Electrical	Cable - Medium Voltage (5kV 1C Cable)	60,000.0	lf	Contr	Contr	14.60	0.127	50.09	7,620	1.09	0	876,000	NO	0	414,163	8,268	1,290,163	0	$1,290,163	HDR|CB Estimated Quantity & Cost
402		Electrical	Cable Terminations - 5kV	96.0	ea	Contr	Contr	195.00	12.00	50.09	1,152	1.09	0	18,720	NO	0	62,614	1,250	81,334	0	$81,334	HDR|CB Estimated Quantity & Cost
403		Electrical	Cable 600V Power 1/c No. 2/0 ave size	120,000.0	lf	Contr	Contr	3.55	0.041	50.09	4,920	1.09	0	426,000	NO	0	267,412	5,338	693,412	0	$693,412	HDR|CB Estimated Quantity & Cost
404		Electrical	Wire 600V Power 3/c # 10 ave. size	185,000.0	lf	Contr	Contr	0.27	0.0185	50.09	3,423	1.09	0	49,950	NO	0	186,020	3,713	235,970	0	$235,970	HDR|CB Estimated Quantity & Cost
405		Electrical	Cable - Fiber Optic	16,500.0	lf	Contr	Contr	6.00	0.025	50.09	413	1.09	0	99,000	NO	0	22,420	448	121,420	0	$121,420	HDR|CB Estimated Quantity & Cost
406		Electrical	Cable - Permanent Telephone Line	1.0	ls	Contr	Contr	10,000.00	240.000	50.09	240	1.09	0	10,000	NO	0	13,044	260	23,044	0	$23,044	HDR|CB Estimated Quantity & Cost
407		Electrical	Cable - Control	500,000.0	lf	Contr	Contr	1.10	0.040	50.09	20,000	1.09	0	550,000	NO	0	1,087,041	21,700	1,637,041	0	$1,637,041	HDR|CB Estimated Quantity & Cost
408		Electrical	Cable - Instrument 4pr tw/shld No. 18	300,000.0	lf	Contr	Contr	3.25	0.025	50.09	7,500	1.09	0	975,000	NO	0	407,641	8,138	1,382,641	0	$1,382,641	HDR|CB Estimated Quantity & Cost
409		Electrical	Cable - Thermocouple 2pr tw/shld No. 16	10,000.0	lf	Contr	Contr	0.33	0.030	50.09	300	1.09	0	3,300	NO	0	16,306	326	19,606	0	$19,606	HDR|CB Estimated Quantity & Cost
410		Electrical	Cable - Data Highway	20,000.0	lf	Contr	Contr	4.59	0.034	50.09	688	1.09	0	91,800	NO	0	37,394	746	129,194	0	$129,194	HDR|CB Estimated Quantity & Cost
411		Electrical	Cable Terminations - low voltage	25,000.0	ea	Contr	Contr	0.85	0.300	50.09	7,500	1.09	0	21,250	NO	0	407,641	8,138	428,891	0	$428,891	HDR|CB Estimated Quantity & Cost
412		Electrical	Cable Terminations - control	25,000.0	ea	Contr	Contr	0.54	0.300	50.09	7,500	1.09	0	13,500	NO	0	407,641	8,138	421,141	0	$421,141	HDR|CB Estimated Quantity & Cost
413		Electrical	Cable Terminations - instrument	25,000.0	ea	Contr	Contr	0.54	0.300	50.09	7,500	1.09	0	13,500	NO	0	407,641	8,138	421,141	0	$421,141	HDR|CB Estimated Quantity & Cost
414		Electrical	Conduit - Lighting A/G	20,000.0	lf	Contr	Contr	2.83	0.25	50.09	5,000	1.09	0	56,600	YES	3,396	271,760	5,425	328,360	0	$328,360	HDR|CB Estimated Quantity & Cost
415		Electrical	Wire - Lighting 1/C No 12	60,000.0	lf	Contr	Contr	0.176	0.018	50.09	1,080	1.09	0	10,560	YES	634	58,700	1,172	69,260	0	$69,260	HDR|CB Estimated Quantity & Cost
416		Electrical	Lighting - Outdoor Fixtures, pole	24.0	ea	Contr	Contr	1,600.00	12.00	50.09	288	1.09	0	38,400	YES	2,304	15,653	312	54,053	0	$54,053	HDR|CB Estimated Quantity & Cost
417		Electrical	Lighting - Outdoor Fixtures, 150W	200.0	ea	Contr	Contr	490.00	4.00	50.09	800	1.09	0	98,000	NO	0	43,482	868	141,482	0	$141,482	HDR|CB Estimated Quantity & Cost
418		Electrical	Lighting - Fixtures, 250W MH	80.0	ea	Contr	Contr	850.00	3.00	50.09	240	1.09	0	68,000	NO	0	13,044	260	81,044	0	$81,044	HDR|CB Estimated Quantity & Cost
419		Electrical	Lighting - Fixtures, fluorescent	180.0	ea	Contr	Contr	85.00	1.60	50.09	288	1.09	0	15,300	YES	918	15,653	312	30,953	0	$30,953	HDR|CB Estimated Quantity & Cost
420		Electrical	Lighting - Receptacles and switches	150.0	ea	Contr	Contr	32.00	1.37	50.09	205	1.09	0	4,800	YES	288	11,148	223	15,948	0	$15,948	HDR|CB Estimated Quantity & Cost
421		Electrical	Welding Receptacles	16.0	ea	Contr	Contr	1,800.00	4.00	50.09	64	1.09	0	28,800	NO	0	3,479	69	32,279	0	$32,279	HDR|CB Estimated Quantity & Cost
422		Electrical	Lighting - Exit	48.0	ea	Contr	Contr	150.00	2.00	50.09	96	1.09	0	7,200	YES	432	5,218	104	12,418	0	$12,418	HDR|CB Estimated Quantity & Cost
423		Electrical	Lighting - Emergency	100.0	ea	Contr	Contr	127.00	2.00	50.09	200	1.09	0	12,700	YES	762	10,870	217	23,570	0	$23,570	HDR|CB Estimated Quantity & Cost
424		Electrical	Cathodic Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
425		Electrical	Lightning Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
426		Electrical	Freeze Protection System	1.0	lot	Contr	Contr	400,000.00	2000	50.09	2,000	1.09	0	400,000	YES	24,000	108,704	2,170	508,704	0	$508,704	HDR|CB Estimated Quantity & Cost
427		Electrical	Electrical Circuit Testing	4,850.0	ea	Contr	Contr		2	50.09	9,700	1.09	0	0	NO	0	527,216	10,525	527,216	0	$527,216	HDR|CB Estimated Quantity & Cost
428			**Total Cable**	**1,212,501.0**	**LF**																	
429																						
430			**Division #6.1 - Electrical/Control Commodities Sub-Total**								**136,100**		**0**	**6,887,174**		**44,734**	**7,397,341**	**147,669**	**14,284,514**	**0**	**14,284,514**	
431																						
432	**Division #6.2 - Switchyard**																					
433																						
434		HV Electrica	138kV Dead End Towers 6 Legged (2 total)	100,000.0	lb	Contr	Contr	2.50	0.02	60.25	2,180	1.09	0	250,000	NO	0	142,500	2,365	392,500		$392,500	HDR|CB Estimated Quantity & Cost
435		HV Electrica	Interonnection Cabling and Termination Allowance	1.0	lot	Contr	Contr	15,000.00	1,526.36	51.33	1,526	1.09	0	15,000	NO	0	85,000	1,656	100,000		$100,000	HDR|CB Estimated Quantity & Cost
436																						
437			**Division #6.2 - Switchyard**								**3,706**		**0**	**$265,000**		**0**	**$227,500**	**$4,021**	**$492,500**	**$0**	**$492,500**	
438																						
439	**Division #7.0 - Instrumentation & Control**																					
440																						
441		I & C	BOP Instrument Devices	900.0	ea	Contr	Contr	750.00	12	50.09	10,800	1.09	0	675,000	NO	0	587,002	11,718	1,262,002	0	$1,262,002	HDR|CB Estimated Quantity & Cost
442		I & C	Auxiliary Boiler CEMS	1.0	lot	Contr	Contr	163,200.00	200	50.09	200	1.09	0	163,200	NO	0	10,870	217	174,070	0	$174,070	HDR|CB Estimated Quantity & Cost
443		I & C	Continuous Emissions Monitoring Equipment (CEMS)	1.0	ea	Contr	Contr	700,000.00	2000	53.33	2,000	1.09	0	700,000	NO	0	115,730	2,170	815,730	0	$815,730	HDR|CB Estimated Quantity & Cost
444		I & C	Control Valves	180.0	ea	Contr	Contr	4,000.00	24	54.96	4,320	1.09	0	720,000	NO	0	257,621	4,687	977,621	0	$977,621	HDR|CB Estimated Quantity & Cost
445		I & C	DCS w/ Configuration, Interfaces, Field Support, Interface, Bulks	1.0	ea	Contr	Contr	1,300,000.00	1691	50.09	1,691	1.09	0	1,300,000	NO	0	91,909	1,835	1,391,909	0	$1,391,909	HDR|CB Estimated Quantity & Cost
446		I & C	Emergency Trip sub Panel	1.0	ea	Contr	Contr	30,000.00	21	50.09	21	1.09	0	30,000	NO	0	1,141	23	31,141	0	$31,141	HDR|CB Estimated Quantity & Cost
447		I & C	Flow Element - Nozzle (Supply)	3.0	ea	Contr	Contr	30,000.00	20	54.96	60	1.09	0	90,000	NO	0	3,578	65	93,578	0	$93,578	HDR|CB Estimated Quantity & Cost
448		I & C	Instrument Calibration and loop check	1,200.0	ea	Contr	Contr	0.00	3	50.09	3,600	1.09	0	0	NO	0	195,667	3,906	195,667	0	$195,667	HDR|CB Estimated Quantity & Cost
449		I & C	Instrument piping 2&3-valve manifolds	240.0	ea	Contr	Contr	400.00	5.22	54.96	1,252	1.09	0	96,000	NO	0	74,646	1,358	170,646	0	$170,646	HDR|CB Estimated Quantity & Cost
450		I & C	Instrument Racks & Enclosures	1.0	lot	Contr	Contr	350,000.00	1450	50.09	1,450	1.09	0	350,000	NO	0	78,811	1,573	428,811	0	$428,811	HDR|CB Estimated Quantity & Cost
451		I & C	Instrument Tubing - copper	4,000.0	lf	Contr	Contr	3.70	0.15	54.96	600	1.09	0	14,800	NO	0	35,781	651	50,581	0	$50,581	HDR|CB Estimated Quantity & Cost
452		I & C	Instrument Tubing - Stainless Steel	1,600.0	lf	Contr	Contr	6.25	0.20	54.96	320	1.09	0	10,000	NO	0	19,083	347	29,083	0	$29,083	HDR|CB Estimated Quantity & Cost
453		I & C	PLC Hardware, Bulks, Aux Controls, Configuration	1.0	ls	Contr	Contr	241,200.00	253	50.09	253	1.09	0	241,200	NO	0	13,751	275	254,951	0	$254,951	HDR|CB Estimated Quantity & Cost
454																						
455			**Division #7.0 - Control Sub-Total**								**26,567**		**0**	**4,390,200**		**0**	**1,485,591**	**28,825**	**5,875,791**	**0**	**$5,875,791**	
456																						
457			**Sub-Total Direct Costs**								**627,155**		**0**	**160,252,797**	**0**		**35,519,175**	**679,975**	**195,771,972**	**18,347,900**	**214,119,872**	
458			Sales Tax - State (Plant Production Equipment is Exempt)	6.00%												**329,927**				**329,927**	**329,927**	Sales Tax Included for Non-Production Facilities
459		Indirects																				
460			**TOTAL DIRECT COSTS**								**627,155**		**0**	**160,252,797**			**35,519,175**	**679,975**	**195,771,972**	**18,677,827**	**$214,449,800**	
461																						
462	**Division #8.0 - Construction and Indirect Services**																					
463																						
464	Const Indirec		Construction Equipment	1.0	ls	Contr	Contr	11,145,203			0	1.09					0	0	0	11,145,203	$11,145,203	See Construction Equipment worksheet
465	Const Indirec		Construction Field staff	1.0	ls	Contr	Contr	11,522,855			0	1.09					0	0	0	11,522,855	$11,522,855	See EPC Field Staff Worksheet for details
466	Const Indirec		Construction Field staff expenses	1.0	ls	Contr	Contr	1,870,168			0	1.09					0	0	0	1,870,168	$1,870,168	See EPC Field Staff Worksheet for details
467	Const Indirec		Construction Permits	1.0	ls	Contr	Contr				0	1.09		51,450			0	0	51,450	0	$51,450	See Const Indirects and Serv Worksheet

Estimate Details

1 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
Line #																					
468	Const Indirec	Construction Testing	1.0	ls	Contr	Contr				0	1.09		117,000			0	0	117,000	0	$117,000	See Const Indirects and Serv Worksheet
469	Const Indirec	Consumable Materials & Safety Supplies	2.00	$/MH	Contr	Contr	1,359,951			0	1.09					0	0	0	1,359,951	$1,359,951	$2.00/Direct hour
470	Const Indirec	Field Office Expenses	1.0	ls	Contr	Contr				1,369	1.09		1,033,370			65,849	1,485	1,099,219	22,373	$1,121,592	See Const Indirects and Serv Worksheet
471	Const Indirec	Performance Testing	1.0	ls	Contr	Contr				0	1.09		304,400			0	0	304,400	0	$304,400	See Const Indirects and Serv Worksheet
472	Const Indirec	Preoperational Testing, Startup & Commissioning	2.0	ls	Contr	Contr				21,690	1.09		1,113,000			752,767	23,534	1,865,767	0	$1,865,767	See Const Indirects and Serv Worksheet
473	Const Indirec	Site Safety	1.0	ls	Contr	Contr				7,580	1.09		658,040			375,008	8,224	1,033,048	0	$1,033,048	See Const Indirects and Serv Worksheet
474	Const Indirec	Small Tools	2.00	$/MH	Contr	Contr	1,359,951			0	1.09					0	0	0	1,359,951	$1,359,951	$2.00/Direct hour
475	Const Indirec	Start-up Supervision	1.0	ls	Contr	Contr	1,296,911			0	1.09					0	0	0	1,296,911	$1,296,911	See EPC Field Staff Worksheet for details
476	Const Indirec	Support Craft, Site Services, Scaffolding	1.0	ls	Contr	Contr				41,753	1.09		459,400			2,008,704	45,302	2,468,104	775,014	$3,243,118	See Const Indirects and Serv Worksheet
477	Const Indirec	Temporary Facilities	1.0	ls	Contr	Contr				17,947	1.09		2,336,753			863,403	19,472	3,200,157	82,500	$3,282,657	See Const Indirects and Serv Worksheet
478	Const Indirec	Temporary Utilities	1.0	ls	Contr	Contr				29,032	1.09		747,600			1,396,697	31,500	2,144,297	0	$2,144,297	See Const Indirects and Serv Worksheet
479																					
480		**Division #8.0 - Construction Indirects and Services Sub-Total**								**119,371**		**0**	**6,821,013**			**5,462,428**	**129,518**	**12,283,441**	**29,434,926**	**$41,718,368**	
481																					
482		**SUB-TOTAL CONSTRUCTION COST**								**746,526**		**0**	**167,073,811**			**40,981,603**	**809,493**	**208,055,414**	**48,112,753**	**256,168,167**	
483		**Subcontract Labor Hours**																			
484		**Material Cost Excluding CT, HRSG and ST (escalation and EPC (**											**62,612,617**								
485	**Division #9.0 - Project Indirects**																				
486																					
487	Project Indire	- Power Plant Design Engineering	1.0	ls	Contr	6.0%	15,370,090											0	15,370,090	$15,370,090	6.0% of the Total Construction Cost
488	Project Indire	- Project Management (Home Office)	0.0	ls	Contr	0.0%	0											0	0	$0	Included in Engineering
489																					
490																					
491		Sub-Total Project Indirects										**0**	**0**			**0**	**0**	**0**	**15,370,090**	**$15,370,090**	
492																					
493	EPC Indirect	EPC Contractor Insurance & Misc Costs (% of Total Const. Cost)																			
494																					
495	EPC Indirect	- Builders Risk Insurance	1.0	ls	Contr	0.50%	1,280,841												1,280,841	$1,280,841	Allowance based on info from other projects
496	EPC Indirect	- Comprehensive General Liability (CGL) Insurance	1.0	ls	Contr	0.50%	1,280,841											0	1,280,841	$1,280,841	Allowance based on info from other projects
497	EPC Indirect	- Warranty Reserve	1.0	ls	Contr		500,000											0	500,000	$500,000	Allowance based on info from other projects
498																					
499		Sub-Total EPC Contractor Indirects										**0**	**0**			**0**	**0**	**0**	**3,061,682**	**$3,061,682**	
500																					
501		**Total Project Indirects**										**0**	**0**			**0**	**0**	**0**	**18,431,772**	**18,431,772**	
502																					
503		Sub-Total										**0**	**167,073,811**			**40,981,603**	**809,493**	**208,055,414**	**66,544,525**	**$274,599,939**	
504							Equipment	Material	Labor	S/C											
505	Project Indire	Escalation - EPC Contractor Escalation Rates					2.4%	2.4%	4.0%	4.0%			5,356,444			6,630,172	0	11,986,617	8,409,302	20,395,918	Excludes CT, HRSG and ST
506																					
507		Sub-Total										**0**	**172,430,255**			**47,611,776**	**809,493**	**220,042,031**	**74,953,827**	**$294,995,857**	
508							Equip	Mat	Labor	S/C											
509	EPC Indirect	EPC Contractor Contingency	Varies	%	Contr		0%	5%	5%	5%		0	3,130,631			2,380,589		5,511,220	3,562,691	9,073,911	Excludes CT, HRSG and ST
510	EPC Indirect	EPC Contractor G&A and Fee	8.0%	%	Contr		0.0%	8.0%	8.0%	8.0%		0	13,794,420			3,808,942		17,603,362	5,996,306	23,599,669	
511																					
512		Sub-Total		ls								0	16,925,051			6,189,531	0	23,114,582	9,558,997	$32,673,580	
513																					
514		**TOTAL EPC PROJECT COST**								**746,526**		**0**	**189,355,306**			**53,801,307**	**809,493**	**243,156,613**	**84,512,824**	**$327,669,437**	
515																					
516	**OWNER INDIRECTS**																				
517	**Division #9.1 - Owner Indirects**																				
518																					
519		**Power Block 1 and Common**																			
520	Owner Indire	Project Development	1.0	ls	Owner														6,500,000	$6,500,000	Budget provided by LG&E
521	Owner Indire	Transmission Line Relocation	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
522	Owner Indire	Transmission Interconnection Facilities	1.0	ls	Owner														5,500,000	$5,500,000	To be estimated by Transmision Operator
523	Owner Indire	Natural Gas Pipeline Interconnection	1.0	ls	Owner														14,250,000	$14,250,000	Budget provided by LG&E
524	Owner Indire	Natural Gas Pipeline Fixed O&M (Startup Period)	1.0	ls	Owner														3,000,000	$3,000,000	Budget provided by LG&E
525	Owner Indire	Construction Power (Service Installation and Energy)	1.0	ls	Owner														750,000	$750,000	Budget estimated by HDR|CB
526	Owner Indire	Owner Operations Personnel (Prior to COD)	1.0	ls	Owner														2,340,000	$2,340,000	Budget estimated by HDR|CB 7 sal @ 12 mo, 26 hr @ 6 m
527	Owner Indire	Owners Project Management	1.0	ls	Owner														5,300,000	$5,300,000	Budget provided by LG&E
528	Owner Indire	Owners Engineer	1.0	ls	Owner														1,700,000	$1,700,000	Budget provided by LG&E
529	Owner Indire	Owners Legal Counsel	1.0	ls	Owner														1,300,000	$1,300,000	Budget provided by LG&E
530	Owner Indire	Operator Training	1.0	ls	Owner														225,000	$225,000	Budget estimated by HDR|CB
531	Owner Indire	Owner Startup Engineering	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
532	Owner Indire	Permitting, License Fees, & Environmental Compliance	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
533	Owner Indire	Highway Improvements, Miscellaneous Mitigation	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
534	Owner Indire	Land	1.0	ls	Owner														0	$0	Budget provided by LG&E
535	Owner Indire	Rolling Stock	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
536	Owner Indire	Water Infrastructure / Supply to Site	0.0	ls	Owner														0	$0	N/A (On site intake/pre-treatment/discharge incl. in EPC)
537	Owner Indire	Startup Testing (Includes Fuel & Power Sales)																			
538	Owner Indire	- Fuel - Natural Gas	1.0	ls	Owner														6,080,400	$6,080,400	HDR|CB [1,351,200 MMBTU @ $4.50/MMBTU per LG&E 2017 Forecast]
539	Owner Indire	- Fuel - Fuel Oil	0.0	ls	Owner														0	$0	Budget estimated by HDR|CB [Not Required]
540	Owner Indire	- Electric Transmission Firm Point to Point	1.0	ls	Owner														2,000,000	$2,000,000	Budget provided by LG&E
541	Owner Indire	- Startup Power	1.0	ls	Owner														195,552	$195,552	Budget estimated by HDR|CB [5432 MWhr @$36/MWH]
542	Owner Indire	- Test Power Sales	1.0	ls	Owner														(7,776,000)	($7,776,000)	Budget estimated by HDR|CB [216,000 MWhr @$36/MWH]
543	Owner Indire	- Variable O&M - Water, Chemicals, etc.	1.0	ls	Owner														800,000	$800,000	Budget estimated by HDR|CB
544	Owner Indire	Site Security	1.0	ls	Owner														50,000	$50,000	Budget estimated by HDR|CB
545	Owner Indire	Operating Spare Parts	1.0	ls	Owner														10,000,000	$10,000,000	Budget estimated by HDR|CB - Does NOT incl. CT LTSA
546	Owner Indire	Permanent Plant Equipment & Furnishings																		$0	
547	Owner Indire	- Office Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
548	Owner Indire	- Kitchen Furniture	1.0	ls	Owner														130,000	$130,000	Budget estimated by HDR|CB
549	Owner Indire	- Laboratory Equipment & Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
550	Owner Indire	- Locker Room Furniture	1.0	ls	Owner														180,000	$180,000	Budget estimated by HDR|CB
551	Owner Indire	- Warehouse Shelves	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
552	Owner Indire	- Workshop Tools & Test Equipment	1.0	ls	Owner														1,800,000	$1,800,000	Budget estimated by HDR|CB
553	Owner Indire	IT and Telecommunication Infrastructure	1.0	ls	Owner														250,000	$250,000	Budget estimated by HDR|CB
554	Owner Indire	NERC - Cyber Security	1.0	ls	Owner														1,000,000	$1,000,000	Budget estimated by HDR|CB
555	Owner Indire	Escalation - Owners Furnished Equipment	0.0	%	Owner														0	$0	N/A
556	Owner Indire	Builders Risk Insurance	0.0	ls	Owner														0	$0	Included with EPC Contractor Indirects
557	Owner Indire	Property Tax During Construction	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
558	Owner Indire	Financing Fees	0.0	ls	Owner														0	$0	N/A

Estimate Details

1 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
E BASIS	**ISCIPLIN**	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
Line #																					
559	Owner Indire	AFUDC	1.0	ls	Owner														4,000,000	$4,000,000	AFUDC Based on 78% KU Ownership
560		**Total Owner Indirects**																	**63,774,952**	**$63,774,952**	
561																					
562																					
563		**Owner Contingency**	10.00%	%	Owner														**32,766,944**	**$32,766,944**	
564																					
565																					
566		**Total Owner Indirects**																	**96,541,896**	**$96,541,896**	
567																					
568		**TOTAL PROJECT COST**										**0**	**189,355,306**			**53,801,307**	**809,493**	**243,156,613**	**181,054,720**	**$424,211,333**	
																			$/kW	**$1,421**	

1 x 1 Siemens F Class Combined Cycle Unit

BUDGET ESTIMATE

5 x 10 Work Week

February 22, 2013

Rev 3

CONFIDENTIAL

1 x 1 Siemens F Class Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 332
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
Site Development	$0	$1,615,475	$1,394,611	33,400	224,000	$3,234,086	1.0%
Raw Water Intake/Discharge Facilities	$0	$500,000	$578,649	10,850	0	$1,078,649	0.3%
Foundations & Concrete	$0	$3,559,575	$2,705,186	69,911	8,432,500	$14,697,261	4.6%
Architectural & Metals	$0	$3,618,060	$1,699,789	33,768	5,366,400	$10,684,249	3.3%
Piping, Valves, Support, Accessories	$0	$10,086,940	$9,380,802	173,848	225,000	$19,692,742	6.2%
HRSG Equipment	$0	$24,761,194	$4,981,680	72,153	0	$29,742,874	9.3%
Steam Turbine Island Equipment	$0	$19,545,406	$1,157,299	21,700	0	$20,702,705	6.5%
Combustion Turbine Equipment	$0	$53,461,668	$1,678,083	31,465	0	$55,139,751	17.3%
Mechanical Draft Cooling Tower	$0	$0	$0	0	3,100,000	$3,100,000	1.0%
BOP Mechanical Equipment	$0	$13,813,900	$1,378,628	23,345	1,000,000	$16,192,528	5.1%
Electrical Equipment	$0	$10,861,280	$1,451,631	28,978	0	$12,312,911	3.9%
Electrical Commodities	$0	$6,887,174	$7,397,341	147,669	0	$14,284,514	4.5%
High Voltage Switchyard	$0	$265,000	$227,500	4,021	0	$492,500	0.2%
Instrumentation & Controls	$0	$4,390,200	$1,485,591	28,825	0	$5,875,791	1.8%
Sub-Total Direct Costs:	$0	$153,365,872	$35,516,790	679,932	$18,347,900	$207,230,562	64.8%
State Sales Tax (Non-Production Material Only)					329,927	$329,927	0.1%
Total Direct Cost	$0	$153,365,872	$35,516,790	679,932	$18,677,827	$207,560,489	64.9%
Construction Indirects & Services							
- Construction Field Staff			$0	0	$11,522,855	$11,522,855	3.6%
- Construction Field Staff Expenses			$0	0	$1,870,168	$1,870,168	0.6%
- Construction Equipment			$0	0	$11,145,203	$11,145,203	3.5%
- Small Tools			$0	0	$1,359,864	$1,359,864	0.4%
- Consumable Materials & Safety Supplies			$0	0	$1,359,864	$1,359,864	0.4%
- Field Office Expense		$1,033,370	$65,849	1,485	$22,373	$1,121,592	0.4%
- Temporary Facilities		$2,336,753	$863,403	19,472	$82,500	$3,282,657	1.0%
- Temporary Utilities		$747,600	$1,396,697	31,500	$0	$2,144,297	0.7%
- Support Craft & Site Services		$459,400	$2,008,704	45,302	$775,014	$3,243,118	1.0%
- Site Safety		$658,040	$375,008	8,224	$0	$1,033,048	0.3%
- Construction Permits		$51,450	$0	0	$0	$51,450	0.0%
- Construction Testing		$117,000	$0	0	$0	$117,000	0.0%
- Performance Testing		$304,400	$0	0	$0	$304,400	0.1%
- Start-up Supervision		$0	$0	0	$1,296,911	$1,296,911	0.4%
- Preop Testing, Start-up		$1,113,000	$752,767	23,534	$0	$1,865,767	0.6%
Sub-Total Construction Indirects and Services		$6,821,013	$5,462,428	129,518	$29,434,753	$41,718,194	13.1%
Total Construction Cost	$0	$160,186,885	$40,979,218	809,450	$48,112,580	$249,278,683	78.0%
Estimated Subcontract Labor Hours				144,852			
Project Indirects							
- Project Engineering (Eng, PM, CM & Procurement)					$14,956,721	$14,956,721	4.7%
Sub-Total Project Indirects	$0	$0	$0	0	$14,956,721	$14,956,721	4.7%
EPC Contractor Insurance & Misc Costs							
- Builders Risk					$1,246,393	$1,246,393	0.4%
- Comprehensive General Liability (CGL) Insurance					$1,246,393	$1,246,393	0.4%

1 x 1 Siemens F Class Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 332
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
- Warranty Reserve					**$500,000**	**$500,000**	**0.2%**
Sub-Total EPC Contractor Insur. & Misc. Co	**$0**	**$0**	**$0**	**0**	**$2,992,787**	**$2,992,787**	**0.9%**
Total EPC Contractor Project Indirect Cost	**$0**	**$0**	**$0**	**0**	**$17,949,508**	**$17,949,508**	**5.6%**
- Escalation (Eqt, Materials & Labor)	**$0**	**$5,346,150**	**$6,629,822**		**$8,374,313**	**$20,350,285**	**6.4%**
Sub-Total	**0**	**165,533,035**	**47,609,040**	**954,301**	**74,436,401**	**287,578,475**	**90.0%**
- EPC Contractor Contingency	**$0**	**$3,120,931**	**$2,380,452**		**$3,536,820**	**$9,038,203**	**2.8%**
- EPC Contractor G&A and Profit	**$0**	**$13,242,643**	**$3,808,723**		**$5,954,912**	**$23,006,278**	**7.2%**
TOTAL EPC PROJECT COST	**$0**	**$181,896,608**	**$53,798,215**	**954,301**	**$83,928,133**	**$319,622,956**	**100.0%**
EPC Price per kW						**$963**	
Owner Indirect Costs							
- Total Owner Indirects						**$63,774,952**	
- Owner Contingency						**$31,962,296**	
TOTAL PROJECT COST						**$415,360,204**	
Total Project Cost per kW						**$1,251**	
Estimate Options (include 25 % markup for indirects)							
Fuel Oil System						**$5,625,000**	
Bypass Stack and Diverter Damper						**$6,250,000**	
Gas Compression						**Included in Base**	
SCR System to meet 12 ppm NOx						**Not Required**	
Optional SCR System						**$2,500,000**	

Total Craft Labor Hours	**954,301**	**erformance Guarantees:**		**Executive-in-Charge:**	**WHD**
Ave. Craft Wage without Escalation	**$51.75**	**Liquidated Damages:**		**Project Manager:**	**JPS**
Field Labor Type	**TBD**	**Special Insurance:**		**Construction Manager:**	**SMP**
Labor Productivity Factor	**1.084**	**Performance Bond:**		**Lead Estimator:**	**CDF**

Estimate Details

1 x 1 Siemens F Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
1	**Division #1.0 - Sitework**																				
2	Sitework	Roads - Asphalt paving main site rds & Parking lots	7,200.0	sy	Sub	Contr	20.00		44.43		1.09	0	0	YES	4,320	0	0	0	144,000	$144,000	HDR|CB Estimated Quantity
3	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Powerblock A	1,740.0	sy	Contr	Contr	5.00	0.055	44.43	96	1.09	0	8,700	YES	522	4,613	104	13,313	0	$13,313	HDR|CB Estimated Quantity
4	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Secondary Ar	6,945.0	sy	Contr	Contr	5.00	0.055	44.43	382	1.09	0	34,725	YES	2,084	18,412	414	53,137	0	$53,137	HDR|CB Estimated Quantity
5	Sitework	Roads - Haul/Construction Roads Treated Gravel	29,700.0	sy	Contr	Contr	8.00	0.1	44.43	2,970	1.09	0	237,600	YES	14,256	143,162	3,222	380,762	0	$380,762	HDR|CB Estimated Quantity
6	Sitework	Roads - Main Roads Crushed stone Base Course	8,500.0	sy	Contr	Contr	12.00	0.1	44.43	850	1.09	0	102,000	YES	6,120	40,972	922	142,972	0	$142,972	HDR|CB Estimated Quantity
7	Sitework	Roads - Drainage and culverts	80,000.0	sy	Contr	Contr	2.00	0.05	44.43	4,000	1.09	0	160,000	YES	9,600	192,810	4,340	352,810	0	$352,810	HDR|CB Estimated Quantity
8	Sitework	Soil Erosion Control Measures	2,000	lf	Contr	Contr	1	0.027	44.43	54	1.09	0	2,000	YES	120	2,603	54	4,603	0	4,603	HDR|CB Estimated Quantity
9	Sitework	Site - Topsoil stripping/stockpiling	10,000	cy	Contr	Contr		0.030	44.43	300	1.09	0	0	YES	0	14,461	300	14,461	0	$14,461	HDR|CB Estimated Quantity
10	Sitework	Site - Drainage - Pipe Culverts (Assume 12" dia)	3,000	lf	Contr	Contr	9.00	0.12	44.43	360	1.09	0	27,000	YES	1,620	17,353	360	44,353	0	$44,353	HDR|CB Estimated Quantity
11	Sitework	Site - Drainage - Manholes	20	ea	Contr	Contr	1,500	16	44.43	320	1.09	0	30,000	YES	1,800	15,425	320	45,425	0	$45,425	HDR|CB Estimated Quantity
14	Sitework	Site - Fire Protection hydrants, valve boxes, ductile iron	24.0	ea	Contr	Contr	3,000.00	20	39.54	480	1.09	0	72,000	YES	4,320	20,591	521	92,591	0	$92,591	HDR|CB Estimated Quantity
15	Sitework	Site - Fire Protection U/G piping, DI	4,000.0	lf	Contr	Contr	41.00	0.5	39.54	2,000	1.09	0	164,000	YES	9,840	85,796	2,170	249,796	0	$249,796	HDR|CB Estimated Quantity
16	Sitework	Pipe Utility Trench Excavation	10,000	cy	Contr	Contr		0.2	39.54	2,000	1.09	0	0	YES	0	85,796	2,000	85,796	0	$85,796	HDR|CB Estimated Quantity
17	Sitework	Pipe Utility Trench Backfill (including bedding)	8,500	cy	Contr	Contr		0.2	39.54	1,700	1.09	0	0	YES	0	72,927	1,700	72,927	0	$72,927	HDR|CB Estimated Quantity
20	Sitework	Spoil Disposal	10,000	cy	Contr	Contr		0.1	44.43	1,000	1.09	0	0	YES	0	48,203	1,000	48,203	0	$48,203	HDR|CB Estimated Quantity
21	Sitework	Site - Sanitary sewer lift stations	1.0	ea	Contr	Contr	11,700.00	40	39.54	40	1.09	0	11,700	YES	702	1,716	43	13,416	0	$13,416	HDR|CB Estimated Quantity
22	Sitework	Site - Sanitary waste piping and manholes	2,000.0	lf	Contr	Contr	20.00	1	39.54	2,000	1.09	0	40,000	YES	2,400	85,796	2,170	125,796	0	$125,796	HDR|CB Estimated Quantity
23	Sitework	Site - Storm drain piping and culverts	20,000.0	lf	Contr	Contr	12.00	0.25	39.54	5,000	1.09	0	240,000	YES	14,400	214,490	5,425	454,490	0	$454,490	HDR|CB Estimated Quantity
24	Sitework	Site Finishing - Seed Site Earthwork	5.0	ac	Contr	Contr	10,000.00	0.54	39.54	3	1.09	0	50,000	YES	3,000	116	3	50,116	0	$50,116	HDR|CB Estimated Quantity
25	Sitework	Site Finishing - Grading around foundations	5,000.0	sy	Contr	Contr		0.02	39.54	100	1.09	0	0	YES	0	4,290	109	4,290	0	$4,290	HDR|CB Estimated Quantity
26	Sitework	Site Finishing - Stone Surfacing	6,000.0	sy	Contr	Contr	10.00	0.015	39.54	90	1.09	0	60,000	YES	3,600	3,861	98	63,861	0	$63,861	HDR|CB Estimated Quantity
27	Sitework	Site Improvements - landscaping at admin building	1.0	ls	Contr	Contr	30,000.00	360	39.54	360	1.09	0	30,000	YES	1,800	15,443	391	45,443	0	$45,443	HDR|CB Estimated Quantity
28	Sitework	Site Improvements - Main Gate Security Facilities	1.0	lot	Contr	Contr	150,000.00	3600	39.54	3,600	1.09	0	150,000	YES	9,000	154,433	3,906	304,433	0	$304,433	HDR|CB Estimated Quantity
29	Sitework	Site Improvements - Site Entrance Sign and Landscaping	1.0	ls	Contr	Contr	18,750.00	240	39.54	240	1.09	0	18,750	YES	1,125	10,296	260	29,046	0	$29,046	HDR|CB Estimated Quantity
30	Sitework	Site Improvements - Site Security Boundary Fencing	15,000.0	lf	Contr	Contr	11.00	0.2	39.54	3,000	1.09	0	165,000	YES	9,900	128,694	3,255	293,694	0	$293,694	HDR|CB Estimated Quantity
31	Sitework	Site Improvements - Fencing Active gates	6.0	ea	Contr	Contr	2,000.00	48	39.54	288	1.09	0	12,000	YES	720	12,355	312	24,355	0	$24,355	HDR|CB Estimated Quantity
32	Sitework	Site Surveying	1.0	lot	Sub	Contr	80,000.00		44.43	0	1.09	0	0	YES	2,400	0	0	0	80,000	$80,000	HDR|CB Estimated Quantity
33																					
34		**Division #1 - Sitework Sub-Total**								**31,232**		**0**	**1,615,475**		**103,649**	**1,394,611**	**33,400**	**3,010,086**	**224,000**	**3,234,086**	
35																					
36	**Division #1.3 - Raw Water Intake and Discharge Facilities**																				HDR Allowance for Interconnection and Updgrage of
37		Raw Water River Intake and Discharge Facilities	1.0	ea	Contr	Contr	500,000.00	10,000	53.33	10,000	1.09	0	500,000	NO	0	578,649	10,850	1,078,649	0	$1,078,649	existing Unit 1 and 2 Intake Structure
38																					
39		**Division #1.3 - Raw Water Intake Clarification and Discharge Facilities Sub-Total**								**10,000**		**0**	**500,000**		**0**	**578,649**	**10,850**	**1,078,649**	**0**	**$1,078,649**	
40																					
41																					
42	**Division #2.0 - Earthwork and Concrete**																				
43	**Division #2.1 - Earthwork**																				
44	Earthwork	Structural Backfill Power Block (using imported material)	155,000.0	cy	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	3,875,000	$3,875,000	HDR|CB Estimated Quantity
45	Earthwork	Retaining Wall (MSE)	27,500.0	sf	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	687,500	$687,500	HDR|CB Estimated Quantity
46	Earthwork	Structural Excavation Main Power Block - Earth/Rock	215,000.0	cy	Sub	Contr	18.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	3,870,000	$3,870,000	HDR|CB Estimated Quantity
47																					
48										0		0	0		0	0	0	0	8,432,500	8,432,500	
49	**Division # 2.2 - Concrete Main Power Block Area**																				
50																					
51		Includes Forms, Rebar, Placement, Finishing, Embeds																			
52	Concrete	HRSG and Stack	3,750	cy	Contr	Contr	250	4.5	38.69	16,875	1.09	0	937,500	NO	0	708,477	18,309	1,645,977	0	$1,645,977	HDR|CB Estimated Quantity
53	Concrete	Gas Turbine Foundation	2,000	cy	Contr	Contr	300	4.5	38.69	9,000	1.09	0	600,000	NO	0	377,854	9,765	977,854	0	$977,854	HDR|CB Estimated Quantity
54	Concrete	Steam Turbine building	600	cy	Contr	Contr	250	4.5	38.69	2,700	1.09	0	150,000	NO	0	113,356	2,930	263,356	0	$263,356	HDR|CB Estimated Quantity
55	Concrete	Spread Footings & Piers Pipe/Tray Trestle/Racks	300.0	cy	Contr	Contr	250	4.5	38.69	1,350	1.09	0	75,000	NO	0	56,678	1,465	131,678	0	$131,678	HDR|CB Estimated Quantity
56	Concrete	Steam Turbine Bldg fill slab	200.0	cy	Contr	Contr	210.00	4.5	38.69	900	1.09	0	42,000	NO	0	37,785	977	79,785	0	$79,785	HDR|CB Estimated Quantity
57	Concrete	Steam Turbine Bldg Mat Foundation	900.0	cy	Contr	Contr	250	4.5	38.69	4,050	1.09	0	225,000	NO	0	170,035	4,394	395,035	0	$395,035	HDR|CB Estimated Quantity
58	Concrete	Steam Turbine Bldg Elevated Slab	400.0	cy	Contr	Contr	250	4.5	38.69	1,800	1.09	0	100,000	NO	0	75,571	1,953	175,571	0	$175,571	HDR|CB Estimated Quantity
59	Concrete	Steam Turbine Bldg sumps foundation	300.0	cy	Contr	Contr	250	4.5	38.69	1,350	1.09	0	75,000	NO	0	56,678	1,465	131,678	0	$131,678	HDR|CB Estimated Quantity
60	Concrete	Steam Turbine Pedestal FDN (Columns & Tabletop, Mat)	750.0	cy	Contr	Contr	350.00	8	38.69	6,000	1.09	0	262,500	NO	0	251,903	6,510	514,403	0	$514,403	HDR|CB Estimated Quantity
61	Concrete	Aux. Equipment Foundations	300	cy	Contr	Contr	250	4.5	38.69	1,350	1.09	0	75,000	YES	4,500	56,678	1,465	131,678	0	$131,678	HDR|CB Estimated Quantity
62	Concrete	Equip Fdn - Generator Breaker	30	cy	Contr	Contr	250	4.5	38.69	135	1.09	0	7,500	YES	450	5,668	146	13,168	0	$13,168	HDR|CB Estimated Quantity
63	Concrete	Equip Fdn - CT PEEC	30	cy	Contr	Contr	250	4.5	38.69	135	1.09	0	7,500	YES	450	5,668	146	13,168	0	$13,168	HDR|CB Estimated Quantity
64	Concrete	Equip Fdn - Power Distribution Center	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
65	Concrete	Equip Fdn - CEMS	20	cy	Contr	Contr	250	4.5	38.69	90	1.09	0	5,000	YES	300	3,779	98	8,779	0	$8,779	HDR|CB Estimated Quantity
66	Concrete	Equip Fdn - Boiler Feed Pump	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
67	Concrete	Equip Fdn - Main Step-up Transformer Fdn/Walls	60.0	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	NO	0	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
68	Concrete	Equip Fdn - Plant Aux Power Transformers Fnd/Walls	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
69	Concrete	Equip Fdn - Misc off Base Equip fnds	60.0	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	NO	0	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
70	Concrete	Elec. Ductbank (Tubes, Conc., Forms, Rebar) 12 Tubes	400.0	lf	Contr	Contr	125	0.57	38.69	228	1.09	0	50,000	NO	0	9,572	247	59,572	0	$59,572	HDR|CB Estimated Quantity
71	Concrete	Elec. Ductbank to Cooling Tower (Tubes, Conc., Forms, Rebar) 6 Tu	750.0	lf	Contr	Contr	100	0.45	38.69	338	1.09	0	75,000	NO	0	14,170	366	89,170	0	$89,170	HDR|CB Estimated Quantity
72	Concrete	Equip Fdn - Pumps & misc equipment	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
73	Concrete	Electrical Building Foundation	80.0	cy	Contr	Contr	250	4.5	38.69	360	1.09	0	20,000	NO	0	15,114	391	35,114	0	$35,114	HDR|CB Estimated Quantity
74	Concrete	Cooling Tower Basin	1,200.0	cy	Contr	Contr	250	5.5	38.69	6,600	1.09	0	300,000	NO	0	277,093	7,161	577,093	0	$577,093	HDR|CB Estimated Quantity
75	Concrete	Administration Building foundation	1,100.0	cy	Contr	Contr	250	4.5	38.69	4,950	1.09	0	275,000	YES	16,500	207,820	5,371	482,820	0	$482,820	HDR|CB Estimated Quantity
76	Concrete	Auxilary Boiler Building floor slab & foundation	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	NO	0	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
77	Concrete	Demineralized Water Tank Foundations	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
78	Concrete	Service water storage tank foundations	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	YES	3,000	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
79	Concrete	Main Gate Guard House	3.0	cy	Contr	Contr	250	4.5	38.69	14	1.09	0	750	YES	45	567	15	1,317	0	$1,317	HDR|CB Estimated Quantity
80	Concrete	Water Treatment Buildings, enclosures and tank fdns	0.0	cy	Contr	Contr	250	4.5	38.69	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
81	Concrete	Grouting (equipment & steel)	30.0	cy	Contr	Contr	2,227.50	81	38.69	2,430	1.09	0	66,825	NO	0	102,021	2,637	168,846	0	$168,846	HDR|CB Estimated Quantity
82																					
83		Sub Total Concrete	**13,983**				AVG MH/CY	4.81		64,434			3,559,575		27,045	2,705,186	69,911	6,264,761	0	6,264,761	
84																					
85		**Division #2 - Earthwork & Concrete Sub-Total**								**64,434**		**0**	**3,559,575**		**27,045**	**2,705,186**	**69,911**	**6,264,761**	**8,432,500**	**14,697,261**	
86																					
87	**Division #3.0 - Architectural**												-								
88																					
89	rchitectura	Exterior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
90	rchitectura	Fire extinguishers	24.0	ea	Contr	Contr	500.00	3	53.33	72	1.09	0	12,000	YES	720	4,166	78	16,166	0	$16,166	HDR|CB Estimated Quantity
91	rchitectura	Fire hose cabinets	26.0	ea	Contr	Contr	1,200.00	20	53.33	520	1.09	0	31,200	YES	1,872	30,090	564	61,290	0	$61,290	HDR|CB Estimated Quantity
92	rchitectura	Fire hydrants w/monitor nozzles	6.0	ea	Contr	Contr	2,550.00	12	54.96	72	1.09	0	15,300	YES	918	4,294	78	19,594	0	$19,594	HDR|CB Estimated Quantity
93	rchitectura	Fire protection control room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
94	rchitectura	Fire Protection Elect Equip & Cable Spreading Room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity

Estimate Details

1 x 1 Siemens F Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
95	rchitectura	Fire Protection GSU and Aux Transformers	1.0	ls	Sub	Contr	200,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	200,000	$200,000	HDR|CB Estimated Quantity
96	rchitectura	Fire Protection Turbine Building	1.0	ls	Sub	Contr	600,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
97	rchitectura	Fire Detection/Alarm	1.0	lot	Contr	Contr	350,000.00	1000	50.09	1,000	1.09	0	350,000	NO	0	54,352	1,085	404,352	0	$404,352	HDR|CB Estimated Quantity
98	rchitectura	HVAC System Allowance	1.0	ls	Sub	Contr	650,000.00		54.96	0	1.09	0	0	YES	19,500	0	0	0	650,000	$650,000	HDR|CB Estimated Quantity
99	rchitectura	Interior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
100	rchitectura	Masonry Walls 8" CMU	15,000.0	sf	Contr	Contr	4.00	0.15	32.95	2,250	1.09	0	60,000	yes	3,600	80,450	2,441	140,450	0	$140,450	HDR|CB Estimated Quantity
101	rchitectura	Overhead Rolling Doors - steel	4.0	ea	Contr	Contr	5,000.00	40	38.68	160	1.09	0	20,000	yes	1,200	6,715	174	26,715	0	$26,715	HDR|CB Estimated Quantity
102	rchitectura	Painting - equipment and piping	1.0	lot	Contr	Contr	80,000.00	3600	36.36	3,600	1.09	0	80,000	yes	4,800	142,016	3,906	222,016	0	$222,016	HDR|CB Estimated Quantity
103	rchitectura	Painting - structural steel, grating, handrail touch-up	200,000.0	sf	Contr	Contr	0.30	0.010	36.36	2,000	1.09	0	60,000	yes	3,600	78,898	2,170	138,898	0	$138,898	HDR|CB Estimated Quantity
104	rchitectura	Painting - turbine room floor epoxy finish	30,000.0	sf	Contr	Contr	0.80	0.045	36.36	1,354	1.09	0	24,000	yes	1,440	53,398	1,469	77,398	0	$77,398	HDR|CB Estimated Quantity
105	rchitectura	Restrooms, showers, locker rooms	1.0	lot	Contr	Contr	125,000.00	1200	53.33	1,200	1.09	0	125,000	YES	7,500	69,438	1,302	194,438	0	$194,438	HDR|CB Estimated Quantity
106	rchitectura	Roof Drains	1,200.0	lf	Contr	Contr	32.50	2.0	54.96	2,400	1.09	0	39,000	yes	2,340	143,123	2,604	182,123	0	$182,123	HDR|CB Estimated Quantity
107	rchitectura	Structural Steel - Misc Building Steel	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	yes	3,840	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
108	rchitectura	Structural Steel - Pipe Rack	300.0	ton	Contr	Contr	3,400.00	20	60.25	6,000	1.09	0	1,020,000	NO	0	392,204	6,510	1,412,204	0	$1,412,204	HDR|CB Estimated Quantity
109	rchitectura	Structural Steel - Misc Platforms	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	NO	0	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
110	rchitectura	Structural Steel - Turbine Building Framing	350.0	ton	Contr	Contr	2,850.00	15	60.25	5,250	1.09	0	997,500	NO	0	343,179	5,696	1,340,679	0	$1,340,679	HDR|CB Estimated Quantity
111	rchitectura	Trench Floor Drain Cover	1,800.0	lf	Contr	Contr	60.45	0.4	54.96	720	1.09	0	108,810	yes	6,529	42,937	781	151,747	0	$151,747	HDR|CB Estimated Quantity
112	rchitectura	Turbine Building Built-up Roof	15,000.0	sf	Contr	Contr	0.75	0.035	35.31	525	1.09	0	11,250	NO	0	20,115	570	31,365	0	$31,365	HDR|CB Estimated Quantity
113	rchitectura	Turbine Building Metal Siding	40,000.0	sf	Contr	Contr	10.40	0.05	56.41	2,000	1.09	0	416,000	NO	0	122,401	2,170	538,401	0	$538,401	HDR|CB Estimated Quantity
114	rchitectura	Administration/Control/Maintenance Building	16,000.0	sf	Sub	Contr	140.00		38.68	0	1.09	0	0	YES	0	0	0	0	2,240,000	$2,240,000	HDR|CB Estimated Quantity
115	rchitectura	Cooling Tower, pre-engineered - Elect, Chem feed, I&C Bldg	3,000.0	sf	Sub	Contr	80.00		59.59	0	1.09	0	0	NO	0	0	0	0	240,000	$240,000	HDR|CB Estimated Quantity
116	rchitectura	Main Gate Guard House	80.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	YES	0	0	0	0	6,400	$6,400	HDR|CB Estimated Quantity
117	rchitectura	Auxilary Boiler Building	4,000.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	440,000	$440,000	HDR|CB Estimated Quantity
118	rchitectura	Water Treatment Building	0.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
119	rchitectura	Warehouse	8,000.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	NO	0	0	0	0	640,000	$640,000	HDR|CB Estimated Quantity
120	rchitectura	Boiler Feed Pump Building	1.0	ea	sub	Contr	300,000.00		38.68	0	1.09	0	0	NO	0	0	0	0	300,000	$300,000	HDR|CB Estimated Quantity
121																					
122		**Division #3 - Architectural Sub-Total**								**31,123**	**1.05**	**0**	**3,618,060**		**65,059**	**1,699,789**	**33,768**	**5,317,849**	**5,366,400**	**$10,684,249**	
123																					
124	**Division #4.0 - Mechanical Piping**																				
125	**Division #4.1 - Mechanical Piping**																				
126																					
127	hanical Pip	Pipe - MS, HR, CR, BFW, LPS	**1,720.0**	lf																	
128	hanical Pip	- System - Cold Reheat (Carbon)	400.0	lf	Contr	Contr	2,400.00	7.2	54.96	2,895	1.09	0	960,000	NO	0	172,654	3,141	1,132,654	0	$1,132,654	HDR|CB Estimated Quantity
129	hanical Pip	- System - Feedwater (Carbon)	320.0	lf	Contr	Contr	700.00	5.6	54.96	1,805	1.09	0	224,000	NO	0	107,628	1,958	331,628	0	$331,628	HDR|CB Estimated Quantity
130	hanical Pip	- System - Hot Reheat (Alloy)	300.0	lf	Contr	Contr	2,500.00	14.4	54.96	4,315	1.09	0	750,000	NO	0	257,299	4,681	1,007,299	0	$1,007,299	HDR|CB Estimated Quantity
131	hanical Pip	- System - Main Steam (Alloy)	300.0	lf	Contr	Contr	3,000.00	14.4	54.96	4,315	1.09	0	900,000	NO	0	257,299	4,681	1,157,299	0	$1,157,299	HDR|CB Estimated Quantity
132	hanical Pip	- System - Low Pressure Steam Steam (Alloy)	400.0	lf	Contr	Contr	234.00	7.5	54.96	3,008	1.09	0	93,600	NO	0	179,381	3,264	272,981	0	$272,981	HDR|CB Estimated Quantity
133	hanical Pip	Pipe - Above Ground - Large Bore Average "	**26,250.0**	lf																	
134	hanical Pip	- System - Boilers, Vents and Drains	400.0	lf	Contr	Contr	300.00	4.14	54.96	1,654	1.09	0	120,000	NO	0	98,659	1,795	218,659	0	$218,659	HDR|CB Estimated Quantity
135	hanical Pip	- System - Aux steam drain returns	2,500.0	lf	Contr	Contr	30.00	1.22	54.96	3,055	1.09	0	75,000	NO	0	182,184	3,315	257,184	0	$257,184	HDR|CB Estimated Quantity
136	hanical Pip	- System - Building drains	1,200.0	lf	Contr	Contr	30.00	1.22	54.96	1,466	1.09	0	36,000	YES	2,160	87,448	1,591	123,448	0	$123,448	HDR|CB Estimated Quantity
137	hanical Pip	- System - Building fire protection	5,000.0	lf	Contr	Contr	18.00	1.50	54.96	7,520	1.09	0	90,000	YES	5,400	448,452	8,159	538,452	0	$538,452	HDR|CB Estimated Quantity
138	hanical Pip	- System - Building sump pumps	800.0	lf	Contr	Contr	47.00	1.55	54.96	1,241	1.09	0	37,600	YES	2,256	73,995	1,346	111,595	0	$111,595	HDR|CB Estimated Quantity
139	hanical Pip	- System - Circulating Water	1,000.0	lf	Contr	Contr	300.00	4.10	54.96	4,100	1.09	0	300,000	NO	0	244,502	4,449	544,502	0	$544,502	HDR|CB Estimated Quantity
140	hanical Pip	- System - Condensate	1,350.0	lf	Contr	Contr	150.00	2.35	54.96	3,173	1.09	0	202,500	NO	0	189,191	3,442	391,691	0	$391,691	HDR|CB Estimated Quantity
141	hanical Pip	- System - Condenser Air Extraction	300.0	lf	Contr	Contr	184.00	2.35	54.96	705	1.09	0	55,200	NO	0	42,042	765	97,242	0	$97,242	HDR|CB Estimated Quantity
142	hanical Pip	- System - Cooling water	600.0	lf	Contr	Contr	280.00	2.63	54.96	1,579	1.09	0	168,000	NO	0	94,175	1,713	262,175	0	$262,175	HDR|CB Estimated Quantity
143	hanical Pip	- System - Demineralized water	400.0	lf	Contr	Contr	27.00	0.39	54.96	154	1.09	0	10,800	NO	0	9,193	167	19,993	0	$19,993	HDR|CB Estimated Quantity
144	hanical Pip	- System - Fire Protection	300.0	lf	Contr	Contr	150.00	2.35	54.96	705	1.09	0	45,000	YES	2,700	42,042	765	87,042	0	$87,042	HDR|CB Estimated Quantity
145	hanical Pip	- System - Natural Gas High Pressure - SS	150.0	lf	Contr	Contr	52.40	0.85	54.96	127	1.09	0	7,860	YES	472	7,568	138	15,428	0	$15,428	HDR|CB Estimated Quantity
146	hanical Pip	- System - Potable water	1,000.0	lf	Contr	Contr	18.00	1.50	54.96	1,504	1.09	0	18,000	YES	1,080	89,690	1,632	107,690	0	$107,690	HDR|CB Estimated Quantity
147	hanical Pip	- System - Sanitary waste	3,000.0	lf	Contr	Contr	47.00	1.55	54.96	4,653	1.09	0	141,000	YES	8,460	277,480	5,049	418,480	0	$418,480	HDR|CB Estimated Quantity
148	hanical Pip	- System - Service Water	1,000.0	lf	Contr	Contr	184.00	1.97	54.96	1,974	1.09	0	184,000	YES	11,040	117,719	2,142	301,719	0	$301,719	HDR|CB Estimated Quantity
149	hanical Pip	- System - STG lube oil	200.0	lf	Contr	Contr	32.00	1.11	54.96	222	1.09	0	6,400	NO	0	13,239	241	19,639	0	$19,639	HDR|CB Estimated Quantity
150	hanical Pip	- System - STG oil purification	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
151	hanical Pip	- System - STG Seal Oil	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
152	hanical Pip	- System - STG Stator cooling	0.0	lf	Contr	Contr	32.00	1.11	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
153	hanical Pip	- System - STG Steam Seal	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
154	hanical Pip	- System - Turbine drains	690.0	lf	Contr	Contr	47.00	1.55	54.96	1,070	1.09	0	32,430	NO	0	63,820	1,161	96,250	0	$96,250	HDR|CB Estimated Quantity
155	hanical Pip	- System - HRSG Blowdown	100.0	lf	Contr	Contr	18.00	1.50	54.96	150	1.09	0	1,800	NO	0	8,969	163	10,769	0	$10,769	HDR|CB Estimated Quantity
156	hanical Pip	- System - Cycle Makeup	360.0	lf	Contr	Contr	47.00	1.55	54.96	558	1.09	0	16,920	NO	0	33,298	606	50,218	0	$50,218	HDR|CB Estimated Quantity
157	hanical Pip	- System - Miscellaneous Systems Piping CS)	5,000.0	lf	Contr	Contr	47.00	1.55	54.96	7,755	1.09	0	235,000	YES	14,100	462,466	8,414	697,466	0	$697,466	HDR|CB Estimated Quantity
158	hanical Pip	Pipe - Above Ground - Small Bore	**22,290.0**	lf																	
159	hanical Pip	- System - Water Cycle Sample - Alloy	150.0	lf	Contr	Contr	13.00	0.85	54.96	127	1.09	0	1,950	NO	0	7,568	138	9,518	0	$9,518	HDR|CB Estimated Quantity
160	hanical Pip	- System - STG lube oil	300.0	lf	Contr	Contr	11.60	0.62	54.96	186	1.09	0	3,480	NO	0	11,092	202	14,572	0	$14,572	HDR|CB Estimated Quantity
161	hanical Pip	- System - CT Auxilaries	900.0	lf	Contr	Contr	18.00	1.13	54.96	1,015	1.09	0	16,200	NO	0	60,541	1,101	76,741	0	$76,741	HDR|CB Estimated Quantity
162	hanical Pip	- System - Instrument Air	2,750.0	lf	Contr	Contr	8.00	0.14	54.96	388	1.09	0	22,000	NO	0	23,123	421	45,123	0	$45,123	HDR|CB Estimated Quantity
163	hanical Pip	- System - Instrument Air supply	2,500.0	lf	Contr	Contr	35.00	0.28	54.96	705	1.09	0	87,500	NO	0	42,042	765	129,542	0	$129,542	HDR|CB Estimated Quantity
164	hanical Pip	- System - Service Air piping	1,000.0	lf	Contr	Contr	12.00	0.22	54.96	216	1.09	0	12,000	YES	720	12,893	235	24,893	0	$24,893	HDR|CB Estimated Quantity
165	hanical Pip	- System - Instrument Air	1,800.0	lf	Contr	Contr	11.50	0.52	54.96	931	1.09	0	20,700	YES	1,242	55,496	1,010	76,196	0	$76,196	HDR|CB Estimated Quantity
166	hanical Pip	- System - Service Water	800.0	lf	Contr	Contr	20.00	1.32	54.96	1,053	1.09	0	16,000	YES	960	62,783	1,142	78,783	0	$78,783	HDR|CB Estimated Quantity
167	hanical Pip	- System - Cycle Chemical Feed	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
168	hanical Pip	- System - Boiler Vents & Drains - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
169	hanical Pip	- System - (HP) Main Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
170	hanical Pip	- System - (LP) Steam - Carbon	1,000.0	lf	Contr	Contr	18.00	1.13	54.96	1,128	1.09	0	18,000	YES	1,080	67,268	1,224	85,268	0	$85,268	HDR|CB Estimated Quantity
171	hanical Pip	- System - Hot Reheat Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
172	hanical Pip	- System - Cold Reheat Steam - Alloy	300.0	lf	Contr	Contr	20.00	1.32	54.96	395	1.09	0	6,000	YES	360	23,544	428	29,544	0	$29,544	HDR|CB Estimated Quantity
173	hanical Pip	- System - Cycle Makeup	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
174	hanical Pip	- System - Aux Steam - Carbon	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
175	hanical Pip	- System - STG Seals and Drains - Alloy	1,400.0	lf	Contr	Contr	20.00	1.32	54.96	1,842	1.09	0	28,000	YES	1,680	109,871	1,999	137,871	0	$137,871	HDR|CB Estimated Quantity
176	hanical Pip	- System - CT System - Carbon	120.0	lf	Contr	Contr	18.00	1.13	54.96	135	1.09	0	2,160	YES	130	8,072	147	10,232	0	$10,232	HDR|CB Estimated Quantity
177	hanical Pip	- System - Hydrogen - Carbon	350.0	lf	Contr	Contr	12.35	1.03	54.96	362	1.09	0	4,323	YES	259	21,582	393	25,904	0	$25,904	HDR|CB Estimated Quantity
178	hanical Pip	- System - Carbon Dioxide - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
179	hanical Pip	- System - Miscellaneous	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
180	hanical Pip	- System - Condensate - Carbon	400.0	lf	Contr	Contr	18.00	1.13	54.96	451	1.09	0	7,200	YES	432	26,907	490	34,107	0	$34,107	HDR|CB Estimated Quantity
181	hanical Pip	- System - Closed Cycle Cooling Water - Carbon	900.0	lf	Contr	Contr	12.35	1.03	54.96	931	1.09	0	11,115	YES	667	55,496	1,010	66,611	0	$66,611	HDR|CB Estimated Quantity
182	hanical Pip	- System - Fuel Gas - Carbon	500.0	lf	Contr	Contr	18.00	1.13	54.96	564	1.09	0	9,000	YES	540	33,634	612	42,634	0	$42,634	HDR|CB Estimated Quantity
183	hanical Pip	- System - Condensed Air Extraction - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
184	hanical Pip	- System - CW Chemical Feed - Carbon	20.0	lf	Contr	Contr	18.00	1.13	54.96	23	1.09	0	360	YES	22	1,345	24	1,705	0	$1,705	HDR|CB Estimated Quantity
185	hanical Pip	- System - Nitrogen Gas System	100.0	lf	Contr	Contr	19.00	0.19	54.96	19	1.09	0	1,900	YES	114	1,121	20	3,021	0	$3,021	HDR|CB Estimated Quantity

Estimate Details

1 x 1 Siemens F Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
186	hanical Pip	- System - Waste Water Coll & Treatment - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
187	hanical Pip	- System - Chemical Waste Treatment	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
188	hanical Pip	- System - Miscellaneous Systems Piping	4,400.0	lf	Contr	Contr	12.35	1.03	54.96	4,550	1.09	0	54,340	YES	3,260	271,313	4,936	325,653	0	$325,653	HDR|CB Estimated Quantity
189	hanical Pip	Pipe - Below Ground - Large Bore	**20,275.0**	lf																	
190	hanical Pip	- System - Hydrogen	470.0	lf	Contr	Contr	20.00	0.71	54.96	331	1.09	0	9,400	NO	0	19,760	360	29,160	0	$29,160	HDR|CB Estimated Quantity
191	hanical Pip	- System - Fuel Gas	400.0	lf	Contr	Contr	170.00	1.97	54.96	790	1.09	0	68,000	NO	0	47,087	857	115,087	0	$115,087	HDR|CB Estimated Quantity
192	hanical Pip	- System - Main Circ. - HDPE	300.0	lf	Contr	Contr	15.00	1.13	54.96	338	1.09	0	4,500	NO	0	20,180	367	24,680	0	$24,680	HDR|CB Estimated Quantity
192	hanical Pip	- System - Miscellaneous Systems Piping - HDPE	6,500.0	lf	Contr	Contr	15.00	1.13	54.96	7,332	1.09	0	97,500	NO	0	437,241	7,955	534,741	0	$534,741	HDR|CB Estimated Quantity
193	hanical Pip	- System - Waste Water Treatment Piping - HDPE (Sch 17)	2,565.0	lf	Contr	Contr	6.00	0.66	54.96	1,688	1.09	0	15,390	NO	0	100,649	1,831	116,039	0	$116,039	HDR|CB Estimated Quantity
193	hanical Pip	- System - Sanitary Sewer	3,000.0	lf	Contr	Contr	15.00	1.13	54.96	3,384	1.09	0	45,000	NO	0	201,803	3,672	246,803	0	$246,803	HDR|CB Estimated Quantity
194	hanical Pip	- System - Natural Gas Low Pressure - CS	500.0	lf	Contr	Contr	30.00	1.22	54.96	611	1.09	0	15,000	NO	0	36,437	663	51,437	0	$51,437	HDR|CB Estimated Quantity
195	hanical Pip	- System - Natural Gas High Pressure - CS	300.0	lf	Contr	Contr	30.00	1.22	54.96	367	1.09	0	9,000	NO	0	21,862	398	30,862	0	$30,862	HDR|CB Estimated Quantity
196	hanical Pip	- System - Potable Water to site facilities	500.0	lf	Contr	Contr	47.00	1.55	54.96	776	1.09	0	23,500	NO	0	46,247	841	69,747	0	$69,747	HDR|CB Estimated Quantity
197	hanical Pip	- System - Cooling tower blowdown	1,160.0	lf	Contr	Contr	115.00	1.69	54.96	1,963	1.09	0	133,400	NO	0	117,046	2,130	250,446	0	$250,446	HDR|CB Estimated Quantity
198	hanical Pip	- System - Cooling tower makeup water Pipe	1,000.0	lf	Contr	Contr	115.00	1.69	39.54	1,692	1.09	0	115,000	NO	0	72,583	1,836	187,583	0	$187,583	HDR|CB Estimated Quantity
199	hanical Pip	Pipe - Below Ground - Small Bore	**790.0**	lf																	HDR|CB Estimated Quantity
200	hanical Pip	- System - Miscellaneous Systems Piping	790.0	lf	Contr	Contr	12.35	1.03	54.96	817	1.09	0	9,757	NO	0	48,713	886	58,470	0	$58,470	HDR|CB Estimated Quantity
201	hanical Pip	Circulating water 72" RCP	2,000.0	lf	Contr	Contr	480.00	7.00	54.96	14,000	1.09	0	960,000	NO	0	834,884	15,190	1,794,884	0	$1,794,884	HDR|CB Estimated Quantity
202	hanical Pip	Piping Non Destructive Examination	1.0	lot	Sub	Contr	75,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	75,000	$75,000	HDR|CB Estimated Quantity
203	hanical Pip	Steam Blows	1.0	lot	Sub	Contr	150,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	150,000	$150,000	HDR|CB Estimated Quantity
204	hanical Pip	Stress relieving LB Alloy	50.0	ea	Contr	Contr	1,500.00	80.00	54.96	4,000	1.09	0	75,000	NO	0	238,538	4,340	313,538	0	$313,538	HDR|CB Estimated Quantity
205																					
206		**Division #4.1 - Mechanical Piping Sub-Total**	**71,325.0**	**LF**						116,815		0	6,672,387		61,426	6,937,875	126,744	13,610,261	225,000	$13,835,261	
207																					
208	**Division #4.2 - Mechanical Valves**																				
209																					
210	hanical Va	Valves - Large Bore General Service	375.0	ea	Contr	Contr	636.00	16.92	54.96	6,345	1.09	0	238,500	NO	0	378,381	6,884	616,881	0	$616,881	HDR|CB Estimated Quantity
211	hanical Va	Valves - Large Bore HP 900# to 3800#	50.0	ea	Contr	Contr	6,750.00	56.4	54.96	2,820	1.09	0	337,500	NO	0	168,169	3,060	505,669	0	$505,669	HDR|CB Estimated Quantity
212	hanical Va	Valves - Large Bore LP Circ Water	2.0	ea	Contr	Contr	197,500.00	112.8	54.96	226	1.09	0	395,000	NO	0	13,454	245	408,454	0	$408,454	HDR|CB Estimated Quantity
213	hanical Va	Valves - Small Bore - I/A supply	50.0	ea	Contr	Contr	17.50	1.88	54.96	94	1.09	0	875	NO	0	5,606	102	6,481	0	$6,481	HDR|CB Estimated Quantity
214	hanical Va	Valves - Small Bore - Instrument piping	375.0	ea	Contr	Contr	270.00	1.88	54.96	705	1.09	0	101,250	NO	0	42,042	765	143,292	0	$143,292	HDR|CB Estimated Quantity
215	hanical Va	Valves - Small Bore Bronze	30.0	ea	Contr	Contr	480.00	2.82	54.96	85	1.09	0	14,400	NO	0	5,045	92	19,445	0	$19,445	HDR|CB Estimated Quantity
216	hanical Va	Valves - Small Bore Class 800	175.0	ea	Contr	Contr	305.00	2.82	54.96	494	1.09	0	53,375	NO	0	29,430	535	82,805	0	$82,805	HDR|CB Estimated Quantity
217	hanical Va	Valves - Small Bore HP 1500# Alloy & CS	75.0	ea	Contr	Contr	670.00	15.04	54.96	1,128	1.09	0	50,250	NO	0	67,268	1,224	117,518	0	$117,518	HDR|CB Estimated Quantity
218	hanical Va	Valves - Small Bore HP 3800# Alloy	15.0	ea	Contr	Contr	3,050.00	22.56	54.96	338	1.09	0	45,750	NO	0	20,180	367	65,930	0	$65,930	HDR|CB Estimated Quantity
219	hanical Va	Valves - By Pass	1.0	ea	Contr	Contr	600,000.00	75.2	54.96	75	1.09	0	600,000	NO	0	4,485	82	604,485	0	$604,485	HDR|CB Estimated Quantity
220																					
221																					
222		**Division #4.2 - Mechanical Valves Sub-Total**	**1,148.0**	**ea**						12,309		$0	1,836,900		0	734,060	13,356	2,570,960	0	$2,570,960	
223																					
224	**Division #4.3 - Mechanical Insulation & Coatings**																				
225																					
226	Insulation	Insulation - BOP Equipment	11,200.0	sf	Contr	Contr	15.00	0.5	46.60	5,600	1.09	0	168,000	NO	0	283,123	6,076	451,123	0	$451,123	HDR|CB Estimated Quantity
227	Insulation	Insulation - Piping Freeze Protection	1,500.0	lf	Contr	Contr	3.50	0.2	46.60	300	1.09	0	5,250	NO	0	15,167	326	20,417	0	$20,417	HDR|CB Estimated Quantity
228	Insulation	Insulation - Piping Large Bore BOP	6,250.0	lf	Contr	Contr	15.00	0.5	46.60	3,125	1.09	0	93,750	NO	0	157,993	3,391	251,743	0	$251,743	HDR|CB Estimated Quantity
229	Insulation	Insulation - Piping Large Bore High Temp	1,720.0	lf	Contr	Contr	50.00	1.5	46.60	2,580	1.09	0	86,000	NO	0	130,439	2,799	216,439	0	$216,439	HDR|CB Estimated Quantity
230	Insulation	Insulation - Piping Small Bore	19,490.0	lf	Contr	Contr	8.00	0.23	46.60	4,483	1.09	0	155,920	NO	0	226,635	4,864	382,555	0	$382,555	HDR|CB Estimated Quantity
231																					
232																					
233		**Division #4.3 - Mechanical Insulation & Coatings Sub-Total**								16,088		0	508,920		0	813,357	17,455	1,322,277	0	$1,322,277	
234																					
235																					
236	**Division #4.4 - Mechanical Engineered Pipe Hangers (Including Supplemental Support Steel)**																				
237																					
238	hanical Pipe H	Hangers & Supports - (Large Bore Engineered)	90	ea	Contr	Contr	1,760.00	12.5	54.96	1,127	1.09	0	158,711	NO	0	67,220	1,223	225,931	0	$225,931	HDR|CB Estimated Quantity
239	hanical Pipe H	Hangers & Supports - (Large Bore Rigid)	1382	ea	Contr	Contr	192.50	7.1	54.96	9,809	1.09	0	265,954	NO	0	584,968	10,643	850,922	0	$850,922	HDR|CB Estimated Quantity
240	hanical Pipe H	Hangers & Supports - (Small Bore Rigid)	1592	ea	Contr	Contr	88.00	1.5	54.96	2,388	1.09	0	140,109	NO	0	142,420	2,591	282,529	0	$282,529	HDR|CB Estimated Quantity
241																					
242		**Division #4.4 - Mechanical Engineered Pipe Hangers Sub-Total**								13,325		0	564,773		0	794,609	14,457	1,359,382	0	$1,359,382	
243																					
244	**Division #4.5 - Mechanical Accessories**																				
245																					
246	nical Acces	Instr. Air Supply filter regulators	30.0	ea	Contr	Contr	132.00	2.4	54.96	72	1.09	0	3,960	NO	0	4,294	78	8,254	0	$8,254	HDR|CB Estimated Quantity
247	nical Acces	Expansion Joints - Circ Water	2.0	ea	Contr	Contr	75,000.00	210	54.96	420	1.09	0	150,000	NO	0	25,047	456	175,047	0	$175,047	HDR|CB Estimated Quantity
248	nical Acces	Miscellaneous Specialties	1.0	lot	Contr	Contr	75,000.00	600	54.96	600	1.09	0	75,000	NO	0	35,781	651	110,781	0	$110,781	HDR|CB Estimated Quantity
249	nical Acces	Miscellaneous Strainers, traps, Exp Joints	1.0	ls	Contr	Contr	125,000.00	120	54.96	120	1.09	0	125,000	NO	0	7,156	130	132,156	0	$132,156	HDR|CB Estimated Quantity
250	nical Acces	Miscellaneous Trolleys & Hoists	1.0	ls	Contr	Contr	150,000.00	480	54.96	480	1.09	0	150,000	NO	0	28,625	521	178,625	0	$178,625	HDR|CB Estimated Quantity
251																					
252		**Division #4.5 - Mechanical Accessories Sub-Total**								1,692		0	503,960		0	100,902	1,836	604,862	0	$604,862	
253																					
254		**Division #4 - Mechanical Piping**								**160,228**		**0**	**10,086,940**		**61,426**	**9,380,802**	**173,848**	**19,467,742**	**225,000**	**$19,692,742**	
255																					
256	**Division #5.0 - Mechanical Equipment**																				
257																					
258	**Division #5.1 - Boiler Equipment**																				
259																					
260	HRSG	Heat Recovery Steam Generator with Duct Burner/CO/Penthouse	1.0	ea	Contr	Contr	24,761,193.82		69.04	0	1.09	0	24,761,194	NO	0	0	0	24,761,194	0	$24,761,194	OEM Budget Proposal
261	HRSG	Steam Generator Erection	1.0	ea	Contr	Contr		66,500	69.04	66,500	1.09	0	0	NO	0	4,981,680	72,153	4,981,680	0	$4,981,680	HDR|CB Estimated cost
262																					
263		**Division #5.1 - Boiler Equipment Sub-Total**								**66,500**		**0**	**24,761,194**		**0**	**4,981,680**	**72,153**	**29,742,874**	**0**	**$29,742,874**	
264																					
265	**Division #5.2 - Turbine Equipment**																				
266																					
267	STG	Steam Turbine Generator	1.0	ea	Contr	Contr	19,545,406.14		53.33	0	1.09	0	19,545,406	NO	0	0	0	19,545,406	0	$19,545,406	Recent Vender quote
268	STG	Steam Turbine Generator, Erection	1.0	ea	Contr	Contr		20,000	53.33	20,000	1.09	0	0	NO	0	1,157,299	21,700	1,157,299	0	$1,157,299	HDR|CB Estimated cost
269																					
270		**Division #5.2 - Turbine Equipment Sub-Total**								**20,000**		**0**	**19,545,406**		**0**	**1,157,299**	**21,700**	**20,702,705**	**0**	**20,702,705**	
271																					
272	**Division #5.3 - Not Used**																				
273																					

Estimate Details

1 x 1 Siemens F Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
Line #	**ISCIPLIN**	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
274	**Division #5.4 - Mechanical Draft Cooling Tower**																				
275																					
276	Cooling Tw	Cooling Tower - Mechanical Draft (F&E)	1.0	Is	Sub	Contr	3,100,000.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	3,100,000	$3,100,000	Recent Vender quote
277																					
278		**Division #5.4 - Mechanical Draft Cooling Tower Sub-Total**								**0**		**0**	**0**		**0**	**0**	**0**	**0**	**3,100,000**	**3,100,000**	
279																					
280	**Division #5.5 - Combustion Turbine Equipment**																				
281																					
282	CT	Combustion Turbine	1.0	ea	Contr	Contr	53,461,668.48		53.33	0	1.09	0	53,461,668	NO	0	0	0	53,461,668	0	$53,461,668	OEM Budget Proposal
283	CT	Combustion Turbine, Installation	1.0	ea	Contr	Contr		29,000	53.33	29,000	1.09	0	0	NO	0	1,678,083	31,465	1,678,083	0	$1,678,083	HDR|CB Estimated cost
284																					
285																					
286		**Division #5.4 - Combustion Turbine Equipment Sub-Total**								**29,000**		**0**	**53,461,668**		**0**	**1,678,083**	**31,465**	**55,139,751**	**0**	**55,139,751**	
287																					
288	**Division #5.6 - BOP Mechanical Equipment**																				
289																					
290	Equipment	Blowdown Tank	2.0	ea	Contr	Contr	16,600.00	20	54.96	40	1.09	0	33,200	NO	0	2,385	43	35,585	0	$35,585	HDR|CB Estimated cost
291	Equipment	Closed Cooling Water Exchanger	2.0	ea	Contr	Contr	600,000.00	200	54.96	400	1.09	0	1,200,000	NO	0	23,854	434	1,223,854	0	$1,223,854	HDR|CB Estimated cost
292	Equipment	Closed Cooling Water Inhibitor Mixing Pot	1.0	ea	Contr	Contr	3,000.00	8	54.96	8	1.09	0	3,000	NO	0	477	9	3,477	0	$3,477	HDR|CB Estimated cost
293	Equipment	Closed Cooling Water (CCW) Heat Exchanger Strainer (Shell & Tube	2.0	ea	Contr	Contr	34,000.00	10	54.96	20	1.09	0	68,000	NO	0	1,193	22	69,193	0	$69,193	HDR|CB Estimated cost
294	Equipment	Instrument Air Receivers	2.0	ea	Contr	Contr	5,000.00	44	54.96	88	1.09	0	10,000	NO	0	5,248	95	15,248	0	$15,248	HDR|CB Estimated cost
295	Equipment	Main Condenser	1.0	ea	Contr	Contr	2,700,000.00	9000	65.52	9,000	1.09	0	2,700,000	NO	0	639,756	9,765	3,339,756	0	$3,339,756	Recent Vender quote
296	Equipment	Oil/Water Separator	1.0	ea	Contr	Contr	50,000.00	244	54.96	244	1.09	0	50,000	NO	0	14,551	265	64,551	0	$64,551	HDR|CB Estimated cost
297	Equipment	Plant Air Compressors	2.0	ea	Contr	Contr	140,000.00	100	54.96	200	1.09	0	280,000	NO	0	11,927	217	291,927	0	$291,927	HDR|CB Estimated cost
298	Equipment	Plant Air Dryers	2.0	ea	Contr	Contr	30,000.00	100	54.96	200	1.09	0	60,000	NO	0	11,927	217	71,927	0	$71,927	HDR|CB Estimated cost
299	Equipment	Plant Air Receivers	2.0	ea	Contr	Contr	5,000.00	20	54.96	40	1.09	0	10,000	NO	0	2,385	43	12,385	0	$12,385	HDR|CB Estimated cost
302	Equipment	Pumps - Circulating Water	2.0	ea	Contr	Contr	500,000.00	500	54.96	1,000	1.09	0	1,000,000	NO	0	59,635	1,085	1,059,635	0	$1,059,635	HDR|CB Estimated cost
303	Equipment	Pumps - Auxiliary Cooling Water	1.0	ea	Contr	Contr	120,000.00	96	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
304	Equipment	Pumps - Closed Cooling Water	2.0	ea	Contr	Contr	134,000.00	200	53.33	400	1.09	0	268,000	NO	0	23,146	434	291,146	0	$291,146	HDR|CB Estimated cost
306	Equipment	Pumps - Boiler Feed	1.0	ea	Contr	Contr	663,000.00	1200	53.33	1,200	1.09	0	663,000	NO	0	69,438	1,302	732,438	0	$732,438	HDR|CB Estimated cost
307	Equipment	Pumps - Condensate	2.0	ea	Contr	Contr	130,000.00	200	53.33	400	1.09	0	260,000	NO	0	23,146	434	283,146	0	$283,146	HDR|CB Estimated cost
308	Equipment	Pumps - Service Water	2.0	ea	Contr	Contr	160,000.00	210	53.33	420	1.09	0	320,000	NO	0	24,303	456	344,303	0	$344,303	HDR|CB Estimated cost
309	Equipment	Pumps - Fire Water (Electric and Diesel)	0.0	lt	Contr	Contr	500,000.00	310	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
310	Equipment	Pumps - Sump - Blowdown, Waste Water	2.0	ea	Contr	Contr	30,000.00	24	53.33	48	1.09	0	60,000	NO	0	2,778	52	62,778	0	$62,778	HDR|CB Estimated cost
311	Equipment	Pumps - Sump - Power Island Misc Building Sumps	4.0	ea	Contr	Contr	30,000.00	24	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
314	Equipment	Pumps - Demin Water Transfer	2.0	ea	Contr	Contr	66,000.00	48	53.33	96	1.09	0	132,000	NO	0	5,555	104	137,555	0	$137,555	HDR|CB Estimated cost
318	Equipment	Pumps - Treated Water Transfer to Serv Water Tank	2.0	ea	Contr	Contr	40,000.00	80	53.33	160	1.09	0	80,000	NO	0	9,258	174	89,258	0	$89,258	HDR|CB Estimated cost
319	Equipment	Pumps - Waste Water	2.0	ea	Contr	Contr	80,000.00	125	53.33	250	1.09	0	160,000	NO	0	14,466	271	174,466	0	$174,466	HDR|CB Estimated cost
320	Equipment	Pumps - Evaporative Cooling Water	2.0	ea	Contr	Contr	37,000.00	80	53.33	160	1.09	0	74,000	NO	0	9,258	174	83,258	0	$83,258	HDR|CB Estimated cost
321	Equipment	Sample Analysis Panel (water)	2.0	ea	Contr	Contr	200,000.00	139	54.96	278	1.09	0	400,000	NO	0	16,578	302	416,578	0	$416,578	HDR|CB Estimated cost
322	Equipment	Tank - 200,000 gal treated water/service water - (F&E)	0.0	ea	Sub	Contr	540,000.00	0		0	1.09	0	0	yes	0	0	0	0	0	$0	Furnish and Erect price
323	Equipment	Tank - Demin Water Storage 200,000 gal. (F&E)	1.0	ea	Sub	Contr	600,000.00	0		0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	Furnish and Erect Price
324	Equipment	Tank - Turbine Drains	2.0	ea	Contr	Contr	75,000.00	200	53.33	400	1.09	0	150,000	NO	0	23,146	434	173,146	0	$173,146	HDR|CB Estimated cost
325	Equipment	Tank - Closed Cooling Water Dispersant 10,000 gal.	1.0	ea	Contr	Contr	36,500.00	100	54.96	100	1.09	0	36,500	NO	0	5,963	109	42,463	0	$42,463	HDR|CB Estimated cost
326	Equipment	Tank - Closed Cooling Water Accumulator	1.0	ea	Contr	Contr	20,600.00	44	54.96	44	1.09	0	20,600	NO	0	2,624	48	23,224	0	$23,224	HDR|CB Estimated cost
329	Equipment	Aqueous Ammonia System Unloading, Storage Tank, Forwarding Pu	0.0	ea	Contr	Contr	0.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
331	Equipment	Auxiliary Boiler System	1.0	ea	Contr	Contr	1,200,000.00	400	53.33	400	1.09	0	1,200,000	NO	0	23,146	434	1,223,146	0	$1,223,146	HDR|CB Estimated cost
332	Equipment	Compressed Gas Storage System (CO2)	1.0	ea	Contr	Contr	40,000.00	475	54.96	475	1.09	0	40,000	NO	0	28,326	515	68,326	0	$68,326	HDR|CB Estimated cost
333	Equipment	Compressed Gas Storage System (H2)	1.0	ea	Contr	Contr	40,000.00	198	54.96	198	1.09	0	40,000	NO	0	11,808	215	51,808	0	$51,808	HDR|CB Estimated cost
334	Equipment	Compressed Gas Storage System (N2)	2.0	ea	Contr	Contr	20,000.00	370	54.96	740	1.09	0	40,000	NO	0	44,130	803	84,130	0	$84,130	HDR|CB Estimated cost
335	Equipment	Demineralized Water Treatment System Dual 100% Trains	0.0	ea	Contr	Contr	800,000.00	3500	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
336	Equipment	Condensate Polisher and Related	1.0	ea	Contr	Contr	800,000.00	3000	54.96	3,000	1.09	0	800,000	NO	0	178,904	3,255	978,904	0	$978,904	HDR|CB Estimated cost
337	Equipment	Fuel Gas Filter Separators	1.0	ea	Contr	Contr	210,000.00	200	54.96	200	1.09	0	210,000	NO	0	11,927	217	221,927	0	$221,927	Sub Budgetary Quote
338	Equipment	Fuel Gas Performance Heater	1.0	ea	Contr	Contr	761,600.00	300	54.96	300	1.09	0	761,600	NO	0	17,890	326	779,490	0	$779,490	Sub Budgetary Quote
339	Equipment	Fuel Gas Electric Startup Heater	1.0	ea	Contr	Contr	84,000.00	40	54.96	40	1.09	0	84,000	NO	0	2,385	43	86,385	0	$86,385	HDR|CB Estimated cost
340	Equipment	Fuel Gas Drain Tank	1.0	ea	Contr	Contr	2,000.00	15	54.96	15	1.09	0	2,000	NO	0	895	16	2,895	0	$2,895	HDR|CB Estimated cost
341	Equipment	Fuel Gas Dewpoint Heater	1.0	ea	Contr	Contr	476,000.00	80	54.96	80	1.09	0	476,000	NO	0	4,771	87	480,771	0	$480,771	HDR|CB Estimated cost
342	Equipment	Fuel Gas Scrubber	1.0	ea	Contr	Contr	392,000.00	60	54.96	60	1.09	0	392,000	NO	0	3,578	65	395,578	0	$395,578	HDR|CB Estimated cost
343	Equipment	Fuel Gas Compressor Package 2 x 100% w/ Building	0.0	ea	Contr	Contr	1,875,000.00	2500	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
344	Equipment	Hydrogen Generator	0.0	ea	Contr	Contr	194,000.00	40	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
345	Equipment	Steam Silencers	1.0	ea	Contr	Contr	150,000.00	20	54.96	20	1.09	0	150,000	NO	0	1,193	22	151,193	0	$151,193	HDR|CB Estimated cost
346	Equipment	Condensate Water Strainer	1.0	ea	Contr	Contr	150,000.00	40	54.96	40	1.09	0	150,000	NO	0	2,385	43	152,385	0	$152,385	HDR|CB Estimated cost
347	Equipment	Cycle Chem Feed	1.0	ea	Contr	Contr	200,000.00	100	54.96	100	1.09	0	200,000	NO	0	5,963	109	205,963	0	$205,963	HDR|CB Estimated cost
348	Equipment	Cooling Tower Chemical Feed	1.0	ea	Contr	Contr	250,000.00	300	54.96	300	1.09	0	250,000	NO	0	17,890	326	267,890	0	$267,890	HDR|CB Estimated cost
349	Equipment	Condeser Vaccum Pump/Air Removal Equipment	1.0	ea	Contr	Contr	350,000.00	40	54.96	40	1.09	0	350,000	NO	0	2,385	43	352,385	0	$352,385	HDR|CB Estimated cost
350	Equipment	Turbine Room Bridge Crane - 60T	1.0	ea	Contr	Contr	390,000.00	120	53.33	120	1.09	0	390,000	NO	0	6,944	130	396,944	0	$396,944	HDR|CB Estimated cost
351	Equipment	Elevator for HRSG	1.0	ea	sub	contr	400,000.00	0		0	1.09	0	0	NO	0	0	0	0	400,000	$400,000	HDR|CB Estimated cost
352																					
353		**Division #5.6 BOP Mechanical Equipment Sub-Total**								**21,516**		**0**	**13,813,900**		**0**	**1,378,628**	**23,345**	**15,192,528**	**1,000,000**	**16,192,528**	
354																					
355	**Division #6.0 - Electrical Equipment**																				
356																					
357	Electrical	Eqpt - 24kv Bus Isolated Phase, 8000A	300.0	lf	Contr	Contr	750.00	16.75	50.09	5,025	1.09	0	225,000	NO	0	273,119	5,452	498,119	0	$498,119	HDR|CB Estimated cost
358	Electrical	Eqpt - 24kv Bus Isolated Phase, 5000A	300.0	lf	Contr	Contr	600.00	12	50.09	3,600	1.09	0	180,000	NO	0	195,667	3,906	375,667	0	$375,667	HDR|CB Estimated cost
359	Electrical	Eqpt - Bus 4.16kV non-seg	600.0	lf	Contr	Contr	400.00	4	50.09	2,400	1.09	0	240,000	NO	0	130,445	2,604	370,445	0	$370,445	HDR|CB Estimated cost
360	Electrical	Eqpt - Bus Duct 480V, 2500A	360.0	lf	Contr	Contr	610.00	3.2	50.09	1,152	1.09	0	219,600	NO	0	62,614	1,250	282,214	0	$282,214	HDR|CB Estimated cost
361	Electrical	Eqpt - Generator Breaker, 8000A, 24kV	2.0	ea	Contr	Contr	420,000.00	396	50.09	792	1.09	0	840,000	NO	0	43,047	859	883,047	0	$883,047	HDR|CB Estimated cost
362	Electrical	Eqpt - LV Switchgear - 480V, 4000A EO Main Ckt Bkr	6.0	ea	Contr	Contr	35,000.00	56	50.09	336	1.09	0	210,000	NO	0	18,262	365	228,262	0	$228,262	HDR|CB Estimated cost
363	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Main Ckt Bkr.	2.0	ea	Contr	Contr	15,400.00	30	50.09	60	1.09	0	30,800	NO	0	3,261	65	34,061	0	$34,061	HDR|CB Estimated cost
364	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Tie Ckt Bkr.	3.0	ea	Contr	Contr	15,400.00	30	50.09	90	1.09	0	46,200	NO	0	4,892	98	51,092	0	$51,092	HDR|CB Estimated cost
365	Electrical	Eqpt - LV Switchgear - 480V, 1200A EO Tie Ckt Bkr.	1.0	ea	Contr	Contr	10,780.00	26	50.09	26	1.09	0	10,780	NO	0	1,413	28	12,193	0	$12,193	HDR|CB Estimated cost
366	Electrical	Eqpt - LV Switchgear - 480V, 800A MO Fdr Ckt Bkr.	16.0	ea	Contr	Contr	4,575.00	22	50.09	352	1.09	0	73,200	NO	0	19,132	382	92,332	0	$92,332	HDR|CB Estimated cost
367	Electrical	Eqpt - LV Switchgear - 480V, 800A Equipped Space	6.0	ea	Contr	Contr	1,090.00	13.2	50.09	79	1.09	0	6,540	NO	0	4,305	86	10,845	0	$10,845	HDR|CB Estimated cost
368	Electrical	Eqpt - Motor Control Centers - 480V	16.0	ea	Contr	Contr	46,000.00	132	50.09	2,112	1.09	0	736,000	NO	0	114,792	2,292	850,792	0	$850,792	HDR|CB Estimated cost
369	Electrical	Eqpt - MV Switchgear - 4kV, 3000A Main Ckt Bkr.	2.00	ea	Contr	Contr	79,640.00	76	50.09	152	1.09	0	159,280	NO	0	8,262	165	167,542	0	$167,542	HDR|CB Estimated cost
370	Electrical	Eqpt - MV Switchgear - 4kV, 2000A Fdr Ckt Bkr.	3.00	ea	Contr	Contr	42,870.00	72	50.09	216	1.09	0	128,610	NO	0	11,740	234	140,350	0	$140,350	HDR|CB Estimated cost
371	Electrical	Eqpt - MV Switchgear - 4kV, 1200A Fdr Ckt Bkr.	20.00	ea	Contr	Contr	36,360.00	48	50.09	960	1.09	0	727,200	NO	0	52,178	1,042	779,378	0	$779,378	HDR|CB Estimated cost
372	Electrical	Eqpt - Relay panels and Metering	2.0	ea	Contr	Contr	34,500.00	120.00	50.09	240	1.09	0	69,000	NO	0	13,044	260	82,044	0	$82,044	HDR|CB Estimated cost
373	Electrical	Eqpt - Station Batteries 125 Volt DC	1.0	lot	Contr	Contr	165,140.00	635	50.09	635	1.09	0	165,140	NO	0	34,514	689	199,654	0	$199,654	HDR|CB Estimated cost

Estimate Details

1 x 1 Siemens F Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
374	Electrical	Eqpt - Transformer GSU - 283 MVA, 18kV-345kV	1.0	ea	Contr	Contr	2,100,000.00	950	50.09	950	1.09	0	2,100,000	NO	0	51,634	1,031	2,151,634	0	$2,151,634	HDR|CB Estimated cost
375	Electrical	Eqpt - Transformer GSU - 142 MVA, 18kV-345kV	1.0	ea	Contr	Contr	1,500,000.00	950	50.09	950	1.09	0	1,500,000	NO	0	51,634	1,031	1,551,634	0	$1,551,634	HDR|CB Estimated cost
376	Electrical	Eqpt - Transformer UAT 20 MVA, 18kV/4.16kV	2.0	ea	Contr	Contr	800,000.00	650	50.09	1,300	1.09	0	1,600,000	NO	0	70,658	1,411	1,670,658	0	$1,670,658	HDR|CB Estimated cost
377	Electrical	Eqpt - Emergency Diesel Gnerator packaged 750kW	1.0	ea	Contr	Contr	200,000.00	100	50.09	100	1.09	0	200,000	NO	0	5,435	109	205,435	0	$205,435	HDR|CB Estimated cost
378	Electrical	Eqpt - UPS (120VAC)	1.0	ea	Contr	Contr	300,000.00	528	50.09	528	1.09	0	300,000	NO	0	28,698	573	328,698	0	$328,698	HDR|CB Estimated cost
379	Electrical	Eqpt - Transformer Aux Power 2.5/3.3MVA, 7kV-480V	6.0	ea	Contr	Contr	104,500.00	210	50.09	1,260	1.09	0	627,000	NO	0	68,484	1,367	695,484	0	$695,484	HDR|CB Estimated cost
380	Electrical	Eqpt - Lighting Transformers	8.0	ea	Contr	Contr	916.27	9.09	50.09	73	1.09	0	7,330	YES	440	3,953	79	11,283	0	$11,283	HDR|CB Estimated cost
381	Electrical	Eqpt - Panelboards 480/120 & 480/277/120	8.0	ea	Contr	Contr	1,200.00	40.00	50.09	320	1.09	0	9,600	YES	576	17,393	347	26,993	0	$26,993	HDR|CB Estimated cost
382	Electrical	Eqpt - Plant Network System	1.0	ea	Contr	Contr	100,000.00	300	50.09	300	1.09	0	100,000	YES	6,000	16,306	326	116,306	0	$116,306	HDR|CB Estimated cost
383	Electrical	Eqpt - Plant Security System	1.0	lot	Contr	Contr	250,000.00	1800	50.09	1,800	1.09	0	250,000	YES	15,000	97,834	1,953	347,834	0	$347,834	HDR|CB Estimated cost
384	Electrical	Eqpt - Plant Telephone System	1.0	ea	Contr	Contr	100,000.00	900	50.09	900	1.09	0	100,000	YES	6,000	48,917	977	148,917	0	$148,917	HDR|CB Estimated cost
385																					
386		**Division #6.0 - Electrical Equipment Sub-Total**								**26,708**		**0**	**10,861,280**		**28,016**	**1,451,631**	**28,978**	**12,312,911**	**0**	**12,312,911**	
387																					
388	**Division #6.1 - Electrical/Control Commodities**																				
389																					
390	Electrical	Grounding - Buried Ground Conductor	28,000.0	lf	Contr	Contr	4.79	0.054	50.09	1,512	1.09	0	134,120	NO	0	82,180	1,641	216,300	0	$216,300	HDR|CB Estimated Quantity & Cost
391	Electrical	Grounding - Above Ground Conductor	28,000.0	lf	Contr	Contr	4.79	0.054	50.09	1,512	1.09	0	134,120	NO	0	82,180	1,641	216,300	0	$216,300	HDR|CB Estimated Quantity & Cost
392	Electrical	Grounding - Ground Rods Copper	96.0	ea	Contr	Contr	22.95	1.74	50.09	167	1.09	0	2,204	NO	0	9,079	181	11,283	0	$11,283	HDR|CB Estimated Quantity & Cost
393	Electrical	Grounding - Exothermic Connections	2,200.0	ea	Contr	Contr	9.75	1.14	50.09	2,508	1.09	0	21,450	NO	0	136,315	2,721	157,765	0	$157,765	HDR|CB Estimated Quantity & Cost
394	Electrical	Grounding - Servit Post	1,000.0	ea	Contr	Contr	30.00	1	50.09	833	1.09	0	30,000	NO	0	45,263	904	75,263	0	$75,263	HDR|CB Estimated Quantity & Cost
395	Electrical	Conduit A/G 5" RGS	800.0	lf	Contr	Contr	58.00	1.00	50.09	800	1.09	0	46,400	NO	0	43,482	868	89,882	0	$89,882	HDR|CB Estimated Quantity & Cost
396	Electrical	Conduit A/G 2" ave RGS	60,000.0	lf	Contr	Contr	8.50	0.30	50.09	18,000	1.09	0	510,000	NO	0	978,337	19,530	1,488,337	0	$1,488,337	HDR|CB Estimated Quantity & Cost
397	Electrical	Conduit U/G - 4 x 6 PVC 5"	6,000.0	lf	Contr	Contr	240.00	2.00	50.09	12,000	1.09	0	1,440,000	NO	0	652,225	13,020	2,092,225	0	$2,092,225	HDR|CB Estimated Quantity & Cost
398	Electrical	Conduit U/G - 8 x 8 PVC 5"	700.0	lf	Contr	Contr	530.00	5.00	50.09	3,500	1.09	0	371,000	NO	0	190,232	3,798	561,232	0	$561,232	HDR|CB Estimated Quantity & Cost
399	Electrical	Cable Tray, Raceway 24" Aluminum	4,000.0	lf	Contr	Contr	17.00	0.84	50.09	3,360	1.09	0	68,000	NO	0	182,623	3,646	250,623	0	$250,623	HDR|CB Estimated Quantity & Cost
400	Electrical	Cable Tray, Raceway 36" Aluminum	1,650.0	lf	Contr	Contr	20.00	1.05	50.09	1,733	1.09	0	33,000	NO	0	94,165	1,880	127,165	0	$127,165	HDR|CB Estimated Quantity & Cost
401	Electrical	Cable - Overhead Conductor to Substation	1,000.0	lf	Contr	Contr	8.50	0.50	50.09	500	1.09	0	8,500	NO	0	27,176	543	35,676	0	$35,676	HDR|CB Estimated Quantity & Cost
402	Electrical	Cable - Medium Voltage (5kV 1C Cable)	60,000.0	lf	Contr	Contr	14.60	0.127	50.09	7,620	1.09	0	876,000	NO	0	414,163	8,268	1,290,163	0	$1,290,163	HDR|CB Estimated Quantity & Cost
403	Electrical	Cable Terminations - 5kV	96.0	ea	Contr	Contr	195.00	12.00	50.09	1,152	1.09	0	18,720	NO	0	62,614	1,250	81,334	0	$81,334	HDR|CB Estimated Quantity & Cost
404	Electrical	Cable 600V Power 1/c No. 2/0 ave size	120,000.0	lf	Contr	Contr	3.55	0.041	50.09	4,920	1.09	0	426,000	NO	0	267,412	5,338	693,412	0	$693,412	HDR|CB Estimated Quantity & Cost
405	Electrical	Wire 600V Power 3/c # 10 ave. size	185,000.0	lf	Contr	Contr	0.27	0.0185	50.09	3,423	1.09	0	49,950	NO	0	186,020	3,713	235,970	0	$235,970	HDR|CB Estimated Quantity & Cost
406	Electrical	Cable - Fiber Optic	16,500.0	lf	Contr	Contr	6.00	0.025	50.09	413	1.09	0	99,000	NO	0	22,420	448	121,420	0	$121,420	HDR|CB Estimated Quantity & Cost
407	Electrical	Cable - Permanent Telephone Line	1.0	ls	Contr	Contr	10,000.00	240.000	50.09	240	1.09	0	10,000	NO	0	13,044	260	23,044	0	$23,044	HDR|CB Estimated Quantity & Cost
408	Electrical	Cable - Control	500,000.0	lf	Contr	Contr	1.10	0.040	50.09	20,000	1.09	0	550,000	NO	0	1,087,041	21,700	1,637,041	0	$1,637,041	HDR|CB Estimated Quantity & Cost
409	Electrical	Cable - Instrument 4pr tw/shld No. 18	300,000.0	lf	Contr	Contr	3.25	0.025	50.09	7,500	1.09	0	975,000	NO	0	407,641	8,138	1,382,641	0	$1,382,641	HDR|CB Estimated Quantity & Cost
410	Electrical	Cable - Thermocouple 2pr tw/shld No. 16	10,000.0	lf	Contr	Contr	0.33	0.030	50.09	300	1.09	0	3,300	NO	0	16,306	326	19,606	0	$19,606	HDR|CB Estimated Quantity & Cost
411	Electrical	Cable - Data Highway	20,000.0	lf	Contr	Contr	4.59	0.034	50.09	688	1.09	0	91,800	NO	0	37,394	746	129,194	0	$129,194	HDR|CB Estimated Quantity & Cost
412	Electrical	Cable Terminations - low voltage	25,000.0	ea	Contr	Contr	0.85	0.300	50.09	7,500	1.09	0	21,250	NO	0	407,641	8,138	428,891	0	$428,891	HDR|CB Estimated Quantity & Cost
413	Electrical	Cable Terminations - control	25,000.0	ea	Contr	Contr	0.54	0.300	50.09	7,500	1.09	0	13,500	NO	0	407,641	8,138	421,141	0	$421,141	HDR|CB Estimated Quantity & Cost
414	Electrical	Cable Terminations - instrument	25,000.0	ea	Contr	Contr	0.54	0.300	50.09	7,500	1.09	0	13,500	NO	0	407,641	8,138	421,141	0	$421,141	HDR|CB Estimated Quantity & Cost
415	Electrical	Conduit - Lighting A/G	20,000.0	lf	Contr	Contr	2.83	0.25	50.09	5,000	1.09	0	56,600	YES	3,396	271,760	5,425	328,360	0	$328,360	HDR|CB Estimated Quantity & Cost
416	Electrical	Wire - Lighting 1/C No 12	60,000.0	lf	Contr	Contr	0.176	0.018	50.09	1,080	1.09	0	10,560	YES	634	58,700	1,172	69,260	0	$69,260	HDR|CB Estimated Quantity & Cost
417	Electrical	Lighting - Outdoor Fixtures, pole	24.0	ea	Contr	Contr	1,600.00	12.00	50.09	288	1.09	0	38,400	YES	2,304	15,653	312	54,053	0	$54,053	HDR|CB Estimated Quantity & Cost
418	Electrical	Lighting - Outdoor Fixtures, 150W	200.0	ea	Contr	Contr	490.00	4.00	50.09	800	1.09	0	98,000	NO	0	43,482	868	141,482	0	$141,482	HDR|CB Estimated Quantity & Cost
419	Electrical	Lighting - Fixtures, 250W MH	80.0	ea	Contr	Contr	850.00	3.00	50.09	240	1.09	0	68,000	NO	0	13,044	260	81,044	0	$81,044	HDR|CB Estimated Quantity & Cost
420	Electrical	Lighting - Fixtures, fluorescent	180.0	ea	Contr	Contr	85.00	1.60	50.09	288	1.09	0	15,300	YES	918	15,653	312	30,953	0	$30,953	HDR|CB Estimated Quantity & Cost
421	Electrical	Lighting - Receptacles and switches	150.0	ea	Contr	Contr	32.00	1.37	50.09	205	1.09	0	4,800	YES	288	11,148	223	15,948	0	$15,948	HDR|CB Estimated Quantity & Cost
422	Electrical	Welding Receptacles	16.0	ea	Contr	Contr	1,800.00	4.00	50.09	64	1.09	0	28,800	NO	0	3,479	69	32,279	0	$32,279	HDR|CB Estimated Quantity & Cost
423	Electrical	Lighting - Exit	48.0	ea	Contr	Contr	150.00	2.00	50.09	96	1.09	0	7,200	YES	432	5,218	104	12,418	0	$12,418	HDR|CB Estimated Quantity & Cost
424	Electrical	Lighting - Emergency	100.0	ea	Contr	Contr	127.00	2.00	50.09	200	1.09	0	12,700	YES	762	10,870	217	23,570	0	$23,570	HDR|CB Estimated Quantity & Cost
425	Electrical	Cathodic Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
426	Electrical	Lightning Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
427	Electrical	Freeze Protection System	1.0	lot	Contr	Contr	400,000.00	2000	50.09	2,000	1.09	0	400,000	YES	24,000	108,704	2,170	508,704	0	$508,704	HDR|CB Estimated Quantity & Cost
428	Electrical	Electrical Circuit Testing	4,850.0	ea	Contr	Contr		2	50.09	9,700	1.09	0	0	NO	0	527,216	10,525	527,216	0	$527,216	HDR|CB Estimated Quantity & Cost
429		**Total Cable**	**1,212,501.0**	**LF**																	
430																					
431		**Division #6.1 - Electrical/Control Commodities Sub-Total**								**136,100**		**0**	**6,887,174**		**44,734**	**7,397,341**	**147,669**	**14,284,514**	**0**	**14,284,514**	
432																					
433	**Division #6.2 - Switchyard**																				
434																					
435	IV Electrica	138kV Dead End Towers 6 Legged (2 total)	100,000.0	lb	Contr	Contr	2.50	0.02	60.25	2,180	1.09	0	250,000	NO	0	142,500	2,365	392,500		$392,500	HDR|CB Estimated Quantity & Cost
436	IV Electrica	Interonnection Cabling and Termination Allowance	1.0	lot	Contr	Contr	15,000.00	1,526.36	51.33	1,526	1.09	0	15,000	NO	0	85,000	1,656	100,000		$100,000	HDR|CB Estimated Quantity & Cost
437																					
438		**Division #6.2 - Switchyard**								**3,706**		**0**	**$265,000**		**0**	**$227,500**	**$4,021**	**$492,500**	**$0**	**$492,500**	
439																					
440	**Division #7.0 - Instrumentation & Control**																				
441																					
442	I & C	BOP Instrument Devices	900.0	ea	Contr	Contr	750.00	12	50.09	10,800	1.09	0	675,000	NO	0	587,002	11,718	1,262,002	0	$1,262,002	HDR|CB Estimated Quantity & Cost
443	I & C	Auxiliary Boiler CEMS	1.0	lot	Contr	Contr	163,200.00	200	50.09	200	1.09	0	163,200	NO	0	10,870	217	174,070	0	$174,070	HDR|CB Estimated Quantity & Cost
444	I & C	Continuous Emissions Monitoring Equipment (CEMS)	1.0	ea	Contr	Contr	700,000.00	2000	53.33	2,000	1.09	0	700,000	NO	0	115,730	2,170	815,730	0	$815,730	HDR|CB Estimated Quantity & Cost
445	I & C	Control Valves	180.0	ea	Contr	Contr	4,000.00	24	54.96	4,320	1.09	0	720,000	NO	0	257,621	4,687	977,621	0	$977,621	HDR|CB Estimated Quantity & Cost
446	I & C	DCS w/ Configuration, Interfaces, Field Support, Interface, Bulks	1.0	ea	Contr	Contr	1,300,000.00	1691	50.09	1,691	1.09	0	1,300,000	NO	0	91,909	1,835	1,391,909	0	$1,391,909	HDR|CB Estimated Quantity & Cost
447	I & C	Emergency Trip sub Panel	1.0	ea	Contr	Contr	30,000.00	21	50.09	21	1.09	0	30,000	NO	0	1,141	23	31,141	0	$31,141	HDR|CB Estimated Quantity & Cost
448	I & C	Flow Element - Nozzle (Supply)	3.0	ea	Contr	Contr	30,000.00	20	54.96	60	1.09	0	90,000	NO	0	3,578	65	93,578	0	$93,578	HDR|CB Estimated Quantity & Cost
449	I & C	Instrument Calibration and loop check	1,200.0	ea	Contr	Contr	0.00	3	50.09	3,600	1.09	0	0	NO	0	195,667	3,906	195,667	0	$195,667	HDR|CB Estimated Quantity & Cost
450	I & C	Instrument piping 2&3-valve manifolds	240.0	ea	Contr	Contr	400.00	5.22	54.96	1,252	1.09	0	96,000	NO	0	74,646	1,358	170,646	0	$170,646	HDR|CB Estimated Quantity & Cost
451	I & C	Instrument Racks & Enclosures	1.0	lot	Contr	Contr	350,000.00	1450	50.09	1,450	1.09	0	350,000	NO	0	78,811	1,573	428,811	0	$428,811	HDR|CB Estimated Quantity & Cost
452	I & C	Instrument Tubing - copper	4,000.0	lf	Contr	Contr	3.70	0.15	54.96	600	1.09	0	14,800	NO	0	35,781	651	50,581	0	$50,581	HDR|CB Estimated Quantity & Cost
453	I & C	Instrument Tubing - Stainless Steel	1,600.0	lf	Contr	Contr	6.25	0.20	54.96	320	1.09	0	10,000	NO	0	19,083	347	29,083	0	$29,083	HDR|CB Estimated Quantity & Cost
454	I & C	PLC Hardware, Bulks, Aux Controls, Configuration	1.0	ls	Contr	Contr	241,200.00	253	50.09	253	1.09	0	241,200	NO	0	13,751	275	254,951	0	$254,951	HDR|CB Estimated Quantity & Cost
455																					
456		**Division #7.0 - Control Sub-Total**								**26,567**		**0**	**4,390,200**		**0**	**1,485,591**	**28,825**	**5,875,791**	**0**	**$5,875,791**	
457																					
458		**Sub-Total Direct Costs**								**627,115**		**0**	**153,365,872**	**0**		**35,516,790**	**679,932**	**188,882,662**	**18,347,900**	**207,230,562**	
459		Sales Tax - State (Plant Production Equipment is Exempt)	6.00%												**329,927**				**329,927**	**329,927**	Sales Tax Included for Non-Production Facilities

Estimate Details

1 x 1 Siemens F Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
460	Indirects																				
461		**TOTAL DIRECT COSTS**								**627,115**		**0**	**153,365,872**			**35,516,790**	**679,932**	**188,882,662**	**18,677,827**	**$207,560,489**	
462																					
463	**Division #8.0 - Construction and Indirect Services**																				
464																					
465	Const Indirec	Construction Equipment	1.0	ls	Contr	Contr	11,145,203			0	1.09					0	0	0	11,145,203	$11,145,203	See Construction Equipment worksheet
466	Const Indirec	Construction Field staff	1.0	ls	Contr	Contr	11,522,855			0	1.09					0	0	0	11,522,855	$11,522,855	See EPC Field Staff Worksheet for details
467	Const Indirec	Construction Field staff expenses	1.0	ls	Contr	Contr	1,870,168			0	1.09					0	0	0	1,870,168	$1,870,168	See EPC Field Staff Worksheet for details
468	Const Indirec	Construction Permits	1.0	ls	Contr	Contr				0	1.09		51,450			0	0	51,450	0	$51,450	See Const Indirects and Serv Worksheet
469	Const Indirec	Construction Testing	1.0	ls	Contr	Contr				0	1.09		117,000			0	0	117,000	0	$117,000	See Const Indirects and Serv Worksheet
470	Const Indirec	Consumable Materials & Safety Supplies	2.00	$/MH	Contr	Contr	1,359,864			0	1.09					0	0	0	1,359,864	$1,359,864	$2.00/Direct hour
471	Const Indirec	Field Office Expenses	1.0	ls	Contr	Contr				1,369	1.09		1,033,370			65,849	1,485	1,099,219	22,373	$1,121,592	See Const Indirects and Serv Worksheet
472	Const Indirec	Performance Testing	1.0	ls	Contr	Contr				0	1.09		304,400			0	0	304,400	0	$304,400	See Const Indirects and Serv Worksheet
473	Const Indirec	Preoperational Testing, Startup & Commissioning	2.0	ls	Contr	Contr				21,690	1.09		1,113,000			752,767	23,534	1,865,767	0	$1,865,767	See Const Indirects and Serv Worksheet
474	Const Indirec	Site Safety	1.0	ls	Contr	Contr				7,580	1.09		658,040			375,008	8,224	1,033,048	0	$1,033,048	See Const Indirects and Serv Worksheet
475	Const Indirec	Small Tools	2.00	$/MH	Contr	Contr	1,359,864			0	1.09					0	0	0	1,359,864	$1,359,864	$2.00/Direct hour
476	Const Indirec	Start-up Supervision	1.0	ls	Contr	Contr	1,296,911			0	1.09					0	0	0	1,296,911	$1,296,911	See EPC Field Staff Worksheet for details
477	Const Indirec	Support Craft, Site Services, Scaffolding	1.0	ls	Contr	Contr				41,753	1.09		459,400			2,008,704	45,302	2,468,104	775,014	$3,243,118	See Const Indirects and Serv Worksheet
478	Const Indirec	Temporary Facilities	1.0	ls	Contr	Contr				17,947	1.09		2,336,753			863,403	19,472	3,200,157	82,500	$3,282,657	See Const Indirects and Serv Worksheet
479	Const Indirec	Temporary Utilities	1.0	ls	Contr	Contr				29,032	1.09		747,600			1,396,697	31,500	2,144,297	0	$2,144,297	See Const Indirects and Serv Worksheet
480																					
481		**Division #8.0 - Construction Indirects and Services Sub-Total**								**119,371**		**0**	**6,821,013**			**5,462,428**	**129,518**	**12,283,441**	**29,434,753**	**$41,718,194**	
482																					
483		**SUB-TOTAL CONSTRUCTION COST**								**746,486**		**0**	**160,186,885**			**40,979,218**	**809,450**	**201,166,103**	**48,112,580**	**249,278,683**	
484		**Subcontract Labor Hours**																			
485		**Material Cost Excluding CT, HRSG and ST (escalation and EPC**											**62,418,617**								
486	**Division #9.0 - Project Indirects**																				
487																					
488	Project Indire	- Power Plant Design Engineering	1.0	ls	Contr	6.0%	14,956,721											0	14,956,721	$14,956,721	6.0% of the Total Construction Cost
489	Project Indire	- Project Management (Home Office)	0.0	ls	Contr	0.0%	0											0	0	$0	Included in Engineering
490																					
491																					
492		Sub-Total Project Indirects										**0**	**0**			**0**	**0**	**0**	**14,956,721**	**$14,956,721**	
493																					
494	EPC Indirect	EPC Contractor Insurance & Misc Costs (% of Total Const. Cost)																			
495																					
496	EPC Indirect	- Builders Risk Insurance	1.0	ls	Contr	0.50%	1,246,393												1,246,393	$1,246,393	Allowance based on info from other projects
497	EPC Indirect	- Comprehensive General Liability (CGL) Insurance	1.0	ls	Contr	0.50%	1,246,393											0	1,246,393	$1,246,393	Allowance based on info from other projects
498	EPC Indirect	- Warranty Reserve	1.0	ls	Contr		500,000											0	500,000	$500,000	Allowance based on info from other projects
499																					
500		Sub-Total EPC Contractor Indirects										**0**	**0**			**0**	**0**	**0**	**2,992,787**	**$2,992,787**	
501																					
502		**Total Project Indirects**										**0**	**0**			**0**	**0**	**0**	**17,949,508**	**17,949,508**	
503																					
504		Sub-Total										**0**	**160,186,885**			**40,979,218**	**809,450**	**201,166,103**	**66,062,088**	**$267,228,191**	
505							Equipment	Material	Labor	S/C											
506	Project Indire	Escalation - EPC Contractor Escalation Rates					2.4%	2.4%	4.0%	4.0%			5,346,150			6,629,822	0	11,975,971	8,374,313	20,350,285	Excludes CT, HRSG and ST
507																					
508		Sub-Total										**0**	**165,533,035**			**47,609,040**	**809,450**	**213,142,075**	**74,436,401**	**$287,578,475**	
509							Equip	Mat	Labor	S/C											
510	EPC Indirect	EPC Contractor Contingency	Varies	%	Contr		0%	5%	5%	5%		0	3,120,931			2,380,452		5,501,383	3,536,820	9,038,203	Excludes CT, HRSG and ST
511	EPC Indirect	EPC Contractor G&A and Fee	8.0%	%	Contr		0.0%	8.0%	8.0%	8.0%		0	13,242,643			3,808,723		17,051,366	5,954,912	23,006,278	
512																					
513		Sub-Total		ls								0	16,363,574			6,189,175	0	22,552,749	9,491,732	$32,044,481	
514																					
515		**TOTAL EPC PROJECT COST**								**746,486**		**0**	**181,896,608**			**53,798,215**	**809,450**	**235,694,823**	**83,928,133**	**$319,622,956**	
516																					
517	**OWNER INDIRECTS**																				
518	**Division #9.1 - Owner Indirects**																				
519																					
520		**Power Block 1 and Common**																			
521	Owner Indire	Project Development	1.0	ls	Owner														6,500,000	$6,500,000	Budget provided by LG&E
522	Owner Indire	Transmission Line Relocation	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
523	Owner Indire	Transmission Interconnection Facilities	1.0	ls	Owner														5,500,000	$5,500,000	To be estimated by Transmision Operator
524	Owner Indire	Natural Gas Pipeline Interconnection	1.0	ls	Owner														14,250,000	$14,250,000	Budget provided by LG&E
525	Owner Indire	Natural Gas Pipeline Fixed O&M (Startup Period)	1.0	ls	Owner														3,000,000	$3,000,000	Budget provided by LG&E
526	Owner Indire	Construction Power (Service Installation and Energy)	1.0	ls	Owner														750,000	$750,000	Budget estimated by HDR|CB
527	Owner Indire	Owner Operations Personnel (Prior to COD)	1.0	ls	Owner														2,340,000	$2,340,000	Budget estimated by HDR|CB 7 sal @ 12 mo, 26 hr @ 6 n
528	Owner Indire	Owners Project Management	1.0	ls	Owner														5,300,000	$5,300,000	Budget provided by LG&E
529	Owner Indire	Owners Engineer	1.0	ls	Owner														1,700,000	$1,700,000	Budget provided by LG&E
530	Owner Indire	Owners Legal Counsel	1.0	ls	Owner														1,300,000	$1,300,000	Budget provided by LG&E
531	Owner Indire	Operator Training	1.0	ls	Owner														225,000	$225,000	Budget estimated by HDR|CB
532	Owner Indire	Owner Startup Engineering	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
533	Owner Indire	Permitting, License Fees, & Environmental Compliance	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
534	Owner Indire	Highway Improvements, Miscellaneous Mitigation	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
535	Owner Indire	Land	1.0	ls	Owner														0	$0	Budget provided by LG&E
536	Owner Indire	Rolling Stock	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
537	Owner Indire	Water Infrastructure / Supply to Site	0.0	ls	Owner														0	$0	N/A (On site intake/pre-treatment/discharge incl. in EPC)
538	Owner Indire	Startup Testing (Includes Fuel & Power Sales)																			
539	Owner Indire	- Fuel - Natural Gas	1.0	ls	Owner														6,080,400	$6,080,400	HDR|CB [1,351,200 MMBTU @ $4.50/MMBTU per LG&E 2017 Forecas
540	Owner Indire	- Fuel - Fuel Oil	0.0	ls	Owner														0	$0	Budget estimated by HDR|CB [Not Required]
541	Owner Indire	- Electric Transmission Firm Point to Point	1.0	ls	Owner														2,000,000	$2,000,000	Budget provided by LG&E
542	Owner Indire	- Startup Power	1.0	ls	Owner														195,552	$195,552	Budget estimated by HDR|CB [5432 MWhr @$36/MWH]
543	Owner Indire	- Test Power Sales	1.0	ls	Owner														(7,776,000)	($7,776,000)	Budget estimated by HDR|CB [216,000 MWhr @$36/MWH
544	Owner Indire	- Variable O&M - Water, Chemicals, etc.	1.0	ls	Owner														800,000	$800,000	Budget estimated by HDR|CB
545	Owner Indire	Site Security	1.0	ls	Owner														50,000	$50,000	Budget estimated by HDR|CB
546	Owner Indire	Operating Spare Parts	1.0	ls	Owner														10,000,000	$10,000,000	Budget estimated by HDR|CB - Does NOT incl. CT LTSA
547	Owner Indire	Permanent Plant Equipment & Furnishings																		$0	

Estimate Details

1 x 1 Siemens F Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
Line #																					
548	Owner Indire	- Office Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
549	Owner Indire	- Kitchen Furniture	1.0	ls	Owner														130,000	$130,000	Budget estimated by HDR|CB
550	Owner Indire	- Laboratory Equipment & Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
551	Owner Indire	- Locker Room Furniture	1.0	ls	Owner														180,000	$180,000	Budget estimated by HDR|CB
552	Owner Indire	- Warehouse Shelves	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
553	Owner Indire	- Workshop Tools & Test Equipment	1.0	ls	Owner														1,800,000	$1,800,000	Budget estimated by HDR|CB
554	Owner Indire	IT and Telecommunication Infrastructure	1.0	ls	Owner														250,000	$250,000	Budget estimated by HDR|CB
555	Owner Indire	NERC - Cyber Security	1.0	ls	Owner														1,000,000	$1,000,000	Budget estimated by HDR|CB
556	Owner Indire	Escalation - Owners Furnished Equipment	0.0	%	Owner														0	$0	N/A
557	Owner Indire	Builders Risk Insurance	0.0	ls	Owner														0	$0	Included with EPC Contractor Indirects
558	Owner Indire	Property Tax During Construction	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
559	Owner Indire	Financing Fees	0.0	ls	Owner														0	$0	N/A
560	Owner Indire	AFUDC	1.0	ls	Owner														4,000,000	$4,000,000	AFUDC Based on 78% KU Ownership
561		**Total Owner Indirects**																	**63,774,952**	**$63,774,952**	
562																					
563																					
564		**Owner Contingency**	10.00%	%	Owner														**31,962,296**	**$31,962,296**	
565																					
566																					
567		**Total Owner Indirects**																	**95,737,248**	**$95,737,248**	
568																					
569		**TOTAL PROJECT COST**										**0**	**181,896,608**			**53,798,215**	**809,450**	**235,694,823**	**179,665,381**	**$415,360,204**	
																			$/kW	**$1,251**	

1 x 1 MHI G Class Combined Cycle Unit

BUDGET ESTIMATE

5 x 10 Work Week

February 22, 2013

Rev 3

CONFIDENTIAL

1 x 1 MHI G Class Combined Cycle Unit

LOCATION:	Kentucky
PROJECT #	189895
PLANT TYPE:	**NGCC**
CLIENT:	LG&E/KU
ESTIMATE TYPE:	Conceptual
LEAD ESTIMATOR:	

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013			TECHNOLOGY:	CT with HRSG & STG		
	NTP PERIOD:		NET MW RATING:	372.7	BOILER:	Fired
	CONSTRUCTION NTP - Mob:		NO. OF UNITS:	1	STEAM TURBINE:	Condensing
	COMMERCIAL OPERATION DATE:	1-Jun-2018	FUEL TYPE:	Nat Gas	COOLING TYPE:	Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
Site Development	$0	$1,615,475	$1,394,611	33,400	224,000	$3,234,086	0.9%
Raw Water Intake/Discharge Facilities	$0	$500,000	$578,649	10,850	0	$1,078,649	0.3%
Foundations & Concrete	$0	$3,897,575	$2,955,871	76,389	9,015,000	$15,868,446	4.5%
Architectural & Metals	$0	$3,660,410	$1,713,370	34,023	5,366,400	$10,740,180	3.0%
Piping, Valves, Support, Accessories	$0	$10,778,940	$9,521,516	176,408	225,000	$20,525,455	5.8%
HRSG Equipment	$0	$26,562,008	$6,479,930	93,853	0	$33,041,938	9.3%
Steam Turbine Island Equipment	$0	$21,630,000	$1,504,488	28,210	0	$23,134,488	6.5%
Combustion Turbine Equipment	$0	$67,530,529	$2,198,867	41,230	0	$69,729,396	19.7%
Mechanical Draft Cooling Tower	$0	$0	$0	0	3,800,000	$3,800,000	1.1%
BOP Mechanical Equipment	$0	$15,113,300	$1,472,929	24,864	1,000,000	$17,586,229	5.0%
Electrical Equipment	$0	$11,904,770	$1,443,587	28,818	0	$13,348,357	3.8%
Electrical Commodities	$0	$6,887,174	$7,397,341	147,669	0	$14,284,514	4.0%
High Voltage Switchyard	$0	$265,000	$227,500	4,021	0	$492,500	0.1%
Instrumentation & Controls	$0	$4,390,200	$1,485,591	28,825	0	$5,875,791	1.7%
Sub-Total Direct Costs:	**$0**	**$174,735,380**	**$38,374,251**	**728,559**	**$19,630,400**	**$232,740,030**	**65.8%**
State Sales Tax (Non-Production Material Only)					**330,152**	**$330,152**	**0.1%**
Total Direct Cost	**$0**	**$174,735,380**	**$38,374,251**	**728,559**	**$19,960,552**	**$233,070,183**	**65.9%**
Construction Indirects & Services							
- Construction Field Staff			$0	0	$11,522,855	$11,522,855	3.3%
- Construction Field Staff Expenses			$0	0	$1,870,168	$1,870,168	0.5%
- Construction Equipment			$0	0	$11,145,203	$11,145,203	3.1%
- Small Tools			$0	0	$1,457,118	$1,457,118	0.4%
- Consumable Materials & Safety Supplies			$0	0	$1,457,118	$1,457,118	0.4%
- Field Office Expense		$1,033,370	$65,849	1,485	$22,373	$1,121,592	0.3%
- Temporary Facilities		$2,336,753	$863,403	19,472	$82,500	$3,282,657	0.9%
- Temporary Utilities		$747,600	$1,396,697	31,500	$0	$2,144,297	0.6%
- Support Craft & Site Services		$459,400	$2,008,704	45,302	$775,014	$3,243,118	0.9%
- Site Safety		$658,040	$375,008	8,224	$0	$1,033,048	0.3%
- Construction Permits		$51,450	$0	0	$0	$51,450	0.0%
- Construction Testing		$117,000	$0	0	$0	$117,000	0.0%
- Performance Testing		$304,400	$0	0	$0	$304,400	0.1%
- Start-up Supervision		$0	$0	0	$1,296,911	$1,296,911	0.4%
- Preop Testing, Start-up		$1,113,000	$752,767	23,534	$0	$1,865,767	0.5%
Sub-Total Construction Indirects and Services		**$6,821,013**	**$5,462,428**	**129,518**	**$29,629,261**	**$41,912,703**	**11.8%**
Total Construction Cost	**$0**	**$181,556,393**	**$43,836,679**	**858,077**	**$49,589,813**	**$274,982,885**	**77.7%**
Estimated Subcontract Labor Hours				**154,977**			
Project Indirects							
- Project Engineering (Eng, PM, CM & Procurement)					**$16,498,973**	**$16,498,973**	**4.7%**
Sub-Total Project Indirects	**$0**	**$0**	**$0**	**0**	**$16,498,973**	**$16,498,973**	**4.7%**
EPC Contractor Insurance & Misc Costs							

1 x 1 MHI G Class Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 372.7
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
- Builders Risk					**$1,374,914**	**$1,374,914**	**0.4%**
- Comprehensive General Liability (CGL) Insurance					**$1,374,914**	**$1,374,914**	**0.4%**
- Warranty Reserve					**$500,000**	**$500,000**	**0.1%**
Sub-Total EPC Contractor Insur. & Misc. Co	**$0**	**$0**	**$0**	**0**	**$3,249,829**	**$3,249,829**	**0.9%**
Total EPC Contractor Project Indirect Cost	**$0**	**$0**	**$0**	**0**	**$19,748,802**	**$19,748,802**	**5.6%**
- Escalation (Eqt, Materials & Labor)	**$0**	**$5,527,378**	**$7,049,936**		**$8,614,531**	**$21,191,846**	**6.0%**
Sub-Total	**0**	**187,083,771**	**50,886,615**	**1,013,054**	**77,953,147**	**315,923,533**	**89.3%**
- EPC Contractor Contingency	**$0**	**$3,291,693**	**$2,544,331**		**$3,677,657**	**$9,513,681**	**2.7%**
- EPC Contractor G&A and Profit	**$0**	**$16,837,539**	**$4,579,795**		**$7,015,783**	**$28,433,118**	**8.0%**
TOTAL EPC PROJECT COST	**$0**	**$207,213,004**	**$58,010,741**	**1,013,054**	**$88,646,587**	**$353,870,332**	**100.0%**
EPC Price per kW						**$949**	
Owner Indirect Costs							
- Total Owner Indirects						**$64,081,948**	
- Owner Contingency						**$35,387,033**	
TOTAL PROJECT COST						**$453,339,313**	
Total Project Cost per kW						**$1,216**	
Estimate Options **(include 25 % markup for indirects)**							
Fuel Oil System						**$8,125,000**	
Bypass Stack and Diverter Damper						**N/A**	
Gas Compression						**Included in Base**	
SCR System to meet 12 ppm NOx						**Included in Base**	

Total Craft Labor Hours	**1,013,054**	**erformance Guarantees:**		**Executive-in-Charge:**	**WHD**
Ave. Craft Wage without Escalation	**$52.14**	**Liquidated Damages:**		**Project Manager:**	**JPS**
Field Labor Type	**TBD**	**Special Insurance:**		**Construction Manager:**	**SMP**
Labor Productivity Factor	**1.084**	**Performance Bond:**		**Lead Estimator:**	**CDF**

Estimate Details

1 x 1 MHI G Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
1	**Division #1.0 - Sitework**																				
2	Sitework	Roads - Asphalt paving main site rds & Parking lots	7,200.0	sy	Sub	Contr	20.00		44.43		1.09	0	0	YES	4,320	0	0	0	144,000	$144,000	HDR|CB Estimated Quantity
3	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Powerblock A	1,740.0	sy	Contr	Contr	5.00	0.055	44.43	96	1.09	0	8,700	YES	522	4,613	104	13,313	0	$13,313	HDR|CB Estimated Quantity
4	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Secondary Ar	6,945.0	sy	Contr	Contr	5.00	0.055	44.43	382	1.09	0	34,725	YES	2,084	18,412	414	53,137	0	$53,137	HDR|CB Estimated Quantity
5	Sitework	Roads - Haul/Construction Roads Treated Gravel	29,700.0	sy	Contr	Contr	8.00	0.1	44.43	2,970	1.09	0	237,600	YES	14,256	143,162	3,222	380,762	0	$380,762	HDR|CB Estimated Quantity
6	Sitework	Roads - Main Roads Crushed stone Base Course	8,500.0	sy	Contr	Contr	12.00	0.1	44.43	850	1.09	0	102,000	YES	6,120	40,972	922	142,972	0	$142,972	HDR|CB Estimated Quantity
7	Sitework	Roads - Drainage and culverts	80,000.0	sy	Contr	Contr	2.00	0.05	44.43	4,000	1.09	0	160,000	YES	9,600	192,810	4,340	352,810	0	$352,810	HDR|CB Estimated Quantity
8	Sitework	Soil Erosion Control Measures	2,000	lf	Contr	Contr	1	0.027	44.43	54	1.09	0	2,000	YES	120	2,603	54	4,603	0	4,603	HDR|CB Estimated Quantity
9	Sitework	Site - Topsoil stripping/stockpiling	10,000	cy	Contr	Contr		0.030	44.43	300	1.09	0	0	YES	0	14,461	300	14,461	0	$14,461	HDR|CB Estimated Quantity
10	Sitework	Site - Drainage - Pipe Culverts (Assume 12" dia)	3,000	lf	Contr	Contr	9.00	0.12	44.43	360	1.09	0	27,000	YES	1,620	17,353	360	44,353	0	$44,353	HDR|CB Estimated Quantity
11	Sitework	Site - Drainage - Manholes	20	ea	Contr	Contr	1,500	16	44.43	320	1.09	0	30,000	YES	1,800	15,425	320	45,425	0	$45,425	HDR|CB Estimated Quantity
14	Sitework	Site - Fire Protection hydrants, valve boxes, ductile iron	24.0	ea	Contr	Contr	3,000.00	20	39.54	480	1.09	0	72,000	YES	4,320	20,591	521	92,591	0	$92,591	HDR|CB Estimated Quantity
15	Sitework	Site - Fire Protection U/G piping, DI	4,000.0	lf	Contr	Contr	41.00	0.5	39.54	2,000	1.09	0	164,000	YES	9,840	85,796	2,170	249,796	0	$249,796	HDR|CB Estimated Quantity
16	Sitework	Pipe Utility Trench Excavation	10,000	cy	Contr	Contr		0.2	39.54	2,000	1.09	0	0	YES	0	85,796	2,000	85,796	0	$85,796	HDR|CB Estimated Quantity
17	Sitework	Pipe Utility Trench Backfill (including bedding)	8,500	cy	Contr	Contr		0.2	39.54	1,700	1.09	0	0	YES	0	72,927	1,700	72,927	0	$72,927	HDR|CB Estimated Quantity
20	Sitework	Spoil Disposal	10,000	cy	Contr	Contr		0.1	44.43	1,000	1.09	0	0	YES	0	48,203	1,000	48,203	0	$48,203	HDR|CB Estimated Quantity
21	Sitework	Site - Sanitary sewer lift stations	1.0	ea	Contr	Contr	11,700.00	40	39.54	40	1.09	0	11,700	YES	702	1,716	43	13,416	0	$13,416	HDR|CB Estimated Quantity
22	Sitework	Site - Sanitary waste piping and manholes	2,000.0	lf	Contr	Contr	20.00	1	39.54	2,000	1.09	0	40,000	YES	2,400	85,796	2,170	125,796	0	$125,796	HDR|CB Estimated Quantity
23	Sitework	Site - Storm drain piping and culverts	20,000.0	lf	Contr	Contr	12.00	0.25	39.54	5,000	1.09	0	240,000	YES	14,400	214,490	5,425	454,490	0	$454,490	HDR|CB Estimated Quantity
24	Sitework	Site Finishing - Seed Site Earthwork	5.0	ac	Contr	Contr	10,000.00	0.54	39.54	3	1.09	0	50,000	YES	3,000	116	3	50,116	0	$50,116	HDR|CB Estimated Quantity
25	Sitework	Site Finishing - Grading around foundations	5,000.0	sy	Contr	Contr		0.02	39.54	100	1.09	0	0	YES	0	4,290	109	4,290	0	$4,290	HDR|CB Estimated Quantity
26	Sitework	Site Finishing - Stone Surfacing	6,000.0	sy	Contr	Contr	10.00	0.015	39.54	90	1.09	0	60,000	YES	3,600	3,861	98	63,861	0	$63,861	HDR|CB Estimated Quantity
27	Sitework	Site Improvements - landscaping at admin building	1.0	ls	Contr	Contr	30,000.00	360	39.54	360	1.09	0	30,000	YES	1,800	15,443	391	45,443	0	$45,443	HDR|CB Estimated Quantity
28	Sitework	Site Improvements - Main Gate Security Facilities	1.0	lot	Contr	Contr	150,000.00	3600	39.54	3,600	1.09	0	150,000	YES	9,000	154,433	3,906	304,433	0	$304,433	HDR|CB Estimated Quantity
29	Sitework	Site Improvements - Site Entrance Sign and Landscaping	1.0	ls	Contr	Contr	18,750.00	240	39.54	240	1.09	0	18,750	YES	1,125	10,296	260	29,046	0	$29,046	HDR|CB Estimated Quantity
30	Sitework	Site Improvements - Site Security Boundary Fencing	15,000.0	lf	Contr	Contr	11.00	0.2	39.54	3,000	1.09	0	165,000	YES	9,900	128,694	3,255	293,694	0	$293,694	HDR|CB Estimated Quantity
31	Sitework	Site Improvements - Fencing Active gates	6.0	ea	Contr	Contr	2,000.00	48	39.54	288	1.09	0	12,000	YES	720	12,355	312	24,355	0	$24,355	HDR|CB Estimated Quantity
32	Sitework	Site Surveying	1.0	lot	Sub	Contr	80,000.00		44.43	0	1.09	0	0	YES	2,400	0	0	0	80,000	$80,000	HDR|CB Estimated Quantity
33																					
34		**Division #1 - Sitework Sub-Total**								**31,232**		**0**	**1,615,475**		**103,649**	**1,394,611**	**33,400**	**3,010,086**	**224,000**	**3,234,086**	
35																					
36	**Division #1.3 - Raw Water Intake and Discharge Facilities**																				HDR Allowance for Interconnection and Updgrage of existing Unit 1 and 2 Intake Structure
37		Raw Water River Intake and Discharge Facilities	1.0	ea	Contr	Contr	500,000.00	10,000	53.33	10,000	1.09	0	500,000	NO	0	578,649	10,850	1,078,649	0	$1,078,649	
38																					
39		**Division #1.3 - Raw Water Intake Clarification and Discharge Facilities Sub-Total**								**10,000**		**0**	**500,000**		**0**	**578,649**	**10,850**	**1,078,649**	**0**	**$1,078,649**	
40																					
41																					
42	**Division #2.0 - Earthwork and Concrete**																				
43	**Division #2.1 - Earthwork**																				
44	Earthwork	Structural Backfill Power Block (using imported material)	165,000.0	cy	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	4,125,000	$4,125,000	HDR|CB Estimated Quantity
45	Earthwork	Retaining Wall (MSE)	30,000.0	sf	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	750,000	$750,000	HDR|CB Estimated Quantity
46	Earthwork	Structural Excavation Main Power Block - Earth/Rock	230,000.0	cy	Sub	Contr	18.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	4,140,000	$4,140,000	HDR|CB Estimated Quantity
47																					
48										0		0	0		0	0	0	0	9,015,000	9,015,000	
49	**Division # 2.2 - Concrete Main Power Block Area**																				
50																					
51		Includes Forms, Rebar, Placement, Finishing, Embeds																			
52	Concrete	HRSG and Stack	3,750	cy	Contr	Contr	250	4.5	38.69	16,875	1.09	0	937,500	NO	0	708,477	18,309	1,645,977	0	$1,645,977	HDR|CB Estimated Quantity
53	Concrete	Gas Turbine Foundation	2,500	cy	Contr	Contr	300	4.5	38.69	11,250	1.09	0	750,000	NO	0	472,318	12,206	1,222,318	0	$1,222,318	HDR|CB Estimated Quantity
54	Concrete	Steam Turbine building	700	cy	Contr	Contr	250	4.5	38.69	3,150	1.09	0	175,000	NO	0	132,249	3,418	307,249	0	$307,249	HDR|CB Estimated Quantity
55	Concrete	Spread Footings & Piers Pipe/Tray Trestle/Racks	300.0	cy	Contr	Contr	250	4.5	38.69	1,350	1.09	0	75,000	NO	0	56,678	1,465	131,678	0	$131,678	HDR|CB Estimated Quantity
56	Concrete	Steam Turbine Bldg fill slab	250.0	cy	Contr	Contr	210.00	4.5	38.69	1,125	1.09	0	52,500	NO	0	47,232	1,221	99,732	0	$99,732	HDR|CB Estimated Quantity
57	Concrete	Steam Turbine Bldg Mat Foundation	1,000.0	cy	Contr	Contr	250	4.5	38.69	4,500	1.09	0	250,000	NO	0	188,927	4,883	438,927	0	$438,927	HDR|CB Estimated Quantity
58	Concrete	Steam Turbine Bldg Elevated Slab	500.0	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	NO	0	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
59	Concrete	Steam Turbine Bldg sumps foundation	300.0	cy	Contr	Contr	250	4.5	38.69	1,350	1.09	0	75,000	NO	0	56,678	1,465	131,678	0	$131,678	HDR|CB Estimated Quantity
60	Concrete	Steam Turbine Pedestal FDN (Columns & Tabletop, Mat)	800.0	cy	Contr	Contr	350.00	8	38.69	6,400	1.09	0	280,000	NO	0	268,697	6,944	548,697	0	$548,697	HDR|CB Estimated Quantity
61	Concrete	Aux. Equipment Foundations	300	cy	Contr	Contr	250	4.5	38.69	1,350	1.09	0	75,000	YES	4,500	56,678	1,465	131,678	0	$131,678	HDR|CB Estimated Quantity
62	Concrete	Equip Fdn - Generator Breaker	30	cy	Contr	Contr	250	4.5	38.69	135	1.09	0	7,500	YES	450	5,668	146	13,168	0	$13,168	HDR|CB Estimated Quantity
63	Concrete	Equip Fdn - CT PEEC	30	cy	Contr	Contr	250	4.5	38.69	135	1.09	0	7,500	YES	450	5,668	146	13,168	0	$13,168	HDR|CB Estimated Quantity
64	Concrete	Equip Fdn - Power Distribution Center	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
65	Concrete	Equip Fdn - CEMS	20	cy	Contr	Contr	250	4.5	38.69	90	1.09	0	5,000	YES	300	3,779	98	8,779	0	$8,779	HDR|CB Estimated Quantity
66	Concrete	Equip Fdn - Boiler Feed Pump	75	cy	Contr	Contr	250	4.5	38.69	338	1.09	0	18,750	YES	1,125	14,170	366	32,920	0	$32,920	HDR|CB Estimated Quantity
67	Concrete	Equip Fdn - Main Step-up Transformer Fdn/Walls	60.0	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	NO	0	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
68	Concrete	Equip Fdn - Plant Aux Power Transformers Fnd/Walls	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
69	Concrete	Equip Fdn - Misc off Base Equip fnds	60.0	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	NO	0	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
70	Concrete	Elec. Ductbank (Tubes, Conc., Forms, Rebar) 12 Tubes	450.0	lf	Contr	Contr	125	0.57	38.69	257	1.09	0	56,250	NO	0	10,769	278	67,019	0	$67,019	HDR|CB Estimated Quantity
71	Concrete	Elec. Ductbank to Cooling Tower (Tubes, Conc., Forms, Rebar) 6 Tu	750.0	lf	Contr	Contr	100	0.45	38.69	338	1.09	0	75,000	NO	0	14,170	366	89,170	0	$89,170	HDR|CB Estimated Quantity
72	Concrete	Equip Fdn - Pumps & misc equipment	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
73	Concrete	Electrical Building Foundation	80.0	cy	Contr	Contr	250	4.5	38.69	360	1.09	0	20,000	NO	0	15,114	391	35,114	0	$35,114	HDR|CB Estimated Quantity
74	Concrete	Cooling Tower Basin	1,500.0	cy	Contr	Contr	250	5.5	38.69	8,250	1.09	0	375,000	NO	0	346,367	8,951	721,367	0	$721,367	HDR|CB Estimated Quantity
75	Concrete	Administration Building foundation	1,100.0	cy	Contr	Contr	250	4.5	38.69	4,950	1.09	0	275,000	YES	16,500	207,820	5,371	482,820	0	$482,820	HDR|CB Estimated Quantity
76	Concrete	Auxilary Boiler Building floor slab & foundation	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	NO	0	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
77	Concrete	Demineralized Water Tank Foundations	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
78	Concrete	Service water storage tank foundations	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	YES	3,000	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
79	Concrete	Main Gate Guard House	3.0	cy	Contr	Contr	250	4.5	38.69	14	1.09	0	750	YES	45	567	15	1,317	0	$1,317	HDR|CB Estimated Quantity
80	Concrete	Water Treatment Buildings, enclosures and tank fdns	0.0	cy	Contr	Contr	250	4.5	38.69	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
81	Concrete	Grouting (equipment & steel)	30.0	cy	Contr	Contr	2,227.50	81	38.69	2,430	1.09	0	66,825	NO	0	102,021	2,637	168,846	0	$168,846	HDR|CB Estimated Quantity
82																					
83		Sub Total Concrete	**15,248**				AVG MH/CY	4.84		70,405			3,897,575		27,270	2,955,871	76,389	6,853,446	0	6,853,446	
84																					
85		**Division #2 - Earthwork & Concrete Sub-Total**								**70,405**		**0**	**3,897,575**		**27,270**	**2,955,871**	**76,389**	**6,853,446**	**9,015,000**	**15,868,446**	
86																					
87	**Division #3.0 - Architectural**												-								
88																					
89	rchitectura	Exterior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
90	rchitectura	Fire extinguishers	24.0	ea	Contr	Contr	500.00	3	53.33	72	1.09	0	12,000	YES	720	4,166	78	16,166	0	$16,166	HDR|CB Estimated Quantity
91	rchitectura	Fire hose cabinets	26.0	ea	Contr	Contr	1,200.00	20	53.33	520	1.09	0	31,200	YES	1,872	30,090	564	61,290	0	$61,290	HDR|CB Estimated Quantity
92	rchitectura	Fire hydrants w/monitor nozzles	6.0	ea	Contr	Contr	2,550.00	12	54.96	72	1.09	0	15,300	YES	918	4,294	78	19,594	0	$19,594	HDR|CB Estimated Quantity
93	rchitectura	Fire protection control room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
94	rchitectura	Fire Protection Elect Equip & Cable Spreading Room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity

Estimate Details

1 x 1 MHI G Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
95	rchitectura	Fire Protection GSU and Aux Transformers	1.0	ls	Sub	Contr	200,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	200,000	$200,000	HDR|CB Estimated Quantity
96	rchitectura	Fire Protection Turbine Building	1.0	ls	Sub	Contr	600,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
97	rchitectura	Fire Detection/Alarm	1.0	lot	Contr	Contr	350,000.00	1000	50.09	1,000	1.09	0	350,000	NO	0	54,352	1,085	404,352	0	$404,352	HDR|CB Estimated Quantity
98	rchitectura	HVAC System Allowance	1.0	ls	Sub	Contr	650,000.00		54.96	0	1.09	0	0	YES	19,500	0	0	0	650,000	$650,000	HDR|CB Estimated Quantity
99	rchitectura	Interior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
100	rchitectura	Masonry Walls 8" CMU	15,000.0	sf	Contr	Contr	4.00	0.15	32.95	2,250	1.09	0	60,000	yes	3,600	80,450	2,441	140,450	0	$140,450	HDR|CB Estimated Quantity
101	rchitectura	Overhead Rolling Doors - steel	4.0	ea	Contr	Contr	5,000.00	40	38.68	160	1.09	0	20,000	yes	1,200	6,715	174	26,715	0	$26,715	HDR|CB Estimated Quantity
102	rchitectura	Painting - equipment and piping	1.0	lot	Contr	Contr	80,000.00	3600	36.36	3,600	1.09	0	80,000	yes	4,800	142,016	3,906	222,016	0	$222,016	HDR|CB Estimated Quantity
103	rchitectura	Painting - structural steel, grating, handrail touch-up	200,000.0	sf	Contr	Contr	0.30	0.010	36.36	2,000	1.09	0	60,000	yes	3,600	78,898	2,170	138,898	0	$138,898	HDR|CB Estimated Quantity
104	rchitectura	Painting - turbine room floor epoxy finish	30,000.0	sf	Contr	Contr	0.80	0.045	36.36	1,354	1.09	0	24,000	yes	1,440	53,398	1,469	77,398	0	$77,398	HDR|CB Estimated Quantity
105	rchitectura	Restrooms, showers, locker rooms	1.0	lot	Contr	Contr	125,000.00	1200	53.33	1,200	1.09	0	125,000	YES	7,500	69,438	1,302	194,438	0	$194,438	HDR|CB Estimated Quantity
106	rchitectura	Roof Drains	1,200.0	lf	Contr	Contr	32.50	2.0	54.96	2,400	1.09	0	39,000	yes	2,340	143,123	2,604	182,123	0	$182,123	HDR|CB Estimated Quantity
107	rchitectura	Structural Steel - Misc Building Steel	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	yes	3,840	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
108	rchitectura	Structural Steel - Pipe Rack	300.0	ton	Contr	Contr	3,400.00	20	60.25	6,000	1.09	0	1,020,000	NO	0	392,204	6,510	1,412,204	0	$1,412,204	HDR|CB Estimated Quantity
109	rchitectura	Structural Steel - Misc Platforms	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	NO	0	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
110	rchitectura	Structural Steel - Turbine Building Framing	350.0	ton	Contr	Contr	2,850.00	15	60.25	5,250	1.09	0	997,500	NO	0	343,179	5,696	1,340,679	0	$1,340,679	HDR|CB Estimated Quantity
111	rchitectura	Trench Floor Drain Cover	1,800.0	lf	Contr	Contr	60.45	0.4	54.96	720	1.09	0	108,810	yes	6,529	42,937	781	151,747	0	$151,747	HDR|CB Estimated Quantity
112	rchitectura	Turbine Building Built-up Roof	16,000.0	sf	Contr	Contr	0.75	0.035	35.31	560	1.09	0	12,000	NO	0	21,456	608	33,456	0	$33,456	HDR|CB Estimated Quantity
113	rchitectura	Turbine Building Metal Siding	44,000.0	sf	Contr	Contr	10.40	0.05	56.41	2,200	1.09	0	457,600	NO	0	134,641	2,387	592,241	0	$592,241	HDR|CB Estimated Quantity
114	rchitectura	Administration/Control/Maintenance Building	16,000.0	sf	Sub	Contr	140.00		38.68	0	1.09	0	0	YES	0	0	0	0	2,240,000	$2,240,000	HDR|CB Estimated Quantity
115	rchitectura	Cooling Tower, pre-engineered - Elect, Chem feed, I&C Bldg	3,000.0	sf	Sub	Contr	80.00		59.59	0	1.09	0	0	NO	0	0	0	0	240,000	$240,000	HDR|CB Estimated Quantity
116	rchitectura	Main Gate Guard House	80.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	YES	0	0	0	0	6,400	$6,400	HDR|CB Estimated Quantity
117	rchitectura	Auxilary Boiler Building	4,000.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	440,000	$440,000	HDR|CB Estimated Quantity
118	rchitectura	Water Treatment Building	0.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
119	rchitectura	Warehouse	8,000.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	NO	0	0	0	0	640,000	$640,000	HDR|CB Estimated Quantity
120	rchitectura	Boiler Feed Pump Building	1.0	ea	sub	Contr	300,000.00		38.68	0	1.09	0	0	NO	0	0	0	0	300,000	$300,000	HDR|CB Estimated Quantity
121																					
122		**Division #3 - Architectural Sub-Total**								**31,358**	**1.05**	**0**	**3,660,410**		**65,059**	**1,713,370**	**34,023**	**5,373,780**	**5,366,400**	**$10,740,180**	
123																					
124	**Division #4.0 - Mechanical Piping**																				
125	**Division #4.1 - Mechanical Piping**																				
126																					
127	hanical Pip	Pipe - MS, HR, CR, BFW, LPS	**1,720.0**	lf																	
128	hanical Pip	- System - Cold Reheat (Carbon)	400.0	lf	Contr	Contr	2,575.00	7.7	54.96	3,080	1.09	0	1,030,000	NO	0	183,674	3,342	1,213,674	0	$1,213,674	HDR|CB Estimated Quantity
129	hanical Pip	- System - Feedwater (Carbon)	320.0	lf	Contr	Contr	800.00	5.7	54.96	1,824	1.09	0	256,000	NO	0	108,773	1,979	364,773	0	$364,773	HDR|CB Estimated Quantity
130	hanical Pip	- System - Hot Reheat (Alloy)	300.0	lf	Contr	Contr	3,200.00	15.0	54.96	4,500	1.09	0	960,000	NO	0	268,356	4,883	1,228,356	0	$1,228,356	HDR|CB Estimated Quantity
131	hanical Pip	- System - Main Steam (Alloy)	300.0	lf	Contr	Contr	3,500.00	15.6	54.96	4,680	1.09	0	1,050,000	NO	0	279,090	5,078	1,329,090	0	$1,329,090	HDR|CB Estimated Quantity
132	hanical Pip	- System - Low Pressure Steam Steam (Alloy)	400.0	lf	Contr	Contr	234.00	7.5	54.96	3,008	1.09	0	93,600	NO	0	179,381	3,264	272,981	0	$272,981	HDR|CB Estimated Quantity
133	hanical Pip	Pipe - Above Ground - Large Bore Average "	**26,250.0**	lf																	
134	hanical Pip	- System - Boilers, Vents and Drains	400.0	lf	Contr	Contr	300.00	4.14	54.96	1,654	1.09	0	120,000	NO	0	98,659	1,795	218,659	0	$218,659	HDR|CB Estimated Quantity
135	hanical Pip	- System - Aux steam drain returns	2,500.0	lf	Contr	Contr	30.00	1.22	54.96	3,055	1.09	0	75,000	NO	0	182,184	3,315	257,184	0	$257,184	HDR|CB Estimated Quantity
136	hanical Pip	- System - Building drains	1,200.0	lf	Contr	Contr	30.00	1.22	54.96	1,466	1.09	0	36,000	YES	2,160	87,448	1,591	123,448	0	$123,448	HDR|CB Estimated Quantity
137	hanical Pip	- System - Building fire protection	5,000.0	lf	Contr	Contr	18.00	1.50	54.96	7,520	1.09	0	90,000	YES	5,400	448,452	8,159	538,452	0	$538,452	HDR|CB Estimated Quantity
138	hanical Pip	- System - Building sump pumps	800.0	lf	Contr	Contr	47.00	1.55	54.96	1,241	1.09	0	37,600	YES	2,256	73,995	1,346	111,595	0	$111,595	HDR|CB Estimated Quantity
139	hanical Pip	- System - Circulating Water	1,000.0	lf	Contr	Contr	300.00	4.10	54.96	4,100	1.09	0	300,000	NO	0	244,502	4,449	544,502	0	$544,502	HDR|CB Estimated Quantity
140	hanical Pip	- System - Condensate	1,350.0	lf	Contr	Contr	150.00	2.35	54.96	3,173	1.09	0	202,500	NO	0	189,191	3,442	391,691	0	$391,691	HDR|CB Estimated Quantity
141	hanical Pip	- System - Condenser Air Extraction	300.0	lf	Contr	Contr	184.00	2.35	54.96	705	1.09	0	55,200	NO	0	42,042	765	97,242	0	$97,242	HDR|CB Estimated Quantity
142	hanical Pip	- System - Cooling water	600.0	lf	Contr	Contr	280.00	2.63	54.96	1,579	1.09	0	168,000	NO	0	94,175	1,713	262,175	0	$262,175	HDR|CB Estimated Quantity
143	hanical Pip	- System - Demineralized water	400.0	lf	Contr	Contr	27.00	0.39	54.96	154	1.09	0	10,800	NO	0	9,193	167	19,993	0	$19,993	HDR|CB Estimated Quantity
144	hanical Pip	- System - Fire Protection	300.0	lf	Contr	Contr	150.00	2.35	54.96	705	1.09	0	45,000	YES	2,700	42,042	765	87,042	0	$87,042	HDR|CB Estimated Quantity
145	hanical Pip	- System - Natural Gas High Pressure - SS	150.0	lf	Contr	Contr	52.40	0.85	54.96	127	1.09	0	7,860	YES	472	7,568	138	15,428	0	$15,428	HDR|CB Estimated Quantity
146	hanical Pip	- System - Potable water	1,000.0	lf	Contr	Contr	18.00	1.50	54.96	1,504	1.09	0	18,000	YES	1,080	89,690	1,632	107,690	0	$107,690	HDR|CB Estimated Quantity
147	hanical Pip	- System - Sanitary waste	3,000.0	lf	Contr	Contr	47.00	1.55	54.96	4,653	1.09	0	141,000	YES	8,460	277,480	5,049	418,480	0	$418,480	HDR|CB Estimated Quantity
148	hanical Pip	- System - Service Water	1,000.0	lf	Contr	Contr	184.00	1.97	54.96	1,974	1.09	0	184,000	YES	11,040	117,719	2,142	301,719	0	$301,719	HDR|CB Estimated Quantity
149	hanical Pip	- System - STG lube oil	200.0	lf	Contr	Contr	32.00	1.11	54.96	222	1.09	0	6,400	NO	0	13,239	241	19,639	0	$19,639	HDR|CB Estimated Quantity
150	hanical Pip	- System - STG oil purification	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
151	hanical Pip	- System - STG Seal Oil	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
152	hanical Pip	- System - STG Stator cooling	0.0	lf	Contr	Contr	32.00	1.11	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
153	hanical Pip	- System - STG Steam Seal	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
154	hanical Pip	- System - Turbine drains	690.0	lf	Contr	Contr	47.00	1.55	54.96	1,070	1.09	0	32,430	NO	0	63,820	1,161	96,250	0	$96,250	HDR|CB Estimated Quantity
155	hanical Pip	- System - HRSG Blowdown	100.0	lf	Contr	Contr	18.00	1.50	54.96	150	1.09	0	1,800	NO	0	8,969	163	10,769	0	$10,769	HDR|CB Estimated Quantity
156	hanical Pip	- System - Cycle Makeup	360.0	lf	Contr	Contr	47.00	1.55	54.96	558	1.09	0	16,920	NO	0	33,298	606	50,218	0	$50,218	HDR|CB Estimated Quantity
157	hanical Pip	- System - Miscellaneous Systems Piping CS)	5,000.0	lf	Contr	Contr	47.00	1.55	54.96	7,755	1.09	0	235,000	YES	14,100	462,466	8,414	697,466	0	$697,466	HDR|CB Estimated Quantity
158	hanical Pip	Pipe - Above Ground - Small Bore	**22,290.0**	lf																	HDR|CB Estimated Quantity
159	hanical Pip	- System - Water Cycle Sample - Alloy	150.0	lf	Contr	Contr	13.00	0.85	54.96	127	1.09	0	1,950	NO	0	7,568	138	9,518	0	$9,518	HDR|CB Estimated Quantity
160	hanical Pip	- System - STG lube oil	300.0	lf	Contr	Contr	11.60	0.62	54.96	186	1.09	0	3,480	NO	0	11,092	202	14,572	0	$14,572	HDR|CB Estimated Quantity
161	hanical Pip	- System - CT Auxilaries	900.0	lf	Contr	Contr	18.00	1.13	54.96	1,015	1.09	0	16,200	NO	0	60,541	1,101	76,741	0	$76,741	HDR|CB Estimated Quantity
162	hanical Pip	- System - Instrument Air	2,750.0	lf	Contr	Contr	8.00	0.14	54.96	388	1.09	0	22,000	NO	0	23,123	421	45,123	0	$45,123	HDR|CB Estimated Quantity
163	hanical Pip	- System - Instrument Air supply	2,500.0	lf	Contr	Contr	35.00	0.28	54.96	705	1.09	0	87,500	NO	0	42,042	765	129,542	0	$129,542	HDR|CB Estimated Quantity
164	hanical Pip	- System - Service Air piping	1,000.0	lf	Contr	Contr	12.00	0.22	54.96	216	1.09	0	12,000	YES	720	12,893	235	24,893	0	$24,893	HDR|CB Estimated Quantity
165	hanical Pip	- System - Instrument Air	1,800.0	lf	Contr	Contr	11.50	0.52	54.96	931	1.09	0	20,700	YES	1,242	55,496	1,010	76,196	0	$76,196	HDR|CB Estimated Quantity
166	hanical Pip	- System - Service Water	800.0	lf	Contr	Contr	20.00	1.32	54.96	1,053	1.09	0	16,000	YES	960	62,783	1,142	78,783	0	$78,783	HDR|CB Estimated Quantity
167	hanical Pip	- System - Cycle Chemical Feed	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
168	hanical Pip	- System - Boiler Vents & Drains - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
169	hanical Pip	- System - (HP) Main Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
170	hanical Pip	- System - (LP) Steam - Carbon	1,000.0	lf	Contr	Contr	18.00	1.13	54.96	1,128	1.09	0	18,000	YES	1,080	67,268	1,224	85,268	0	$85,268	HDR|CB Estimated Quantity
171	hanical Pip	- System - Hot Reheat Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
172	hanical Pip	- System - Cold Reheat Steam - Alloy	300.0	lf	Contr	Contr	20.00	1.32	54.96	395	1.09	0	6,000	YES	360	23,544	428	29,544	0	$29,544	HDR|CB Estimated Quantity
173	hanical Pip	- System - Cycle Makeup	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
174	hanical Pip	- System - Aux Steam - Carbon	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
175	hanical Pip	- System - STG Seals and Drains - Alloy	1,400.0	lf	Contr	Contr	20.00	1.32	54.96	1,842	1.09	0	28,000	YES	1,680	109,871	1,999	137,871	0	$137,871	HDR|CB Estimated Quantity
176	hanical Pip	- System - CT System - Carbon	120.0	lf	Contr	Contr	18.00	1.13	54.96	135	1.09	0	2,160	YES	130	8,072	147	10,232	0	$10,232	HDR|CB Estimated Quantity
177	hanical Pip	- System - Hydrogen - Carbon	350.0	lf	Contr	Contr	12.35	1.03	54.96	362	1.09	0	4,323	YES	259	21,582	393	25,904	0	$25,904	HDR|CB Estimated Quantity
178	hanical Pip	- System - Carbon Dioxide - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
179	hanical Pip	- System - Miscellaneous	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
180	hanical Pip	- System - Condensate - Carbon	400.0	lf	Contr	Contr	18.00	1.13	54.96	451	1.09	0	7,200	YES	432	26,907	490	34,107	0	$34,107	HDR|CB Estimated Quantity
181	hanical Pip	- System - Closed Cycle Cooling Water - Carbon	900.0	lf	Contr	Contr	12.35	1.03	54.96	931	1.09	0	11,115	YES	667	55,496	1,010	66,611	0	$66,611	HDR|CB Estimated Quantity
182	hanical Pip	- System - Fuel Gas - Carbon	500.0	lf	Contr	Contr	18.00	1.13	54.96	564	1.09	0	9,000	YES	540	33,634	612	42,634	0	$42,634	HDR|CB Estimated Quantity
183	hanical Pip	- System - Condensed Air Extraction - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
184	hanical Pip	- System - CW Chemical Feed - Carbon	20.0	lf	Contr	Contr	18.00	1.13	54.96	23	1.09	0	360	YES	22	1,345	24	1,705	0	$1,705	HDR|CB Estimated Quantity
185	hanical Pip	- System - Nitrogen Gas System	100.0	lf	Contr	Contr	19.00	0.19	54.96	19	1.09	0	1,900	YES	114	1,121	20	3,021	0	$3,021	HDR|CB Estimated Quantity

Estimate Details

1 x 1 MHI G Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

Line #	DISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
186	chanical Pip	- System - Waste Water Coll & Treatment - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
187	chanical Pip	- System - Chemical Waste Treatment	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
188	chanical Pip	- System - Miscellaneous Systems Piping	4,400.0	lf	Contr	Contr	12.35	1.03	54.96	4,550	1.09	0	54,340	YES	3,260	271,313	4,936	325,653	0	$325,653	HDR|CB Estimated Quantity
189	chanical Pip	Pipe - Below Ground - Large Bore	**20,275.0**	lf																	
190	chanical Pip	- System - Hydrogen	470.0	lf	Contr	Contr	20.00	0.71	54.96	331	1.09	0	9,400	NO	0	19,760	360	29,160	0	$29,160	HDR|CB Estimated Quantity
191	chanical Pip	- System - Fuel Gas	400.0	lf	Contr	Contr	170.00	1.97	54.96	790	1.09	0	68,000	NO	0	47,087	857	115,087	0	$115,087	HDR|CB Estimated Quantity
192	chanical Pip	- System - Main Circ. - HDPE	300.0	lf	Contr	Contr	15.00	1.13	54.96	338	1.09	0	4,500	NO	0	20,180	367	24,680	0	$24,680	HDR|CB Estimated Quantity
192	chanical Pip	- System - Miscellaneous Systems Piping - HDPE	6,500.0	lf	Contr	Contr	15.00	1.13	54.96	7,332	1.09	0	97,500	NO	0	437,241	7,955	534,741	0	$534,741	HDR|CB Estimated Quantity
193	chanical Pip	- System - Waste Water Treatment Piping - HDPE (Sch 17)	2,565.0	lf	Contr	Contr	6.00	0.66	54.96	1,688	1.09	0	15,390	NO	0	100,649	1,831	116,039	0	$116,039	HDR|CB Estimated Quantity
193	chanical Pip	- System - Sanitary Sewer	3,000.0	lf	Contr	Contr	15.00	1.13	54.96	3,384	1.09	0	45,000	NO	0	201,803	3,672	246,803	0	$246,803	HDR|CB Estimated Quantity
194	chanical Pip	- System - Natural Gas Low Pressure - CS	500.0	lf	Contr	Contr	30.00	1.22	54.96	611	1.09	0	15,000	NO	0	36,437	663	51,437	0	$51,437	HDR|CB Estimated Quantity
195	chanical Pip	- System - Natural Gas High Pressure - CS	300.0	lf	Contr	Contr	30.00	1.22	54.96	367	1.09	0	9,000	NO	0	21,862	398	30,862	0	$30,862	HDR|CB Estimated Quantity
196	chanical Pip	- System - Potable Water to site facilities	500.0	lf	Contr	Contr	47.00	1.55	54.96	776	1.09	0	23,500	NO	0	46,247	841	69,747	0	$69,747	HDR|CB Estimated Quantity
197	chanical Pip	- System - Cooling tower blowdown	1,160.0	lf	Contr	Contr	115.00	1.69	54.96	1,963	1.09	0	133,400	NO	0	117,046	2,130	250,446	0	$250,446	HDR|CB Estimated Quantity
198	chanical Pip	- System - Cooling tower makeup water Pipe	1,000.0	lf	Contr	Contr	115.00	1.69	39.54	1,692	1.09	0	115,000	NO	0	72,583	1,836	187,583	0	$187,583	HDR|CB Estimated Quantity
199	chanical Pip	Pipe - Below Ground - Small Bore	**790.0**	lf																	
200	chanical Pip	- System - Miscellaneous Systems Piping	790.0	lf	Contr	Contr	12.35	1.03	54.96	817	1.09	0	9,757	NO	0	48,713	886	58,470	0	$58,470	HDR|CB Estimated Quantity
201	chanical Pip	Circulating water 84" RCP	2,000.0	lf	Contr	Contr	520.00	7.80	54.96	15,600	1.09	0	1,040,000	NO	0	930,299	16,926	1,970,299	0	$1,970,299	HDR|CB Estimated Quantity
202	chanical Pip	Piping Non Destructive Examination	1.0	lot	Sub	Contr	75,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	75,000	$75,000	HDR|CB Estimated Quantity
203	chanical Pip	Steam Blows	1.0	lot	Sub	Contr	150,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	150,000	$150,000	HDR|CB Estimated Quantity
204	chanical Pip	Stress relieving LB Alloy	50.0	ea	Contr	Contr	1,500.00	80.00	54.96	4,000	1.09	0	75,000	NO	0	238,538	4,340	313,538	0	$313,538	HDR|CB Estimated Quantity
205																					
206		**Division #4.1 - Mechanical Piping Sub-Total**	**71,325.0**	**LF**						119,169		0	7,214,387		61,426	7,078,302	129,299	14,292,689	225,000	$14,517,689	
207																					
208	**Division #4.2 - Mechanical Valves**																				
209																					
210	chanical Va	Valves - Large Bore General Service	375.0	ea	Contr	Contr	636.00	16.92	54.96	6,345	1.09	0	238,500	NO	0	378,381	6,884	616,881	0	$616,881	HDR|CB Estimated Quantity
211	chanical Va	Valves - Large Bore HP 900# to 3800#	50.0	ea	Contr	Contr	6,750.00	56.4	54.96	2,820	1.09	0	337,500	NO	0	168,169	3,060	505,669	0	$505,669	HDR|CB Estimated Quantity
212	chanical Va	Valves - Large Bore LP Circ Water	2.0	ea	Contr	Contr	197,500.00	112.8	54.96	226	1.09	0	395,000	NO	0	13,454	245	408,454	0	$408,454	HDR|CB Estimated Quantity
213	chanical Va	Valves - Small Bore - I/A supply	50.0	ea	Contr	Contr	17.50	1.88	54.96	94	1.09	0	875	NO	0	5,606	102	6,481	0	$6,481	HDR|CB Estimated Quantity
214	chanical Va	Valves - Small Bore - Instrument piping	375.0	ea	Contr	Contr	270.00	1.88	54.96	705	1.09	0	101,250	NO	0	42,042	765	143,292	0	$143,292	HDR|CB Estimated Quantity
215	chanical Va	Valves - Small Bore Bronze	30.0	ea	Contr	Contr	480.00	2.82	54.96	85	1.09	0	14,400	NO	0	5,045	92	19,445	0	$19,445	HDR|CB Estimated Quantity
216	chanical Va	Valves - Small Bore Class 800	175.0	ea	Contr	Contr	305.00	2.82	54.96	494	1.09	0	53,375	NO	0	29,430	535	82,805	0	$82,805	HDR|CB Estimated Quantity
217	chanical Va	Valves - Small Bore HP 1500# Alloy & CS	75.0	ea	Contr	Contr	670.00	15.04	54.96	1,128	1.09	0	50,250	NO	0	67,268	1,224	117,518	0	$117,518	HDR|CB Estimated Quantity
218	chanical Va	Valves - Small Bore HP 3800# Alloy	15.0	ea	Contr	Contr	3,050.00	22.56	54.96	338	1.09	0	45,750	NO	0	20,180	367	65,930	0	$65,930	HDR|CB Estimated Quantity
219	chanical Va	Valves - By Pass	1.0	ea	Contr	Contr	750,000.00	80	54.96	80	1.09	0	750,000	NO	0	4,771	87	754,771	0	$754,771	HDR|CB Estimated Quantity
220																					
221																					
222		**Division #4.2 - Mechanical Valves Sub-Total**	**1,148.0**	**ea**						12,314		$0	1,986,900		0	734,346	13,361	2,721,246	0	$2,721,246	
223																					
224	**Division #4.3 - Mechanical Insulation & Coatings**																				
225																					
226	Insulation	Insulation - BOP Equipment	11,200.0	sf	Contr	Contr	15.00	0.5	46.60	5,600	1.09	0	168,000	NO	0	283,123	6,076	451,123	0	$451,123	
227	Insulation	Insulation - Piping Freeze Protection	1,500.0	lf	Contr	Contr	3.50	0.2	46.60	300	1.09	0	5,250	NO	0	15,167	326	20,417	0	$20,417	HDR|CB Estimated Quantity
228	Insulation	Insulation - Piping Large Bore BOP	6,250.0	lf	Contr	Contr	15.00	0.5	46.60	3,125	1.09	0	93,750	NO	0	157,993	3,391	251,743	0	$251,743	HDR|CB Estimated Quantity
229	Insulation	Insulation - Piping Large Bore High Temp	1,720.0	lf	Contr	Contr	50.00	1.5	46.60	2,580	1.09	0	86,000	NO	0	130,439	2,799	216,439	0	$216,439	HDR|CB Estimated Quantity
230	Insulation	Insulation - Piping Small Bore	19,490.0	lf	Contr	Contr	8.00	0.23	46.60	4,483	1.09	0	155,920	NO	0	226,635	4,864	382,555	0	$382,555	HDR|CB Estimated Quantity
231																					
232																					
233		**Division #4.3 - Mechanical Insulation & Coatings Sub-Total**								16,088		0	508,920		0	813,357	17,455	1,322,277	0	$1,322,277	
234																					
235																					
236	**Division #4.4 - Mechanical Engineered Pipe Hangers (Including Supplemental Support Steel)**																				
237																					
238	hanical Pipe H	Hangers & Supports - (Large Bore Engineered)	90	ea	Contr	Contr	1,760.00	12.5	54.96	1,127	1.09	0	158,711	NO	0	67,220	1,223	225,931	0	$225,931	HDR|CB Estimated Quantity
239	hanical Pipe H	Hangers & Supports - (Large Bore Rigid)	1382	ea	Contr	Contr	192.50	7.1	54.96	9,809	1.09	0	265,954	NO	0	584,968	10,643	850,922	0	$850,922	HDR|CB Estimated Quantity
240	hanical Pipe H	Hangers & Supports - (Small Bore Rigid)	1592	ea	Contr	Contr	88.00	1.5	54.96	2,388	1.09	0	140,109	NO	0	142,420	2,591	282,529	0	$282,529	HDR|CB Estimated Quantity
241																					
242		**Division #4.4 - Mechanical Engineered Pipe Hangers Sub-Total**								13,325		0	564,773		0	794,609	14,457	1,359,382	0	$1,359,382	
243																					
244	**Division #4.5 - Mechanical Accessories**																				
245																					
246	nical Acces	Instr. Air Supply filter regulators	30.0	ea	Contr	Contr	132.00	2.4	54.96	72	1.09	0	3,960	NO	0	4,294	78	8,254	0	$8,254	HDR|CB Estimated Quantity
247	nical Acces	Expansion Joints - Circ Water	2.0	ea	Contr	Contr	75,000.00	210	54.96	420	1.09	0	150,000	NO	0	25,047	456	175,047	0	$175,047	HDR|CB Estimated Quantity
248	nical Acces	Miscellaneous Specialties	1.0	lot	Contr	Contr	75,000.00	600	54.96	600	1.09	0	75,000	NO	0	35,781	651	110,781	0	$110,781	HDR|CB Estimated Quantity
249	nical Acces	Miscellaneous Strainers, traps, Exp Joints	1.0	ls	Contr	Contr	125,000.00	120	54.96	120	1.09	0	125,000	NO	0	7,156	130	132,156	0	$132,156	HDR|CB Estimated Quantity
250	nical Acces	Miscellaneous Trolleys & Hoists	1.0	ls	Contr	Contr	150,000.00	480	54.96	480	1.09	0	150,000	NO	0	28,625	521	178,625	0	$178,625	HDR|CB Estimated Quantity
251																					
252		**Division #4.5 - Mechanical Accessories Sub-Total**								1,692		0	503,960		0	100,902	1,836	604,862	0	$604,862	
253																					
254		**Division #4 - Mechanical Piping**								**162,588**		**0**	**10,778,940**		**61,426**	**9,521,516**	**176,408**	**20,300,455**	**225,000**	**$20,525,455**	
255																					
256	**Division #5.0 - Mechanical Equipment**																				
257																					
258	**Division #5.1 - Boiler Equipment**																				
259																					
260	HRSG	Heat Recovery Steam Generator with Duct Burner/SCR/CO/Penthou	1.0	ea	Contr	Contr	26,562,007.92		69.04	0	1.09	0	26,562,008	NO	0	0	0	26,562,008	0	$26,562,008	OEM Budget Proposal
261	HRSG	Steam Generator Erection	1.0	ea	Contr	Contr		86,500	69.04	86,500	1.09	0	0	NO	0	6,479,930	93,853	6,479,930	0	$6,479,930	HDR|CB Estimated cost
262																					
263		**Division #5.1 - Boiler Equipment Sub-Total**								**86,500**		**0**	**26,562,008**		**0**	**6,479,930**	**93,853**	**33,041,938**	**0**	**$33,041,938**	
264																					
265	**Division #5.2 - Turbine Equipment**																				
266																					
267	STG	Steam Turbine Generator	1.0	ea	Contr	Contr	21,630,000.00		53.33	0	1.09	0	21,630,000	NO	0	0	0	21,630,000	0	$21,630,000	Recent Vender quote
268	STG	Steam Turbine Generator, Erection	1.0	ea	Contr	Contr		26,000	53.33	26,000	1.09	0	0	NO	0	1,504,488	28,210	1,504,488	0	$1,504,488	HDR|CB Estimated cost
269																					
270		**Division #5.2 - Turbine Equipment Sub-Total**								**26,000**		**0**	**21,630,000**		**0**	**1,504,488**	**28,210**	**23,134,488**	**0**	**23,134,488**	
271																					
272	**Division #5.3 - Not Used**																				
273																					

Estimate Details

1 x 1 MHI G Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
274	**Division #5.4 - Mechanical Draft Cooling Tower**																				
275																					
276	Cooling Tw	Cooling Tower - Mechanical Draft (F&E)	1.0	Is	Sub	Contr	3,800,000.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	3,800,000	$3,800,000	Recent Vender quote
277																					
278		**Division #5.4 - Mechanical Draft Cooling Tower Sub-Total**								**0**		**0**	**0**		**0**	**0**	**0**	**0**	**3,800,000**	**3,800,000**	
279																					
280	**Division #5.5 - Combustion Turbine Equipment**																				
281																					
282	CT	Combustion Turbine	1.0	ea	Contr	Contr	67,530,528.60		53.33	0	1.09	0	67,530,529	NO	0	0	0	67,530,529	0	$67,530,529	OEM Budget Proposal
283	CT	Combustion Turbine, Installation	1.0	ea	Contr	Contr		38,000	53.33	38,000	1.09	0	0	NO	0	2,198,867	41,230	2,198,867	0	$2,198,867	HDR|CB Estimated cost
284																					
285																					
286		**Division #5.4 - Combustion Turbine Equipment Sub-Total**								**38,000**		**0**	**67,530,529**		**0**	**2,198,867**	**41,230**	**69,729,396**	**0**	**69,729,396**	
287																					
288	**Division #5.6 - BOP Mechanical Equipment**																				
289																					
290	Equipment	Blowdown Tank	2.0	ea	Contr	Contr	16,600.00	20	54.96	40	1.09	0	33,200	NO	0	2,385	43	35,585	0	$35,585	HDR|CB Estimated cost
291	Equipment	Closed Cooling Water Exchanger	2.0	ea	Contr	Contr	600,000.00	200	54.96	400	1.09	0	1,200,000	NO	0	23,854	434	1,223,854	0	$1,223,854	HDR|CB Estimated cost
292	Equipment	Closed Cooling Water Inhibitor Mixing Pot	1.0	ea	Contr	Contr	3,000.00	8	54.96	8	1.09	0	3,000	NO	0	477	9	3,477	0	$3,477	HDR|CB Estimated cost
293	Equipment	Closed Cooling Water (CCW) Heat Exchanger Strainer (Shell & Tube	2.0	ea	Contr	Contr	34,000.00	10	54.96	20	1.09	0	68,000	NO	0	1,193	22	69,193	0	$69,193	HDR|CB Estimated cost
294	Equipment	Instrument Air Receivers	2.0	ea	Contr	Contr	5,000.00	44	54.96	88	1.09	0	10,000	NO	0	5,248	95	15,248	0	$15,248	HDR|CB Estimated cost
295	Equipment	Main Condenser	1.0	ea	Contr	Contr	3,000,000.00	10000	65.52	10,000	1.09	0	3,000,000	NO	0	710,840	10,850	3,710,840	0	$3,710,840	Recent Vender quote
296	Equipment	Oil/Water Separator	1.0	ea	Contr	Contr	50,000.00	244	54.96	244	1.09	0	50,000	NO	0	14,551	265	64,551	0	$64,551	HDR|CB Estimated cost
297	Equipment	Plant Air Compressors	2.0	ea	Contr	Contr	140,000.00	100	54.96	200	1.09	0	280,000	NO	0	11,927	217	291,927	0	$291,927	HDR|CB Estimated cost
298	Equipment	Plant Air Dryers	2.0	ea	Contr	Contr	30,000.00	100	54.96	200	1.09	0	60,000	NO	0	11,927	217	71,927	0	$71,927	HDR|CB Estimated cost
299	Equipment	Plant Air Receivers	2.0	ea	Contr	Contr	5,000.00	20	54.96	40	1.09	0	10,000	NO	0	2,385	43	12,385	0	$12,385	HDR|CB Estimated cost
302	Equipment	Pumps - Circulating Water	2.0	ea	Contr	Contr	600,000.00	500	54.96	1,000	1.09	0	1,200,000	NO	0	59,635	1,085	1,259,635	0	$1,259,635	HDR|CB Estimated cost
303	Equipment	Pumps - Auxiliary Cooling Water	1.0	ea	Contr	Contr	120,000.00	96	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
304	Equipment	Pumps - Closed Cooling Water	2.0	ea	Contr	Contr	134,000.00	200	53.33	400	1.09	0	268,000	NO	0	23,146	434	291,146	0	$291,146	HDR|CB Estimated cost
306	Equipment	Pumps - Boiler Feed	1.0	ea	Contr	Contr	750,000.00	1200	53.33	1,200	1.09	0	750,000	NO	0	69,438	1,302	819,438	0	$819,438	HDR|CB Estimated cost
307	Equipment	Pumps - Condensate	2.0	ea	Contr	Contr	130,000.00	200	53.33	400	1.09	0	260,000	NO	0	23,146	434	283,146	0	$283,146	HDR|CB Estimated cost
308	Equipment	Pumps - Service water	2.0	ea	Contr	Contr	160,000.00	210	53.33	420	1.09	0	320,000	NO	0	24,303	456	344,303	0	$344,303	HDR|CB Estimated cost
309	Equipment	Pumps - Fire Water (Electric and Diesel)	0.0	lt	Contr	Contr	500,000.00	310	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
310	Equipment	Pumps - Sump - Blowdown, Waste Water	2.0	ea	Contr	Contr	30,000.00	24	53.33	48	1.09	0	60,000	NO	0	2,778	52	62,778	0	$62,778	HDR|CB Estimated cost
311	Equipment	Pumps - Sump - Power Island Misc Building Sumps	4.0	ea	Contr	Contr	30,000.00	24	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
314	Equipment	Pumps - Demin Water Transfer	2.0	ea	Contr	Contr	66,000.00	48	53.33	96	1.09	0	132,000	NO	0	5,555	104	137,555	0	$137,555	HDR|CB Estimated cost
318	Equipment	Pumps - Treated Water Transfer to Serv Water Tank	2.0	ea	Contr	Contr	40,000.00	80	53.33	160	1.09	0	80,000	NO	0	9,258	174	89,258	0	$89,258	HDR|CB Estimated cost
319	Equipment	Pumps - Waste Water	2.0	ea	Contr	Contr	80,000.00	125	53.33	250	1.09	0	160,000	NO	0	14,466	271	174,466	0	$174,466	HDR|CB Estimated cost
320	Equipment	Pumps - Evaporative Cooling Water	2.0	ea	Contr	Contr	37,000.00	80	53.33	160	1.09	0	74,000	NO	0	9,258	174	83,258	0	$83,258	HDR|CB Estimated cost
321	Equipment	Sample Analysis Panel (water)	2.0	ea	Contr	Contr	200,000.00	139	54.96	278	1.09	0	400,000	NO	0	16,578	302	416,578	0	$416,578	HDR|CB Estimated cost
322	Equipment	Tank - 200,000 gal treated water/service water - (F&E)	0.0	ea	Sub	Contr	540,000.00	0		0	1.09	0	0	yes	0	0	0	0	0	$0	Furnish and Erect price
323	Equipment	Tank - Demin Water Storage 200,000 gal. (F&E)	1.0	ea	Sub	Contr	600,000.00	0		0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	Furnish and Erect Price
324	Equipment	Tank - Turbine Drains	2.0	ea	Contr	Contr	75,000.00	200	53.33	400	1.09	0	150,000	NO	0	23,146	434	173,146	0	$173,146	HDR|CB Estimated cost
325	Equipment	Tank - Closed Cooling Water Dispersant 10,000 gal.	1.0	ea	Contr	Contr	36,500.00	100	54.96	100	1.09	0	36,500	NO	0	5,963	109	42,463	0	$42,463	HDR|CB Estimated cost
326	Equipment	Tank - Closed Cooling Water Accumulator	1.0	ea	Contr	Contr	20,600.00	44	54.96	44	1.09	0	20,600	NO	0	2,624	48	23,224	0	$23,224	HDR|CB Estimated cost
329	Equipment	Aqueous Ammonia System Unloading, Storage Tank, Forwarding Pu	1.0	ea	Contr	Contr	400,000.00	360	53.33	360	1.09	0	400,000	NO	0	20,831	391	420,831	0	$420,831	HDR|CB Estimated cost
331	Equipment	Auxiliary Boiler System	1.0	ea	Contr	Contr	1,200,000.00	400	53.33	400	1.09	0	1,200,000	NO	0	23,146	434	1,223,146	0	$1,223,146	HDR|CB Estimated cost
332	Equipment	Compressed Gas Storage System (CO2)	1.0	ea	Contr	Contr	40,000.00	475	54.96	475	1.09	0	40,000	NO	0	28,326	515	68,326	0	$68,326	HDR|CB Estimated cost
333	Equipment	Compressed Gas Storage System (H2)	1.0	ea	Contr	Contr	40,000.00	198	54.96	198	1.09	0	40,000	NO	0	11,808	215	51,808	0	$51,808	HDR|CB Estimated cost
334	Equipment	Compressed Gas Storage System (N2)	2.0	ea	Contr	Contr	20,000.00	370	54.96	740	1.09	0	40,000	NO	0	44,130	803	84,130	0	$84,130	HDR|CB Estimated cost
335	Equipment	Demineralized Water Treatment System Dual 100% Trains	0.0	ea	Contr	Contr	800,000.00	3500	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
336	Equipment	Condensate Polisher and Related	1.0	ea	Contr	Contr	800,000.00	3000	54.96	3,000	1.09	0	800,000	NO	0	178,904	3,255	978,904	0	$978,904	HDR|CB Estimated cost
337	Equipment	Fuel Gas Filter Separators	1.0	ea	Contr	Contr	210,000.00	200	54.96	200	1.09	0	210,000	NO	0	11,927	217	221,927	0	$221,927	Sub Budgetary Quote
338	Equipment	Fuel Gas Performance Heater	1.0	ea	Contr	Contr	880,000.00	300	54.96	300	1.09	0	880,000	NO	0	17,890	326	897,890	0	$897,890	Sub Budgetary Quote
339	Equipment	Fuel Gas Electric Startup Heater	1.0	ea	Contr	Contr	84,000.00	40	54.96	40	1.09	0	84,000	NO	0	2,385	43	86,385	0	$86,385	HDR|CB Estimated cost
340	Equipment	Fuel Gas Drain Tank	1.0	ea	Contr	Contr	2,000.00	15	54.96	15	1.09	0	2,000	NO	0	895	16	2,895	0	$2,895	HDR|CB Estimated cost
341	Equipment	Fuel Gas Dewpoint Heater	1.0	ea	Contr	Contr	476,000.00	80	54.96	80	1.09	0	476,000	NO	0	4,771	87	480,771	0	$480,771	HDR|CB Estimated cost
342	Equipment	Fuel Gas Scrubber	1.0	ea	Contr	Contr	392,000.00	60	54.96	60	1.09	0	392,000	NO	0	3,578	65	395,578	0	$395,578	HDR|CB Estimated cost
343	Equipment	Fuel Gas Compressor Package 2 x 100% w/ Building	0.0	ea	Contr	Contr	2,400,000.00	3000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
344	Equipment	Hydrogen Generator	1.0	ea	Contr	Contr	194,000.00	40	54.96	40	1.09	0	194,000	NO	0	2,385	43	196,385	0	$196,385	HDR|CB Estimated cost
345	Equipment	Steam Silencers	1.0	ea	Contr	Contr	150,000.00	20	54.96	20	1.09	0	150,000	NO	0	1,193	22	151,193	0	$151,193	HDR|CB Estimated cost
346	Equipment	Condensate Water Strainer	1.0	ea	Contr	Contr	150,000.00	40	54.96	40	1.09	0	150,000	NO	0	2,385	43	152,385	0	$152,385	HDR|CB Estimated cost
347	Equipment	Cycle Chem Feed	1.0	ea	Contr	Contr	200,000.00	100	54.96	100	1.09	0	200,000	NO	0	5,963	109	205,963	0	$205,963	HDR|CB Estimated cost
348	Equipment	Cooling Tower Chemical Feed	1.0	ea	Contr	Contr	250,000.00	300	54.96	300	1.09	0	250,000	NO	0	17,890	326	267,890	0	$267,890	HDR|CB Estimated cost
349	Equipment	Condeser Vaccum Pump/Air Removal Equipment	1.0	ea	Contr	Contr	350,000.00	40	54.96	40	1.09	0	350,000	NO	0	2,385	43	352,385	0	$352,385	HDR|CB Estimated cost
350	Equipment	Turbine Room Bridge Crane - 60T	1.0	ea	Contr	Contr	390,000.00	120	53.33	120	1.09	0	390,000	NO	0	6,944	130	396,944	0	$396,944	HDR|CB Estimated cost
351	Equipment	Elevator for HRSG	1.0	ea	sub	contr	400,000.00	0		0	1.09	0	0	NO	0	0	0	0	400,000	$400,000	HDR|CB Estimated cost
352																					
353		**Division #5.6 BOP Mechanical Equipment Sub-Total**								**22,916**		**0**	**15,113,300**		**0**	**1,472,929**	**24,864**	**16,586,229**	**1,000,000**	**17,586,229**	
354																					
355	**Division #6.0 - Electrical Equipment**																				
356																					
357	Electrical	Eqpt - 24kv Bus Isolated Phase, 8000A	300.0	lf	Contr	Contr	750.00	16.75	50.09	5,025	1.09	0	225,000	NO	0	273,119	5,452	498,119	0	$498,119	HDR|CB Estimated cost
358	Electrical	Eqpt - 24kv Bus Isolated Phase, 5000A	300.0	lf	Contr	Contr	600.00	12	50.09	3,600	1.09	0	180,000	NO	0	195,667	3,906	375,667	0	$375,667	HDR|CB Estimated cost
359	Electrical	Eqpt - Bus 6.9kV non-seg	600.0	lf	Contr	Contr	510.00	4	50.09	2,400	1.09	0	306,000	NO	0	130,445	2,604	436,445	0	$436,445	HDR|CB Estimated cost
360	Electrical	Eqpt - Bus Duct 480V, 2500A	360.0	lf	Contr	Contr	610.00	3.2	50.09	1,152	1.09	0	219,600	NO	0	62,614	1,250	282,214	0	$282,214	HDR|CB Estimated cost
361	Electrical	Eqpt - Generator Breaker, 8000A, 24kV	2.0	ea	Contr	Contr	420,000.00	396	50.09	792	1.09	0	840,000	NO	0	43,047	859	883,047	0	$883,047	HDR|CB Estimated cost
362	Electrical	Eqpt - LV Switchgear - 480V, 4000A EO Main Ckt Bkr	6.0	ea	Contr	Contr	35,000.00	56	50.09	336	1.09	0	210,000	NO	0	18,262	365	228,262	0	$228,262	HDR|CB Estimated cost
363	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Main Ckt Bkr.	2.0	ea	Contr	Contr	15,400.00	30	50.09	60	1.09	0	30,800	NO	0	3,261	65	34,061	0	$34,061	HDR|CB Estimated cost
364	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Tie Ckt Bkr.	3.0	ea	Contr	Contr	15,400.00	30	50.09	90	1.09	0	46,200	NO	0	4,892	98	51,092	0	$51,092	HDR|CB Estimated cost
365	Electrical	Eqpt - LV Switchgear - 480V, 1200A EO Tie Ckt Bkr.	1.0	ea	Contr	Contr	10,780.00	26	50.09	26	1.09	0	10,780	NO	0	1,413	28	12,193	0	$12,193	HDR|CB Estimated cost
366	Electrical	Eqpt - LV Switchgear - 480V, 800A MO Fdr Ckt Bkr.	16.0	ea	Contr	Contr	4,575.00	22	50.09	352	1.09	0	73,200	NO	0	19,132	382	92,332	0	$92,332	HDR|CB Estimated cost
367	Electrical	Eqpt - LV Switchgear - 480V, 800A Equipped Space	6.0	ea	Contr	Contr	1,090.00	13.2	50.09	79	1.09	0	6,540	NO	0	4,305	86	10,845	0	$10,845	HDR|CB Estimated cost
368	Electrical	Eqpt - Motor Control Centers - 480V	16.0	ea	Contr	Contr	46,000.00	132	50.09	2,112	1.09	0	736,000	NO	0	114,792	2,292	850,792	0	$850,792	HDR|CB Estimated cost
369	Electrical	Eqpt - MV Switchgear - 7kV, 3000A Main Ckt Bkr.	1.00	ea	Contr	Contr	79,640.00	76	50.09	76	1.09	0	79,640	NO	0	4,131	82	83,771	0	$83,771	HDR|CB Estimated cost
370	Electrical	Eqpt - MV Switchgear - 7kV, 2000A Fdr Ckt Bkr.	2.00	ea	Contr	Contr	42,870.00	72	50.09	144	1.09	0	85,740	NO	0	7,827	156	93,567	0	$93,567	HDR|CB Estimated cost
371	Electrical	Eqpt - MV Switchgear - 7kV, 1200A Fdr Ckt Bkr.	20.00	ea	Contr	Contr	36,360.00	48	50.09	960	1.09	0	727,200	NO	0	52,178	1,042	779,378	0	$779,378	HDR|CB Estimated cost
372	Electrical	Eqpt - Relay panels and Metering	2.0	ea	Contr	Contr	34,500.00	120.00	50.09	240	1.09	0	69,000	NO	0	13,044	260	82,044	0	$82,044	HDR|CB Estimated cost
373	Electrical	Eqpt - Station Batteries 125 Volt DC	1.0	lot	Contr	Contr	165,140.00	635	50.09	635	1.09	0	165,140	NO	0	34,514	689	199,654	0	$199,654	HDR|CB Estimated cost

Confidential

Estimate Details

1 x 1 MHI G Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

												CONSTRUCTION PROJECT TOTALS CONTRACTOR									
	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
374	Electrical	Eqpt - Transformer GSU - 320 MVA, 18kV-345kV	1.0	ea	Contr	Contr	3,200,000.00	950	50.09	950	1.09	0	3,200,000	NO	0	51,634	1,031	3,251,634	0	$3,251,634	HDR|CB Estimated cost
375	Electrical	Eqpt - Transformer GSU - 142 MVA, 18kV-345kV	1.0	ea	Contr	Contr	1,500,000.00	950	50.09	950	1.09	0	1,500,000	NO	0	51,634	1,031	1,551,634	0	$1,551,634	HDR|CB Estimated cost
376	Electrical	Eqpt - Transformer UAT 20 MVA, 18kV/4.16kV	2.0	ea	Contr	Contr	800,000.00	650	50.09	1,300	1.09	0	1,600,000	NO	0	70,658	1,411	1,670,658	0	$1,670,658	HDR|CB Estimated cost
377	Electrical	Eqpt - Emergency Diesel Gnerator packaged 750kW	1.0	ea	Contr	Contr	200,000.00	100	50.09	100	1.09	0	200,000	NO	0	5,435	109	205,435	0	$205,435	HDR|CB Estimated cost
378	Electrical	Eqpt - UPS (120VAC)	1.0	ea	Contr	Contr	300,000.00	528	50.09	528	1.09	0	300,000	NO	0	28,698	573	328,698	0	$328,698	HDR|CB Estimated cost
379	Electrical	Eqpt - Transformer Aux Power 2.5/3.3MVA, 7kV-480V	6.0	ea	Contr	Contr	104,500.00	210	50.09	1,260	1.09	0	627,000	NO	0	68,484	1,367	695,484	0	$695,484	HDR|CB Estimated cost
380	Electrical	Eqpt - Lighting Transformers	8.0	ea	Contr	Contr	916.27	9.09	50.09	73	1.09	0	7,330	YES	440	3,953	79	11,283	0	$11,283	HDR|CB Estimated cost
381	Electrical	Eqpt - Panelboards 480/120 & 480/277/120	8.0	ea	Contr	Contr	1,200.00	40.00	50.09	320	1.09	0	9,600	YES	576	17,393	347	26,993	0	$26,993	HDR|CB Estimated cost
382	Electrical	Eqpt - Plant Network System	1.0	ea	Contr	Contr	100,000.00	300	50.09	300	1.09	0	100,000	YES	6,000	16,306	326	116,306	0	$116,306	HDR|CB Estimated cost
383	Electrical	Eqpt - Plant Security System	1.0	lot	Contr	Contr	250,000.00	1800	50.09	1,800	1.09	0	250,000	YES	15,000	97,834	1,953	347,834	0	$347,834	HDR|CB Estimated cost
384	Electrical	Eqpt - Plant Telephone System	1.0	ea	Contr	Contr	100,000.00	900	50.09	900	1.09	0	100,000	YES	6,000	48,917	977	148,917	0	$148,917	HDR|CB Estimated cost
385																					
386		**Division #6.0 - Electrical Equipment Sub-Total**								**26,560**		**0**	**11,904,770**		**28,016**	**1,443,587**	**28,818**	**13,348,357**	**0**	**13,348,357**	
387																					
388	**Division #6.1 - Electrical/Control Commodities**																				
389																					
390	Electrical	Grounding - Buried Ground Conductor	28,000.0	lf	Contr	Contr	4.79	0.054	50.09	1,512	1.09	0	134,120	NO	0	82,180	1,641	216,300	0	$216,300	HDR|CB Estimated Quantity & Cost
391	Electrical	Grounding - Above Ground Conductor	28,000.0	lf	Contr	Contr	4.79	0.054	50.09	1,512	1.09	0	134,120	NO	0	82,180	1,641	216,300	0	$216,300	HDR|CB Estimated Quantity & Cost
392	Electrical	Grounding - Ground Rods Copper	96.0	ea	Contr	Contr	22.95	1.74	50.09	167	1.09	0	2,204	NO	0	9,079	181	11,283	0	$11,283	HDR|CB Estimated Quantity & Cost
393	Electrical	Grounding - Exothermic Connections	2,200.0	ea	Contr	Contr	9.75	1.14	50.09	2,508	1.09	0	21,450	NO	0	136,315	2,721	157,765	0	$157,765	HDR|CB Estimated Quantity & Cost
394	Electrical	Grounding - Servit Post	1,000.0	ea	Contr	Contr	30.00	1	50.09	833	1.09	0	30,000	NO	0	45,263	904	75,263	0	$75,263	HDR|CB Estimated Quantity & Cost
395	Electrical	Conduit A/G 5" RGS	800.0	lf	Contr	Contr	58.00	1.00	50.09	800	1.09	0	46,400	NO	0	43,482	868	89,882	0	$89,882	HDR|CB Estimated Quantity & Cost
396	Electrical	Conduit A/G 2" ave RGS	60,000.0	lf	Contr	Contr	8.50	0.30	50.09	18,000	1.09	0	510,000	NO	0	978,337	19,530	1,488,337	0	$1,488,337	HDR|CB Estimated Quantity & Cost
397	Electrical	Conduit U/G - 4 x 6 PVC 5"	6,000.0	lf	Contr	Contr	240.00	2.00	50.09	12,000	1.09	0	1,440,000	NO	0	652,225	13,020	2,092,225	0	$2,092,225	HDR|CB Estimated Quantity & Cost
398	Electrical	Conduit U/G - 8 x 8 PVC 5"	700.0	lf	Contr	Contr	530.00	5.00	50.09	3,500	1.09	0	371,000	NO	0	190,232	3,798	561,232	0	$561,232	HDR|CB Estimated Quantity & Cost
399	Electrical	Cable Tray, Raceway 24" Aluminum	4,000.0	lf	Contr	Contr	17.00	0.84	50.09	3,360	1.09	0	68,000	NO	0	182,623	3,646	250,623	0	$250,623	HDR|CB Estimated Quantity & Cost
400	Electrical	Cable Tray, Raceway 36" Aluminum	1,650.0	lf	Contr	Contr	20.00	1.05	50.09	1,733	1.09	0	33,000	NO	0	94,165	1,880	127,165	0	$127,165	HDR|CB Estimated Quantity & Cost
401	Electrical	Cable - Overhead Conductor to Substation	1,000.0	lf	Contr	Contr	8.50	0.50	50.09	500	1.09	0	8,500	NO	0	27,176	543	35,676	0	$35,676	HDR|CB Estimated Quantity & Cost
402	Electrical	Cable - Medium Voltage (5kV 1C Cable)	60,000.0	lf	Contr	Contr	14.60	0.127	50.09	7,620	1.09	0	876,000	NO	0	414,163	8,268	1,290,163	0	$1,290,163	HDR|CB Estimated Quantity & Cost
403	Electrical	Cable Terminations - 5kV	96.0	ea	Contr	Contr	195.00	12.00	50.09	1,152	1.09	0	18,720	NO	0	62,614	1,250	81,334	0	$81,334	HDR|CB Estimated Quantity & Cost
404	Electrical	Cable 600V Power 1/c No. 2/0 ave size	120,000.0	lf	Contr	Contr	3.55	0.041	50.09	4,920	1.09	0	426,000	NO	0	267,412	5,338	693,412	0	$693,412	HDR|CB Estimated Quantity & Cost
405	Electrical	Wire 600V Power 3/c # 10 ave. size	185,000.0	lf	Contr	Contr	0.27	0.0185	50.09	3,423	1.09	0	49,950	NO	0	186,020	3,713	235,970	0	$235,970	HDR|CB Estimated Quantity & Cost
406	Electrical	Cable - Fiber Optic	16,500.0	lf	Contr	Contr	6.00	0.025	50.09	413	1.09	0	99,000	NO	0	22,420	448	121,420	0	$121,420	HDR|CB Estimated Quantity & Cost
407	Electrical	Cable - Permanent Telephone Line	1.0	ls	Contr	Contr	10,000.00	240.000	50.09	240	1.09	0	10,000	NO	0	13,044	260	23,044	0	$23,044	HDR|CB Estimated Quantity & Cost
408	Electrical	Cable - Control	500,000.0	lf	Contr	Contr	1.10	0.040	50.09	20,000	1.09	0	550,000	NO	0	1,087,041	21,700	1,637,041	0	$1,637,041	HDR|CB Estimated Quantity & Cost
409	Electrical	Cable - Instrument 4pr tw/shld No. 18	300,000.0	lf	Contr	Contr	3.25	0.025	50.09	7,500	1.09	0	975,000	NO	0	407,641	8,138	1,382,641	0	$1,382,641	HDR|CB Estimated Quantity & Cost
410	Electrical	Cable - Thermocouple 2pr tw/shld No. 16	10,000.0	lf	Contr	Contr	0.33	0.030	50.09	300	1.09	0	3,300	NO	0	16,306	326	19,606	0	$19,606	HDR|CB Estimated Quantity & Cost
411	Electrical	Cable - Data Highway	20,000.0	lf	Contr	Contr	4.59	0.034	50.09	688	1.09	0	91,800	NO	0	37,394	746	129,194	0	$129,194	HDR|CB Estimated Quantity & Cost
412	Electrical	Cable Terminations - low voltage	25,000.0	ea	Contr	Contr	0.85	0.300	50.09	7,500	1.09	0	21,250	NO	0	407,641	8,138	428,891	0	$428,891	HDR|CB Estimated Quantity & Cost
413	Electrical	Cable Terminations - control	25,000.0	ea	Contr	Contr	0.54	0.300	50.09	7,500	1.09	0	13,500	NO	0	407,641	8,138	421,141	0	$421,141	HDR|CB Estimated Quantity & Cost
414	Electrical	Cable Terminations - instrument	25,000.0	ea	Contr	Contr	0.54	0.300	50.09	7,500	1.09	0	13,500	NO	0	407,641	8,138	421,141	0	$421,141	HDR|CB Estimated Quantity & Cost
415	Electrical	Conduit - Lighting A/G	20,000.0	lf	Contr	Contr	2.83	0.25	50.09	5,000	1.09	0	56,600	YES	3,396	271,760	5,425	328,360	0	$328,360	HDR|CB Estimated Quantity & Cost
416	Electrical	Wire - Lighting 1/C No 12	60,000.0	lf	Contr	Contr	0.176	0.018	50.09	1,080	1.09	0	10,560	YES	634	58,700	1,172	69,260	0	$69,260	HDR|CB Estimated Quantity & Cost
417	Electrical	Lighting - Outdoor Fixtures, pole	24.0	ea	Contr	Contr	1,600.00	12.00	50.09	288	1.09	0	38,400	YES	2,304	15,653	312	54,053	0	$54,053	HDR|CB Estimated Quantity & Cost
418	Electrical	Lighting - Outdoor Fixtures, 150W	200.0	ea	Contr	Contr	490.00	4.00	50.09	800	1.09	0	98,000	NO	0	43,482	868	141,482	0	$141,482	HDR|CB Estimated Quantity & Cost
419	Electrical	Lighting - Fixtures, 250W MH	80.0	ea	Contr	Contr	850.00	3.00	50.09	240	1.09	0	68,000	NO	0	13,044	260	81,044	0	$81,044	HDR|CB Estimated Quantity & Cost
420	Electrical	Lighting - Fixtures, fluorescent	180.0	ea	Contr	Contr	85.00	1.60	50.09	288	1.09	0	15,300	YES	918	15,653	312	30,953	0	$30,953	HDR|CB Estimated Quantity & Cost
421	Electrical	Lighting - Receptacles and switches	150.0	ea	Contr	Contr	32.00	1.37	50.09	205	1.09	0	4,800	YES	288	11,148	223	15,948	0	$15,948	HDR|CB Estimated Quantity & Cost
422	Electrical	Welding Receptacles	16.0	ea	Contr	Contr	1,800.00	4.00	50.09	64	1.09	0	28,800	NO	0	3,479	69	32,279	0	$32,279	HDR|CB Estimated Quantity & Cost
423	Electrical	Lighting - Exit	48.0	ea	Contr	Contr	150.00	2.00	50.09	96	1.09	0	7,200	YES	432	5,218	104	12,418	0	$12,418	HDR|CB Estimated Quantity & Cost
424	Electrical	Lighting - Emergency	100.0	ea	Contr	Contr	127.00	2.00	50.09	200	1.09	0	12,700	YES	762	10,870	217	23,570	0	$23,570	HDR|CB Estimated Quantity & Cost
425	Electrical	Cathodic Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
426	Electrical	Lightning Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
427	Electrical	Freeze Protection System	1.0	lot	Contr	Contr	400,000.00	2000	50.09	2,000	1.09	0	400,000	YES	24,000	108,704	2,170	508,704	0	$508,704	HDR|CB Estimated Quantity & Cost
428	Electrical	Electrical Circuit Testing	4,850.0	ea	Contr	Contr		2	50.09	9,700	1.09	0	0	NO	0	527,216	10,525	527,216	0	$527,216	HDR|CB Estimated Quantity & Cost
429		**Total Cable**	**1,212,501.0**	**LF**																	
430																					
431		**Division #6.1 - Electrical/Control Commodities Sub-Total**								**136,100**		**0**	**6,887,174**		**44,734**	**7,397,341**	**147,669**	**14,284,514**	**0**	**14,284,514**	
432																					
433	**Division #6.2 - Switchyard**																				
434																					
435	IV Electrica	138kV Dead End Towers 6 Legged (2 total)	100,000.0	lb	Contr	Contr	2.50	0.02	60.25	2,180	1.09	0	250,000	NO	0	142,500	2,365	392,500		$392,500	HDR|CB Estimated Quantity & Cost
436	IV Electrica	Interonnection Cabling and Termination Allowance	1.0	lot	Contr	Contr	15,000.00	1,526.36	51.33	1,526	1.09	0	15,000	NO	0	85,000	1,656	100,000		$100,000	HDR|CB Estimated Quantity & Cost
437																					
438		**Division #6.2 - Switchyard**								**3,706**		**0**	**$265,000**		**0**	**$227,500**	**$4,021**	**$492,500**	**$0**	**$492,500**	
439																					
440	**Division #7.0 - Instrumentation & Control**																				
441																					
442	I & C	BOP Instrument Devices	900.0	ea	Contr	Contr	750.00	12	50.09	10,800	1.09	0	675,000	NO	0	587,002	11,718	1,262,002	0	$1,262,002	HDR|CB Estimated Quantity & Cost
443	I & C	Auxiliary Boiler CEMS	1.0	lot	Contr	Contr	163,200.00	200	50.09	200	1.09	0	163,200	NO	0	10,870	217	174,070	0	$174,070	HDR|CB Estimated Quantity & Cost
444	I & C	Continuous Emissions Monitoring Equipment (CEMS)	1.0	ea	Contr	Contr	700,000.00	2000	53.33	2,000	1.09	0	700,000	NO	0	115,730	2,170	815,730	0	$815,730	HDR|CB Estimated Quantity & Cost
445	I & C	Control Valves	180.0	ea	Contr	Contr	4,000.00	24	54.96	4,320	1.09	0	720,000	NO	0	257,621	4,687	977,621	0	$977,621	HDR|CB Estimated Quantity & Cost
446	I & C	DCS w/ Configuration, Interfaces, Field Support, Interface, Bulks	1.0	ea	Contr	Contr	1,300,000.00	1691	50.09	1,691	1.09	0	1,300,000	NO	0	91,909	1,835	1,391,909	0	$1,391,909	HDR|CB Estimated Quantity & Cost
447	I & C	Emergency Trip sub Panel	1.0	ea	Contr	Contr	30,000.00	21	50.09	21	1.09	0	30,000	NO	0	1,141	23	31,141	0	$31,141	HDR|CB Estimated Quantity & Cost
448	I & C	Flow Element - Nozzle (Supply)	3.0	ea	Contr	Contr	30,000.00	20	54.96	60	1.09	0	90,000	NO	0	3,578	65	93,578	0	$93,578	HDR|CB Estimated Quantity & Cost
449	I & C	Instrument Calibration and loop check	1,200.0	ea	Contr	Contr	0.00	3	50.09	3,600	1.09	0	0	NO	0	195,667	3,906	195,667	0	$195,667	HDR|CB Estimated Quantity & Cost
450	I & C	Instrument piping 2&3-valve manifolds	240.0	ea	Contr	Contr	400.00	5.22	54.96	1,252	1.09	0	96,000	NO	0	74,646	1,358	170,646	0	$170,646	HDR|CB Estimated Quantity & Cost
451	I & C	Instrument Racks & Enclosures	1.0	lot	Contr	Contr	350,000.00	1450	50.09	1,450	1.09	0	350,000	NO	0	78,811	1,573	428,811	0	$428,811	HDR|CB Estimated Quantity & Cost
452	I & C	Instrument Tubing - copper	4,000.0	lf	Contr	Contr	3.70	0.15	54.96	600	1.09	0	14,800	NO	0	35,781	651	50,581	0	$50,581	HDR|CB Estimated Quantity & Cost
453	I & C	Instrument Tubing - Stainless Steel	1,600.0	lf	Contr	Contr	6.25	0.20	54.96	320	1.09	0	10,000	NO	0	19,083	347	29,083	0	$29,083	HDR|CB Estimated Quantity & Cost
454	I & C	PLC Hardware, Bulks, Aux Controls, Configuration	1.0	ls	Contr	Contr	241,200.00	253	50.09	253	1.09	0	241,200	NO	0	13,751	275	254,951	0	$254,951	HDR|CB Estimated Quantity & Cost
455																					
456		**Division #7.0 - Control Sub-Total**								**26,567**		**0**	**4,390,200**		**0**	**1,485,591**	**28,825**	**5,875,791**	**0**	**$5,875,791**	
457																					
458		**Sub-Total Direct Costs**								**671,932**		**0**	**174,735,380**	**0**		**38,374,251**	**728,559**	**213,109,630**	**19,630,400**	**232,740,030**	
459		Sales Tax - State (Plant Production Equipment is Exempt)	6.00%												**330,152**				**330,152**	**330,152**	Sales Tax Included for Non-Production Facilities

Estimate Details

1 x 1 MHI G Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
460	Indirects																				
461		**TOTAL DIRECT COSTS**								**671,932**		**0**	**174,735,380**			**38,374,251**	**728,559**	**213,109,630**	**19,960,552**	**$233,070,183**	
462																					
463	**Division #8.0 - Construction and Indirect Services**																				
464																					
465	Const Indirec	Construction Equipment	1.0	ls	Contr	Contr	11,145,203			0	1.09					0	0	0	11,145,203	$11,145,203	See Construction Equipment worksheet
466	Const Indirec	Construction Field staff	1.0	ls	Contr	Contr	11,522,855			0	1.09					0	0	0	11,522,855	$11,522,855	See EPC Field Staff Worksheet for details
467	Const Indirec	Construction Field staff expenses	1.0	ls	Contr	Contr	1,870,168			0	1.09					0	0	0	1,870,168	$1,870,168	See EPC Field Staff Worksheet for details
468	Const Indirec	Construction Permits	1.0	ls	Contr	Contr				0	1.09		51,450			0	0	51,450	0	$51,450	See Const Indirects and Serv Worksheet
469	Const Indirec	Construction Testing	1.0	ls	Contr	Contr				0	1.09		117,000			0	0	117,000	0	$117,000	See Const Indirects and Serv Worksheet
470	Const Indirec	Consumable Materials & Safety Supplies	2.00	$/MH	Contr	Contr	1,457,118			0	1.09					0	0	0	1,457,118	$1,457,118	$2.00/Direct hour
471	Const Indirec	Field Office Expenses	1.0	ls	Contr	Contr				1,369	1.09		1,033,370			65,849	1,485	1,099,219	22,373	$1,121,592	See Const Indirects and Serv Worksheet
472	Const Indirec	Performance Testing	1.0	ls	Contr	Contr				0	1.09		304,400			0	0	304,400	0	$304,400	See Const Indirects and Serv Worksheet
473	Const Indirec	Preoperational Testing, Startup & Commissioning	2.0	ls	Contr	Contr				21,690	1.09		1,113,000			752,767	23,534	1,865,767	0	$1,865,767	See Const Indirects and Serv Worksheet
474	Const Indirec	Site Safety	1.0	ls	Contr	Contr				7,580	1.09		658,040			375,008	8,224	1,033,048	0	$1,033,048	See Const Indirects and Serv Worksheet
475	Const Indirec	Small Tools	2.00	$/MH	Contr	Contr	1,457,118			0	1.09					0	0	0	1,457,118	$1,457,118	$2.00/Direct hour
476	Const Indirec	Start-up Supervision	1.0	ls	Contr	Contr	1,296,911			0	1.09					0	0	0	1,296,911	$1,296,911	See EPC Field Staff Worksheet for details
477	Const Indirec	Support Craft, Site Services, Scaffolding	1.0	ls	Contr	Contr				41,753	1.09		459,400			2,008,704	45,302	2,468,104	775,014	$3,243,118	See Const Indirects and Serv Worksheet
478	Const Indirec	Temporary Facilities	1.0	ls	Contr	Contr				17,947	1.09		2,336,753			863,403	19,472	3,200,157	82,500	$3,282,657	See Const Indirects and Serv Worksheet
479	Const Indirec	Temporary Utilities	1.0	ls	Contr	Contr				29,032	1.09		747,600			1,396,697	31,500	2,144,297	0	$2,144,297	See Const Indirects and Serv Worksheet
480																					
481		**Division #8.0 - Construction Indirects and Services Sub-Total**								**119,371**		**0**	**6,821,013**			**5,462,428**	**129,518**	**12,283,441**	**29,629,261**	**$41,912,703**	
482																					
483		**SUB-TOTAL CONSTRUCTION COST**								**791,303**		**0**	**181,556,393**			**43,836,679**	**858,077**	**225,393,072**	**49,589,813**	**274,982,885**	
484		**Subcontract Labor Hours**																			
485		**Material Cost Excluding CT, HRSG and ST (escalation and EPC**											**65,833,857**								
486	**Division #9.0 - Project Indirects**																				
487																					
488	Project Indire	- Power Plant Design Engineering	1.0	ls	Contr	6.0%	16,498,973											0	16,498,973	$16,498,973	6.0% of the Total Construction Cost
489	Project Indire	- Project Management (Home Office)	0.0	ls	Contr	0.0%	0											0	0	$0	Included in Engineering
490																					
491																					
492		Sub-Total Project Indirects										**0**	**0**			**0**	**0**	**0**	**16,498,973**	**$16,498,973**	
493																					
494	EPC Indirect	EPC Contractor Insurance & Misc Costs (% of Total Const. Cost)																			
495																					
496	EPC Indirect	- Builders Risk Insurance	1.0	ls	Contr	0.50%	1,374,914												1,374,914	$1,374,914	Allowance based on info from other projects
497	EPC Indirect	- Comprehensive General Liability (CGL) Insurance	1.0	ls	Contr	0.50%	1,374,914											0	1,374,914	$1,374,914	Allowance based on info from other projects
498	EPC Indirect	- Warranty Reserve	1.0	ls	Contr		500,000											0	500,000	$500,000	Allowance based on info from other projects
499																					
500		Sub-Total EPC Contractor Indirects										**0**	**0**			**0**	**0**	**0**	**3,249,829**	**$3,249,829**	
501																					
502		**Total Project Indirects**										**0**	**0**			**0**	**0**	**0**	**19,748,802**	**19,748,802**	
503																					
504		Sub-Total										**0**	**181,556,393**			**43,836,679**	**858,077**	**225,393,072**	**69,338,615**	**$294,731,687**	
505							Equipment	Material	Labor	S/C											
506	Project Indire	Escalation - EPC Contractor Escalation Rates					2.4%	2.4%	4.0%	4.0%			5,527,378			7,049,936	0	12,577,315	8,614,531	21,191,846	Excludes CT, HRSG and ST
507																					
508		Sub-Total										**0**	**187,083,771**			**50,886,615**	**858,077**	**237,970,386**	**77,953,147**	**$315,923,533**	
509							Equip	Mat	Labor	S/C											
510	EPC Indirect	EPC Contractor Contingency	Varies	%	Contr		0%	5%	5%	5%		0	3,291,693			2,544,331		5,836,024	3,677,657	9,513,681	Excludes CT, HRSG and ST
511	EPC Indirect	EPC Contractor G&A and Fee	9.0%	%	Contr		0.0%	9.0%	9.0%	9.0%		0	16,837,539			4,579,795		21,417,335	7,015,783	28,433,118	
512																					
513		Sub-Total		ls								0	20,129,232			7,124,126	0	27,253,358	10,693,441	$37,946,799	
514																					
515		**TOTAL EPC PROJECT COST**								**791,303**		**0**	**207,213,004**			**58,010,741**	**858,077**	**265,223,745**	**88,646,587**	**$353,870,332**	
516																					
517	**OWNER INDIRECTS**																				
518	**Division #9.1 - Owner Indirects**																				
519																					
520		**Power Block 1 and Common**																			
521	Owner Indire	Project Development	1.0	ls	Owner														6,500,000	$6,500,000	Budget provided by LG&E
522	Owner Indire	Transmission Line Relocation	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
523	Owner Indire	Transmission Interconnection Facilities	1.0	ls	Owner														5,500,000	$5,500,000	To be estimated by Transmision Operator
524	Owner Indire	Natural Gas Pipeline Interconnection	1.0	ls	Owner														14,250,000	$14,250,000	Budget provided by LG&E
525	Owner Indire	Natural Gas Pipeline Fixed O&M (Startup Period)	1.0	ls	Owner														3,000,000	$3,000,000	Budget provided by LG&E
526	Owner Indire	Construction Power (Service Installation and Energy)	1.0	ls	Owner														750,000	$750,000	Budget estimated by HDR|CB
527	Owner Indire	Owner Operations Personnel (Prior to COD)	1.0	ls	Owner														2,340,000	$2,340,000	Budget estimated by HDR|CB 7 sal @ 12 mo, 26 hr @ 6 n
528	Owner Indire	Owners Project Management	1.0	ls	Owner														5,300,000	$5,300,000	Budget provided by LG&E
529	Owner Indire	Owners Engineer	1.0	ls	Owner														1,700,000	$1,700,000	Budget provided by LG&E
530	Owner Indire	Owners Legal Counsel	1.0	ls	Owner														1,300,000	$1,300,000	Budget provided by LG&E
531	Owner Indire	Operator Training	1.0	ls	Owner														225,000	$225,000	Budget estimated by HDR|CB
532	Owner Indire	Owner Startup Engineering	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
533	Owner Indire	Permitting, License Fees, & Environmental Compliance	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
534	Owner Indire	Highway Improvements, Miscellaneous Mitigation	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
535	Owner Indire	Land	1.0	ls	Owner														0	$0	Budget provided by LG&E
536	Owner Indire	Rolling Stock	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
537	Owner Indire	Water Infrastructure / Supply to Site	0.0	ls	Owner														0	$0	N/A (On site intake/pre-treatment/discharge incl. in EPC)
538	Owner Indire	Startup Testing (Includes Fuel & Power Sales)																			
539	Owner Indire	- Fuel - Natural Gas	1.0	ls	Owner														8,107,200	$8,107,200	HDR|CB [1,801,600 MMBTU @ $4.50/MMBTU per LG&E 2017 Forecas
540	Owner Indire	- Fuel - Fuel Oil	0.0	ls	Owner														0	$0	Budget estimated by HDR|CB [Not Required]
541	Owner Indire	- Electric Transmission Firm Point to Point	1.0	ls	Owner														2,400,000	$2,400,000	Budget provided by LG&E
542	Owner Indire	- Startup Power	1.0	ls	Owner														267,748	$267,748	Budget estimated by HDR|CB [7243 MWhr @$36/MWH]
543	Owner Indire	- Test Power Sales	1.0	ls	Owner														(10,368,000)	($10,368,000)	Budget estimated by HDR|CB [288,000 MWhr @$36/MWH
544	Owner Indire	- Variable O&M - Water, Chemicals, etc.	1.0	ls	Owner														800,000	$800,000	Budget estimated by HDR|CB
545	Owner Indire	Site Security	1.0	ls	Owner														50,000	$50,000	Budget estimated by HDR|CB
546	Owner Indire	Operating Spare Parts	1.0	ls	Owner														10,000,000	$10,000,000	Budget estimated by HDR|CB - Does NOT incl. CT LTSA
547	Owner Indire	Permanent Plant Equipment & Furnishings																		$0	

Estimate Details

1 x 1 MHI G Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
548	Owner Indire	- Office Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
549	Owner Indire	- Kitchen Furniture	1.0	ls	Owner														130,000	$130,000	Budget estimated by HDR|CB
550	Owner Indire	- Laboratory Equipment & Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
551	Owner Indire	- Locker Room Furniture	1.0	ls	Owner														180,000	$180,000	Budget estimated by HDR|CB
552	Owner Indire	- Warehouse Shelves	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
553	Owner Indire	- Workshop Tools & Test Equipment	1.0	ls	Owner														1,800,000	$1,800,000	Budget estimated by HDR|CB
554	Owner Indire	IT and Telecommunication Infrastructure	1.0	ls	Owner														250,000	$250,000	Budget estimated by HDR|CB
555	Owner Indire	NERC - Cyber Security	1.0	ls	Owner														1,000,000	$1,000,000	Budget estimated by HDR|CB
556	Owner Indire	Escalation - Owners Furnished Equipment	0.0	%	Owner														0	$0	N/A
557	Owner Indire	Builders Risk Insurance	0.0	ls	Owner														0	$0	Included with EPC Contractor Indirects
558	Owner Indire	Property Tax During Construction	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
559	Owner Indire	Financing Fees	0.0	ls	Owner														0	$0	N/A
560	Owner Indire	AFUDC	1.0	ls	Owner														4,400,000	$4,400,000	AFUDC Based on 78% KU Ownership
561		**Total Owner Indirects**																	**64,081,948**	**$64,081,948**	
562																					
563																					
564		**Owner Contingency**	10.00%	%	Owner														**35,387,033**	**$35,387,033**	
565																					
566																					
567		**Total Owner Indirects**																	**99,468,981**	**$99,468,981**	
568																					
569		**TOTAL PROJECT COST**										**0**	**207,213,004**			**58,010,741**	**858,077**	**265,223,745**	**188,115,568**	**$453,339,313**	
																			$/kW	**$1,216**	

1 x 1 Siemens H Class Combined Cycle Unit

BUDGET ESTIMATE

5 x 10 Work Week

February 22, 2013

Rev 3

CONFIDENTIAL

1 x 1 Siemens H Class Combined Cycle Unit

LOCATION:	Kentucky
PROJECT #	189895
PLANT TYPE:	**NGCC**
CLIENT:	LG&E/KU
ESTIMATE TYPE:	Conceptual
LEAD ESTIMATOR:	

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013		TECHNOLOGY:	CT with HRSG & STG		
NTP PERIOD:		NET MW RATING:	379.4	BOILER:	Fired
CONSTRUCTION NTP - Mob:		NO. OF UNITS:	1	STEAM TURBINE:	Condensing
COMMERCIAL OPERATION DATE:	1-Jun-2018	FUEL TYPE:	Nat Gas	COOLING TYPE:	Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
Site Development	$0	$1,615,475	$1,394,611	33,400	224,000	$3,234,086	0.9%
Raw Water Intake/Discharge Facilities	$0	$500,000	$578,649	10,850	0	$1,078,649	0.3%
Foundations & Concrete	$0	$3,897,575	$2,955,871	76,389	9,015,000	$15,868,446	4.4%
Architectural & Metals	$0	$3,660,410	$1,713,370	34,023	5,366,400	$10,740,180	3.0%
Piping, Valves, Support, Accessories	$0	$10,778,940	$9,521,516	176,408	225,000	$20,525,455	5.7%
HRSG Equipment	$0	$29,825,983	$6,479,930	93,853	0	$36,305,914	10.1%
Steam Turbine Island Equipment	$0	$21,717,118	$1,504,488	28,210	0	$23,221,606	6.5%
Combustion Turbine Equipment	$0	$67,496,763	$2,198,867	41,230	0	$69,695,631	19.4%
Mechanical Draft Cooling Tower	$0	$0	$0	0	4,000,000	$4,000,000	1.1%
BOP Mechanical Equipment	$0	$14,919,300	$1,470,543	24,820	1,000,000	$17,389,843	4.8%
Electrical Equipment	$0	$11,904,770	$1,443,587	28,818	0	$13,348,357	3.7%
Electrical Commodities	$0	$6,887,174	$7,397,341	147,669	0	$14,284,514	4.0%
High Voltage Switchyard	$0	$265,000	$227,500	4,021	0	$492,500	0.1%
Instrumentation & Controls	$0	$4,390,200	$1,485,591	28,825	0	$5,875,791	1.6%
Sub-Total Direct Costs:	$0	$177,858,708	$38,371,865	728,516	$19,830,400	$236,060,973	65.7%
State Sales Tax (Non-Production Material Only)					330,152	$330,152	0.1%
Total Direct Cost	$0	$177,858,708	$38,371,865	728,516	$20,160,552	$236,391,125	65.8%
Construction Indirects & Services							
- Construction Field Staff			$0	0	$11,522,855	$11,522,855	3.2%
- Construction Field Staff Expenses			$0	0	$1,870,168	$1,870,168	0.5%
- Construction Equipment			$0	0	$11,145,203	$11,145,203	3.1%
- Small Tools			$0	0	$1,457,032	$1,457,032	0.4%
- Consumable Materials & Safety Supplies			$0	0	$1,457,032	$1,457,032	0.4%
- Field Office Expense		$1,033,370	$65,849	1,485	$22,373	$1,121,592	0.3%
- Temporary Facilities		$2,336,753	$863,403	19,472	$82,500	$3,282,657	0.9%
- Temporary Utilities		$747,600	$1,396,697	31,500	$0	$2,144,297	0.6%
- Support Craft & Site Services		$459,400	$2,008,704	45,302	$775,014	$3,243,118	0.9%
- Site Safety		$658,040	$375,008	8,224	$0	$1,033,048	0.3%
- Construction Permits		$51,450	$0	0	$0	$51,450	0.0%
- Construction Testing		$117,000	$0	0	$0	$117,000	0.0%
- Performance Testing		$304,400	$0	0	$0	$304,400	0.1%
- Start-up Supervision		$0	$0	0	$1,296,911	$1,296,911	0.4%
- Preop Testing, Start-up		$1,113,000	$752,767	23,534	$0	$1,865,767	0.5%
Sub-Total Construction Indirects and Services		$6,821,013	$5,462,428	129,518	$29,629,088	$41,912,529	11.7%
Total Construction Cost	$0	$184,679,721	$43,834,293	858,033	$49,789,640	$278,303,654	77.4%
Estimated Subcontract Labor Hours				156,556			
Project Indirects							
- Project Engineering (Eng, PM, CM & Procurement)					$16,698,219	$16,698,219	4.6%
Sub-Total Project Indirects	$0	$0	$0	0	$16,698,219	$16,698,219	4.6%
EPC Contractor Insurance & Misc Costs							

1 x 1 Siemens H Class Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013		TECHNOLOGY:	CT with HRSG & STG		
NTP PERIOD:		NET MW RATING:	379.4	BOILER:	Fired
CONSTRUCTION NTP - Mob:		NO. OF UNITS:	1	STEAM TURBINE:	Condensing
COMMERCIAL OPERATION DATE:	1-Jun-2018	FUEL TYPE:	Nat Gas	COOLING TYPE:	Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
- Builders Risk					**$1,391,518**	**$1,391,518**	**0.4%**
- Comprehensive General Liability (CGL) Insurance					**$1,391,518**	**$1,391,518**	**0.4%**
- Warranty Reserve					**$500,000**	**$500,000**	**0.1%**
Sub-Total EPC Contractor Insur. & Misc. Co	**$0**	**$0**	**$0**	**0**	**$3,283,037**	**$3,283,037**	**0.9%**
Total EPC Contractor Project Indirect Cost	**$0**	**$0**	**$0**	**0**	**$19,981,256**	**$19,981,256**	**5.6%**
- Escalation (Eqt, Materials & Labor)	**$0**	**$5,517,084**	**$7,049,586**		**$7,233,379**	**$19,800,048**	**5.5%**
Sub-Total	**0**	**190,196,805**	**50,883,879**	**1,014,589**	**77,004,274**	**318,084,958**	**88.5%**
- EPC Contractor Contingency	**$0**	**$3,281,993**	**$2,544,194**		**$3,620,214**	**$9,446,400**	**2.6%**
- EPC Contractor G&A and Profit	**$0**	**$19,019,681**	**$5,088,388**		**$7,700,427**	**$31,808,496**	**8.9%**
TOTAL EPC PROJECT COST	**$0**	**$212,498,478**	**$58,516,461**	**1,014,589**	**$88,324,915**	**$359,339,855**	**100.0%**
EPC Price per kW						**$947**	
Owner Indirect Costs							
- Total Owner Indirects						**$56,081,948**	
- Owner Contingency						**$35,933,985**	
TOTAL PROJECT COST						**$451,355,788**	
Total Project Cost per kW						**$1,190**	
Estimate Options							
(include 25 % markup for indirects)							
Fuel Oil System						**$9,000,000**	
Bypass Stack and Diverter Damper						**N/A**	
Gas Compression						**Included in Base**	
SCR System to meet 12 ppm NOx						**Included in Base**	

Total Craft Labor Hours	**1,014,589**	**erformance Guarantees:**		**Executive-in-Charge:**	**WHD**
Ave. Craft Wage without Escalation	**$52.15**	**Liquidated Damages:**		**Project Manager:**	**JPS**
Field Labor Type	**TBD**	**Special Insurance:**		**Construction Manager:**	**SMP**
Labor Productivity Factor	**1.084**	**Performance Bond:**		**Lead Estimator:**	**CDF**

Estimate Details

1 x 1 Siemens H Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
1	**Division #1.0 - Sitework**																				
2	Sitework	Roads - Asphalt paving main site rds & Parking lots	7,200.0	sy	Sub	Contr	20.00		44.43		1.09	0	0	YES	4,320	0	0	0	144,000	$144,000	HDR|CB Estimated Quantity
3	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Powerblock A	1,740.0	sy	Contr	Contr	5.00	0.055	44.43	96	1.09	0	8,700	YES	522	4,613	104	13,313	0	$13,313	HDR|CB Estimated Quantity
4	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Secondary Ar	6,945.0	sy	Contr	Contr	5.00	0.055	44.43	382	1.09	0	34,725	YES	2,084	18,412	414	53,137	0	$53,137	HDR|CB Estimated Quantity
5	Sitework	Roads - Haul/Construction Roads Treated Gravel	29,700.0	sy	Contr	Contr	8.00	0.1	44.43	2,970	1.09	0	237,600	YES	14,256	143,162	3,222	380,762	0	$380,762	HDR|CB Estimated Quantity
6	Sitework	Roads - Main Roads Crushed stone Base Course	8,500.0	sy	Contr	Contr	12.00	0.1	44.43	850	1.09	0	102,000	YES	6,120	40,972	922	142,972	0	$142,972	HDR|CB Estimated Quantity
7	Sitework	Roads - Drainage and culverts	80,000.0	sy	Contr	Contr	2.00	0.05	44.43	4,000	1.09	0	160,000	YES	9,600	192,810	4,340	352,810	0	$352,810	HDR|CB Estimated Quantity
8	Sitework	Soil Erosion Control Measures	2,000	lf	Contr	Contr	1	0.027	44.43	54	1.09	0	2,000	YES	120	2,603	54	4,603	0	4,603	HDR|CB Estimated Quantity
9	Sitework	Site - Topsoil stripping/stockpiling	10,000	cy	Contr	Contr		0.030	44.43	300	1.09	0	0	YES	0	14,461	300	14,461	0	$14,461	HDR|CB Estimated Quantity
10	Sitework	Site - Drainage - Pipe Culverts (Assume 12" dia)	3,000	lf	Contr	Contr	9.00	0.12	44.43	360	1.09	0	27,000	YES	1,620	17,353	360	44,353	0	$44,353	HDR|CB Estimated Quantity
11	Sitework	Site - Drainage - Manholes	20	ea	Contr	Contr	1,500	16	44.43	320	1.09	0	30,000	YES	1,800	15,425	320	45,425	0	$45,425	HDR|CB Estimated Quantity
14	Sitework	Site - Fire Protection hydrants, valve boxes, ductile iron	24.0	ea	Contr	Contr	3,000.00	20	39.54	480	1.09	0	72,000	YES	4,320	20,591	521	92,591	0	$92,591	HDR|CB Estimated Quantity
15	Sitework	Site - Fire Protection U/G piping, DI	4,000.0	lf	Contr	Contr	41.00	0.5	39.54	2,000	1.09	0	164,000	YES	9,840	85,796	2,170	249,796	0	$249,796	HDR|CB Estimated Quantity
16	Sitework	Pipe Utility Trench Excavation	10,000	cy	Contr	Contr		0.2	39.54	2,000	1.09	0	0	YES	0	85,796	2,000	85,796	0	$85,796	HDR|CB Estimated Quantity
17	Sitework	Pipe Utility Trench Backfill (including bedding)	8,500	cy	Contr	Contr		0.2	39.54	1,700	1.09	0	0	YES	0	72,927	1,700	72,927	0	$72,927	HDR|CB Estimated Quantity
20	Sitework	Spoil Disposal	10,000	cy	Contr	Contr		0.1	44.43	1,000	1.09	0	0	YES	0	48,203	1,000	48,203	0	$48,203	HDR|CB Estimated Quantity
21	Sitework	Site - Sanitary sewer lift stations	1.0	ea	Contr	Contr	11,700.00	40	39.54	40	1.09	0	11,700	YES	702	1,716	43	13,416	0	$13,416	HDR|CB Estimated Quantity
22	Sitework	Site - Sanitary waste piping and manholes	2,000.0	lf	Contr	Contr	20.00	1	39.54	2,000	1.09	0	40,000	YES	2,400	85,796	2,170	125,796	0	$125,796	HDR|CB Estimated Quantity
23	Sitework	Site - Storm drain piping and culverts	20,000.0	lf	Contr	Contr	12.00	0.25	39.54	5,000	1.09	0	240,000	YES	14,400	214,490	5,425	454,490	0	$454,490	HDR|CB Estimated Quantity
24	Sitework	Site Finishing - Seed Site Earthwork	5.0	ac	Contr	Contr	10,000.00	0.54	39.54	3	1.09	0	50,000	YES	3,000	116	3	50,116	0	$50,116	HDR|CB Estimated Quantity
25	Sitework	Site Finishing - Grading around foundations	5,000.0	sy	Contr	Contr		0.02	39.54	100	1.09	0	0	YES	0	4,290	109	4,290	0	$4,290	HDR|CB Estimated Quantity
26	Sitework	Site Finishing - Stone Surfacing	6,000.0	sy	Contr	Contr	10.00	0.015	39.54	90	1.09	0	60,000	YES	3,600	3,861	98	63,861	0	$63,861	HDR|CB Estimated Quantity
27	Sitework	Site Improvements - landscaping at admin building	1.0	ls	Contr	Contr	30,000.00	360	39.54	360	1.09	0	30,000	YES	1,800	15,443	391	45,443	0	$45,443	HDR|CB Estimated Quantity
28	Sitework	Site Improvements - Main Gate Security Facilities	1.0	lot	Contr	Contr	150,000.00	3600	39.54	3,600	1.09	0	150,000	YES	9,000	154,433	3,906	304,433	0	$304,433	HDR|CB Estimated Quantity
29	Sitework	Site Improvements - Site Entrance Sign and Landscaping	1.0	ls	Contr	Contr	18,750.00	240	39.54	240	1.09	0	18,750	YES	1,125	10,296	260	29,046	0	$29,046	HDR|CB Estimated Quantity
30	Sitework	Site Improvements - Site Security Boundary Fencing	15,000.0	lf	Contr	Contr	11.00	0.2	39.54	3,000	1.09	0	165,000	YES	9,900	128,694	3,255	293,694	0	$293,694	HDR|CB Estimated Quantity
31	Sitework	Site Improvements - Fencing Active gates	6.0	ea	Contr	Contr	2,000.00	48	39.54	288	1.09	0	12,000	YES	720	12,355	312	24,355	0	$24,355	HDR|CB Estimated Quantity
32	Sitework	Site Surveying	1.0	lot	Sub	Contr	80,000.00		44.43	0	1.09	0	0	YES	2,400	0	0	0	80,000	$80,000	HDR|CB Estimated Quantity
33																					
34		**Division #1 - Sitework Sub-Total**								**31,232**		**0**	**1,615,475**		**103,649**	**1,394,611**	**33,400**	**3,010,086**	**224,000**	**3,234,086**	
35																					
36	**Division #1.3 - Raw Water Intake and Discharge Facilities**																				HDR Allowance for Interconnection and Updgrage of existing Unit 1 and 2 Intake Structure
37		Raw Water River Intake and Discharge Facilities	1.0	ea	Contr	Contr	500,000.00	10,000	53.33	10,000	1.09	0	500,000	NO	0	578,649	10,850	1,078,649	0	$1,078,649	
38																					
39		**Division #1.3 - Raw Water Intake Clarification and Discharge Facilities Sub-Total**								**10,000**		**0**	**500,000**		**0**	**578,649**	**10,850**	**1,078,649**	**0**	**$1,078,649**	
40																					
41																					
42	**Division #2.0 - Earthwork and Concrete**																				
43	**Division #2.1 - Earthwork**																				
44	Earthwork	Structural Backfill Power Block (using imported material)	165,000.0	cy	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	4,125,000	$4,125,000	HDR|CB Estimated Quantity
45	Earthwork	Retaining Wall (MSE)	30,000.0	sf	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	750,000	$750,000	HDR|CB Estimated Quantity
46	Earthwork	Structural Excavation Main Power Block - Earth/Rock	230,000.0	cy	Sub	Contr	18.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	4,140,000	$4,140,000	HDR|CB Estimated Quantity
47																					
48										0		0	0		0	0	0	0	9,015,000	9,015,000	
49	**Division # 2.2 - Concrete Main Power Block Area**																				
50																					
51		Includes Forms, Rebar, Placement, Finishing, Embeds																			
52	Concrete	HRSG and Stack	3,750	cy	Contr	Contr	250	4.5	38.69	16,875	1.09	0	937,500	NO	0	708,477	18,309	1,645,977	0	$1,645,977	HDR|CB Estimated Quantity
53	Concrete	Gas Turbine Foundation	2,500	cy	Contr	Contr	300	4.5	38.69	11,250	1.09	0	750,000	NO	0	472,318	12,206	1,222,318	0	$1,222,318	HDR|CB Estimated Quantity
54	Concrete	Steam Turbine building	700	cy	Contr	Contr	250	4.5	38.69	3,150	1.09	0	175,000	NO	0	132,249	3,418	307,249	0	$307,249	HDR|CB Estimated Quantity
55	Concrete	Spread Footings & Piers Pipe/Tray Trestle/Racks	300.0	cy	Contr	Contr	250	4.5	38.69	1,350	1.09	0	75,000	NO	0	56,678	1,465	131,678	0	$131,678	HDR|CB Estimated Quantity
56	Concrete	Steam Turbine Bldg fill slab	250.0	cy	Contr	Contr	210.00	4.5	38.69	1,125	1.09	0	52,500	NO	0	47,232	1,221	99,732	0	$99,732	HDR|CB Estimated Quantity
57	Concrete	Steam Turbine Bldg Mat Foundation	1,000.0	cy	Contr	Contr	250	4.5	38.69	4,500	1.09	0	250,000	NO	0	188,927	4,883	438,927	0	$438,927	HDR|CB Estimated Quantity
58	Concrete	Steam Turbine Bldg Elevated Slab	500.0	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	NO	0	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
59	Concrete	Steam Turbine Bldg sumps foundation	300.0	cy	Contr	Contr	250	4.5	38.69	1,350	1.09	0	75,000	NO	0	56,678	1,465	131,678	0	$131,678	HDR|CB Estimated Quantity
60	Concrete	Steam Turbine Pedestal FDN (Columns & Tabletop, Mat)	800.0	cy	Contr	Contr	350.00	8	38.69	6,400	1.09	0	280,000	NO	0	268,697	6,944	548,697	0	$548,697	HDR|CB Estimated Quantity
61	Concrete	Aux. Equipment Foundations	300	cy	Contr	Contr	250	4.5	38.69	1,350	1.09	0	75,000	YES	4,500	56,678	1,465	131,678	0	$131,678	HDR|CB Estimated Quantity
62	Concrete	Equip Fdn - Generator Breaker	30	cy	Contr	Contr	250	4.5	38.69	135	1.09	0	7,500	YES	450	5,668	146	13,168	0	$13,168	HDR|CB Estimated Quantity
63	Concrete	Equip Fdn - CT PEEC	30	cy	Contr	Contr	250	4.5	38.69	135	1.09	0	7,500	YES	450	5,668	146	13,168	0	$13,168	HDR|CB Estimated Quantity
64	Concrete	Equip Fdn - Power Distribution Center	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
65	Concrete	Equip Fdn - CEMS	20	cy	Contr	Contr	250	4.5	38.69	90	1.09	0	5,000	YES	300	3,779	98	8,779	0	$8,779	HDR|CB Estimated Quantity
66	Concrete	Equip Fdn - Boiler Feed Pump	75	cy	Contr	Contr	250	4.5	38.69	338	1.09	0	18,750	YES	1,125	14,170	366	32,920	0	$32,920	HDR|CB Estimated Quantity
67	Concrete	Equip Fdn - Main Step-up Transformer Fdn/Walls	60.0	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	NO	0	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
68	Concrete	Equip Fdn - Plant Aux Power Transformers Fnd/Walls	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
69	Concrete	Equip Fdn - Misc off Base Equip fnds	60.0	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	NO	0	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
70	Concrete	Elec. Ductbank (Tubes, Conc., Forms, Rebar) 12 Tubes	450.0	lf	Contr	Contr	125	0.57	38.69	257	1.09	0	56,250	NO	0	10,769	278	67,019	0	$67,019	HDR|CB Estimated Quantity
71	Concrete	Elec. Ductbank to Cooling Tower (Tubes, Conc., Forms, Rebar) 6 Tu	750.0	lf	Contr	Contr	100	0.45	38.69	338	1.09	0	75,000	NO	0	14,170	366	89,170	0	$89,170	HDR|CB Estimated Quantity
72	Concrete	Equip Fdn - Pumps & misc equipment	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
73	Concrete	Electrical Building Foundation	80.0	cy	Contr	Contr	250	4.5	38.69	360	1.09	0	20,000	NO	0	15,114	391	35,114	0	$35,114	HDR|CB Estimated Quantity
74	Concrete	Cooling Tower Basin	1,500.0	cy	Contr	Contr	250	5.5	38.69	8,250	1.09	0	375,000	NO	0	346,367	8,951	721,367	0	$721,367	HDR|CB Estimated Quantity
75	Concrete	Administration Building foundation	1,100.0	cy	Contr	Contr	250	4.5	38.69	4,950	1.09	0	275,000	YES	16,500	207,820	5,371	482,820	0	$482,820	HDR|CB Estimated Quantity
76	Concrete	Auxilary Boiler Building floor slab & foundation	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	NO	0	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
77	Concrete	Demineralized Water Tank Foundations	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
78	Concrete	Service water storage tank foundations	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	YES	3,000	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
79	Concrete	Main Gate Guard House	3.0	cy	Contr	Contr	250	4.5	38.69	14	1.09	0	750	YES	45	567	15	1,317	0	$1,317	HDR|CB Estimated Quantity
80	Concrete	Water Treatment Buildings, enclosures and tank fdns	0.0	cy	Contr	Contr	250	4.5	38.69	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
81	Concrete	Grouting (equipment & steel)	30.0	cy	Contr	Contr	2,227.50	81	38.69	2,430	1.09	0	66,825	NO	0	102,021	2,637	168,846	0	$168,846	HDR|CB Estimated Quantity
82																					
83		Sub Total Concrete	**15,248**				AVG MH/CY	4.84		70,405			3,897,575		27,270	2,955,871	76,389	6,853,446	0	6,853,446	
84																					
85		**Division #2 - Earthwork & Concrete Sub-Total**								**70,405**		**0**	**3,897,575**		**27,270**	**2,955,871**	**76,389**	**6,853,446**	**9,015,000**	**15,868,446**	
86																					
87	**Division #3.0 - Architectural**												-								
88																					
89	rchitectura	Exterior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
90	rchitectura	Fire extinguishers	24.0	ea	Contr	Contr	500.00	3	53.33	72	1.09	0	12,000	YES	720	4,166	78	16,166	0	$16,166	HDR|CB Estimated Quantity
91	rchitectura	Fire hose cabinets	26.0	ea	Contr	Contr	1,200.00	20	53.33	520	1.09	0	31,200	YES	1,872	30,090	564	61,290	0	$61,290	HDR|CB Estimated Quantity
92	rchitectura	Fire hydrants w/monitor nozzles	6.0	ea	Contr	Contr	2,550.00	12	54.96	72	1.09	0	15,300	YES	918	4,294	78	19,594	0	$19,594	HDR|CB Estimated Quantity
93	rchitectura	Fire protection control room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
94	rchitectura	Fire Protection Elect Equip & Cable Spreading Room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity

Estimate Details

1 x 1 Siemens H Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
95	rchitectura	Fire Protection GSU and Aux Transformers	1.0	ls	Sub	Contr	200,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	200,000	$200,000	HDR|CB Estimated Quantity
96	rchitectura	Fire Protection Turbine Building	1.0	ls	Sub	Contr	600,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
97	rchitectura	Fire Detection/Alarm	1.0	lot	Contr	Contr	350,000.00	1000	50.09	1,000	1.09	0	350,000	NO	0	54,352	1,085	404,352	0	$404,352	HDR|CB Estimated Quantity
98	rchitectura	HVAC System Allowance	1.0	ls	Sub	Contr	650,000.00		54.96	0	1.09	0	0	YES	19,500	0	0	0	650,000	$650,000	HDR|CB Estimated Quantity
99	rchitectura	Interior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
100	rchitectura	Masonry Walls 8" CMU	15,000.0	sf	Contr	Contr	4.00	0.15	32.95	2,250	1.09	0	60,000	yes	3,600	80,450	2,441	140,450	0	$140,450	HDR|CB Estimated Quantity
101	rchitectura	Overhead Rolling Doors - steel	4.0	ea	Contr	Contr	5,000.00	40	38.68	160	1.09	0	20,000	yes	1,200	6,715	174	26,715	0	$26,715	HDR|CB Estimated Quantity
102	rchitectura	Painting - equipment and piping	1.0	lot	Contr	Contr	80,000.00	3600	36.36	3,600	1.09	0	80,000	yes	4,800	142,016	3,906	222,016	0	$222,016	HDR|CB Estimated Quantity
103	rchitectura	Painting - structural steel, grating, handrail touch-up	200,000.0	sf	Contr	Contr	0.30	0.010	36.36	2,000	1.09	0	60,000	yes	3,600	78,898	2,170	138,898	0	$138,898	HDR|CB Estimated Quantity
104	rchitectura	Painting - turbine room floor epoxy finish	30,000.0	sf	Contr	Contr	0.80	0.045	36.36	1,354	1.09	0	24,000	yes	1,440	53,398	1,469	77,398	0	$77,398	HDR|CB Estimated Quantity
105	rchitectura	Restrooms, showers, locker rooms	1.0	lot	Contr	Contr	125,000.00	1200	53.33	1,200	1.09	0	125,000	YES	7,500	69,438	1,302	194,438	0	$194,438	HDR|CB Estimated Quantity
106	rchitectura	Roof Drains	1,200.0	lf	Contr	Contr	32.50	2.0	54.96	2,400	1.09	0	39,000	yes	2,340	143,123	2,604	182,123	0	$182,123	HDR|CB Estimated Quantity
107	rchitectura	Structural Steel - Misc Building Steel	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	yes	3,840	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
108	rchitectura	Structural Steel - Pipe Rack	300.0	ton	Contr	Contr	3,400.00	20	60.25	6,000	1.09	0	1,020,000	NO	0	392,204	6,510	1,412,204	0	$1,412,204	HDR|CB Estimated Quantity
109	rchitectura	Structural Steel - Misc Platforms	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	NO	0	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
110	rchitectura	Structural Steel - Turbine Building Framing	350.0	ton	Contr	Contr	2,850.00	15	60.25	5,250	1.09	0	997,500	NO	0	343,179	5,696	1,340,679	0	$1,340,679	HDR|CB Estimated Quantity
111	rchitectura	Trench Floor Drain Cover	1,800.0	lf	Contr	Contr	60.45	0.4	54.96	720	1.09	0	108,810	yes	6,529	42,937	781	151,747	0	$151,747	HDR|CB Estimated Quantity
112	rchitectura	Turbine Building Built-up Roof	16,000.0	sf	Contr	Contr	0.75	0.035	35.31	560	1.09	0	12,000	NO	0	21,456	608	33,456	0	$33,456	HDR|CB Estimated Quantity
113	rchitectura	Turbine Building Metal Siding	44,000.0	sf	Contr	Contr	10.40	0.05	56.41	2,200	1.09	0	457,600	NO	0	134,641	2,387	592,241	0	$592,241	HDR|CB Estimated Quantity
114	rchitectura	Administration/Control/Maintenance Building	16,000.0	sf	Sub	Contr	140.00		38.68	0	1.09	0	0	YES	0	0	0	0	2,240,000	$2,240,000	HDR|CB Estimated Quantity
115	rchitectura	Cooling Tower, pre-engineered - Elect, Chem feed, I&C Bldg	3,000.0	sf	Sub	Contr	80.00		59.59	0	1.09	0	0	NO	0	0	0	0	240,000	$240,000	HDR|CB Estimated Quantity
116	rchitectura	Main Gate Guard House	80.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	YES	0	0	0	0	6,400	$6,400	HDR|CB Estimated Quantity
117	rchitectura	Auxilary Boiler Building	4,000.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	440,000	$440,000	HDR|CB Estimated Quantity
118	rchitectura	Water Treatment Building	0.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
119	rchitectura	Warehouse	8,000.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	NO	0	0	0	0	640,000	$640,000	HDR|CB Estimated Quantity
120	rchitectura	Boiler Feed Pump Building	1.0	ea	sub	Contr	300,000.00		38.68	0	1.09	0	0	NO	0	0	0	0	300,000	$300,000	HDR|CB Estimated Quantity
121																					
122		**Division #3 - Architectural Sub-Total**								**31,358**	**1.05**	**0**	**3,660,410**		**65,059**	**1,713,370**	**34,023**	**5,373,780**	**5,366,400**	**$10,740,180**	
123																					
124	**Division #4.0 - Mechanical Piping**																				
125	**Division #4.1 - Mechanical Piping**																				
126																					
127	hanical Pip	Pipe - MS, HR, CR, BFW, LPS	**1,720.0**	lf																	
128	hanical Pip	- System - Cold Reheat (Carbon)	400.0	lf	Contr	Contr	2,575.00	7.7	54.96	3,080	1.09	0	1,030,000	NO	0	183,674	3,342	1,213,674	0	$1,213,674	HDR|CB Estimated Quantity
129	hanical Pip	- System - Feedwater (Carbon)	320.0	lf	Contr	Contr	800.00	5.7	54.96	1,824	1.09	0	256,000	NO	0	108,773	1,979	364,773	0	$364,773	HDR|CB Estimated Quantity
130	hanical Pip	- System - Hot Reheat (Alloy)	300.0	lf	Contr	Contr	3,200.00	15.0	54.96	4,500	1.09	0	960,000	NO	0	268,356	4,883	1,228,356	0	$1,228,356	HDR|CB Estimated Quantity
131	hanical Pip	- System - Main Steam (Alloy)	300.0	lf	Contr	Contr	3,500.00	15.6	54.96	4,680	1.09	0	1,050,000	NO	0	279,090	5,078	1,329,090	0	$1,329,090	HDR|CB Estimated Quantity
132	hanical Pip	- System - Low Pressure Steam Steam (Alloy)	400.0	lf	Contr	Contr	234.00	7.5	54.96	3,008	1.09	0	93,600	NO	0	179,381	3,264	272,981	0	$272,981	HDR|CB Estimated Quantity
133	hanical Pip	Pipe - Above Ground - Large Bore Average "	**26,250.0**	lf																	
134	hanical Pip	- System - Boilers, Vents and Drains	400.0	lf	Contr	Contr	300.00	4.14	54.96	1,654	1.09	0	120,000	NO	0	98,659	1,795	218,659	0	$218,659	HDR|CB Estimated Quantity
135	hanical Pip	- System - Aux steam drain returns	2,500.0	lf	Contr	Contr	30.00	1.22	54.96	3,055	1.09	0	75,000	NO	0	182,184	3,315	257,184	0	$257,184	HDR|CB Estimated Quantity
136	hanical Pip	- System - Building drains	1,200.0	lf	Contr	Contr	30.00	1.22	54.96	1,466	1.09	0	36,000	YES	2,160	87,448	1,591	123,448	0	$123,448	HDR|CB Estimated Quantity
137	hanical Pip	- System - Building fire protection	5,000.0	lf	Contr	Contr	18.00	1.50	54.96	7,520	1.09	0	90,000	YES	5,400	448,452	8,159	538,452	0	$538,452	HDR|CB Estimated Quantity
138	hanical Pip	- System - Building sump pumps	800.0	lf	Contr	Contr	47.00	1.55	54.96	1,241	1.09	0	37,600	YES	2,256	73,995	1,346	111,595	0	$111,595	HDR|CB Estimated Quantity
139	hanical Pip	- System - Circulating Water	1,000.0	lf	Contr	Contr	300.00	4.10	54.96	4,100	1.09	0	300,000	NO	0	244,502	4,449	544,502	0	$544,502	HDR|CB Estimated Quantity
140	hanical Pip	- System - Condensate	1,350.0	lf	Contr	Contr	150.00	2.35	54.96	3,173	1.09	0	202,500	NO	0	189,191	3,442	391,691	0	$391,691	HDR|CB Estimated Quantity
141	hanical Pip	- System - Condenser Air Extraction	300.0	lf	Contr	Contr	184.00	2.35	54.96	705	1.09	0	55,200	NO	0	42,042	765	97,242	0	$97,242	HDR|CB Estimated Quantity
142	hanical Pip	- System - Cooling water	600.0	lf	Contr	Contr	280.00	2.63	54.96	1,579	1.09	0	168,000	NO	0	94,175	1,713	262,175	0	$262,175	HDR|CB Estimated Quantity
143	hanical Pip	- System - Demineralized water	400.0	lf	Contr	Contr	27.00	0.39	54.96	154	1.09	0	10,800	NO	0	9,193	167	19,993	0	$19,993	HDR|CB Estimated Quantity
144	hanical Pip	- System - Fire Protection	300.0	lf	Contr	Contr	150.00	2.35	54.96	705	1.09	0	45,000	YES	2,700	42,042	765	87,042	0	$87,042	HDR|CB Estimated Quantity
145	hanical Pip	- System - Natural Gas High Pressure - SS	150.0	lf	Contr	Contr	52.40	0.85	54.96	127	1.09	0	7,860	YES	472	7,568	138	15,428	0	$15,428	HDR|CB Estimated Quantity
146	hanical Pip	- System - Potable water	1,000.0	lf	Contr	Contr	18.00	1.50	54.96	1,504	1.09	0	18,000	YES	1,080	89,690	1,632	107,690	0	$107,690	HDR|CB Estimated Quantity
147	hanical Pip	- System - Sanitary waste	3,000.0	lf	Contr	Contr	47.00	1.55	54.96	4,653	1.09	0	141,000	YES	8,460	277,480	5,049	418,480	0	$418,480	HDR|CB Estimated Quantity
148	hanical Pip	- System - Service Water	1,000.0	lf	Contr	Contr	184.00	1.97	54.96	1,974	1.09	0	184,000	YES	11,040	117,719	2,142	301,719	0	$301,719	HDR|CB Estimated Quantity
149	hanical Pip	- System - STG lube oil	200.0	lf	Contr	Contr	32.00	1.11	54.96	222	1.09	0	6,400	NO	0	13,239	241	19,639	0	$19,639	HDR|CB Estimated Quantity
150	hanical Pip	- System - STG oil purification	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
151	hanical Pip	- System - STG Seal Oil	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
152	hanical Pip	- System - STG Stator cooling	0.0	lf	Contr	Contr	32.00	1.11	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
153	hanical Pip	- System - STG Steam Seal	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
154	hanical Pip	- System - Turbine drains	690.0	lf	Contr	Contr	47.00	1.55	54.96	1,070	1.09	0	32,430	NO	0	63,820	1,161	96,250	0	$96,250	HDR|CB Estimated Quantity
155	hanical Pip	- System - HRSG Blowdown	100.0	lf	Contr	Contr	18.00	1.50	54.96	150	1.09	0	1,800	NO	0	8,969	163	10,769	0	$10,769	HDR|CB Estimated Quantity
156	hanical Pip	- System - Cycle Makeup	360.0	lf	Contr	Contr	47.00	1.55	54.96	558	1.09	0	16,920	NO	0	33,298	606	50,218	0	$50,218	HDR|CB Estimated Quantity
157	hanical Pip	- System - Miscellaneous Systems Piping CS)	5,000.0	lf	Contr	Contr	47.00	1.55	54.96	7,755	1.09	0	235,000	YES	14,100	462,466	8,414	697,466	0	$697,466	HDR|CB Estimated Quantity
158	hanical Pip	Pipe - Above Ground - Small Bore	**22,290.0**	lf																	
159	hanical Pip	- System - Water Cycle Sample - Alloy	150.0	lf	Contr	Contr	13.00	0.85	54.96	127	1.09	0	1,950	NO	0	7,568	138	9,518	0	$9,518	HDR|CB Estimated Quantity
160	hanical Pip	- System - STG lube oil	300.0	lf	Contr	Contr	11.60	0.62	54.96	186	1.09	0	3,480	NO	0	11,092	202	14,572	0	$14,572	HDR|CB Estimated Quantity
161	hanical Pip	- System - CT Auxilaries	900.0	lf	Contr	Contr	18.00	1.13	54.96	1,015	1.09	0	16,200	NO	0	60,541	1,101	76,741	0	$76,741	HDR|CB Estimated Quantity
162	hanical Pip	- System - Instrument Air	2,750.0	lf	Contr	Contr	8.00	0.14	54.96	388	1.09	0	22,000	NO	0	23,123	421	45,123	0	$45,123	HDR|CB Estimated Quantity
163	hanical Pip	- System - Instrument Air supply	2,500.0	lf	Contr	Contr	35.00	0.28	54.96	705	1.09	0	87,500	NO	0	42,042	765	129,542	0	$129,542	HDR|CB Estimated Quantity
164	hanical Pip	- System - Service Air piping	1,000.0	lf	Contr	Contr	12.00	0.22	54.96	216	1.09	0	12,000	YES	720	12,893	235	24,893	0	$24,893	HDR|CB Estimated Quantity
165	hanical Pip	- System - Instrument Air	1,800.0	lf	Contr	Contr	11.50	0.52	54.96	931	1.09	0	20,700	YES	1,242	55,496	1,010	76,196	0	$76,196	HDR|CB Estimated Quantity
166	hanical Pip	- System - Service Water	800.0	lf	Contr	Contr	20.00	1.32	54.96	1,053	1.09	0	16,000	YES	960	62,783	1,142	78,783	0	$78,783	HDR|CB Estimated Quantity
167	hanical Pip	- System - Cycle Chemical Feed	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
168	hanical Pip	- System - Boiler Vents & Drains - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
169	hanical Pip	- System - (HP) Main Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
170	hanical Pip	- System - (LP) Steam - Carbon	1,000.0	lf	Contr	Contr	18.00	1.13	54.96	1,128	1.09	0	18,000	YES	1,080	67,268	1,224	85,268	0	$85,268	HDR|CB Estimated Quantity
171	hanical Pip	- System - Hot Reheat Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
172	hanical Pip	- System - Cold Reheat Steam - Alloy	300.0	lf	Contr	Contr	20.00	1.32	54.96	395	1.09	0	6,000	YES	360	23,544	428	29,544	0	$29,544	HDR|CB Estimated Quantity
173	hanical Pip	- System - Cycle Makeup	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
174	hanical Pip	- System - Aux Steam - Carbon	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
175	hanical Pip	- System - STG Seals and Drains - Alloy	1,400.0	lf	Contr	Contr	20.00	1.32	54.96	1,842	1.09	0	28,000	YES	1,680	109,871	1,999	137,871	0	$137,871	HDR|CB Estimated Quantity
176	hanical Pip	- System - CT System - Carbon	120.0	lf	Contr	Contr	18.00	1.13	54.96	135	1.09	0	2,160	YES	130	8,072	147	10,232	0	$10,232	HDR|CB Estimated Quantity
177	hanical Pip	- System - Hydrogen - Carbon	350.0	lf	Contr	Contr	12.35	1.03	54.96	362	1.09	0	4,323	YES	259	21,582	393	25,904	0	$25,904	HDR|CB Estimated Quantity
178	hanical Pip	- System - Carbon Dioxide - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
179	hanical Pip	- System - Miscellaneous	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
180	hanical Pip	- System - Condensate - Carbon	400.0	lf	Contr	Contr	18.00	1.13	54.96	451	1.09	0	7,200	YES	432	26,907	490	34,107	0	$34,107	HDR|CB Estimated Quantity
181	hanical Pip	- System - Closed Cycle Cooling Water - Carbon	900.0	lf	Contr	Contr	12.35	1.03	54.96	931	1.09	0	11,115	YES	667	55,496	1,010	66,611	0	$66,611	HDR|CB Estimated Quantity
182	hanical Pip	- System - Fuel Gas - Carbon	500.0	lf	Contr	Contr	18.00	1.13	54.96	564	1.09	0	9,000	YES	540	33,634	612	42,634	0	$42,634	HDR|CB Estimated Quantity
183	hanical Pip	- System - Condensed Air Extraction - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
184	hanical Pip	- System - CW Chemical Feed - Carbon	20.0	lf	Contr	Contr	18.00	1.13	54.96	23	1.09	0	360	YES	22	1,345	24	1,705	0	$1,705	HDR|CB Estimated Quantity
185	hanical Pip	- System - Nitrogen Gas System	100.0	lf	Contr	Contr	19.00	0.19	54.96	19	1.09	0	1,900	YES	114	1,121	20	3,021	0	$3,021	HDR|CB Estimated Quantity

1 x 1 Siemens H Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
Line #																					
186	hanical Pip	- System - Waste Water Coll & Treatment - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
187	hanical Pip	- System - Chemical Waste Treatment	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
188	hanical Pip	- System - Miscellaneous Systems Piping	4,400.0	lf	Contr	Contr	12.35	1.03	54.96	4,550	1.09	0	54,340	YES	3,260	271,313	4,936	325,653	0	$325,653	HDR|CB Estimated Quantity
189	hanical Pip	Pipe - Below Ground - Large Bore	**20,275.0**	lf																	
190	hanical Pip	- System - Hydrogen	470.0	lf	Contr	Contr	20.00	0.71	54.96	331	1.09	0	9,400	NO	0	19,760	360	29,160	0	$29,160	HDR|CB Estimated Quantity
191	hanical Pip	- System - Fuel Gas	400.0	lf	Contr	Contr	170.00	1.97	54.96	790	1.09	0	68,000	NO	0	47,087	857	115,087	0	$115,087	HDR|CB Estimated Quantity
192	hanical Pip	- System - Main Circ. - HDPE	300.0	lf	Contr	Contr	15.00	1.13	54.96	338	1.09	0	4,500	NO	0	20,180	367	24,680	0	$24,680	HDR|CB Estimated Quantity
192	hanical Pip	- System - Miscellaneous Systems Piping - HDPE	6,500.0	lf	Contr	Contr	15.00	1.13	54.96	7,332	1.09	0	97,500	NO	0	437,241	7,955	534,741	0	$534,741	HDR|CB Estimated Quantity
193	hanical Pip	- System - Waste Water Treatment Piping - HDPE (Sch 17)	2,565.0	lf	Contr	Contr	6.00	0.66	54.96	1,688	1.09	0	15,390	NO	0	100,649	1,831	116,039	0	$116,039	HDR|CB Estimated Quantity
193	hanical Pip	- System - Sanitary Sewer	3,000.0	lf	Contr	Contr	15.00	1.13	54.96	3,384	1.09	0	45,000	NO	0	201,803	3,672	246,803	0	$246,803	HDR|CB Estimated Quantity
194	hanical Pip	- System - Natural Gas Low Pressure - CS	500.0	lf	Contr	Contr	30.00	1.22	54.96	611	1.09	0	15,000	NO	0	36,437	663	51,437	0	$51,437	HDR|CB Estimated Quantity
195	hanical Pip	- System - Natural Gas High Pressure - CS	300.0	lf	Contr	Contr	30.00	1.22	54.96	367	1.09	0	9,000	NO	0	21,862	398	30,862	0	$30,862	HDR|CB Estimated Quantity
196	hanical Pip	- System - Potable Water to site facilities	500.0	lf	Contr	Contr	47.00	1.55	54.96	776	1.09	0	23,500	NO	0	46,247	841	69,747	0	$69,747	HDR|CB Estimated Quantity
197	hanical Pip	- System - Cooling tower blowdown	1,160.0	lf	Contr	Contr	115.00	1.69	54.96	1,963	1.09	0	133,400	NO	0	117,046	2,130	250,446	0	$250,446	HDR|CB Estimated Quantity
198	hanical Pip	- System - Cooling tower makeup water Pipe	1,000.0	lf	Contr	Contr	115.00	1.69	39.54	1,692	1.09	0	115,000	NO	0	72,583	1,836	187,583	0	$187,583	HDR|CB Estimated Quantity
199	hanical Pip	Pipe - Below Ground - Small Bore	**790.0**	lf																	
200	hanical Pip	- System - Miscellaneous Systems Piping	790.0	lf	Contr	Contr	12.35	1.03	54.96	817	1.09	0	9,757	NO	0	48,713	886	58,470	0	$58,470	HDR|CB Estimated Quantity
201	hanical Pip	Circulating water 84" RCP	2,000.0	lf	Contr	Contr	520.00	7.80	54.96	15,600	1.09	0	1,040,000	NO	0	930,299	16,926	1,970,299	0	$1,970,299	HDR|CB Estimated Quantity
202	hanical Pip	Piping Non Destructive Examination	1.0	lot	Sub	Contr	75,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	75,000	$75,000	HDR|CB Estimated Quantity
203	hanical Pip	Steam Blows	1.0	lot	Sub	Contr	150,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	150,000	$150,000	HDR|CB Estimated Quantity
204	hanical Pip	Stress relieving LB Alloy	50.0	ea	Contr	Contr	1,500.00	80.00	54.96	4,000	1.09	0	75,000	NO	0	238,538	4,340	313,538	0	$313,538	HDR|CB Estimated Quantity
205																					
206		**Division #4.1 - Mechanical Piping Sub-Total**	**71,325.0**	**LF**						119,169		0	7,214,387		61,426	7,078,302	129,299	14,292,689	225,000	$14,517,689	
207																					
208	**Division #4.2 - Mechanical Valves**																				
209																					
210	hanical Va	Valves - Large Bore General Service	375.0	ea	Contr	Contr	636.00	16.92	54.96	6,345	1.09	0	238,500	NO	0	378,381	6,884	616,881	0	$616,881	HDR|CB Estimated Quantity
211	hanical Va	Valves - Large Bore HP 900# to 3800#	50.0	ea	Contr	Contr	6,750.00	56.4	54.96	2,820	1.09	0	337,500	NO	0	168,169	3,060	505,669	0	$505,669	HDR|CB Estimated Quantity
212	hanical Va	Valves - Large Bore LP Circ Water	2.0	ea	Contr	Contr	197,500.00	112.8	54.96	226	1.09	0	395,000	NO	0	13,454	245	408,454	0	$408,454	HDR|CB Estimated Quantity
213	hanical Va	Valves - Small Bore - I/A supply	50.0	ea	Contr	Contr	17.50	1.88	54.96	94	1.09	0	875	NO	0	5,606	102	6,481	0	$6,481	HDR|CB Estimated Quantity
214	hanical Va	Valves - Small Bore - Instrument piping	375.0	ea	Contr	Contr	270.00	1.88	54.96	705	1.09	0	101,250	NO	0	42,042	765	143,292	0	$143,292	HDR|CB Estimated Quantity
215	hanical Va	Valves - Small Bore Bronze	30.0	ea	Contr	Contr	480.00	2.82	54.96	85	1.09	0	14,400	NO	0	5,045	92	19,445	0	$19,445	HDR|CB Estimated Quantity
216	hanical Va	Valves - Small Bore Class 800	175.0	ea	Contr	Contr	305.00	2.82	54.96	494	1.09	0	53,375	NO	0	29,430	535	82,805	0	$82,805	HDR|CB Estimated Quantity
217	hanical Va	Valves - Small Bore HP 1500# Alloy & CS	75.0	ea	Contr	Contr	670.00	15.04	54.96	1,128	1.09	0	50,250	NO	0	67,268	1,224	117,518	0	$117,518	HDR|CB Estimated Quantity
218	hanical Va	Valves - Small Bore HP 3800# Alloy	15.0	ea	Contr	Contr	3,050.00	22.56	54.96	338	1.09	0	45,750	NO	0	20,180	367	65,930	0	$65,930	HDR|CB Estimated Quantity
219	hanical Va	Valves - By Pass	1.0	ea	Contr	Contr	750,000.00	80	54.96	80	1.09	0	750,000	NO	0	4,771	87	754,771	0	$754,771	HDR|CB Estimated Quantity
220																					
221																					
222		**Division #4.2 - Mechanical Valves Sub-Total**	**1,148.0**	**ea**						12,314		$0	1,986,900		0	734,346	13,361	2,721,246	0	$2,721,246	
223																					
224	**Division #4.3 - Mechanical Insulation & Coatings**																				
225																					
226	Insulation	Insulation - BOP Equipment	11,200.0	sf	Contr	Contr	15.00	0.5	46.60	5,600	1.09	0	168,000	NO	0	283,123	6,076	451,123	0	$451,123	HDR|CB Estimated Quantity
227	Insulation	Insulation - Piping Freeze Protection	1,500.0	lf	Contr	Contr	3.50	0.2	46.60	300	1.09	0	5,250	NO	0	15,167	326	20,417	0	$20,417	HDR|CB Estimated Quantity
228	Insulation	Insulation - Piping Large Bore BOP	6,250.0	lf	Contr	Contr	15.00	0.5	46.60	3,125	1.09	0	93,750	NO	0	157,993	3,391	251,743	0	$251,743	HDR|CB Estimated Quantity
229	Insulation	Insulation - Piping Large Bore High Temp	1,720.0	lf	Contr	Contr	50.00	1.5	46.60	2,580	1.09	0	86,000	NO	0	130,439	2,799	216,439	0	$216,439	HDR|CB Estimated Quantity
230	Insulation	Insulation - Piping Small Bore	19,490.0	lf	Contr	Contr	8.00	0.23	46.60	4,483	1.09	0	155,920	NO	0	226,635	4,864	382,555	0	$382,555	HDR|CB Estimated Quantity
231																					
232																					
233		**Division #4.3 - Mechanical Insulation & Coatings Sub-Total**								16,088		0	508,920		0	813,357	17,455	1,322,277	0	$1,322,277	
234																					
235																					
236	**Division #4.4 - Mechanical Engineered Pipe Hangers (Including Supplemental Support Steel)**																				
237																					
238	hanical Pipe H	Hangers & Supports - (Large Bore Engineered)	90	ea	Contr	Contr	1,760.00	12.5	54.96	1,127	1.09	0	158,711	NO	0	67,220	1,223	225,931	0	$225,931	HDR|CB Estimated Quantity
239	hanical Pipe H	Hangers & Supports - (Large Bore Rigid)	1382	ea	Contr	Contr	192.50	7.1	54.96	9,809	1.09	0	265,954	NO	0	584,968	10,643	850,922	0	$850,922	HDR|CB Estimated Quantity
240	hanical Pipe H	Hangers & Supports - (Small Bore Rigid)	1592	ea	Contr	Contr	88.00	1.5	54.96	2,388	1.09	0	140,109	NO	0	142,420	2,591	282,529	0	$282,529	HDR|CB Estimated Quantity
241																					
242		**Division #4.4 - Mechanical Engineered Pipe Hangers Sub-Total**								13,325		0	564,773		0	794,609	14,457	1,359,382	0	$1,359,382	
243																					
244	**Division #4.5 - Mechanical Accessories**																				
245																					
246	nical Acces	Instr. Air Supply filter regulators	30.0	ea	Contr	Contr	132.00	2.4	54.96	72	1.09	0	3,960	NO	0	4,294	78	8,254	0	$8,254	HDR|CB Estimated Quantity
247	nical Acces	Expansion Joints - Circ Water	2.0	ea	Contr	Contr	75,000.00	210	54.96	420	1.09	0	150,000	NO	0	25,047	456	175,047	0	$175,047	HDR|CB Estimated Quantity
248	nical Acces	Miscellaneous Specialties	1.0	lot	Contr	Contr	75,000.00	600	54.96	600	1.09	0	75,000	NO	0	35,781	651	110,781	0	$110,781	HDR|CB Estimated Quantity
249	nical Acces	Miscellaneous Strainers, traps, Exp Joints	1.0	ls	Contr	Contr	125,000.00	120	54.96	120	1.09	0	125,000	NO	0	7,156	130	132,156	0	$132,156	HDR|CB Estimated Quantity
250	nical Acces	Miscellaneous Trolleys & Hoists	1.0	ls	Contr	Contr	150,000.00	480	54.96	480	1.09	0	150,000	NO	0	28,625	521	178,625	0	$178,625	HDR|CB Estimated Quantity
251																					
252		**Division #4.5 - Mechanical Accessories Sub-Total**								1,692		0	503,960		0	100,902	1,836	604,862	0	$604,862	
253																					
254		**Division #4 - Mechanical Piping**								**162,588**		**0**	**10,778,940**		**61,426**	**9,521,516**	**176,408**	**20,300,455**	**225,000**	**$20,525,455**	
255																					
256	**Division #5.0 - Mechanical Equipment**																				
257																					
258	**Division #5.1 - Boiler Equipment**																				
259																					
260	HRSG	Heat Recovery Steam Generator with Duct Burner/SCR/CO/Penthou	1.0	ea	Contr	Contr	29,825,983.47		69.04	0	1.09	0	29,825,983	NO	0	0	0	29,825,983	0	$29,825,983	OEM Budget Proposal
261	HRSG	Steam Generator Erection	1.0	ea	Contr	Contr		86,500	69.04	86,500	1.09	0	0	NO	0	6,479,930	93,853	6,479,930	0	$6,479,930	HDR|CB Estimated cost
262																					
263		**Division #5.1 - Boiler Equipment Sub-Total**								**86,500**		**0**	**29,825,983**		**0**	**6,479,930**	**93,853**	**36,305,914**	**0**	**$36,305,914**	
264																					
265	**Division #5.2 - Turbine Equipment**																				
266																					
267	STG	Steam Turbine Generator	1.0	ea	Contr	Contr	21,717,117.93		53.33	0	1.09	0	21,717,118	NO	0	0	0	21,717,118	0	$21,717,118	Recent Vender quote
268	STG	Steam Turbine Generator, Erection	1.0	ea	Contr	Contr		26,000	53.33	26,000	1.09	0	0	NO	0	1,504,488	28,210	1,504,488	0	$1,504,488	HDR|CB Estimated cost
269																					
270		**Division #5.2 - Turbine Equipment Sub-Total**								**26,000**		**0**	**21,717,118**		**0**	**1,504,488**	**28,210**	**23,221,606**	**0**	**23,221,606**	
271																					
272	**Division #5.3 - Not Used**																				
273																					

Estimate Details

1 x 1 Siemens H Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

Line #	DISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
274	**Division #5.4 - Mechanical Draft Cooling Tower**																				
275																					
276	Cooling Tw	Cooling Tower - Mechanical Draft (F&E)	1.0	Is	Sub	Contr	4,000,000.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	4,000,000	$4,000,000	Recent Vender quote
277																					
278		**Division #5.4 - Mechanical Draft Cooling Tower Sub-Total**								**0**		**0**	**0**		**0**	**0**	**0**	**0**	**4,000,000**	**4,000,000**	
279																					
280	**Division #5.5 - Combustion Turbine Equipment**																				
281																					
282	CT	Combustion Turbine	1.0	ea	Contr	Contr	67,496,763.34		53.33	0	1.09	0	67,496,763	NO	0	0	0	67,496,763	0	$67,496,763	OEM Budget Proposal
283	CT	Combustion Turbine, Installation	1.0	ea	Contr	Contr		38,000	53.33	38,000	1.09	0	0	NO	0	2,198,867	41,230	2,198,867	0	$2,198,867	HDR|CB Estimated cost
284																					
285																					
286		**Division #5.4 - Combustion Turbine Equipment Sub-Total**								**38,000**		**0**	**67,496,763**		**0**	**2,198,867**	**41,230**	**69,695,631**	**0**	**69,695,631**	
287																					
288	**Division #5.6 - BOP Mechanical Equipment**																				
289																					
290	Equipment	Blowdown Tank	2.0	ea	Contr	Contr	16,600.00	20	54.96	40	1.09	0	33,200	NO	0	2,385	43	35,585	0	$35,585	HDR|CB Estimated cost
291	Equipment	Closed Cooling Water Exchanger	2.0	ea	Contr	Contr	600,000.00	200	54.96	400	1.09	0	1,200,000	NO	0	23,854	434	1,223,854	0	$1,223,854	HDR|CB Estimated cost
292	Equipment	Closed Cooling Water Inhibitor Mixing Pot	1.0	ea	Contr	Contr	3,000.00	8	54.96	8	1.09	0	3,000	NO	0	477	9	3,477	0	$3,477	HDR|CB Estimated cost
293	Equipment	Closed Cooling Water (CCW) Heat Exchanger Strainer (Shell & Tube	2.0	ea	Contr	Contr	34,000.00	10	54.96	20	1.09	0	68,000	NO	0	1,193	22	69,193	0	$69,193	HDR|CB Estimated cost
294	Equipment	Instrument Air Receivers	2.0	ea	Contr	Contr	5,000.00	44	54.96	88	1.09	0	10,000	NO	0	5,248	95	15,248	0	$15,248	HDR|CB Estimated cost
295	Equipment	Main Condenser	1.0	ea	Contr	Contr	3,000,000.00	10000	65.52	10,000	1.09	0	3,000,000	NO	0	710,840	10,850	3,710,840	0	$3,710,840	Recent Vender quote
296	Equipment	Oil/Water Separator	1.0	ea	Contr	Contr	50,000.00	244	54.96	244	1.09	0	50,000	NO	0	14,551	265	64,551	0	$64,551	HDR|CB Estimated cost
297	Equipment	Plant Air Compressors	2.0	ea	Contr	Contr	140,000.00	100	54.96	200	1.09	0	280,000	NO	0	11,927	217	291,927	0	$291,927	HDR|CB Estimated cost
298	Equipment	Plant Air Dryers	2.0	ea	Contr	Contr	30,000.00	100	54.96	200	1.09	0	60,000	NO	0	11,927	217	71,927	0	$71,927	HDR|CB Estimated cost
299	Equipment	Plant Air Receivers	2.0	ea	Contr	Contr	5,000.00	20	54.96	40	1.09	0	10,000	NO	0	2,385	43	12,385	0	$12,385	HDR|CB Estimated cost
302	Equipment	Pumps - Circulating Water	2.0	ea	Contr	Contr	600,000.00	500	54.96	1,000	1.09	0	1,200,000	NO	0	59,635	1,085	1,259,635	0	$1,259,635	HDR|CB Estimated cost
303	Equipment	Pumps - Auxiliary Cooling Water	1.0	ea	Contr	Contr	120,000.00	96	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
304	Equipment	Pumps - Closed Cooling Water	2.0	ea	Contr	Contr	134,000.00	200	53.33	400	1.09	0	268,000	NO	0	23,146	434	291,146	0	$291,146	HDR|CB Estimated cost
306	Equipment	Pumps - Boiler Feed	1.0	ea	Contr	Contr	750,000.00	1200	53.33	1,200	1.09	0	750,000	NO	0	69,438	1,302	819,438	0	$819,438	HDR|CB Estimated cost
307	Equipment	Pumps - Condensate	2.0	ea	Contr	Contr	130,000.00	200	53.33	400	1.09	0	260,000	NO	0	23,146	434	283,146	0	$283,146	HDR|CB Estimated cost
308	Equipment	Pumps - Service water	2.0	ea	Contr	Contr	160,000.00	210	53.33	420	1.09	0	320,000	NO	0	24,303	456	344,303	0	$344,303	HDR|CB Estimated cost
309	Equipment	Pumps - Fire Water (Electric and Diesel)	0.0	lt	Contr	Contr	500,000.00	310	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
310	Equipment	Pumps - Sump - Blowdown, Waste Water	2.0	ea	Contr	Contr	30,000.00	24	53.33	48	1.09	0	60,000	NO	0	2,778	52	62,778	0	$62,778	HDR|CB Estimated cost
311	Equipment	Pumps - Sump - Power Island Misc Building Sumps	4.0	ea	Contr	Contr	30,000.00	24	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
314	Equipment	Pumps - Demin Water Transfer	2.0	ea	Contr	Contr	66,000.00	48	53.33	96	1.09	0	132,000	NO	0	5,555	104	137,555	0	$137,555	HDR|CB Estimated cost
318	Equipment	Pumps - Treated Water Transfer to Serv Water Tank	2.0	ea	Contr	Contr	40,000.00	80	53.33	160	1.09	0	80,000	NO	0	9,258	174	89,258	0	$89,258	HDR|CB Estimated cost
319	Equipment	Pumps - Waste Water	2.0	ea	Contr	Contr	80,000.00	125	53.33	250	1.09	0	160,000	NO	0	14,466	271	174,466	0	$174,466	HDR|CB Estimated cost
320	Equipment	Pumps - Evaporative Cooling Water	2.0	ea	Contr	Contr	37,000.00	80	53.33	160	1.09	0	74,000	NO	0	9,258	174	83,258	0	$83,258	HDR|CB Estimated cost
321	Equipment	Sample Analysis Panel (water)	2.0	ea	Contr	Contr	200,000.00	139	54.96	278	1.09	0	400,000	NO	0	16,578	302	416,578	0	$416,578	HDR|CB Estimated cost
322	Equipment	Tank - 200,000 gal treated water/service water - (F&E)	0.0	ea	Sub	Contr	540,000.00	0		0	1.09	0	0	yes	0	0	0	0	0	$0	Furnish and Erect price
323	Equipment	Tank - Demin Water Storage 200,000 gal. (F&E)	1.0	ea	Sub	Contr	600,000.00	0		0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	Furnish and Erect Price
324	Equipment	Tank - Turbine Drains	2.0	ea	Contr	Contr	75,000.00	200	53.33	400	1.09	0	150,000	NO	0	23,146	434	173,146	0	$173,146	HDR|CB Estimated cost
325	Equipment	Tank - Closed Cooling Water Dispersant 10,000 gal.	1.0	ea	Contr	Contr	36,500.00	100	54.96	100	1.09	0	36,500	NO	0	5,963	109	42,463	0	$42,463	HDR|CB Estimated cost
326	Equipment	Tank - Closed Cooling Water Accumulator	1.0	ea	Contr	Contr	20,600.00	44	54.96	44	1.09	0	20,600	NO	0	2,624	48	23,224	0	$23,224	HDR|CB Estimated cost
329	Equipment	Aqueous Ammonia System Unloading, Storage Tank, Forwarding Pu	1.0	ea	Contr	Contr	400,000.00	360	53.33	360	1.09	0	400,000	NO	0	20,831	391	420,831	0	$420,831	HDR|CB Estimated cost
331	Equipment	Auxiliary Boiler System	1.0	ea	Contr	Contr	1,200,000.00	400	53.33	400	1.09	0	1,200,000	NO	0	23,146	434	1,223,146	0	$1,223,146	HDR|CB Estimated cost
332	Equipment	Compressed Gas Storage System (CO2)	1.0	ea	Contr	Contr	40,000.00	475	54.96	475	1.09	0	40,000	NO	0	28,326	515	68,326	0	$68,326	HDR|CB Estimated cost
333	Equipment	Compressed Gas Storage System (H2)	1.0	ea	Contr	Contr	40,000.00	198	54.96	198	1.09	0	40,000	NO	0	11,808	215	51,808	0	$51,808	HDR|CB Estimated cost
334	Equipment	Compressed Gas Storage System (N2)	2.0	ea	Contr	Contr	20,000.00	370	54.96	740	1.09	0	40,000	NO	0	44,130	803	84,130	0	$84,130	HDR|CB Estimated cost
335	Equipment	Demineralized Water Treatment System Dual 100% Trains	0.0	ea	Contr	Contr	800,000.00	3500	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
336	Equipment	Condensate Polisher and Related	1.0	ea	Contr	Contr	800,000.00	3000	54.96	3,000	1.09	0	800,000	NO	0	178,904	3,255	978,904	0	$978,904	HDR|CB Estimated cost
337	Equipment	Fuel Gas Filter Separators	1.0	ea	Contr	Contr	210,000.00	200	54.96	200	1.09	0	210,000	NO	0	11,927	217	221,927	0	$221,927	Sub Budgetary Quote
338	Equipment	Fuel Gas Performance Heater	1.0	ea	Contr	Contr	880,000.00	300	54.96	300	1.09	0	880,000	NO	0	17,890	326	897,890	0	$897,890	Sub Budgetary Quote
339	Equipment	Fuel Gas Electric Startup Heater	1.0	ea	Contr	Contr	84,000.00	40	54.96	40	1.09	0	84,000	NO	0	2,385	43	86,385	0	$86,385	HDR|CB Estimated cost
340	Equipment	Fuel Gas Drain Tank	1.0	ea	Contr	Contr	2,000.00	15	54.96	15	1.09	0	2,000	NO	0	895	16	2,895	0	$2,895	HDR|CB Estimated cost
341	Equipment	Fuel Gas Dewpoint Heater	1.0	ea	Contr	Contr	476,000.00	80	54.96	80	1.09	0	476,000	NO	0	4,771	87	480,771	0	$480,771	HDR|CB Estimated cost
342	Equipment	Fuel Gas Scrubber	1.0	ea	Contr	Contr	392,000.00	60	54.96	60	1.09	0	392,000	NO	0	3,578	65	395,578	0	$395,578	HDR|CB Estimated cost
343	Equipment	Fuel Gas Compressor Package 2 x 100% w/ Building	0.0	ea	Contr	Contr	2,200,000.00	3000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
344	Equipment	Hydrogen Generator	0.0	ea	Contr	Contr	194,000.00	40	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
345	Equipment	Steam Silencers	1.0	ea	Contr	Contr	150,000.00	20	54.96	20	1.09	0	150,000	NO	0	1,193	22	151,193	0	$151,193	HDR|CB Estimated cost
346	Equipment	Condensate Water Strainer	1.0	ea	Contr	Contr	150,000.00	40	54.96	40	1.09	0	150,000	NO	0	2,385	43	152,385	0	$152,385	HDR|CB Estimated cost
347	Equipment	Cycle Chem Feed	1.0	ea	Contr	Contr	200,000.00	100	54.96	100	1.09	0	200,000	NO	0	5,963	109	205,963	0	$205,963	HDR|CB Estimated cost
348	Equipment	Cooling Tower Chemical Feed	1.0	ea	Contr	Contr	250,000.00	300	54.96	300	1.09	0	250,000	NO	0	17,890	326	267,890	0	$267,890	HDR|CB Estimated cost
349	Equipment	Condeser Vaccum Pump/Air Removal Equipment	1.0	ea	Contr	Contr	350,000.00	40	54.96	40	1.09	0	350,000	NO	0	2,385	43	352,385	0	$352,385	HDR|CB Estimated cost
350	Equipment	Turbine Room Bridge Crane - 60T	1.0	ea	Contr	Contr	390,000.00	120	53.33	120	1.09	0	390,000	NO	0	6,944	130	396,944	0	$396,944	HDR|CB Estimated cost
351	Equipment	Elevator for HRSG	1.0	ea	sub	contr	400,000.00	0		0	1.09	0	0	NO	0	0	0	0	400,000	$400,000	HDR|CB Estimated cost
352																					
353		**Division #5.6 BOP Mechanical Equipment Sub-Total**								**22,876**		**0**	**14,919,300**		**0**	**1,470,543**	**24,820**	**16,389,843**	**1,000,000**	**17,389,843**	
354																					
355	**Division #6.0 - Electrical Equipment**																				
356																					
357	Electrical	Eqpt - 24kv Bus Isolated Phase, 8000A	300.0	lf	Contr	Contr	750.00	16.75	50.09	5,025	1.09	0	225,000	NO	0	273,119	5,452	498,119	0	$498,119	HDR|CB Estimated cost
358	Electrical	Eqpt - 24kv Bus Isolated Phase, 5000A	300.0	lf	Contr	Contr	600.00	12	50.09	3,600	1.09	0	180,000	NO	0	195,667	3,906	375,667	0	$375,667	HDR|CB Estimated cost
359	Electrical	Eqpt - Bus 6.9kV non-seg	600.0	lf	Contr	Contr	510.00	4	50.09	2,400	1.09	0	306,000	NO	0	130,445	2,604	436,445	0	$436,445	HDR|CB Estimated cost
360	Electrical	Eqpt - Bus Duct 480V, 2500A	360.0	lf	Contr	Contr	610.00	3.2	50.09	1,152	1.09	0	219,600	NO	0	62,614	1,250	282,214	0	$282,214	HDR|CB Estimated cost
361	Electrical	Eqpt - Generator Breaker, 8000A, 24kV	2.0	ea	Contr	Contr	420,000.00	396	50.09	792	1.09	0	840,000	NO	0	43,047	859	883,047	0	$883,047	HDR|CB Estimated cost
362	Electrical	Eqpt - LV Switchgear - 480V, 4000A EO Main Ckt Bkr	6.0	ea	Contr	Contr	35,000.00	56	50.09	336	1.09	0	210,000	NO	0	18,262	365	228,262	0	$228,262	HDR|CB Estimated cost
363	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Main Ckt Bkr.	2.0	ea	Contr	Contr	15,400.00	30	50.09	60	1.09	0	30,800	NO	0	3,261	65	34,061	0	$34,061	HDR|CB Estimated cost
364	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Tie Ckt Bkr.	3.0	ea	Contr	Contr	15,400.00	30	50.09	90	1.09	0	46,200	NO	0	4,892	98	51,092	0	$51,092	HDR|CB Estimated cost
365	Electrical	Eqpt - LV Switchgear - 480V, 1200A EO Tie Ckt Bkr.	1.0	ea	Contr	Contr	10,780.00	26	50.09	26	1.09	0	10,780	NO	0	1,413	28	12,193	0	$12,193	HDR|CB Estimated cost
366	Electrical	Eqpt - LV Switchgear - 480V, 800A MO Fdr Ckt Bkr.	16.0	ea	Contr	Contr	4,575.00	22	50.09	352	1.09	0	73,200	NO	0	19,132	382	92,332	0	$92,332	HDR|CB Estimated cost
367	Electrical	Eqpt - LV Switchgear - 480V, 800A Equipped Space	6.0	ea	Contr	Contr	1,090.00	13.2	50.09	79	1.09	0	6,540	NO	0	4,305	86	10,845	0	$10,845	HDR|CB Estimated cost
368	Electrical	Eqpt - Motor Control Centers - 480V	16.0	ea	Contr	Contr	46,000.00	132	50.09	2,112	1.09	0	736,000	NO	0	114,792	2,292	850,792	0	$850,792	HDR|CB Estimated cost
369	Electrical	Eqpt - MV Switchgear - 7kV, 3000A Main Ckt Bkr.	1.00	ea	Contr	Contr	79,640.00	76	50.09	76	1.09	0	79,640	NO	0	4,131	82	83,771	0	$83,771	HDR|CB Estimated cost
370	Electrical	Eqpt - MV Switchgear - 7kV, 2000A Fdr Ckt Bkr.	2.00	ea	Contr	Contr	42,870.00	72	50.09	144	1.09	0	85,740	NO	0	7,827	156	93,567	0	$93,567	HDR|CB Estimated cost
371	Electrical	Eqpt - MV Switchgear - 7kV, 1200A Fdr Ckt Bkr.	20.00	ea	Contr	Contr	36,360.00	48	50.09	960	1.09	0	727,200	NO	0	52,178	1,042	779,378	0	$779,378	HDR|CB Estimated cost
372	Electrical	Eqpt - Relay panels and Metering	2.0	ea	Contr	Contr	34,500.00	120.00	50.09	240	1.09	0	69,000	NO	0	13,044	260	82,044	0	$82,044	HDR|CB Estimated cost
373	Electrical	Eqpt - Station Batteries 125 Volt DC	1.0	lot	Contr	Contr	165,140.00	635	50.09	635	1.09	0	165,140	NO	0	34,514	689	199,654	0	$199,654	HDR|CB Estimated cost

Estimate Details

1 x 1 Siemens H Class Combined Cycle Unit
Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
374	Electrical	Eqpt - Transformer GSU - 320 MVA, 18kV-345kV	1.0	ea	Contr	Contr	3,200,000.00	950	50.09	950	1.09	0	3,200,000	NO	0	51,634	1,031	3,251,634	0	$3,251,634	HDR|CB Estimated cost
375	Electrical	Eqpt - Transformer GSU - 142 MVA, 18kV-345kV	1.0	ea	Contr	Contr	1,500,000.00	950	50.09	950	1.09	0	1,500,000	NO	0	51,634	1,031	1,551,634	0	$1,551,634	HDR|CB Estimated cost
376	Electrical	Eqpt - Transformer UAT 20 MVA, 18kV/4.16kV	2.0	ea	Contr	Contr	800,000.00	650	50.09	1,300	1.09	0	1,600,000	NO	0	70,658	1,411	1,670,658	0	$1,670,658	HDR|CB Estimated cost
377	Electrical	Eqpt - Emergency Diesel Gnerator packaged 750kW	1.0	ea	Contr	Contr	200,000.00	100	50.09	100	1.09	0	200,000	NO	0	5,435	109	205,435	0	$205,435	HDR|CB Estimated cost
378	Electrical	Eqpt - UPS (120VAC)	1.0	ea	Contr	Contr	300,000.00	528	50.09	528	1.09	0	300,000	NO	0	28,698	573	328,698	0	$328,698	HDR|CB Estimated cost
379	Electrical	Eqpt - Transformer Aux Power 2.5/3.3MVA, 7kV-480V	6.0	ea	Contr	Contr	104,500.00	210	50.09	1,260	1.09	0	627,000	NO	0	68,484	1,367	695,484	0	$695,484	HDR|CB Estimated cost
380	Electrical	Eqpt - Lighting Transformers	8.0	ea	Contr	Contr	916.27	9.09	50.09	73	1.09	0	7,330	YES	440	3,953	79	11,283	0	$11,283	HDR|CB Estimated cost
381	Electrical	Eqpt - Panelboards 480/120 & 480/277/120	8.0	ea	Contr	Contr	1,200.00	40.00	50.09	320	1.09	0	9,600	YES	576	17,393	347	26,993	0	$26,993	HDR|CB Estimated cost
382	Electrical	Eqpt - Plant Network System	1.0	ea	Contr	Contr	100,000.00	300	50.09	300	1.09	0	100,000	YES	6,000	16,306	326	116,306	0	$116,306	HDR|CB Estimated cost
383	Electrical	Eqpt - Plant Security System	1.0	lot	Contr	Contr	250,000.00	1800	50.09	1,800	1.09	0	250,000	YES	15,000	97,834	1,953	347,834	0	$347,834	HDR|CB Estimated cost
384	Electrical	Eqpt - Plant Telephone System	1.0	ea	Contr	Contr	100,000.00	900	50.09	900	1.09	0	100,000	YES	6,000	48,917	977	148,917	0	$148,917	HDR|CB Estimated cost
385																					
386		**Division #6.0 - Electrical Equipment Sub-Total**								**26,560**		**0**	**11,904,770**		**28,016**	**1,443,587**	**28,818**	**13,348,357**	**0**	**13,348,357**	
387																					
388	**Division #6.1 - Electrical/Control Commodities**																				
389																					
390	Electrical	Grounding - Buried Ground Conductor	28,000.0	lf	Contr	Contr	4.79	0.054	50.09	1,512	1.09	0	134,120	NO	0	82,180	1,641	216,300	0	$216,300	HDR|CB Estimated Quantity & Cost
391	Electrical	Grounding - Above Ground Conductor	28,000.0	lf	Contr	Contr	4.79	0.054	50.09	1,512	1.09	0	134,120	NO	0	82,180	1,641	216,300	0	$216,300	HDR|CB Estimated Quantity & Cost
392	Electrical	Grounding - Ground Rods Copper	96.0	ea	Contr	Contr	22.95	1.74	50.09	167	1.09	0	2,204	NO	0	9,079	181	11,283	0	$11,283	HDR|CB Estimated Quantity & Cost
393	Electrical	Grounding - Exothermic Connections	2,200.0	ea	Contr	Contr	9.75	1.14	50.09	2,508	1.09	0	21,450	NO	0	136,315	2,721	157,765	0	$157,765	HDR|CB Estimated Quantity & Cost
394	Electrical	Grounding - Servit Post	1,000.0	ea	Contr	Contr	30.00	1	50.09	833	1.09	0	30,000	NO	0	45,263	904	75,263	0	$75,263	HDR|CB Estimated Quantity & Cost
395	Electrical	Conduit A/G 5" RGS	800.0	lf	Contr	Contr	58.00	1.00	50.09	800	1.09	0	46,400	NO	0	43,482	868	89,882	0	$89,882	HDR|CB Estimated Quantity & Cost
396	Electrical	Conduit A/G 2" ave RGS	60,000.0	lf	Contr	Contr	8.50	0.30	50.09	18,000	1.09	0	510,000	NO	0	978,337	19,530	1,488,337	0	$1,488,337	HDR|CB Estimated Quantity & Cost
397	Electrical	Conduit U/G - 4 x 6 PVC 5"	6,000.0	lf	Contr	Contr	240.00	2.00	50.09	12,000	1.09	0	1,440,000	NO	0	652,225	13,020	2,092,225	0	$2,092,225	HDR|CB Estimated Quantity & Cost
398	Electrical	Conduit U/G - 8 x 8 PVC 5"	700.0	lf	Contr	Contr	530.00	5.00	50.09	3,500	1.09	0	371,000	NO	0	190,232	3,798	561,232	0	$561,232	HDR|CB Estimated Quantity & Cost
399	Electrical	Cable Tray, Raceway 24" Aluminum	4,000.0	lf	Contr	Contr	17.00	0.84	50.09	3,360	1.09	0	68,000	NO	0	182,623	3,646	250,623	0	$250,623	HDR|CB Estimated Quantity & Cost
400	Electrical	Cable Tray, Raceway 36" Aluminum	1,650.0	lf	Contr	Contr	20.00	1.05	50.09	1,733	1.09	0	33,000	NO	0	94,165	1,880	127,165	0	$127,165	HDR|CB Estimated Quantity & Cost
401	Electrical	Cable - Overhead Conductor to Substation	1,000.0	lf	Contr	Contr	8.50	0.50	50.09	500	1.09	0	8,500	NO	0	27,176	543	35,676	0	$35,676	HDR|CB Estimated Quantity & Cost
402	Electrical	Cable - Medium Voltage (5kV 1C Cable)	60,000.0	lf	Contr	Contr	14.60	0.127	50.09	7,620	1.09	0	876,000	NO	0	414,163	8,268	1,290,163	0	$1,290,163	HDR|CB Estimated Quantity & Cost
403	Electrical	Cable Terminations - 5kV	96.0	ea	Contr	Contr	195.00	12.00	50.09	1,152	1.09	0	18,720	NO	0	62,614	1,250	81,334	0	$81,334	HDR|CB Estimated Quantity & Cost
404	Electrical	Cable 600V Power 1/c No. 2/0 ave size	120,000.0	lf	Contr	Contr	3.55	0.041	50.09	4,920	1.09	0	426,000	NO	0	267,412	5,338	693,412	0	$693,412	HDR|CB Estimated Quantity & Cost
405	Electrical	Wire 600V Power 3/c # 10 ave. size	185,000.0	lf	Contr	Contr	0.27	0.0185	50.09	3,423	1.09	0	49,950	NO	0	186,020	3,713	235,970	0	$235,970	HDR|CB Estimated Quantity & Cost
406	Electrical	Cable - Fiber Optic	16,500.0	lf	Contr	Contr	6.00	0.025	50.09	413	1.09	0	99,000	NO	0	22,420	448	121,420	0	$121,420	HDR|CB Estimated Quantity & Cost
407	Electrical	Cable - Permanent Telephone Line	1.0	ls	Contr	Contr	10,000.00	240.000	50.09	240	1.09	0	10,000	NO	0	13,044	260	23,044	0	$23,044	HDR|CB Estimated Quantity & Cost
408	Electrical	Cable - Control	500,000.0	lf	Contr	Contr	1.10	0.040	50.09	20,000	1.09	0	550,000	NO	0	1,087,041	21,700	1,637,041	0	$1,637,041	HDR|CB Estimated Quantity & Cost
409	Electrical	Cable - Instrument 4pr tw/shld No. 18	300,000.0	lf	Contr	Contr	3.25	0.025	50.09	7,500	1.09	0	975,000	NO	0	407,641	8,138	1,382,641	0	$1,382,641	HDR|CB Estimated Quantity & Cost
410	Electrical	Cable - Thermocouple 2pr tw/shld No. 16	10,000.0	lf	Contr	Contr	0.33	0.030	50.09	300	1.09	0	3,300	NO	0	16,306	326	19,606	0	$19,606	HDR|CB Estimated Quantity & Cost
411	Electrical	Cable - Data Highway	20,000.0	lf	Contr	Contr	4.59	0.034	50.09	688	1.09	0	91,800	NO	0	37,394	746	129,194	0	$129,194	HDR|CB Estimated Quantity & Cost
412	Electrical	Cable Terminations - low voltage	25,000.0	ea	Contr	Contr	0.85	0.300	50.09	7,500	1.09	0	21,250	NO	0	407,641	8,138	428,891	0	$428,891	HDR|CB Estimated Quantity & Cost
413	Electrical	Cable Terminations - control	25,000.0	ea	Contr	Contr	0.54	0.300	50.09	7,500	1.09	0	13,500	NO	0	407,641	8,138	421,141	0	$421,141	HDR|CB Estimated Quantity & Cost
414	Electrical	Cable Terminations - instrument	25,000.0	ea	Contr	Contr	0.54	0.300	50.09	7,500	1.09	0	13,500	NO	0	407,641	8,138	421,141	0	$421,141	HDR|CB Estimated Quantity & Cost
415	Electrical	Conduit - Lighting A/G	20,000.0	lf	Contr	Contr	2.83	0.25	50.09	5,000	1.09	0	56,600	YES	3,396	271,760	5,425	328,360	0	$328,360	HDR|CB Estimated Quantity & Cost
416	Electrical	Wire - Lighting 1/C No 12	60,000.0	lf	Contr	Contr	0.176	0.018	50.09	1,080	1.09	0	10,560	YES	634	58,700	1,172	69,260	0	$69,260	HDR|CB Estimated Quantity & Cost
417	Electrical	Lighting - Outdoor Fixtures, pole	24.0	ea	Contr	Contr	1,600.00	12.00	50.09	288	1.09	0	38,400	YES	2,304	15,653	312	54,053	0	$54,053	HDR|CB Estimated Quantity & Cost
418	Electrical	Lighting - Outdoor Fixtures, 150W	200.0	ea	Contr	Contr	490.00	4.00	50.09	800	1.09	0	98,000	NO	0	43,482	868	141,482	0	$141,482	HDR|CB Estimated Quantity & Cost
419	Electrical	Lighting - Fixtures, 250W MH	80.0	ea	Contr	Contr	850.00	3.00	50.09	240	1.09	0	68,000	NO	0	13,044	260	81,044	0	$81,044	HDR|CB Estimated Quantity & Cost
420	Electrical	Lighting - Fixtures, fluorescent	180.0	ea	Contr	Contr	85.00	1.60	50.09	288	1.09	0	15,300	YES	918	15,653	312	30,953	0	$30,953	HDR|CB Estimated Quantity & Cost
421	Electrical	Lighting - Receptacles and switches	150.0	ea	Contr	Contr	32.00	1.37	50.09	205	1.09	0	4,800	YES	288	11,148	223	15,948	0	$15,948	HDR|CB Estimated Quantity & Cost
422	Electrical	Welding Receptacles	16.0	ea	Contr	Contr	1,800.00	4.00	50.09	64	1.09	0	28,800	NO	0	3,479	69	32,279	0	$32,279	HDR|CB Estimated Quantity & Cost
423	Electrical	Lighting - Exit	48.0	ea	Contr	Contr	150.00	2.00	50.09	96	1.09	0	7,200	YES	432	5,218	104	12,418	0	$12,418	HDR|CB Estimated Quantity & Cost
424	Electrical	Lighting - Emergency	100.0	ea	Contr	Contr	127.00	2.00	50.09	200	1.09	0	12,700	YES	762	10,870	217	23,570	0	$23,570	HDR|CB Estimated Quantity & Cost
425	Electrical	Cathodic Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
426	Electrical	Lightning Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
427	Electrical	Freeze Protection System	1.0	lot	Contr	Contr	400,000.00	2000	50.09	2,000	1.09	0	400,000	YES	24,000	108,704	2,170	508,704	0	$508,704	HDR|CB Estimated Quantity & Cost
428	Electrical	Electrical Circuit Testing	4,850.0	ea	Contr	Contr		2	50.09	9,700	1.09	0	0	NO	0	527,216	10,525	527,216	0	$527,216	HDR|CB Estimated Quantity & Cost
429		**Total Cable**	**1,212,501.0**	**LF**																	
430																					
431		**Division #6.1 - Electrical/Control Commodities Sub-Total**								**136,100**		**0**	**6,887,174**		**44,734**	**7,397,341**	**147,669**	**14,284,514**	**0**	**14,284,514**	
432																					
433	**Division #6.2 - Switchyard**																				
434																					
435	V Electrica	138kV Dead End Towers 6 Legged (2 total)	100,000.0	lb	Contr	Contr	2.50	0.02	60.25	2,180	1.09	0	250,000	NO	0	142,500	2,365	392,500		$392,500	HDR|CB Estimated Quantity & Cost
436	V Electrica	Interonnection Cabling and Termination	1.0	lot	Contr	Contr	15,000.00	1,526.36	51.33	1,526	1.09	0	15,000	NO	0	85,000	1,656	100,000		$100,000	HDR|CB Estimated Quantity & Cost
437																					
438		**Division #6.2 - Switchyard**								**3,706**		**0**	**$265,000**		**0**	**$227,500**	**$4,021**	**$492,500**	**$0**	**$492,500**	
439																					
440	**Division #7.0 - Instrumentation & Control**																				
441																					
442	I & C	BOP Instrument Devices	900.0	ea	Contr	Contr	750.00	12	50.09	10,800	1.09	0	675,000	NO	0	587,002	11,718	1,262,002	0	$1,262,002	HDR|CB Estimated Quantity & Cost
443	I & C	Auxiliary Boiler CEMS	1.0	lot	Contr	Contr	163,200.00	200	50.09	200	1.09	0	163,200	NO	0	10,870	217	174,070	0	$174,070	HDR|CB Estimated Quantity & Cost
444	I & C	Continuous Emissions Monitoring Equipment (CEMS)	1.0	ea	Contr	Contr	700,000.00	2000	53.33	2,000	1.09	0	700,000	NO	0	115,730	2,170	815,730	0	$815,730	HDR|CB Estimated Quantity & Cost
445	I & C	Control Valves	180.0	ea	Contr	Contr	4,000.00	24	54.96	4,320	1.09	0	720,000	NO	0	257,621	4,687	977,621	0	$977,621	HDR|CB Estimated Quantity & Cost
446	I & C	DCS w/ Configuration, Interfaces, Field Support, Interface, Bulks	1.0	ea	Contr	Contr	1,300,000.00	1691	50.09	1,691	1.09	0	1,300,000	NO	0	91,909	1,835	1,391,909	0	$1,391,909	HDR|CB Estimated Quantity & Cost
447	I & C	Emergency Trip sub Panel	1.0	ea	Contr	Contr	30,000.00	21	50.09	21	1.09	0	30,000	NO	0	1,141	23	31,141	0	$31,141	HDR|CB Estimated Quantity & Cost
448	I & C	Flow Element - Nozzle (Supply)	3.0	ea	Contr	Contr	30,000.00	20	54.96	60	1.09	0	90,000	NO	0	3,578	65	93,578	0	$93,578	HDR|CB Estimated Quantity & Cost
449	I & C	Instrument Calibration and loop check	1,200.0	ea	Contr	Contr	0.00	3	50.09	3,600	1.09	0	0	NO	0	195,667	3,906	195,667	0	$195,667	HDR|CB Estimated Quantity & Cost
450	I & C	Instrument piping 2&3-valve manifolds	240.0	ea	Contr	Contr	400.00	5.22	54.96	1,252	1.09	0	96,000	NO	0	74,646	1,358	170,646	0	$170,646	HDR|CB Estimated Quantity & Cost
451	I & C	Instrument Racks & Enclosures	1.0	lot	Contr	Contr	350,000.00	1450	50.09	1,450	1.09	0	350,000	NO	0	78,811	1,573	428,811	0	$428,811	HDR|CB Estimated Quantity & Cost
452	I & C	Instrument Tubing - copper	4,000.0	lf	Contr	Contr	3.70	0.15	54.96	600	1.09	0	14,800	NO	0	35,781	651	50,581	0	$50,581	HDR|CB Estimated Quantity & Cost
453	I & C	Instrument Tubing - Stainless Steel	1,600.0	lf	Contr	Contr	6.25	0.20	54.96	320	1.09	0	10,000	NO	0	19,083	347	29,083	0	$29,083	HDR|CB Estimated Quantity & Cost
454	I & C	PLC Hardware, Bulks, Aux Controls, Configuration	1.0	ls	Contr	Contr	241,200.00	253	50.09	253	1.09	0	241,200	NO	0	13,751	275	254,951	0	$254,951	HDR|CB Estimated Quantity & Cost
455																					
456		**Division #7.0 - Control Sub-Total**								**26,567**		**0**	**4,390,200**		**0**	**1,485,591**	**28,825**	**5,875,791**	**0**	**$5,875,791**	
457																					
458		**Sub-Total Direct Costs**								**671,892**		**0**	**177,858,708**	**0**		**38,371,865**	**728,516**	**216,230,573**	**19,830,400**	**236,060,973**	
459		Sales Tax - State (Plant Production Equipment is Exempt)	6.00%												**330,152**				**330,152**	**330,152**	Sales Tax Included for Non-Production Facilities

Estimate Details

1 x 1 Siemens H Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
460	Indirects																				
461		**TOTAL DIRECT COSTS**								**671,892**		**0**	**177,858,708**			**38,371,865**	**728,516**	**216,230,573**	**20,160,552**	**$236,391,125**	
462																					
463	**Division #8.0 - Construction and Indirect Services**																				
464																					
465	Const Indirec	Construction Equipment	1.0	ls	Contr	Contr	11,145,203			0	1.09					0	0	0	11,145,203	$11,145,203	See Construction Equipment worksheet
466	Const Indirec	Construction Field staff	1.0	ls	Contr	Contr	11,522,855			0	1.09					0	0	0	11,522,855	$11,522,855	See EPC Field Staff Worksheet for details
467	Const Indirec	Construction Field staff expenses	1.0	ls	Contr	Contr	1,870,168			0	1.09					0	0	0	1,870,168	$1,870,168	See EPC Field Staff Worksheet for details
468	Const Indirec	Construction Permits	1.0	ls	Contr	Contr				0	1.09		51,450			0	0	51,450	0	$51,450	See Const Indirects and Serv Worksheet
469	Const Indirec	Construction Testing	1.0	ls	Contr	Contr				0	1.09		117,000			0	0	117,000	0	$117,000	See Const Indirects and Serv Worksheet
470	Const Indirec	Consumable Materials & Safety Supplies	2.00	$/MH	Contr	Contr	1,457,032			0	1.09					0	0	0	1,457,032	$1,457,032	$2.00/Direct hour
471	Const Indirec	Field Office Expenses	1.0	ls	Contr	Contr				1,369	1.09		1,033,370			65,849	1,485	1,099,219	22,373	$1,121,592	See Const Indirects and Serv Worksheet
472	Const Indirec	Performance Testing	1.0	ls	Contr	Contr				0	1.09		304,400			0	0	304,400	0	$304,400	See Const Indirects and Serv Worksheet
473	Const Indirec	Preoperational Testing, Startup & Commissioning	2.0	ls	Contr	Contr				21,690	1.09		1,113,000			752,767	23,534	1,865,767	0	$1,865,767	See Const Indirects and Serv Worksheet
474	Const Indirec	Site Safety	1.0	ls	Contr	Contr				7,580	1.09		658,040			375,008	8,224	1,033,048	0	$1,033,048	See Const Indirects and Serv Worksheet
475	Const Indirec	Small Tools	2.00	$/MH	Contr	Contr	1,457,032			0	1.09					0	0	0	1,457,032	$1,457,032	$2.00/Direct hour
476	Const Indirec	Start-up Supervision	1.0	ls	Contr	Contr	1,296,911			0	1.09					0	0	0	1,296,911	$1,296,911	See EPC Field Staff Worksheet for details
477	Const Indirec	Support Craft, Site Services, Scaffolding	1.0	ls	Contr	Contr				41,753	1.09		459,400			2,008,704	45,302	2,468,104	775,014	$3,243,118	See Const Indirects and Serv Worksheet
478	Const Indirec	Temporary Facilities	1.0	ls	Contr	Contr				17,947	1.09		2,336,753			863,403	19,472	3,200,157	82,500	$3,282,657	See Const Indirects and Serv Worksheet
479	Const Indirec	Temporary Utilities	1.0	ls	Contr	Contr				29,032	1.09		747,600			1,396,697	31,500	2,144,297	0	$2,144,297	See Const Indirects and Serv Worksheet
480																					
481		**Division #8.0 - Construction Indirects and Services Sub-Total**								**119,371**		**0**	**6,821,013**			**5,462,428**	**129,518**	**12,283,441**	**29,629,088**	**$41,912,529**	
482																					
483		**SUB-TOTAL CONSTRUCTION COST**								**791,263**		**0**	**184,679,721**			**43,834,293**	**858,033**	**228,514,015**	**49,789,640**	**278,303,654**	
484		**Subcontract Labor Hours**																			
485		**Material Cost Excluding CT, HRSG and ST (escalation and EPC**											**65,639,857**								
486	**Division #9.0 - Project Indirects**																				
487																					
488	Project Indire	- Power Plant Design Engineering	1.0	ls	Contr	6.0%	16,698,219											0	16,698,219	$16,698,219	6.0% of the Total Construction Cost
489	Project Indire	- Project Management (Home Office)	0.0	ls	Contr	0.0%	0											0	0	$0	Included in Engineering
490																					
491																					
492		Sub-Total Project Indirects										**0**	**0**			**0**	**0**	**0**	**16,698,219**	**$16,698,219**	
493																					
494	EPC Indirect	EPC Contractor Insurance & Misc Costs (% of Total Const. Cost)																			
495																					
496	EPC Indirect	- Builders Risk Insurance	1.0	ls	Contr	0.50%	1,391,518												1,391,518	$1,391,518	Allowance based on info from other projects
497	EPC Indirect	- Comprehensive General Liability (CGL) Insurance	1.0	ls	Contr	0.50%	1,391,518											0	1,391,518	$1,391,518	Allowance based on info from other projects
498	EPC Indirect	- Warranty Reserve	1.0	ls	Contr		500,000											0	500,000	$500,000	Allowance based on info from other projects
499																					
500		Sub-Total EPC Contractor Indirects										**0**	**0**			**0**	**0**	**0**	**3,283,037**	**$3,283,037**	
501																					
502		**Total Project Indirects**										**0**	**0**			**0**	**0**	**0**	**19,981,256**	**19,981,256**	
503																					
504		Sub-Total										**0**	**184,679,721**			**43,834,293**	**858,033**	**228,514,015**	**69,770,895**	**$298,284,910**	
505							Equipment	Material	Labor	S/C											
506	Project Indire	Escalation - EPC Contractor Escalation Rates					2.4%	2.4%	4.0%	4.0%			5,517,084			7,049,586	0	12,566,669	7,233,379	19,800,048	Excludes CT, HRSG and ST
507																					
508		Sub-Total										**0**	**190,196,805**			**50,883,879**	**858,033**	**241,080,684**	**77,004,274**	**$318,084,958**	
509							Equip	Mat	Labor	S/C											
510	EPC Indirect	EPC Contractor Contingency	Varies	%	Contr		0%	5%	5%	5%		0	3,281,993			2,544,194		5,826,187	3,620,214	9,446,400	Excludes CT, HRSG and ST
511	EPC Indirect	EPC Contractor G&A and Fee	10.0%	%	Contr		0.0%	10.0%	10.0%	10.0%		0	19,019,681			5,088,388		24,108,068	7,700,427	31,808,496	
512																					
513		Sub-Total		ls								0	22,301,673			7,632,582	0	29,934,255	11,320,641	$41,254,896	
514																					
515		**TOTAL EPC PROJECT COST**								**791,263**		**0**	**212,498,478**			**58,516,461**	**858,033**	**271,014,939**	**88,324,915**	**$359,339,855**	
516																					
517	**OWNER INDIRECTS**																				
518	**Division #9.1 - Owner Indirects**																				
519																					
520		**Power Block 1 and Common**																			
521	Owner Indire	Project Development	1.0	ls	Owner														6,500,000	$6,500,000	Budget provided by LG&E
522	Owner Indire	Transmission Line Relocation	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
523	Owner Indire	Transmission Interconnection Facilities	1.0	ls	Owner														5,500,000	$5,500,000	To be estimated by Transmision Operator
524	Owner Indire	Natural Gas Pipeline Interconnection	1.0	ls	Owner														14,250,000	$14,250,000	Budget provided by LG&E
525	Owner Indire	Natural Gas Pipeline Fixed O&M (Startup Period)	1.0	ls	Owner														3,000,000	$3,000,000	Budget provided by LG&E
526	Owner Indire	Construction Power (Service Installation and Energy)	1.0	ls	Owner														750,000	$750,000	Budget estimated by HDR|CB
527	Owner Indire	Owner Operations Personnel (Prior to COD)	1.0	ls	Owner														2,340,000	$2,340,000	Budget estimated by HDR|CB 7 sal @ 12 mo, 26 hr @ 6 n
528	Owner Indire	Owners Project Management	1.0	ls	Owner														5,300,000	$5,300,000	Budget provided by LG&E
529	Owner Indire	Owners Engineer	1.0	ls	Owner														1,700,000	$1,700,000	Budget provided by LG&E
530	Owner Indire	Owners Legal Counsel	1.0	ls	Owner														1,300,000	$1,300,000	Budget provided by LG&E
531	Owner Indire	Operator Training	1.0	ls	Owner														225,000	$225,000	Budget estimated by HDR|CB
532	Owner Indire	Owner Startup Engineering	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
533	Owner Indire	Permitting, License Fees, & Environmental Compliance	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
534	Owner Indire	Highway Improvements, Miscellaneous Mitigation	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
535	Owner Indire	Land	1.0	ls	Owner														0	$0	Budget provided by LG&E
536	Owner Indire	Rolling Stock	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
537	Owner Indire	Water Infrastructure / Supply to Site	0.0	ls	Owner														0	$0	N/A (On site intake/pre-treatment/discharge incl. in EPC)
538	Owner Indire	Startup Testing (Includes Fuel & Power Sales)																			
539	Owner Indire	- Fuel - Natural Gas	1.0	ls	Owner														8,107,200	$8,107,200	HDR|CB [1,801,600 MMBTU @ $4.50/MMBTU per LG&E 2017 Forecas
540	Owner Indire	- Fuel - Fuel Oil	0.0	ls	Owner														0	$0	Budget estimated by HDR|CB [Not Required]
541	Owner Indire	- Electric Transmission Firm Point to Point	1.0	ls	Owner														2,400,000	$2,400,000	Budget provided by LG&E
542	Owner Indire	- Startup Power	1.0	ls	Owner														267,748	$267,748	Budget estimated by HDR|CB [7243 MWhr @$36/MWH]
543	Owner Indire	- Test Power Sales	1.0	ls	Owner														(10,368,000)	($10,368,000)	Budget estimated by HDR|CB [288,000 MWhr @$36/MWH
544	Owner Indire	- Variable O&M - Water, Chemicals, etc.	1.0	ls	Owner														800,000	$800,000	Budget estimated by HDR|CB
545	Owner Indire	Site Security	1.0	ls	Owner														50,000	$50,000	Budget estimated by HDR|CB
546	Owner Indire	Operating Spare Parts	1.0	ls	Owner														2,000,000	$2,000,000	Budget estimated by HDR|CB - Does NOT incl. CT LTSA
547	Owner Indire	Permanent Plant Equipment & Furnishings																		$0	

Estimate Details

1 x 1 Siemens H Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
Line #																					
548	Owner Indire	- Office Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
549	Owner Indire	- Kitchen Furniture	1.0	ls	Owner														130,000	$130,000	Budget estimated by HDR|CB
550	Owner Indire	- Laboratory Equipment & Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
551	Owner Indire	- Locker Room Furniture	1.0	ls	Owner														180,000	$180,000	Budget estimated by HDR|CB
552	Owner Indire	- Warehouse Shelves	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
553	Owner Indire	- Workshop Tools & Test Equipment	1.0	ls	Owner														1,800,000	$1,800,000	Budget estimated by HDR|CB
554	Owner Indire	IT and Telecommunication Infrastructure	1.0	ls	Owner														250,000	$250,000	Budget estimated by HDR|CB
555	Owner Indire	NERC - Cyber Security	1.0	ls	Owner														1,000,000	$1,000,000	Budget estimated by HDR|CB
556	Owner Indire	Escalation - Owners Furnished Equipment	0.0	%	Owner														0	$0	N/A
557	Owner Indire	Builders Risk Insurance	0.0	ls	Owner														0	$0	Included with EPC Contractor Indirects
558	Owner Indire	Property Tax During Construction	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
559	Owner Indire	Financing Fees	0.0	ls	Owner														0	$0	N/A
560	Owner Indire	AFUDC	1.0	ls	Owner														4,400,000	$4,400,000	AFUDC Based on 78% KU Ownership
561		**Total Owner Indirects**																	**56,081,948**	**$56,081,948**	
562																					
563																					
564		**Owner Contingency**	10.00%	%	Owner														**35,933,985**	**$35,933,985**	
565																					
566																					
567		**Total Owner Indirects**																	**92,015,933**	**$92,015,933**	
568																					
569		**TOTAL PROJECT COST**										**0**	**212,498,478**			**58,516,461**	**858,033**	**271,014,939**	**180,340,849**	**$451,355,788**	
570																					

$/kW **$1,190**

2 x 1 GE 7F5 Combined Cycle Unit

BUDGET ESTIMATE

5 x 10 Work Week

February 22, 2013

Rev 3

CONFIDENTIAL

2 x 1 GE 7F5 Combined Cycle Unit

LOCATION:	Kentucky
PROJECT #	189895
PLANT TYPE:	**NGCC**
CLIENT:	LG&/KU
ESTIMATE TYPE:	Conceptual
LEAD ESTIMATOR:	

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013

NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018

TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 597.7
NO. OF UNITS: 1
FUEL TYPE: Nat Gas

BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
Site Development	**$0**	**$1,787,885**	**$1,537,001**	**36,870**	**250,000**	**$3,574,886**	**0.7%**
Raw Water Intake/Discharge Facilities	**$0**	**$6,500,000**	**$1,446,623**	**27,125**	**0**	**$7,946,623**	**1.6%**
Foundations & Concrete	**$0**	**$6,415,575**	**$4,963,370**	**128,270**	**11,900,000**	**$23,278,945**	**4.7%**
Architectural & Metals	**$0**	**$5,385,510**	**$2,426,063**	**46,805**	**5,766,400**	**$13,577,973**	**2.7%**
Piping, Valves, Support, Accessories	**$0**	**$17,227,875**	**$12,317,297**	**228,411**	**225,000**	**$29,770,171**	**6.0%**
HRSG Equipment	**$0**	**$47,271,370**	**$9,963,361**	**144,305**	**0**	**$57,234,731**	**11.6%**
Steam Turbine Island Equipment	**$0**	**$37,180,000**	**$1,157,299**	**21,700**	**0**	**$38,337,299**	**7.8%**
Combustion Turbine Equipment	**$0**	**$99,800,000**	**$3,356,166**	**62,930**	**0**	**$103,156,166**	**20.9%**
Mechanical Draft Cooling Tower	**$0**	**$0**	**$0**	**0**	**5,390,000**	**$5,390,000**	**1.1%**
BOP Mechanical Equipment	**$0**	**$19,630,700**	**$1,536,419**	**26,256**	**1,346,000**	**$22,513,119**	**4.6%**
Electrical Equipment	**$0**	**$15,909,330**	**$1,319,501**	**26,340**	**0**	**$17,228,831**	**3.5%**
Electrical Commodities	**$0**	**$9,213,019**	**$9,788,760**	**195,408**	**0**	**$19,001,779**	**3.8%**
High Voltage Switchyard	**$0**	**$390,000**	**$227,500**	**4,021**	**0**	**$617,500**	**0.1%**
Instrumentation & Controls	**$0**	**$5,995,825**	**$1,949,043**	**37,754**	**0**	**$7,944,868**	**1.6%**
Sub-Total Direct Costs:	**$0**	**$272,707,089**	**$51,988,403**	**986,195**	**$24,877,400**	**$349,572,892**	**70.8%**
State Sales Tax (Non-Production Material Only)					**393,268**	**$393,268**	**0.1%**
Total Direct Cost	**$0**	**$272,707,089**	**$51,988,403**	**986,195**	**$25,270,668**	**$349,966,160**	**70.9%**
Construction Indirects & Services							
- Construction Field Staff			**$0**	**0**	**$11,522,855**	**$11,522,855**	**2.3%**
- Construction Field Staff Expenses			**$0**	**0**	**$1,870,168**	**$1,870,168**	**0.4%**
- Construction Equipment			**$0**	**0**	**$12,055,653**	**$12,055,653**	**2.4%**
- Small Tools			**$0**	**0**	**$1,972,391**	**$1,972,391**	**0.4%**
- Consumable Materials & Safety Supplies			**$0**	**0**	**$1,972,391**	**$1,972,391**	**0.4%**
- Field Office Expense		**$1,033,370**	**$65,849**	**1,485**	**$22,373**	**$1,121,592**	**0.2%**
- Temporary Facilities		**$2,336,753**	**$863,403**	**19,472**	**$82,500**	**$3,282,657**	**0.7%**
- Temporary Utilities		**$747,600**	**$1,396,697**	**31,500**	**$0**	**$2,144,297**	**0.4%**
- Support Craft & Site Services		**$459,400**	**$2,008,704**	**45,302**	**$775,014**	**$3,243,118**	**0.7%**
- Site Safety		**$658,040**	**$375,008**	**8,224**	**$0**	**$1,033,048**	**0.2%**
- Construction Permits		**$51,450**	**$0**	**0**	**$0**	**$51,450**	**0.0%**
- Construction Testing		**$117,000**	**$0**	**0**	**$0**	**$117,000**	**0.0%**
- Performance Testing		**$304,400**	**$0**	**0**	**$0**	**$304,400**	**0.1%**
- Start-up Supervision		**$0**	**$0**	**0**	**$1,296,911**	**$1,296,911**	**0.3%**
- Preop Testing, Start-up		**$1,113,000**	**$752,767**	**23,534**	**$0**	**$1,865,767**	**0.4%**
Sub-Total Construction Indirects and Services		**$6,821,013**	**$5,462,428**	**129,518**	**$31,570,255**	**$43,853,697**	**8.9%**
Total Construction Cost	**$0**	**$279,528,102**	**$57,450,831**	**1,115,713**	**$56,840,923**	**$393,819,857**	**79.7%**
Estimated Subcontract Labor Hours				**196,401**			
Project Indirects							
- Project Engineering (Eng, PM, CM & Procurement)					**$23,629,191**	**$23,629,191**	**4.8%**
Sub-Total Project Indirects	**$0**	**$0**	**$0**	**0**	**$23,629,191**	**$23,629,191**	**4.8%**
EPC Contractor Insurance & Misc Costs							
- Builders Risk					**$1,969,099**	**$1,969,099**	**0.4%**
- Comprehensive General Liability (CGL) Insurance					**$1,969,099**	**$1,969,099**	**0.4%**

2 x 1 GE 7F5 Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 597.7
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
- Warranty Reserve					**$500,000**	**$500,000**	**0.1%**
Sub-Total EPC Contractor Insur. & Misc. Co	**$0**	**$0**	**$0**	**0**	**$4,438,199**	**$4,438,199**	**0.9%**
Total EPC Contractor Project Indirect Cost	**$0**	**$0**	**$0**	**0**	**$28,067,390**	**$28,067,390**	**5.7%**
- Escalation (Eqt, Materials & Labor)	**$0**	**$7,089,754**	**$9,051,541**		**$7,757,137**	**$23,898,432**	**4.8%**
Sub-Total	**0**	**286,617,856**	**66,502,372**	**1,312,113**	**92,665,451**	**445,785,679**	**90.3%**
- EPC Contractor Contingency	**$0**	**$4,763,837**	**$3,325,119**		**$4,333,773**	**$12,422,728**	**2.5%**
- EPC Contractor G&A and Profit	**$0**	**$22,929,429**	**$5,320,190**		**$7,413,236**	**$35,662,854**	**7.2%**
TOTAL EPC PROJECT COST	**$0**	**$314,311,121**	**$75,147,680**	**1,312,113**	**$104,412,459**	**$493,871,261**	**100.0%**
EPC Price per kW						**$826**	
Owner Indirect Costs							
- Total Owner Indirects						**$69,224,904**	
- Owner Contingency						**$49,387,126**	
TOTAL PROJECT COST						**$612,483,291**	
Total Project Cost per kW						**$1,025**	
Estimate Options (include 25 % markup for indirects)							
Fuel Oil System						**$9,250,000**	
Bypass Stack and Diverter Damper						**$11,250,000**	
Gas Compression						**Not Required**	
SCR System to meet 12 ppm NOx						**Not Required**	
Optional SCR System						**$4,700,000**	

Total Craft Labor Hours	**1,312,113**	**erformance Guarantees:**		**Executive-in-Charge:**	**WHD**
Ave. Craft Wage without Escalation	**$52.45**	**Liquidated Damages:**		**Project Manager:**	**JPS**
Field Labor Type	**TBD**	**Special Insurance:**		**Construction Manager:**	**SMP**
Labor Productivity Factor	**1.084**	**Performance Bond:**		**Lead Estimator:**	**CDF**

Estimate Details

2 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

Line #													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
1	**Division #1.0 - Sitework**																				
2	Sitework	Roads - Asphalt paving main site rds & Parking lots	8,500.0	sy	Sub	Contr	20.00		44.43		1.09	0	0	YES	5,100	0	0	0	170,000	$170,000	HDR|CB Estimated Quantity
3	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Powerblock A	1,740.0	sy	Contr	Contr	5.00	0.055	44.43	96	1.09	0	8,700	YES	522	4,613	104	13,313	0	$13,313	HDR|CB Estimated Quantity
4	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Secondary Ar	6,945.0	sy	Contr	Contr	5.00	0.055	44.43	382	1.09	0	34,725	YES	2,084	18,412	414	53,137	0	$53,137	HDR|CB Estimated Quantity
5	Sitework	Roads - Haul/Construction Roads Treated Gravel	29,700.0	sy	Contr	Contr	8.00	0.1	44.43	2,970	1.09	0	237,600	YES	14,256	143,162	3,222	380,762	0	$380,762	HDR|CB Estimated Quantity
6	Sitework	Roads - Main Roads Crushed stone Base Course	8,500.0	sy	Contr	Contr	12.00	0.1	44.43	850	1.09	0	102,000	YES	6,120	40,972	922	142,972	0	$142,972	HDR|CB Estimated Quantity
7	Sitework	Roads - Drainage and culverts	90,000.0	sy	Contr	Contr	2.00	0.05	44.43	4,500	1.09	0	180,000	YES	10,800	216,912	4,883	396,912	0	$396,912	HDR|CB Estimated Quantity
8	Sitework	Soil Erosion Control Measures	2,160	lf	Contr	Contr	1	0.027	44.43	58	1.09	0	2,160	YES	130	2,811	58	4,971	0	4,971	HDR|CB Estimated Quantity
9	Sitework	Site - Topsoil stripping/stockpiling	10,125	cy	Contr	Contr		0.030	44.43	304	1.09	0	0	YES	0	14,642	304	14,642	0	$14,642	HDR|CB Estimated Quantity
10	Sitework	Site - Drainage - Pipe Culverts (Assume 12" dia)	3,000	lf	Contr	Contr	9.00	0.12	44.43	360	1.09	0	27,000	YES	1,620	17,353	360	44,353	0	$44,353	HDR|CB Estimated Quantity
11	Sitework	Site - Drainage - Manholes	25	ea	Contr	Contr	1,500	16	44.43	400	1.09	0	37,500	YES	2,250	19,281	400	56,781	0	$56,781	HDR|CB Estimated Quantity
14	Sitework	Site - Fire Protection hydrants, valve boxes, ductile iron	30.0	ea	Contr	Contr	3,000.00	20	39.54	600	1.09	0	90,000	YES	5,400	25,739	651	115,739	0	$115,739	HDR|CB Estimated Quantity
15	Sitework	Site - Fire Protection U/G piping, DI	4,500.0	lf	Contr	Contr	41.00	0.5	39.54	2,250	1.09	0	184,500	YES	11,070	96,520	2,441	281,020	0	$281,020	HDR|CB Estimated Quantity
16	Sitework	Pipe Utility Trench Excavation	10,500	cy	Contr	Contr		0.2	39.54	2,100	1.09	0	0	YES	0	90,086	2,100	90,086	0	$90,086	HDR|CB Estimated Quantity
17	Sitework	Pipe Utility Trench Backfill (including bedding)	9,000	cy	Contr	Contr		0.2	39.54	1,800	1.09	0	0	YES	0	77,216	1,800	77,216	0	$77,216	HDR|CB Estimated Quantity
20	Sitework	Spoil Disposal	11,250	cy	Contr	Contr		0.1	44.43	1,125	1.09	0	0	YES	0	54,228	1,125	54,228	0	$54,228	HDR|CB Estimated Quantity
21	Sitework	Site - Sanitary sewer lift stations	1.0	ea	Contr	Contr	11,700.00	40	39.54	40	1.09	0	11,700	YES	702	1,716	43	13,416	0	$13,416	HDR|CB Estimated Quantity
22	Sitework	Site - Sanitary waste piping and manholes	2,500.0	lf	Contr	Contr	20.00	1	39.54	2,500	1.09	0	50,000	YES	3,000	107,245	2,713	157,245	0	$157,245	HDR|CB Estimated Quantity
23	Sitework	Site - Storm drain piping and culverts	22,500.0	lf	Contr	Contr	12.00	0.25	39.54	5,625	1.09	0	270,000	YES	16,200	241,301	6,103	511,301	0	$511,301	HDR|CB Estimated Quantity
24	Sitework	Site Finishing - Seed Site Earthwork	6.0	ac	Contr	Contr	10,000.00	0.54	39.54	3	1.09	0	60,000	YES	3,600	139	4	60,139	0	$60,139	HDR|CB Estimated Quantity
25	Sitework	Site Finishing - Grading around foundations	7,500.0	sy	Contr	Contr		0.02	39.54	150	1.09	0	0	YES	0	6,435	163	6,435	0	$6,435	HDR|CB Estimated Quantity
26	Sitework	Site Finishing - Stone Surfacing	7,500.0	sy	Contr	Contr	10.00	0.015	39.54	113	1.09	0	75,000	YES	4,500	4,826	122	79,826	0	$79,826	HDR|CB Estimated Quantity
27	Sitework	Site Improvements - landscaping at admin building	1.0	ls	Contr	Contr	30,000.00	360	39.54	360	1.09	0	30,000	YES	1,800	15,443	391	45,443	0	$45,443	HDR|CB Estimated Quantity
28	Sitework	Site Improvements - Main Gate Security Facilities	1.0	lot	Contr	Contr	150,000.00	3600	39.54	3,600	1.09	0	150,000	YES	9,000	154,433	3,906	304,433	0	$304,433	HDR|CB Estimated Quantity
29	Sitework	Site Improvements - Site Entrance Sign and Landscaping	1.0	ls	Contr	Contr	18,750.00	240	39.54	240	1.09	0	18,750	YES	1,125	10,296	260	29,046	0	$29,046	HDR|CB Estimated Quantity
30	Sitework	Site Improvements - Site Security Boundary Fencing	18,750.0	lf	Contr	Contr	11.00	0.2	39.54	3,750	1.09	0	206,250	YES	12,375	160,867	4,069	367,117	0	$367,117	HDR|CB Estimated Quantity
31	Sitework	Site Improvements - Fencing Active gates	6.0	ea	Contr	Contr	2,000.00	48	39.54	288	1.09	0	12,000	YES	720	12,355	312	24,355	0	$24,355	HDR|CB Estimated Quantity
32	Sitework	Site Surveying	1.0	lot	Sub	Contr	80,000.00		44.43	0	1.09	0	0	YES	2,400	0	0	0	80,000	$80,000	HDR|CB Estimated Quantity
33																					
34		**Division #1 - Sitework Sub-Total**								**34,463**		**0**	**1,787,885**		**114,773**	**1,537,001**	**36,870**	**3,324,886**	**250,000**	**3,574,886**	
35																					
36	**Division #1.3 - Raw Water Intake, Clarification and Discharge Facilities**																				
37		Raw Water River Intake and Discharge Facilities	1.0	ea	Contr	Contr	6,500,000.00	25,000	53.33	25,000	1.09	0	6,500,000	NO	0	1,446,623	27,125	7,946,623	0	$7,946,623	HDR Allowance for Interconnection and Updgrage of existing Unit 1 and 2 Intake Structure
38																					
39		**Division #1.3 - Raw Water Intake Clarification and Discharge Facilities Sub-Total**								**25,000**		**0**	**6,500,000**		**0**	**1,446,623**	**27,125**	**7,946,623**	**0**	**$7,946,623**	
40																					
41																					
42	**Division #2.0 - Earthwork and Concrete**																				
43	**Division #2.1 - Earthwork**																				
44	Earthwork	Structural Backfill Power Block (using imported material)	220,000.0	cy	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,500,000	$5,500,000	HDR|CB Estimated Quantity
45	Earthwork	Retaining Wall (MSE)	40,000.0	sf	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	1,000,000	$1,000,000	HDR|CB Estimated Quantity
46	Earthwork	Structural Excavation Main Power Block - Earth/Rock	300,000.0	cy	Sub	Contr	18.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,400,000	$5,400,000	HDR|CB Estimated Quantity
47																					
48				cy						0		0	0		0	0	0	0	11,900,000	11,900,000	
49	**Division # 2.2 - Concrete Main Power Block Area**																				
50																					
51		Includes Forms, Rebar, Placement, Finishing, Embeds																			
52	Concrete	HRSG and Stack	7,500	cy	Contr	Contr	250	4.5	38.69	33,750	1.09	0	1,875,000	NO	0	1,416,954	36,619	3,291,954	0	$3,291,954	HDR|CB Estimated Quantity
53	Concrete	Gas Turbine Foundation	4,000	cy	Contr	Contr	300	4.5	38.69	18,000	1.09	0	1,200,000	NO	0	755,709	19,530	1,955,709	0	$1,955,709	HDR|CB Estimated Quantity
54	Concrete	Steam Turbine building	800	cy	Contr	Contr	250	4.5	38.69	3,600	1.09	0	200,000	NO	0	151,142	3,906	351,142	0	$351,142	HDR|CB Estimated Quantity
55	Concrete	Spread Footings & Piers Pipe/Tray Trestle/Racks	400.0	cy	Contr	Contr	250	4.5	38.69	1,800	1.09	0	100,000	NO	0	75,571	1,953	175,571	0	$175,571	HDR|CB Estimated Quantity
56	Concrete	Steam Turbine Bldg fill slab	300.0	cy	Contr	Contr	210.00	4.5	38.69	1,350	1.09	0	63,000	NO	0	56,678	1,465	119,678	0	$119,678	HDR|CB Estimated Quantity
57	Concrete	Steam Turbine Bldg Mat Foundation	1,200.0	cy	Contr	Contr	250	4.5	38.69	5,400	1.09	0	300,000	NO	0	226,713	5,859	526,713	0	$526,713	HDR|CB Estimated Quantity
58	Concrete	Steam Turbine Bldg Elevated Slab	500.0	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	NO	0	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
59	Concrete	Steam Turbine Bldg sumps foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
60	Concrete	Steam Turbine Pedestal FDN (Columns & Tabletop, Mat)	2,500.0	cy	Contr	Contr	350.00	8	38.69	20,000	1.09	0	875,000	NO	0	839,677	21,700	1,714,677	0	$1,714,677	HDR|CB Estimated Quantity
61	Concrete	Aux. Equipment Foundations	500	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	YES	7,500	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
62	Concrete	Equip Fdn - Generator Breaker	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
63	Concrete	Equip Fdn - CT PEEC	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
64	Concrete	Equip Fdn - Power Distribution Center	80	cy	Contr	Contr	250	4.5	38.69	360	1.09	0	20,000	YES	1,200	15,114	391	35,114	0	$35,114	HDR|CB Estimated Quantity
65	Concrete	Equip Fdn - CEMS	40	cy	Contr	Contr	250	4.5	38.69	180	1.09	0	10,000	YES	600	7,557	195	17,557	0	$17,557	HDR|CB Estimated Quantity
66	Concrete	Equip Fdn - Boiler Feed Pump	120	cy	Contr	Contr	250	4.5	38.69	540	1.09	0	30,000	YES	1,800	22,671	586	52,671	0	$52,671	HDR|CB Estimated Quantity
67	Concrete	Equip Fdn - Main Step-up Transformer Fdn/Walls	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
68	Concrete	Equip Fdn - Plant Aux Power Transformers Fnd/Walls	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
69	Concrete	Equip Fdn - Misc off Base Equip fnds	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
70	Concrete	Elec. Ductbank (Tubes, Conc., Forms, Rebar) 12 Tubes	500.0	lf	Contr	Contr	125	0.57	38.69	285	1.09	0	62,500	NO	0	11,965	309	74,465	0	$74,465	HDR|CB Estimated Quantity
71	Concrete	Elec. Ductbank to Cooling Tower (Tubes, Conc., Forms, Rebar) 6 Tu	750.0	lf	Contr	Contr	100	0.45	38.69	338	1.09	0	75,000	NO	0	14,170	366	89,170	0	$89,170	HDR|CB Estimated Quantity
72	Concrete	Equip Fdn - Pumps & misc equipment	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
73	Concrete	Electrical Building Foundation	130.0	cy	Contr	Contr	250	4.5	38.69	585	1.09	0	32,500	NO	0	24,561	635	57,061	0	$57,061	HDR|CB Estimated Quantity
74	Concrete	Cooling Tower Basin	2,500.0	cy	Contr	Contr	250	5.5	38.69	13,750	1.09	0	625,000	NO	0	577,278	14,919	1,202,278	0	$1,202,278	HDR|CB Estimated Quantity
75	Concrete	Administration Building foundation	1,100.0	cy	Contr	Contr	250	4.5	38.69	4,950	1.09	0	275,000	YES	16,500	207,820	5,371	482,820	0	$482,820	HDR|CB Estimated Quantity
76	Concrete	Auxilary Boiler Building floor slab & foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
77	Concrete	Demineralized Water Tank Foundations	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
78	Concrete	Service water storage tank foundations	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	YES	3,000	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
79	Concrete	Main Gate Guard House	3.0	cy	Contr	Contr	250	4.5	38.69	14	1.09	0	750	YES	45	567	15	1,317	0	$1,317	HDR|CB Estimated Quantity
80	Concrete	Water Treatment Buildings, enclosures and tank fdns	0.0	cy	Contr	Contr	250	4.5	38.69	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
81	Concrete	Grouting (equipment & steel)	30.0	cy	Contr	Contr	2,227.50	81	38.69	2,430	1.09	0	66,825	NO	0	102,021	2,637	168,846	0	$168,846	HDR|CB Estimated Quantity
82																					
83		Sub Total Concrete	**24,373**				AVG MH/CY	5.15		118,221			6,415,575		32,445	4,963,370	128,270	11,378,945	0	11,378,945	
84																					
85		**Division #2 - Earthwork & Concrete Sub-Total**								**118,221**		**0**	**6,415,575**		**32,445**	**4,963,370**	**128,270**	**11,378,945**	**11,900,000**	**23,278,945**	
86																					
87	**Division #3.0 - Architectural**												-								
88																					
89	rchitectura	Exterior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
90	rchitectura	Fire extinguishers	36.0	ea	Contr	Contr	500.00	3	53.33	108	1.09	0	18,000	YES	1,080	6,249	117	24,249	0	$24,249	HDR|CB Estimated Quantity
91	rchitectura	Fire hose cabinets	26.0	ea	Contr	Contr	1,200.00	20	53.33	520	1.09	0	31,200	YES	1,872	30,090	564	61,290	0	$61,290	HDR|CB Estimated Quantity
92	rchitectura	Fire hydrants w/monitor nozzles	10.0	ea	Contr	Contr	2,550.00	12	54.96	120	1.09	0	25,500	YES	1,530	7,156	130	32,656	0	$32,656	HDR|CB Estimated Quantity
93	rchitectura	Fire protection control room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
94	rchitectura	Fire Protection Elect Equip & Cable Spreading Room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity

Estimate Details

2 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
95	rchitectura	Fire Protection GSU and Aux Transformers	1.0	ls	Sub	Contr	200,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	200,000	$200,000	HDR|CB Estimated Quantity
96	rchitectura	Fire Protection Turbine Building	1.0	ls	Sub	Contr	600,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
97	rchitectura	Fire Detection/Alarm	1.0	lot	Contr	Contr	410,000.00	1000	50.09	1,000	1.09	0	410,000	NO	0	54,352	1,085	464,352	0	$464,352	HDR|CB Estimated Quantity
98	rchitectura	HVAC System Allowance	1.0	ls	Sub	Contr	750,000.00		54.96	0	1.09	0	0	YES	22,500	0	0	0	750,000	$750,000	HDR|CB Estimated Quantity
99	rchitectura	Interior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
100	rchitectura	Masonry Walls 8" CMU	20,000.0	sf	Contr	Contr	4.00	0.15	32.95	3,000	1.09	0	80,000	yes	4,800	107,267	3,255	187,267	0	$187,267	HDR|CB Estimated Quantity
101	rchitectura	Overhead Rolling Doors - steel	4.0	ea	Contr	Contr	5,000.00	40	38.68	160	1.09	0	20,000	yes	1,200	6,715	174	26,715	0	$26,715	HDR|CB Estimated Quantity
102	rchitectura	Painting - equipment and piping	1.0	lot	Contr	Contr	100,000.00	3600	36.36	3,600	1.09	0	100,000	yes	6,000	142,016	3,906	242,016	0	$242,016	HDR|CB Estimated Quantity
103	rchitectura	Painting - structural steel, grating, handrail touch-up	250,000.0	sf	Contr	Contr	0.30	0.010	36.36	2,500	1.09	0	75,000	yes	4,500	98,622	2,713	173,622	0	$173,622	HDR|CB Estimated Quantity
104	rchitectura	Painting - turbine room floor epoxy finish	40,000.0	sf	Contr	Contr	0.80	0.045	36.36	1,805	1.09	0	32,000	yes	1,920	71,197	1,958	103,197	0	$103,197	HDR|CB Estimated Quantity
105	rchitectura	Restrooms, showers, locker rooms	1.0	lot	Contr	Contr	125,000.00	1200	53.33	1,200	1.09	0	125,000	YES	7,500	69,438	1,302	194,438	0	$194,438	HDR|CB Estimated Quantity
106	rchitectura	Roof Drains	1,700.0	lf	Contr	Contr	32.50	2.0	54.96	3,400	1.09	0	55,250	yes	3,315	202,758	3,689	258,008	0	$258,008	HDR|CB Estimated Quantity
107	rchitectura	Structural Steel - Misc Building Steel	25.0	ton	Contr	Contr	3,200.00	30	60.25	750	1.09	0	80,000	yes	4,800	49,026	814	129,026	0	$129,026	HDR|CB Estimated Quantity
108	rchitectura	Structural Steel - Pipe Rack	600.0	ton	Contr	Contr	3,400.00	20	60.25	12,000	1.09	0	2,040,000	NO	0	784,409	13,020	2,824,409	0	$2,824,409	HDR|CB Estimated Quantity
109	rchitectura	Structural Steel - Misc Platforms	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	NO	0	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
110	rchitectura	Structural Steel - Turbine Building Framing	500.0	ton	Contr	Contr	2,850.00	15	60.25	7,500	1.09	0	1,425,000	NO	0	490,255	8,138	1,915,255	0	$1,915,255	HDR|CB Estimated Quantity
111	rchitectura	Trench Floor Drain Cover	2,000.0	lf	Contr	Contr	60.45	0.4	54.96	800	1.09	0	120,900	yes	7,254	47,708	868	168,608	0	$168,608	HDR|CB Estimated Quantity
112	rchitectura	Turbine Building Built-up Roof	18,000.0	sf	Contr	Contr	0.75	0.035	35.31	630	1.09	0	13,500	NO	0	24,138	684	37,638	0	$37,638	HDR|CB Estimated Quantity
113	rchitectura	Turbine Building Metal Siding	52,900.0	sf	Contr	Contr	10.40	0.05	56.41	2,645	1.09	0	550,160	NO	0	161,876	2,870	712,036	0	$712,036	HDR|CB Estimated Quantity
114	rchitectura	Administration/Control/Maintenance Building	16,000.0	sf	Sub	Contr	140.00		38.68	0	1.09	0	0	YES	0	0	0	0	2,240,000	$2,240,000	HDR|CB Estimated Quantity
115	rchitectura	Cooling Tower, pre-engineered - Elect, Chem feed, I&C Bldg	3,000.0	sf	Sub	Contr	80.00		59.59	0	1.09	0	0	NO	0	0	0	0	240,000	$240,000	HDR|CB Estimated Quantity
116	rchitectura	Main Gate Guard House	80.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	YES	0	0	0	0	6,400	$6,400	HDR|CB Estimated Quantity
117	rchitectura	Auxilary Boiler Building	4,000.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	440,000	$440,000	HDR|CB Estimated Quantity
118	rchitectura	Water Treatment Building	0.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
119	rchitectura	Warehouse	8,000.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	NO	0	0	0	0	640,000	$640,000	HDR|CB Estimated Quantity
120	rchitectura	Boiler Feed Pump Buildings	2.0	ea	sub	Contr	300,000.00		38.68	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
121																					
122		**Division #3 - Architectural Sub-Total**								**43,138**	**1.05**	**0**	**5,385,510**		**75,471**	**2,426,063**	**46,805**	**7,811,573**	**5,766,400**	**$13,577,973**	
123																					
124	**Division #4.0 - Mechanical Piping**																				
125	**Division #4.1 - Mechanical Piping**																				
126																					
127	hanical Pip	Pipe - MS, HR, CR, BFW, LPS	**3,590.0**	lf																	
128	hanical Pip	- System - Cold Reheat (Carbon)	800.0	lf	Contr	Contr	2,600.00	7.2	54.96	5,790	1.09	0	2,080,000	NO	0	345,308	6,283	2,425,308	0	$2,425,308	HDR|CB Estimated Quantity
129	hanical Pip	- System - Feedwater (Carbon)	650.0	lf	Contr	Contr	790.00	5.6	54.96	3,666	1.09	0	513,500	NO	0	218,620	3,978	732,120	0	$732,120	HDR|CB Estimated Quantity
130	hanical Pip	- System - Hot Reheat (Alloy)	540.0	lf	Contr	Contr	3,170.00	14.4	54.96	7,766	1.09	0	1,711,800	NO	0	463,139	8,426	2,174,939	0	$2,174,939	HDR|CB Estimated Quantity
131	hanical Pip	- System - Main Steam (Alloy)	800.0	lf	Contr	Contr	3,480.00	14.4	54.96	11,506	1.09	0	2,784,000	NO	0	686,131	12,484	3,470,131	0	$3,470,131	HDR|CB Estimated Quantity
132	hanical Pip	- System - Low Pressure Steam Steam (Alloy)	800.0	lf	Contr	Contr	246.00	7.5	54.96	6,016	1.09	0	196,800	NO	0	358,762	6,527	555,562	0	$555,562	HDR|CB Estimated Quantity
133	hanical Pip	Pipe - Above Ground - Large Bore Average "	**29,610.0**	lf																	
134	hanical Pip	- System - Boilers, Vents and Drains	700.0	lf	Contr	Contr	300.00	4.14	54.96	2,895	1.09	0	210,000	NO	0	172,654	3,141	382,654	0	$382,654	HDR|CB Estimated Quantity
135	hanical Pip	- System - Aux steam drain returns	2,500.0	lf	Contr	Contr	30.00	1.22	54.96	3,055	1.09	0	75,000	NO	0	182,184	3,315	257,184	0	$257,184	HDR|CB Estimated Quantity
136	hanical Pip	- System - Building drains	1,350.0	lf	Contr	Contr	30.00	1.22	54.96	1,650	1.09	0	40,500	YES	2,430	98,379	1,790	138,879	0	$138,879	HDR|CB Estimated Quantity
137	hanical Pip	- System - Building fire protection	5,800.0	lf	Contr	Contr	18.00	1.50	54.96	8,723	1.09	0	104,400	YES	6,264	520,204	9,465	624,604	0	$624,604	HDR|CB Estimated Quantity
138	hanical Pip	- System - Building sump pumps	800.0	lf	Contr	Contr	47.00	1.55	54.96	1,241	1.09	0	37,600	YES	2,256	73,995	1,346	111,595	0	$111,595	HDR|CB Estimated Quantity
139	hanical Pip	- System - Circulating Water	1,000.0	lf	Contr	Contr	450.00	4.70	54.96	4,700	1.09	0	450,000	NO	0	280,282	5,100	730,282	0	$730,282	HDR|CB Estimated Quantity
140	hanical Pip	- System - Condensate	1,350.0	lf	Contr	Contr	190.00	2.35	54.96	3,173	1.09	0	256,500	NO	0	189,191	3,442	445,691	0	$445,691	HDR|CB Estimated Quantity
141	hanical Pip	- System - Condenser Air Extraction	300.0	lf	Contr	Contr	184.00	2.35	54.96	705	1.09	0	55,200	NO	0	42,042	765	97,242	0	$97,242	HDR|CB Estimated Quantity
142	hanical Pip	- System - Cooling water	600.0	lf	Contr	Contr	320.00	2.63	54.96	1,579	1.09	0	192,000	NO	0	94,175	1,713	286,175	0	$286,175	HDR|CB Estimated Quantity
143	hanical Pip	- System - Demineralized water	400.0	lf	Contr	Contr	27.00	0.39	54.96	154	1.09	0	10,800	NO	0	9,193	167	19,993	0	$19,993	HDR|CB Estimated Quantity
144	hanical Pip	- System - Fire Protection	300.0	lf	Contr	Contr	150.00	2.35	54.96	705	1.09	0	45,000	YES	2,700	42,042	765	87,042	0	$87,042	HDR|CB Estimated Quantity
145	hanical Pip	- System - Natural Gas High Pressure - SS	260.0	lf	Contr	Contr	52.40	0.85	54.96	220	1.09	0	13,624	YES	817	13,117	239	26,741	0	$26,741	HDR|CB Estimated Quantity
146	hanical Pip	- System - Potable water	1,000.0	lf	Contr	Contr	18.00	1.50	54.96	1,504	1.09	0	18,000	YES	1,080	89,690	1,632	107,690	0	$107,690	HDR|CB Estimated Quantity
147	hanical Pip	- System - Sanitary waste	3,000.0	lf	Contr	Contr	47.00	1.55	54.96	4,653	1.09	0	141,000	YES	8,460	277,480	5,049	418,480	0	$418,480	HDR|CB Estimated Quantity
148	hanical Pip	- System - Service Water	1,000.0	lf	Contr	Contr	184.00	1.97	54.96	1,974	1.09	0	184,000	YES	11,040	117,719	2,142	301,719	0	$301,719	HDR|CB Estimated Quantity
149	hanical Pip	- System - STG lube oil	200.0	lf	Contr	Contr	32.00	1.11	54.96	222	1.09	0	6,400	NO	0	13,239	241	19,639	0	$19,639	HDR|CB Estimated Quantity
150	hanical Pip	- System - STG oil purification	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
151	hanical Pip	- System - STG Seal Oil	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
152	hanical Pip	- System - STG Stator cooling	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
153	hanical Pip	- System - STG Steam Seal	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
154	hanical Pip	- System - Turbine drains	690.0	lf	Contr	Contr	47.00	1.55	54.96	1,070	1.09	0	32,430	NO	0	63,820	1,161	96,250	0	$96,250	HDR|CB Estimated Quantity
155	hanical Pip	- System - HRSG Blowdown	200.0	lf	Contr	Contr	18.00	1.50	54.96	301	1.09	0	3,600	NO	0	17,938	326	21,538	0	$21,538	HDR|CB Estimated Quantity
156	hanical Pip	- System - Cycle Makeup	360.0	lf	Contr	Contr	47.00	1.55	54.96	558	1.09	0	16,920	NO	0	33,298	606	50,218	0	$50,218	HDR|CB Estimated Quantity
157	hanical Pip	- System - Miscellaneous Systems Piping CS)	6,600.0	lf	Contr	Contr	47.00	1.55	54.96	10,237	1.09	0	310,200	YES	18,612	610,455	11,107	920,655	0	$920,655	HDR|CB Estimated Quantity
158	hanical Pip	Pipe - Above Ground - Small Bore	**27,055.0**	lf																	
159	hanical Pip	- System - Water Cycle Sample - Alloy	150.0	lf	Contr	Contr	13.00	0.85	54.96	127	1.09	0	1,950	NO	0	7,568	138	9,518	0	$9,518	HDR|CB Estimated Quantity
160	hanical Pip	- System - STG lube oil	300.0	lf	Contr	Contr	11.60	0.62	54.96	186	1.09	0	3,480	NO	0	11,092	202	14,572	0	$14,572	HDR|CB Estimated Quantity
161	hanical Pip	- System - CT Auxilarie	1,800.0	lf	Contr	Contr	18.00	1.13	54.96	2,030	1.09	0	32,400	NO	0	121,082	2,203	153,482	0	$153,482	HDR|CB Estimated Quantity
162	hanical Pip	- System - Instrument Air	3,100.0	lf	Contr	Contr	8.00	0.14	54.96	437	1.09	0	24,800	NO	0	26,066	474	50,866	0	$50,866	HDR|CB Estimated Quantity
163	hanical Pip	- System - Instrument Air supply	3,000.0	lf	Contr	Contr	35.00	0.28	54.96	846	1.09	0	105,000	NO	0	50,451	918	155,451	0	$155,451	HDR|CB Estimated Quantity
164	hanical Pip	- System - Service Air piping	1,300.0	lf	Contr	Contr	12.00	0.22	54.96	281	1.09	0	15,600	YES	936	16,761	305	32,361	0	$32,361	HDR|CB Estimated Quantity
165	hanical Pip	- System - Instrument Air	2,035.0	lf	Contr	Contr	11.50	0.52	54.96	1,052	1.09	0	23,403	YES	1,404	62,741	1,142	86,144	0	$86,144	HDR|CB Estimated Quantity
166	hanical Pip	- System - Service Water	900.0	lf	Contr	Contr	20.00	1.32	54.96	1,184	1.09	0	18,000	YES	1,080	70,631	1,285	88,631	0	$88,631	HDR|CB Estimated Quantity
167	hanical Pip	- System - Cycle Chemical Feed	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
168	hanical Pip	- System - Boiler Vents & Drains - Alloy	700.0	lf	Contr	Contr	20.00	1.32	54.96	921	1.09	0	14,000	YES	840	54,935	1,000	68,935	0	$68,935	HDR|CB Estimated Quantity
169	hanical Pip	- System - (HP) Main Steam - Alloy	600.0	lf	Contr	Contr	20.00	1.32	54.96	790	1.09	0	12,000	YES	720	47,087	857	59,087	0	$59,087	HDR|CB Estimated Quantity
170	hanical Pip	- System - (LP) Steam - Carbon	1,400.0	lf	Contr	Contr	18.00	1.13	54.96	1,579	1.09	0	25,200	YES	1,512	94,175	1,713	119,375	0	$119,375	HDR|CB Estimated Quantity
171	hanical Pip	- System - Hot Reheat Steam - Alloy	650.0	lf	Contr	Contr	20.00	1.32	54.96	855	1.09	0	13,000	YES	780	51,011	928	64,011	0	$64,011	HDR|CB Estimated Quantity
172	hanical Pip	- System - Cold Reheat Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
173	hanical Pip	- System - Cycle Makeup	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
174	hanical Pip	- System - Aux Steam - Carbon	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
175	hanical Pip	- System - STG Seals and Drains - Alloy	1,400.0	lf	Contr	Contr	20.00	1.32	54.96	1,842	1.09	0	28,000	YES	1,680	109,871	1,999	137,871	0	$137,871	HDR|CB Estimated Quantity
176	hanical Pip	- System - CT System - Carbon	250.0	lf	Contr	Contr	18.00	1.13	54.96	282	1.09	0	4,500	YES	270	16,817	306	21,317	0	$21,317	HDR|CB Estimated Quantity
177	hanical Pip	- System - Hydrogen - Carbon	700.0	lf	Contr	Contr	12.35	1.03	54.96	724	1.09	0	8,645	YES	519	43,164	785	51,809	0	$51,809	HDR|CB Estimated Quantity
178	hanical Pip	- System - Carbon Dioxide - Carbon	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
179	hanical Pip	- System - Miscellaneous	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
180	hanical Pip	- System - Condensate - Carbon	400.0	lf	Contr	Contr	18.00	1.13	54.96	451	1.09	0	7,200	YES	432	26,907	490	34,107	0	$34,107	HDR|CB Estimated Quantity
181	hanical Pip	- System - Closed Cycle Cooling Water - Carbon	900.0	lf	Contr	Contr	12.35	1.03	54.96	931	1.09	0	11,115	YES	667	55,496	1,010	66,611	0	$66,611	HDR|CB Estimated Quantity
182	hanical Pip	- System - Fuel Gas - Carbon	900.0	lf	Contr	Contr	18.00	1.13	54.96	1,015	1.09	0	16,200	YES	972	60,541	1,101	76,741	0	$76,741	HDR|CB Estimated Quantity
183	hanical Pip	- System - Condensed Air Extraction - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
184	hanical Pip	- System - CW Chemical Feed - Carbon	20.0	lf	Contr	Contr	18.00	1.13	54.96	23	1.09	0	360	YES	22	1,345	24	1,705	0	$1,705	HDR|CB Estimated Quantity
185	hanical Pip	- System - Nitrogen Gas System	200.0	lf	Contr	Contr	19.00	0.19	54.96	38	1.09	0	3,800	YES	228	2,242	41	6,042	0	$6,042	HDR|CB Estimated Quantity

Estimate Details

2 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
Line #																					
186	chanical Pip	- System - Waste Water Coll & Treatment - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
187	chanical Pip	- System - Chemical Waste Treatment	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
188	chanical Pip	- System - Miscellaneous Systems Piping	4,400.0	lf	Contr	Contr	12.35	1.03	54.96	4,550	1.09	0	54,340	YES	3,260	271,313	4,936	325,653	0	$325,653	HDR|CB Estimated Quantity
189	chanical Pip	Pipe - Below Ground - Large Bore	**22,665.0**	lf																	
190	chanical Pip	- System - Hydrogen	470.0	lf	Contr	Contr	20.00	0.71	54.96	331	1.09	0	9,400	NO	0	19,760	360	29,160	0	$29,160	HDR|CB Estimated Quantity
191	chanical Pip	- System - Fuel Gas	800.0	lf	Contr	Contr	170.00	1.97	54.96	1,579	1.09	0	136,000	NO	0	94,175	1,713	230,175	0	$230,175	HDR|CB Estimated Quantity
192	chanical Pip	- System - Main Circ. - HDPE	400.0	lf	Contr	Contr	15.00	1.13	54.96	451	1.09	0	6,000	NO	0	26,907	490	32,907	0	$32,907	HDR|CB Estimated Quantity
192	chanical Pip	- System - Miscellaneous Systems Piping - HDPE	7,840.0	lf	Contr	Contr	15.00	1.13	54.96	8,844	1.09	0	117,600	NO	0	527,379	9,595	644,979	0	$644,979	HDR|CB Estimated Quantity
193	chanical Pip	- System - Waste Water Treatment Piping - HDPE (Sch 17)	2,565.0	lf	Contr	Contr	6.00	0.66	54.96	1,688	1.09	0	15,390	NO	0	100,649	1,831	116,039	0	$116,039	HDR|CB Estimated Quantity
193	chanical Pip	- System - Sanitary Sewer	3,000.0	lf	Contr	Contr	15.00	1.13	54.96	3,384	1.09	0	45,000	NO	0	201,803	3,672	246,803	0	$246,803	HDR|CB Estimated Quantity
194	chanical Pip	- System - Natural Gas Low Pressure - CS	850.0	lf	Contr	Contr	30.00	1.22	54.96	1,039	1.09	0	25,500	NO	0	61,942	1,127	87,442	0	$87,442	HDR|CB Estimated Quantity
195	chanical Pip	- System - Natural Gas High Pressure - CS	500.0	lf	Contr	Contr	30.00	1.22	54.96	611	1.09	0	15,000	NO	0	36,437	663	51,437	0	$51,437	HDR|CB Estimated Quantity
196	chanical Pip	- System - Potable Water to site facilities	500.0	lf	Contr	Contr	47.00	1.55	54.96	776	1.09	0	23,500	NO	0	46,247	841	69,747	0	$69,747	HDR|CB Estimated Quantity
197	chanical Pip	- System - Cooling tower blowdown	1,160.0	lf	Contr	Contr	115.00	1.69	54.96	1,963	1.09	0	133,400	NO	0	117,046	2,130	250,446	0	$250,446	HDR|CB Estimated Quantity
198	chanical Pip	- System - Cooling tower makeup water Pipe	1,000.0	lf	Contr	Contr	115.00	1.69	39.54	1,692	1.09	0	115,000	NO	0	72,583	1,836	187,583	0	$187,583	HDR|CB Estimated Quantity
199	chanical Pip	Pipe - Below Ground - Small Bore	**790.0**	lf																	
200	chanical Pip	- System - Miscellaneous Systems Piping	790.0	lf	Contr	Contr	12.35	1.03	54.96	817	1.09	0	9,757	NO	0	48,713	886	58,470	0	$58,470	HDR|CB Estimated Quantity
201	chanical Pip	Circulating water 96" RCP	2,000.0	lf	Contr	Contr	636.00	7.52	54.96	15,040	1.09	0	1,272,000	NO	0	896,904	16,318	2,168,904	0	$2,168,904	HDR|CB Estimated Quantity
202	chanical Pip	Piping Non Destructive Examination	1.0	lot	Sub	Contr	75,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	75,000	$75,000	HDR|CB Estimated Quantity
203	chanical Pip	Steam Blows	1.0	lot	Sub	Contr	150,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	150,000	$150,000	HDR|CB Estimated Quantity
204	chanical Pip	Stress relieving LB Alloy	50.0	ea	Contr	Contr	1,500.00	80.00	54.96	4,000	1.09	0	75,000	NO	0	238,538	4,340	313,538	0	$313,538	HDR|CB Estimated Quantity
205																					
206		**Division #4.1 - Mechanical Piping Sub-Total**	**83,710.0**	**LF**						149,860		0	11,964,868		70,424	8,908,523	162,598	20,873,391	225,000	$21,098,391	
207																					
208	**Division #4.2 - Mechanical Valves**																				
209																					
210	chanical Va	Valves - Large Bore General Service	500.0	ea	Contr	Contr	636.00	16.92	54.96	8,460	1.09	0	318,000	NO	0	504,508	9,179	822,508	0	$822,508	HDR|CB Estimated Quantity
211	chanical Va	Valves - Large Bore HP 900# to 3800#	100.0	ea	Contr	Contr	6,750.00	56.4	54.96	5,640	1.09	0	675,000	NO	0	336,339	6,119	1,011,339	0	$1,011,339	HDR|CB Estimated Quantity
212	chanical Va	Valves - Large Bore LP Circ Water	4.0	ea	Contr	Contr	197,500.00	112.8	54.96	451	1.09	0	790,000	NO	0	26,907	490	816,907	0	$816,907	HDR|CB Estimated Quantity
213	chanical Va	Valves - Small Bore - I/A supply	100.0	ea	Contr	Contr	17.50	1.88	54.96	188	1.09	0	1,750	NO	0	11,211	204	12,961	0	$12,961	HDR|CB Estimated Quantity
214	chanical Va	Valves - Small Bore - Instrument piping	500.0	ea	Contr	Contr	270.00	1.88	54.96	940	1.09	0	135,000	NO	0	56,056	1,020	191,056	0	$191,056	HDR|CB Estimated Quantity
215	chanical Va	Valves - Small Bore Bronze	40.0	ea	Contr	Contr	480.00	2.82	54.96	113	1.09	0	19,200	NO	0	6,727	122	25,927	0	$25,927	HDR|CB Estimated Quantity
216	chanical Va	Valves - Small Bore Class 800	250.0	ea	Contr	Contr	305.00	2.82	54.96	705	1.09	0	76,250	NO	0	42,042	765	118,292	0	$118,292	HDR|CB Estimated Quantity
217	chanical Va	Valves - Small Bore HP 1500# Alloy & CS	150.0	ea	Contr	Contr	670.00	15.04	54.96	2,256	1.09	0	100,500	NO	0	134,536	2,448	235,036	0	$235,036	HDR|CB Estimated Quantity
218	chanical Va	Valves - Small Bore HP 3800# Alloy	30.0	ea	Contr	Contr	3,050.00	22.56	54.96	677	1.09	0	91,500	NO	0	40,361	734	131,861	0	$131,861	HDR|CB Estimated Quantity
219	chanical Va	Valves - By Pass	1.0	ea	Contr	Contr	1,000,000.00	75.2	54.96	75	1.09	0	1,000,000	NO	0	4,485	82	1,004,485	0	$1,004,485	HDR|CB Estimated Quantity
220																					
221																					
222		**Division #4.2 - Mechanical Valves Sub-Total**	**1,675.0**	**ea**						19,505		$0	3,207,200		0	1,163,172	21,163	4,370,372	0	$4,370,372	
223																					
224	**Division #4.3 - Mechanical Insulation & Coatings**																				
225																					
226	Insulation	Insulation - BOP Equipment	16,000.0	sf	Contr	Contr	15.00	0.5	46.60	8,000	1.09	0	240,000	NO	0	404,462	8,680	644,462	0	$644,462	HDR|CB Estimated Quantity
227	Insulation	Insulation - Piping Freeze Protection	2,000.0	lf	Contr	Contr	3.50	0.2	46.60	400	1.09	0	7,000	NO	0	20,223	434	27,223	0	$27,223	HDR|CB Estimated Quantity
228	Insulation	Insulation - Piping Large Bore BOP	7,460.0	lf	Contr	Contr	15.00	0.5	46.60	3,730	1.09	0	111,900	NO	0	188,580	4,047	300,480	0	$300,480	HDR|CB Estimated Quantity
229	Insulation	Insulation - Piping Large Bore High Temp	3,590.0	lf	Contr	Contr	50.00	1.5	46.60	5,385	1.09	0	179,500	NO	0	272,253	5,843	451,753	0	$451,753	HDR|CB Estimated Quantity
230	Insulation	Insulation - Piping Small Bore	23,720.0	lf	Contr	Contr	8.00	0.23	46.60	5,456	1.09	0	189,760	NO	0	275,823	5,919	465,583	0	$465,583	HDR|CB Estimated Quantity
231																					
232																					
233		**Division #4.3 - Mechanical Insulation & Coatings Sub-Total**								22,971		0	728,160		0	1,161,341	24,923	1,889,501	0	$1,889,501	
234																					
235																					
236	**Division #4.4 - Mechanical Engineered Pipe Hangers (Including Supplemental Support Steel)**																				
237																					
238	hanical Pipe H	Hangers & Supports - (Large Bore Engineered)	200	ea	Contr	Contr	1,760.00	12.5	54.96	2,502	1.09	0	352,311	NO	0	149,218	2,715	501,529	0	$501,529	HDR|CB Estimated Quantity
239	hanical Pipe H	Hangers & Supports - (Large Bore Rigid)	1558	ea	Contr	Contr	192.50	7.1	54.96	11,065	1.09	0	299,996	NO	0	659,844	12,005	959,840	0	$959,840	HDR|CB Estimated Quantity
240	hanical Pipe H	Hangers & Supports - (Small Bore Rigid)	1933	ea	Contr	Contr	88.00	1.5	54.96	2,899	1.09	0	170,060	NO	0	172,866	3,145	342,926	0	$342,926	HDR|CB Estimated Quantity
241																					
242		**Division #4.4 - Mechanical Engineered Pipe Hangers Sub-Total**								16,466		0	822,367		0	981,928	17,865	1,804,294	0	$1,804,294	
243																					
244	**Division #4.5 - Mechanical Accessories**																				
245																					
246	nical Acces	Instr. Air Supply filter regulators	40.0	ea	Contr	Contr	132.00	2.4	54.96	96	1.09	0	5,280	NO	0	5,725	104	11,005	0	$11,005	HDR|CB Estimated Quantity
247	nical Acces	Expansion Joints - Circ Water	2.0	ea	Contr	Contr	75,000.00	210	54.96	420	1.09	0	150,000	NO	0	25,047	456	175,047	0	$175,047	HDR|CB Estimated Quantity
248	nical Acces	Miscellaneous Specialties	1.0	lot	Contr	Contr	75,000.00	600	54.96	600	1.09	0	75,000	NO	0	35,781	651	110,781	0	$110,781	HDR|CB Estimated Quantity
249	nical Acces	Miscellaneous Strainers, traps, Exp Joints	1.0	ls	Contr	Contr	125,000.00	120	54.96	120	1.09	0	125,000	NO	0	7,156	130	132,156	0	$132,156	HDR|CB Estimated Quantity
250	nical Acces	Miscellaneous Trolleys & Hoists	1.0	ls	Contr	Contr	150,000.00	480	54.96	480	1.09	0	150,000	NO	0	28,625	521	178,625	0	$178,625	HDR|CB Estimated Quantity
251																					
252		**Division #4.5 - Mechanical Accessories Sub-Total**								1,716		0	505,280		0	102,333	1,862	607,613	0	$607,613	
253																					
254		**Division #4 - Mechanical Piping**								**210,517**		**0**	**17,227,875**		**70,424**	**12,317,297**	**228,411**	**29,545,171**	**225,000**	**$29,770,171**	
255																					
256	**Division #5.0 - Mechanical Equipment**																				
257																					
258	**Division #5.1 - Boiler Equipment**																				
259																					
260	HRSG	Heat Recovery Steam Generator with Duct Burner/CO/Penthouse	2.0	ea	Contr	Contr	23,635,685.01		69.04	0	1.09	0	47,271,370	NO	0	0	0	47,271,370	0	$47,271,370	OEM Budget Proposal
261	HRSG	Steam Generator Erection	2.0	ea	Contr	Contr		66,500	69.04	133,000	1.09	0	0	NO	0	9,963,361	144,305	9,963,361	0	$9,963,361	HDR|CB Estimated cost
262																					
263		**Division #5.1 - Boiler Equipment Sub-Total**								**133,000**		**0**	**47,271,370**		**0**	**9,963,361**	**144,305**	**57,234,731**	**0**	**$57,234,731**	
264																					
265	**Division #5.2 - Turbine Equipment**																				
266																					
267	STG	Steam Turbine Generator	1.0	ea	Contr	Contr	37,180,000.00		53.33	0	1.09	0	37,180,000	NO	0	0	0	37,180,000	0	$37,180,000	Recent Vender quote
268	STG	Steam Turbine Generator, Erection	1.0	ea	Contr	Contr		20,000	53.33	20,000	1.09	0	0	NO	0	1,157,299	21,700	1,157,299	0	$1,157,299	HDR|CB Estimated cost
269																					
270		**Division #5.2 - Turbine Equipment Sub-Total**								**20,000**		**0**	**37,180,000**		**0**	**1,157,299**	**21,700**	**38,337,299**	**0**	**38,337,299**	
271																					
272	**Division #5.3 - Not Used**																				
273																					

Estimate Details

Print Date: 2/24/2013

2 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
274	**Division #5.4 - Mechanical Draft Cooling Tower**																				
275																					
276	Cooling Tw	Cooling Tower - Mechanical Draft (F&E)	1.0	Is	Sub	Contr	5,390,000.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	5,390,000	$5,390,000	Recent Vender quote
277																					
278		**Division #5.4 - Mechanical Draft Cooling Tower Sub-Total**								**0**		**0**	**0**		**0**	**0**	**0**	**0**	**5,390,000**	**5,390,000**	
279																					
280	**Division #5.5 - Combustion Turbine Equipment**																				
281																					
282	CT	Combustion Turbine	1.0	ea	Contr	Contr	99,800,000.00		53.33	0	1.09	0	99,800,000	NO	0	0	0	99,800,000	0	$99,800,000	OEM Budget Proposal
283	CT	Combustion Turbine, Installation	2.0	ea	Contr	Contr		29,000	53.33	58,000	1.09	0	0	NO	0	3,356,166	62,930	3,356,166	0	$3,356,166	HDR|CB Estimated cost
284																					
285																					
286		**Division #5.4 - Combustion Turbine Equipment Sub-Total**								**58,000**		**0**	**99,800,000**		**0**	**3,356,166**	**62,930**	**103,156,166**	**0**	**103,156,166**	
287																					
288	**Division #5.6 - BOP Mechanical Equipment**																				
289																					
290	Equipment	Blowdown Tank	4.0	ea	Contr	Contr	16,600.00	20	54.96	80	1.09	0	66,400	NO	0	4,771	87	71,171	0	$71,171	HDR|CB Estimated cost
291	Equipment	Closed Cooling Water Exchanger	2.0	ea	Contr	Contr	1,039,500.00	300	54.96	600	1.09	0	2,079,000	NO	0	35,781	651	2,114,781	0	$2,114,781	HDR|CB Estimated cost
292	Equipment	Closed Cooling Water Inhibitor Mixing Pot	1.0	ea	Contr	Contr	3,000.00	8	54.96	8	1.09	0	3,000	NO	0	477	9	3,477	0	$3,477	HDR|CB Estimated cost
293	Equipment	Closed Cooling Water (CCW) Heat Exchanger Strainer (Shell & Tube	2.0	ea	Contr	Contr	34,000.00	10	54.96	20	1.09	0	68,000	NO	0	1,193	22	69,193	0	$69,193	HDR|CB Estimated cost
294	Equipment	Instrument Air Receivers	2.0	ea	Contr	Contr	5,000.00	44	54.96	88	1.09	0	10,000	NO	0	5,248	95	15,248	0	$15,248	HDR|CB Estimated cost
295	Equipment	Main Condenser	1.0	ea	Contr	Contr	4,400,000.00	9000	65.52	9,000	1.09	0	4,400,000	NO	0	639,756	9,765	5,039,756	0	$5,039,756	Recent Vender quote
296	Equipment	Oil/Water Separator	1.0	ea	Contr	Contr	50,000.00	244	54.96	244	1.09	0	50,000	NO	0	14,551	265	64,551	0	$64,551	HDR|CB Estimated cost
297	Equipment	Plant Air Compressors	2.0	ea	Contr	Contr	140,000.00	100	54.96	200	1.09	0	280,000	NO	0	11,927	217	291,927	0	$291,927	HDR|CB Estimated cost
298	Equipment	Plant Air Dryers	2.0	ea	Contr	Contr	30,000.00	100	54.96	200	1.09	0	60,000	NO	0	11,927	217	71,927	0	$71,927	HDR|CB Estimated cost
299	Equipment	Plant Air Receivers	2.0	ea	Contr	Contr	5,000.00	20	54.96	40	1.09	0	10,000	NO	0	2,385	43	12,385	0	$12,385	HDR|CB Estimated cost
302	Equipment	Pumps - Circulating Water	2.0	ea	Contr	Contr	750,000.00	500	54.96	1,000	1.09	0	1,500,000	NO	0	59,635	1,085	1,559,635	0	$1,559,635	HDR|CB Estimated cost
303	Equipment	Pumps - Auxiliary Cooling Water	1.0	ea	Contr	Contr	120,000.00	96	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
304	Equipment	Pumps - Closed Cooling Water	2.0	ea	Contr	Contr	134,000.00	200	53.33	400	1.09	0	268,000	NO	0	23,146	434	291,146	0	$291,146	HDR|CB Estimated cost
306	Equipment	Pumps - Boiler Feed	2.0	ea	Contr	Contr	663,000.00	1200	53.33	2,400	1.09	0	1,326,000	NO	0	138,876	2,604	1,464,876	0	$1,464,876	HDR|CB Estimated cost
307	Equipment	Pumps - Condensate	2.0	ea	Contr	Contr	195,000.00	200	53.33	400	1.09	0	390,000	NO	0	23,146	434	413,146	0	$413,146	HDR|CB Estimated cost
308	Equipment	Pumps - Service water	2.0	ea	Contr	Contr	160,000.00	210	53.33	420	1.09	0	320,000	NO	0	24,303	456	344,303	0	$344,303	HDR|CB Estimated cost
309	Equipment	Pumps - Fire Water (Electric and Diesel)	0.0	lt	Contr	Contr	500,000.00	310	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
310	Equipment	Pumps - Sump - Blowdown, Waste Water	2.0	ea	Contr	Contr	30,000.00	24	53.33	48	1.09	0	60,000	NO	0	2,778	52	62,778	0	$62,778	HDR|CB Estimated cost
311	Equipment	Pumps - Sump - Power Island Misc Building Sumps	6.0	ea	Contr	Contr	30,000.00	24	53.33	144	1.09	0	180,000	NO	0	8,333	156	188,333	0	$188,333	HDR|CB Estimated cost
314	Equipment	Pumps - Demin Water Transfer	2.0	ea	Contr	Contr	66,000.00	48	53.33	96	1.09	0	132,000	NO	0	5,555	104	137,555	0	$137,555	HDR|CB Estimated cost
318	Equipment	Pumps - Treated Water Transfer to Serv Water Tank	2.0	ea	Contr	Contr	40,000.00	80	53.33	160	1.09	0	80,000	NO	0	9,258	174	89,258	0	$89,258	HDR|CB Estimated cost
319	Equipment	Pumps - Waste Water	2.0	ea	Contr	Contr	80,000.00	125	53.33	250	1.09	0	160,000	NO	0	14,466	271	174,466	0	$174,466	HDR|CB Estimated cost
320	Equipment	Pumps - Evaporative Cooling Water	2.0	ea	Contr	Contr	37,000.00	80	53.33	160	1.09	0	74,000	NO	0	9,258	174	83,258	0	$83,258	HDR|CB Estimated cost
321	Equipment	Sample Analysis Panel (water)	2.0	ea	Contr	Contr	200,000.00	139	54.96	278	1.09	0	400,000	NO	0	16,578	302	416,578	0	$416,578	HDR|CB Estimated cost
322	Equipment	Tank - 200,000 gal treated water/service water - (F&E)	0.0	ea	Sub	Contr	540,000.00	0		0	1.09	0	0	yes	0	0	0	0	0	$0	Furnish and Erect price
323	Equipment	Tank - Demin Water Storage 200,000 gal. (F&E)	1.0	ea	Sub	Contr	600,000.00	0		0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	Furnish and Erect Price
324	Equipment	Tank - Turbine Drains	2.0	ea	Contr	Contr	75,000.00	200	53.33	400	1.09	0	150,000	NO	0	23,146	434	173,146	0	$173,146	HDR|CB Estimated cost
325	Equipment	Tank - Closed Cooling Water Dispersant 10,000 gal.	1.0	ea	Contr	Contr	36,500.00	100	54.96	100	1.09	0	36,500	NO	0	5,963	109	42,463	0	$42,463	HDR|CB Estimated cost
326	Equipment	Tank - Closed Cooling Water Accumulator	1.0	ea	Contr	Contr	20,600.00	44	54.96	44	1.09	0	20,600	NO	0	2,624	48	23,224	0	$23,224	HDR|CB Estimated cost
329	Equipment	Aqueous Ammonia System Unloading, Storage Tank, Forwarding Pu	0.0	ea	Contr	Contr	0.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
331	Equipment	Auxiliary Boiler System	1.0	ea	Contr	Contr	1,600,000.00	400	53.33	400	1.09	0	1,600,000	NO	0	23,146	434	1,623,146	0	$1,623,146	HDR|CB Estimated cost
332	Equipment	Compressed Gas Storage System (CO2)	1.0	ea	Contr	Contr	40,000.00	475	54.96	475	1.09	0	40,000	NO	0	28,326	515	68,326	0	$68,326	HDR|CB Estimated cost
333	Equipment	Compressed Gas Storage System (H2)	1.0	ea	Contr	Contr	40,000.00	198	54.96	198	1.09	0	40,000	NO	0	11,808	215	51,808	0	$51,808	HDR|CB Estimated cost
334	Equipment	Compressed Gas Storage System (N2)	2.0	ea	Contr	Contr	20,000.00	370	54.96	740	1.09	0	40,000	NO	0	44,130	803	84,130	0	$84,130	HDR|CB Estimated cost
335	Equipment	Demineralized Water Treatment System Dual 100% Trains	0.0	ea	Contr	Contr	1,197,000.00	4000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
336	Equipment	Condensate Polisher and Related	1.0	ea	Contr	Contr	1,000,000.00	3600	54.96	3,600	1.09	0	1,000,000	NO	0	214,684	3,906	1,214,684	0	$1,214,684	HDR|CB Estimated cost
337	Equipment	Fuel Gas Filter Separators	2.0	ea	Contr	Contr	210,000.00	200	54.96	400	1.09	0	420,000	NO	0	23,854	434	443,854	0	$443,854	Sub Budgetary Quote
338	Equipment	Fuel Gas Performance Heater	2.0	ea	Contr	Contr	761,600.00	300	54.96	600	1.09	0	1,523,200	NO	0	35,781	651	1,558,981	0	$1,558,981	Sub Budgetary Quote
339	Equipment	Fuel Gas Electric Startup Heater	2.0	ea	Contr	Contr	84,000.00	40	54.96	80	1.09	0	168,000	NO	0	4,771	87	172,771	0	$172,771	HDR|CB Estimated cost
340	Equipment	Fuel Gas Drain Tank	2.0	ea	Contr	Contr	2,000.00	15	54.96	30	1.09	0	4,000	NO	0	1,789	33	5,789	0	$5,789	HDR|CB Estimated cost
341	Equipment	Fuel Gas Dewpoint Heater	1.0	ea	Contr	Contr	476,000.00	80	54.96	80	1.09	0	476,000	NO	0	4,771	87	480,771	0	$480,771	HDR|CB Estimated cost
342	Equipment	Fuel Gas Scrubber	1.0	ea	Contr	Contr	392,000.00	60	54.96	60	1.09	0	392,000	NO	0	3,578	65	395,578	0	$395,578	HDR|CB Estimated cost
343	Equipment	Hydrogen Generator	1.0	ea	Contr	Contr	194,000.00	40	54.96	40	1.09	0	194,000	NO	0	2,385	43	196,385	0	$196,385	HDR|CB Estimated cost
344	Equipment	Steam Silencers	1.0	ea	Contr	Contr	150,000.00	20	54.96	20	1.09	0	150,000	NO	0	1,193	22	151,193	0	$151,193	HDR|CB Estimated cost
345	Equipment	Condensate Water Strainer	1.0	ea	Contr	Contr	150,000.00	40	54.96	40	1.09	0	150,000	NO	0	2,385	43	152,385	0	$152,385	HDR|CB Estimated cost
346	Equipment	Cycle Chem Feed	1.0	ea	Contr	Contr	200,000.00	100	54.96	100	1.09	0	200,000	NO	0	5,963	109	205,963	0	$205,963	HDR|CB Estimated cost
347	Equipment	Cooling Tower Chemical Feed	1.0	ea	Contr	Contr	250,000.00	300	54.96	300	1.09	0	250,000	NO	0	17,890	326	267,890	0	$267,890	HDR|CB Estimated cost
348	Equipment	Condeser Vaccum Pump/Air Removal Equipment	1.0	ea	Contr	Contr	350,000.00	40	54.96	40	1.09	0	350,000	NO	0	2,385	43	352,385	0	$352,385	HDR|CB Estimated cost
349	Equipment	Turbine Room Bridge Crane - 60T	1.0	ea	Contr	Contr	390,000.00	120	53.33	120	1.09	0	390,000	NO	0	6,944	130	396,944	0	$396,944	HDR|CB Estimated cost
350	Equipment	Elevator for 2 HRSG	1.0	ea	sub	contr	746,000.00	0		0	1.09	0	0	NO	0	0	0	0	746,000	$746,000	HDR|CB Estimated cost
351																					
352		**Division #5.6 BOP Mechanical Equipment Sub-Total**								**24,199**		**0**	**19,630,700**		**0**	**1,536,419**	**26,256**	**21,167,119**	**1,346,000**	**22,513,119**	
353																					
354	**Division #6.0 - Electrical Equipment**																				
355																					
356	Electrical	Eqpt - 24kv Bus Isolated Phase, 8000A	600.0	lf	Contr	Contr	750.00	8	50.09	4,800	1.09	0	450,000	NO	0	260,890	5,208	710,890	0	$710,890	HDR|CB Estimated cost
357	Electrical	Eqpt - 24kv Bus Isolated Phase, 9000A	300.0	lf	Contr	Contr	900.00	8	50.09	2,400	1.09	0	270,000	NO	0	130,445	2,604	400,445	0	$400,445	HDR|CB Estimated cost
358	Electrical	Eqpt - Bus 6.9kV non-seg	200.0	lf	Contr	Contr	510.00	4	50.09	800	1.09	0	102,000	NO	0	43,482	868	145,482	0	$145,482	HDR|CB Estimated cost
359	Electrical	Eqpt - Bus Duct 480V, 2500A	480.0	lf	Contr	Contr	610.00	3.2	50.09	1,536	1.09	0	292,800	NO	0	83,485	1,667	376,285	0	$376,285	HDR|CB Estimated cost
360	Electrical	Eqpt - Generator Breaker, 8000A, 24kV	3.0	ea	Contr	Contr	450,000.00	300	50.09	900	1.09	0	1,350,000	NO	0	48,917	977	1,398,917	0	$1,398,917	HDR|CB Estimated cost
361	Electrical	Eqpt - LV Switchgear - 480V, 4000A EO Main Ckt Bkr	6.0	ea	Contr	Contr	35,000.00	56	50.09	336	1.09	0	210,000	NO	0	18,262	365	228,262	0	$228,262	HDR|CB Estimated cost
362	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Main Ckt Bkr.	2.0	ea	Contr	Contr	15,400.00	30	50.09	60	1.09	0	30,800	NO	0	3,261	65	34,061	0	$34,061	HDR|CB Estimated cost
363	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Tie Ckt Bkr.	3.0	ea	Contr	Contr	15,400.00	30	50.09	90	1.09	0	46,200	NO	0	4,892	98	51,092	0	$51,092	HDR|CB Estimated cost
364	Electrical	Eqpt - LV Switchgear - 480V, 1200A EO Tie Ckt Bkr.	1.0	ea	Contr	Contr	10,780.00	26	50.09	26	1.09	0	10,780	NO	0	1,413	28	12,193	0	$12,193	HDR|CB Estimated cost
365	Electrical	Eqpt - LV Switchgear - 480V, 800A MO Fdr Ckt Bkr.	16.0	ea	Contr	Contr	4,575.00	22	50.09	352	1.09	0	73,200	NO	0	19,132	382	92,332	0	$92,332	HDR|CB Estimated cost
366	Electrical	Eqpt - LV Switchgear - 480V, 800A Equipped Space	6.0	ea	Contr	Contr	1,090.00	13.2	50.09	79	1.09	0	6,540	NO	0	4,305	86	10,845	0	$10,845	HDR|CB Estimated cost
367	Electrical	Eqpt - Motor Control Centers - 480V	16.0	ea	Contr	Contr	46,000.00	132	50.09	2,112	1.09	0	736,000	NO	0	114,792	2,292	850,792	0	$850,792	HDR|CB Estimated cost
368	Electrical	Eqpt - MV Switchgear - 7kV, 3000A Main Ckt Bkr.	1.00	ea	Contr	Contr	79,640.00	76	50.09	76	1.09	0	79,640	NO	0	4,131	82	83,771	0	$83,771	HDR|CB Estimated cost
369	Electrical	Eqpt - MV Switchgear - 7kV, 2000A Fdr Ckt Bkr.	2.00	ea	Contr	Contr	42,870.00	72	50.09	144	1.09	0	85,740	NO	0	7,827	156	93,567	0	$93,567	HDR|CB Estimated cost
370	Electrical	Eqpt - MV Switchgear - 7kV, 1200A Fdr Ckt Bkr.	20.00	ea	Contr	Contr	36,360.00	48	50.09	960	1.09	0	727,200	NO	0	52,178	1,042	779,378	0	$779,378	HDR|CB Estimated cost
371	Electrical	Eqpt - Relay panels and Metering	3.0	ea	Contr	Contr	34,500.00	120.00	50.09	360	1.09	0	103,500	NO	0	19,567	391	123,067	0	$123,067	HDR|CB Estimated cost
372	Electrical	Eqpt - Station Batteries 125 Volt DC/Charger	1.0	lot	Contr	Contr	350,000.00	635	50.09	635	1.09	0	350,000	NO	0	34,514	689	384,514	0	$384,514	HDR|CB Estimated cost
373	Electrical	Eqpt - Transformer GSU - 283 MVA, 18kV-345kV	2.0	ea	Contr	Contr	2,100,000.00	950	50.09	1,900	1.09	0	4,200,000	NO	0	103,269	2,062	4,303,269	0	$4,303,269	HDR|CB Estimated cost

Estimate Details

2 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
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Conceptual

STATUS DATE: 22-Feb-13

Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
374	Electrical	Eqpt - Transformer GSU - 415 MVA, 18kV-345kV	1.0	ea	Contr	Contr	3,600,000.00	950	50.09	950	1.09	0	3,600,000	NO	0	51,634	1,031	3,651,634	0	$3,651,634	HDR|CB Estimated cost
375	Electrical	Eqpt - Transformer UAT 33 MVA, 18kV/6.9kV	2.0	ea	Contr	Contr	900,000.00	650	50.09	1,300	1.09	0	1,800,000	NO	0	70,658	1,411	1,870,658	0	$1,870,658	HDR|CB Estimated cost
376	Electrical	Eqpt - Emergency Diesel Gnerator packaged 750kW	1.0	ea	Contr	Contr	200,000.00	100	50.09	100	1.09	0	200,000	NO	0	5,435	109	205,435	0	$205,435	HDR|CB Estimated cost
377	Electrical	Eqpt - UPS (120VAC)	1.0	ea	Contr	Contr	300,000.00	528	50.09	528	1.09	0	300,000	NO	0	28,698	573	328,698	0	$328,698	HDR|CB Estimated cost
378	Electrical	Eqpt - Transformer Aux Power 2.5/3.3MVA, 7kV-480V	4.0	ea	Contr	Contr	104,500.00	210	50.09	840	1.09	0	418,000	NO	0	45,656	911	463,656	0	$463,656	HDR|CB Estimated cost
379	Electrical	Eqpt - Lighting Transformers	8.0	ea	Contr	Contr	916.27	9.09	50.09	73	1.09	0	7,330	YES	440	3,953	79	11,283	0	$11,283	HDR|CB Estimated cost
380	Electrical	Eqpt - Panelboards 480/120 & 480/277/120	8.0	ea	Contr	Contr	1,200.00	40.00	50.09	320	1.09	0	9,600	YES	576	17,393	347	26,993	0	$26,993	HDR|CB Estimated cost
381	Electrical	Eqpt - Plant Network System	1.0	ea	Contr	Contr	100,000.00	300	50.09	300	1.09	0	100,000	YES	6,000	16,306	326	116,306	0	$116,306	HDR|CB Estimated cost
382	Electrical	Eqpt - Plant Security System	1.0	lot	Contr	Contr	250,000.00	1800	50.09	1,800	1.09	0	250,000	YES	15,000	97,834	1,953	347,834	0	$347,834	HDR|CB Estimated cost
383	Electrical	Eqpt - Plant Telephone System	1.0	ea	Contr	Contr	100,000.00	500	50.09	500	1.09	0	100,000	YES	6,000	27,176	543	127,176	0	$127,176	HDR|CB Estimated cost
384																					
385		**Division #6.0 - Electrical Equipment Sub-Total**								**24,277**		**0**	**15,909,330**		**28,016**	**1,319,501**	**26,340**	**17,228,831**	**0**	**17,228,831**	
386																					
387	**Division #6.1 - Electrical/Control Commodities**																				
388																					
389	Electrical	Grounding - Buried Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
390	Electrical	Grounding - Above Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
391	Electrical	Grounding - Ground Rods Copper	96.0	ea	Contr	Contr	22.95	1.74	50.09	167	1.09	0	2,204	NO	0	9,079	181	11,283	0	$11,283	HDR|CB Estimated Quantity & Cost
392	Electrical	Grounding - Exothermic Connections	2,850.0	ea	Contr	Contr	9.75	1.14	50.09	3,249	1.09	0	27,788	NO	0	176,590	3,525	204,377	0	$204,377	HDR|CB Estimated Quantity & Cost
393	Electrical	Grounding - Servit Post	1,328.8	ea	Contr	Contr	30.00	1	50.09	1,107	1.09	0	39,864	NO	0	60,146	1,201	100,010	0	$100,010	HDR|CB Estimated Quantity & Cost
394	Electrical	Conduit A/G 5" RGS	1,000.0	lf	Contr	Contr	58.00	1.00	50.09	1,000	1.09	0	58,000	NO	0	54,352	1,085	112,352	0	$112,352	HDR|CB Estimated Quantity & Cost
395	Electrical	Conduit A/G 2" ave RGS	85,000.0	lf	Contr	Contr	8.50	0.30	50.09	25,500	1.09	0	722,500	NO	0	1,385,978	27,668	2,108,478	0	$2,108,478	HDR|CB Estimated Quantity & Cost
396	Electrical	Conduit U/G - 4 x 6 PVC 5"	8,000.0	lf	Contr	Contr	240.00	2.00	50.09	16,000	1.09	0	1,920,000	NO	0	869,633	17,360	2,789,633	0	$2,789,633	HDR|CB Estimated Quantity & Cost
397	Electrical	Conduit U/G - 8 x 8 PVC 5"	700.0	lf	Contr	Contr	530.00	5.00	50.09	3,500	1.09	0	371,000	NO	0	190,232	3,798	561,232	0	$561,232	HDR|CB Estimated Quantity & Cost
398	Electrical	Cable Tray, Raceway 24" Aluminum	5,200.0	lf	Contr	Contr	17.00	0.84	50.09	4,368	1.09	0	88,400	NO	0	237,410	4,739	325,810	0	$325,810	HDR|CB Estimated Quantity & Cost
399	Electrical	Cable Tray, Raceway 36" Aluminum	2,200.0	lf	Contr	Contr	20.00	1.05	50.09	2,310	1.09	0	44,000	NO	0	125,553	2,506	169,553	0	$169,553	HDR|CB Estimated Quantity & Cost
400	Electrical	Cable - Overhead Conductor to Substation	2,250.0	lf	Contr	Contr	8.50	0.50	50.09	1,125	1.09	0	19,125	NO	0	61,146	1,221	80,271	0	$80,271	HDR|CB Estimated Quantity & Cost
401	Electrical	Cable - Medium Voltage (7kV 1C Cable)	80,000.0	lf	Contr	Contr	14.60	0.127	50.09	10,160	1.09	0	1,168,000	NO	0	552,217	11,024	1,720,217	0	$1,720,217	HDR|CB Estimated Quantity & Cost
402	Electrical	Cable Terminations - 7kV	96.0	ea	Contr	Contr	195.00	12.00	50.09	1,152	1.09	0	18,720	NO	0	62,614	1,250	81,334	0	$81,334	HDR|CB Estimated Quantity & Cost
403	Electrical	Cable 600V Power 1/c No. 2/0 ave size	160,000.0	lf	Contr	Contr	3.55	0.041	50.09	6,560	1.09	0	568,000	NO	0	356,550	7,118	924,550	0	$924,550	HDR|CB Estimated Quantity & Cost
404	Electrical	Wire 600V Power 3/c # 10 ave. size	250,000.0	lf	Contr	Contr	0.27	0.0185	50.09	4,625	1.09	0	67,500	NO	0	251,378	5,018	318,878	0	$318,878	HDR|CB Estimated Quantity & Cost
405	Electrical	Cable - Fiber Optic	16,500.0	lf	Contr	Contr	6.00	0.025	50.09	413	1.09	0	99,000	NO	0	22,420	448	121,420	0	$121,420	HDR|CB Estimated Quantity & Cost
406	Electrical	Cable - Permanent Telephone Line	1.0	ls	Contr	Contr	10,000.00	240.000	50.09	240	1.09	0	10,000	NO	0	13,044	260	23,044	0	$23,044	HDR|CB Estimated Quantity & Cost
407	Electrical	Cable - Control	600,000.0	lf	Contr	Contr	1.10	0.040	50.09	24,000	1.09	0	660,000	NO	0	1,304,450	26,040	1,964,450	0	$1,964,450	HDR|CB Estimated Quantity & Cost
408	Electrical	Cable - Instrument 4pr tw/shld No. 18	400,000.0	lf	Contr	Contr	3.25	0.025	50.09	10,000	1.09	0	1,300,000	NO	0	543,521	10,850	1,843,521	0	$1,843,521	HDR|CB Estimated Quantity & Cost
409	Electrical	Cable - Thermocouple 2pr tw/shld No. 16	13,000.0	lf	Contr	Contr	0.33	0.030	50.09	390	1.09	0	4,290	NO	0	21,197	423	25,487	0	$25,487	HDR|CB Estimated Quantity & Cost
410	Electrical	Cable - Data Highway	24,068.0	lf	Contr	Contr	4.59	0.034	50.09	828	1.09	0	110,472	NO	0	45,000	898	155,472	0	$155,472	HDR|CB Estimated Quantity & Cost
411	Electrical	Cable Terminations - low voltage	30,500.0	ea	Contr	Contr	0.85	0.300	50.09	9,150	1.09	0	25,925	NO	0	497,321	9,928	523,246	0	$523,246	HDR|CB Estimated Quantity & Cost
412	Electrical	Cable Terminations - control	31,500.0	ea	Contr	Contr	0.54	0.300	50.09	9,450	1.09	0	17,010	NO	0	513,627	10,253	530,637	0	$530,637	HDR|CB Estimated Quantity & Cost
413	Electrical	Cable Terminations - instrument	32,800.0	ea	Contr	Contr	0.54	0.300	50.09	9,840	1.09	0	17,712	NO	0	534,824	10,676	552,536	0	$552,536	HDR|CB Estimated Quantity & Cost
414	Electrical	Conduit - Lighting A/G	33,000.0	lf	Contr	Contr	2.83	0.25	50.09	8,250	1.09	0	93,390	YES	5,603	448,405	8,951	541,795	0	$541,795	HDR|CB Estimated Quantity & Cost
415	Electrical	Wire - Lighting 1/C No 12	80,000.0	lf	Contr	Contr	0.176	0.018	50.09	1,440	1.09	0	14,080	YES	845	78,267	1,562	92,347	0	$92,347	HDR|CB Estimated Quantity & Cost
416	Electrical	Lighting - Outdoor Fixtures, pole	30.0	ea	Contr	Contr	1,600.00	12.00	50.09	360	1.09	0	48,000	YES	2,880	19,567	391	67,567	0	$67,567	HDR|CB Estimated Quantity & Cost
417	Electrical	Lighting - Outdoor Fixtures, 150W	320.0	ea	Contr	Contr	490.00	4.00	50.09	1,280	1.09	0	156,800	NO	0	69,571	1,389	226,371	0	$226,371	HDR|CB Estimated Quantity & Cost
418	Electrical	Lighting - Fixtures, 250W	80.0	ea	Contr	Contr	850.00	3.00	50.09	240	1.09	0	68,000	NO	0	13,044	260	81,044	0	$81,044	HDR|CB Estimated Quantity & Cost
419	Electrical	Lighting - Fixtures, fluorescent	180.0	ea	Contr	Contr	85.00	1.60	50.09	288	1.09	0	15,300	YES	918	15,653	312	30,953	0	$30,953	HDR|CB Estimated Quantity & Cost
420	Electrical	Lighting - Receptacles and switches	200.0	ea	Contr	Contr	32.00	1.37	50.09	273	1.09	0	6,400	YES	384	14,864	297	21,264	0	$21,264	HDR|CB Estimated Quantity & Cost
421	Electrical	Welding Receptacles	24.0	ea	Contr	Contr	1,800.00	4.00	50.09	96	1.09	0	43,200	NO	0	5,218	104	48,418	0	$48,418	HDR|CB Estimated Quantity & Cost
422	Electrical	Lighting - Exit	66.0	ea	Contr	Contr	150.00	2.00	50.09	132	1.09	0	9,900	YES	594	7,174	143	17,074	0	$17,074	HDR|CB Estimated Quantity & Cost
423	Electrical	Lighting - Emergency	120.0	ea	Contr	Contr	127.00	2.00	50.09	240	1.09	0	15,240	YES	914	13,044	260	28,284	0	$28,284	HDR|CB Estimated Quantity & Cost
424	Electrical	Cathodic Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
425	Electrical	Lightning Protection System	1.0	lot	Contr	Contr	100,000.00	200	50.09	200	1.09	0	100,000	YES	6,000	10,870	217	110,870	0	$110,870	HDR|CB Estimated Quantity & Cost
426	Electrical	Freeze Protection System	1.0	lot	Contr	Contr	800,000.00	5000	50.09	5,000	1.09	0	800,000	YES	48,000	271,760	5,425	1,071,760	0	$1,071,760	HDR|CB Estimated Quantity & Cost
427	Electrical	Electrical Circuit Testing	6,183.3	ea	Contr	Contr		2	50.09	12,367	1.09	0	0	NO	0	672,148	13,418	672,148	0	$672,148	HDR|CB Estimated Quantity & Cost
428		**Total Cable**	**1,545,819.0**	**LF**																	
429																					
430		**Division #6.1 - Electrical/Control Commodities Sub-Total**								**180,099**		**0**	**9,213,019**		**72,139**	**9,788,760**	**195,408**	**19,001,779**	**0**	**19,001,779**	
431																					
432	**Division #6.2 - Switchyard**																				
433																					
434	IV Electrica	138kV Dead End Towers 6 Legged (3 total)	150,000.0	lb	Contr	Contr	2.50	0.01	60.25	2,180	1.09	0	375,000	NO	0	142,500	2,365	517,500		$517,500	HDR|CB Estimated Quantity & Cost
435	IV Electrica	Interonnection Cabling and Termination Allowance	1.0	lot	Contr	Contr	15,000.00	1,526.36	51.33	1,526	1.09	0	15,000	NO	0	85,000	1,656	100,000		$100,000	HDR|CB Estimated Quantity & Cost
436																					
437		**Division #6.2 - Switchyard**								**3,706**		**0**	**$390,000**		**0**	**$227,500**	**$4,021**	**$617,500**	**$0**	**$617,500**	
438																					
439	**Division #7.0 - Instrumentation & Control**																				
440																					
441	I & C	BOP Instrument Devices	1,200.0	ea	Contr	Contr	750.00	12	50.09	14,400	1.09	0	900,000	NO	0	782,670	15,624	1,682,670	0	$1,682,670	HDR|CB Estimated Quantity & Cost
442	I & C	Auxiliary Boiler CEMS	1.0	lot	Contr	Contr	163,200.00	200	50.09	200	1.09	0	163,200	NO	0	10,870	217	174,070	0	$174,070	HDR|CB Estimated Quantity & Cost
443	I & C	Continuous Emissions Monitoring Equipment (CEMS)	2.0	ea	Contr	Contr	700,000.00	2000	53.33	4,000	1.09	0	1,400,000	NO	0	231,460	4,340	1,631,460	0	$1,631,460	HDR|CB Estimated Quantity & Cost
444	I & C	Control Valves	220.0	ea	Contr	Contr	4,000.00	24	54.96	5,280	1.09	0	880,000	NO	0	314,871	5,729	1,194,871	0	$1,194,871	HDR|CB Estimated Quantity & Cost
445	I & C	DCS w/ Configuration, Interfaces, Field Support, Interface, Bulks	1.0	ea	Contr	Contr	1,700,000.00	1691	50.09	1,691	1.09	0	1,700,000	NO	0	91,909	1,835	1,791,909	0	$1,791,909	HDR|CB Estimated Quantity & Cost
446	I & C	Emergency Trip sub Panel	1.0	ea	Contr	Contr	30,000.00	21	50.09	21	1.09	0	30,000	NO	0	1,141	23	31,141	0	$31,141	HDR|CB Estimated Quantity & Cost
447	I & C	Flow Element - Nozzle (Supply)	6.0	ea	Contr	Contr	30,000.00	20	54.96	120	1.09	0	180,000	NO	0	7,156	130	187,156	0	$187,156	HDR|CB Estimated Quantity & Cost
448	I & C	Instrument Calibration and loop check	1,500.0	ea	Contr	Contr	0.00	3	50.09	4,500	1.09	0	0	NO	0	244,584	4,883	244,584	0	$244,584	HDR|CB Estimated Quantity & Cost
449	I & C	Instrument piping 2&3-valve manifolds	284.0	ea	Contr	Contr	400.00	5.22	54.96	1,481	1.09	0	113,600	NO	0	88,331	1,607	201,931	0	$201,931	HDR|CB Estimated Quantity & Cost
450	I & C	Instrument Racks & Enclosures	1.0	lot	Contr	Contr	350,000.00	1450	50.09	1,450	1.09	0	350,000	NO	0	78,811	1,573	428,811	0	$428,811	HDR|CB Estimated Quantity & Cost
451	I & C	Instrument Tubing - copper	6,000.0	lf	Contr	Contr	3.70	0.15	54.96	900	1.09	0	22,200	NO	0	53,671	977	75,871	0	$75,871	HDR|CB Estimated Quantity & Cost
452	I & C	Instrument Tubing - Stainless Steel	2,500.0	lf	Contr	Contr	6.25	0.20	54.96	500	1.09	0	15,625	NO	0	29,817	543	45,442	0	$45,442	HDR|CB Estimated Quantity & Cost
453	I & C	PLC Hardware, Bulks, Aux Controls, Configuration	1.0	ls	Contr	Contr	241,200.00	253	50.09	253	1.09	0	241,200	NO	0	13,751	275	254,951	0	$254,951	HDR|CB Estimated Quantity & Cost
454																					
455		**Division #7.0 - Control Sub-Total**								**34,796**		**0**	**5,995,825**		**0**	**1,949,043**	**37,754**	**7,944,868**	**0**	**$7,944,868**	
456																					
457		**Sub-Total Direct Costs**								**909,417**		**0**	**272,707,089**	**0**		**51,988,403**	**986,195**	**324,695,492**	**24,877,400**	**349,572,892**	
458		Sales Tax - State (Plant Production Equipment is Exempt)	6.00%												**393,268**				**393,268**	**393,268**	Sales Tax Included for Non-Production Facilities
459	Indirects																				

Estimate Details

2 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
460		**TOTAL DIRECT COSTS**								**909,417**		**0**	**272,707,089**			**51,988,403**	**986,195**	**324,695,492**	**25,270,668**	**$349,966,160**	
461																					
462	**Division #8.0 - Construction and Indirect Services**																				
463																					
464	Const Indirec	Construction Equipment	1.0	ls	Contr	Contr	12,055,653			0	1.09					0	0	0	12,055,653	$12,055,653	See Construction Equipment worksheet
465	Const Indirec	Construction Field staff	1.0	ls	Contr	Contr	11,522,855			0	1.09					0	0	0	11,522,855	$11,522,855	See EPC Field Staff Worksheet for details
466	Const Indirec	Construction Field staff expenses	1.0	ls	Contr	Contr	1,870,168			0	1.09					0	0	0	1,870,168	$1,870,168	See EPC Field Staff Worksheet for details
467	Const Indirec	Construction Permits	1.0	ls	Contr	Contr				0	1.09		51,450			0	0	51,450	0	$51,450	See Const Indirects and Serv Worksheet
468	Const Indirec	Construction Testing	1.0	ls	Contr	Contr				0	1.09		117,000			0	0	117,000	0	$117,000	See Const Indirects and Serv Worksheet
469	Const Indirec	Consumable Materials & Safety Supplies	2.00	$/MH	Contr	Contr	1,972,391			0	1.09					0	0	0	1,972,391	$1,972,391	$2.00/Direct hour
470	Const Indirec	Field Office Expenses	1.0	ls	Contr	Contr				1,369	1.09		1,033,370			65,849	1,485	1,099,219	22,373	$1,121,592	See Const Indirects and Serv Worksheet
471	Const Indirec	Performance Testing	1.0	ls	Contr	Contr				0	1.09		304,400			0	0	304,400	0	$304,400	See Const Indirects and Serv Worksheet
472	Const Indirec	Preoperational Testing, Startup & Commissioning	2.0	ls	Contr	Contr				21,690	1.09		1,113,000			752,767	23,534	1,865,767	0	$1,865,767	See Const Indirects and Serv Worksheet
473	Const Indirec	Site Safety	1.0	ls	Contr	Contr				7,580	1.09		658,040			375,008	8,224	1,033,048	0	$1,033,048	See Const Indirects and Serv Worksheet
474	Const Indirec	Small Tools	2.00	$/MH	Contr	Contr	1,972,391			0	1.09					0	0	0	1,972,391	$1,972,391	$2.00/Direct hour
475	Const Indirec	Start-up Supervision	1.0	ls	Contr	Contr	1,296,911			0	1.09					0	0	0	1,296,911	$1,296,911	See EPC Field Staff Worksheet for details
476	Const Indirec	Support Craft, Site Services, Scaffolding	1.0	ls	Contr	Contr				41,753	1.09		459,400			2,008,704	45,302	2,468,104	775,014	$3,243,118	See Const Indirects and Serv Worksheet
477	Const Indirec	Temporary Facilities	1.0	ls	Contr	Contr				17,947	1.09		2,336,753			863,403	19,472	3,200,157	82,500	$3,282,657	See Const Indirects and Serv Worksheet
478	Const Indirec	Temporary Utilities	1.0	ls	Contr	Contr				29,032	1.09		747,600			1,396,697	31,500	2,144,297	0	$2,144,297	See Const Indirects and Serv Worksheet
479																					
480		**Division #8.0 - Construction Indirects and Services Sub-Total**								**119,371**		**0**	**6,821,013**			**5,462,428**	**129,518**	**12,283,441**	**31,570,255**	**$43,853,697**	
481																					
482		**SUB-TOTAL CONSTRUCTION COST**								**1,028,788**		**0**	**279,528,102**			**57,450,831**	**1,115,713**	**336,978,933**	**56,840,923**	**393,819,857**	
483		**Subcontract Labor Hours**																			
484		**Material Cost Excluding CT, HRSG and ST (escalation and EPC**											**95,276,732**								
485	**Division #9.0 - Project Indirects**																				
486																					
487	Project Indire	- Power Plant Design Engineering	1.0	ls	Contr	6.0%	23,629,191											0	23,629,191	$23,629,191	6.0% of the Total Construction Cost
488	Project Indire	- Project Management (Home Office)	0.0	ls	Contr	0.0%	0											0	0	$0	Included in Engineering
489																					
490																					
491		Sub-Total Project Indirects										**0**	**0**			**0**	**0**	**0**	**23,629,191**	**$23,629,191**	
492																					
493	EPC Indirect	EPC Contractor Insurance & Misc Costs (% of Total Const. Cost)																			
494																					
495	EPC Indirect	- Builders Risk Insurance	1.0	ls	Contr	0.50%	1,969,099												1,969,099	$1,969,099	Allowance based on info from other projects
496	EPC Indirect	- Comprehensive General Liability (CGL) Insurance	1.0	ls	Contr	0.50%	1,969,099											0	1,969,099	$1,969,099	Allowance based on info from other projects
497	EPC Indirect	- Warranty Reserve	1.0	ls	Contr		500,000											0	500,000	$500,000	Allowance based on info from other projects
498																					
499		Sub-Total EPC Contractor Indirects										**0**	**0**			**0**	**0**	**0**	**4,438,199**	**$4,438,199**	
500																					
501		**Total Project Indirects**										**0**	**0**			**0**	**0**	**0**	**28,067,390**	**28,067,390**	
502																					
503		Sub-Total										**0**	**279,528,102**			**57,450,831**	**1,115,713**	**336,978,933**	**84,908,313**	**$421,887,247**	
504							Equipment	Material	Labor	S/C											
505	Project Indire	Escalation - EPC Contractor Escalation Rates					2.4%	2.4%	4.0%	4.0%			7,089,754			9,051,541	0	16,141,295	7,757,137	23,898,432	Excludes CT, HRSG and ST
506																					
507		Sub-Total										**0**	**286,617,856**			**66,502,372**	**1,115,713**	**353,120,228**	**92,665,451**	**$445,785,679**	
508							Equip	Mat	Labor	S/C											
509	EPC Indirect	EPC Contractor Contingency	Varies	%	Contr		0%	5%	5%	5%		0	4,763,837			3,325,119		8,088,955	4,333,773	12,422,728	Excludes CT, HRSG and ST
510	EPC Indirect	EPC Contractor G&A and Fee	8.0%	%	Contr		1.0%	8.0%	8.0%	8.0%		0	22,929,429			5,320,190		28,249,618	7,413,236	35,662,854	
511																					
512		Sub-Total		ls								0	27,693,265			8,645,308	0	36,338,573	11,747,009	$48,085,582	
513																					
514		**TOTAL EPC PROJECT COST**								**1,028,788**		**0**	**314,311,121**			**75,147,680**	**1,115,713**	**389,458,802**	**104,412,459**	**$493,871,261**	
515																					
516	**OWNER INDIRECTS**																				
517	**Division #9.1 - Owner Indirects**																				
518																					
519		**Power Block 1 and Common**																			
520	Owner Indire	Project Development	1.0	ls	Owner														6,500,000	$6,500,000	Budget provided by LG&E
521	Owner Indire	Transmission Line Relocation	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
522	Owner Indire	Transmission Interconnection Facilities	1.0	ls	Owner														5,500,000	$5,500,000	To be estimated by Transmision Operator
523	Owner Indire	Natural Gas Pipeline Interconnection	1.0	ls	Owner														14,250,000	$14,250,000	Budget provided by LG&E
524	Owner Indire	Natural Gas Pipeline Fixed O&M (Startup Period)	1.0	ls	Owner														6,000,000	$6,000,000	Budget provided by LG&E
525	Owner Indire	Construction Power (Service Installation and Energy)	1.0	ls	Owner														750,000	$750,000	Budget estimated by HDR|CB
526	Owner Indire	Owner Operations Personnel (Prior to COD)	1.0	ls	Owner														2,340,000	$2,340,000	Budget estimated by HDR|CB 7 sal @ 12 mo, 26 hr @ 6 n
527	Owner Indire	Owners Project Management	1.0	ls	Owner														5,300,000	$5,300,000	Budget provided by LG&E
528	Owner Indire	Owners Engineer	1.0	ls	Owner														1,900,000	$1,900,000	Budget provided by LG&E
529	Owner Indire	Owners Legal Counsel	1.0	ls	Owner														1,300,000	$1,300,000	Budget provided by LG&E
530	Owner Indire	Operator Training	1.0	ls	Owner														225,000	$225,000	Budget estimated by HDR|CB
531	Owner Indire	Owner Startup Engineering	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
532	Owner Indire	Permitting, License Fees, & Environmental Compliance	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
533	Owner Indire	Highway Improvements, Miscellaneous Mitigation	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
534	Owner Indire	Land	1.0	ls	Owner														0	$0	Budget provided by LG&E
535	Owner Indire	Rolling Stock	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
536	Owner Indire	Water Infrastructure / Supply to Site	0.0	ls	Owner														0	$0	N/A (On site intake/pre-treatment/discharge incl. in EPC)
537	Owner Indire	Startup Testing (Includes Fuel & Power Sales)																			
538	Owner Indire	- Fuel - Natural Gas	1.0	ls	Owner														12,160,800	$12,160,800	HDR|CB [2,702,400 MMBTU @ $4.50/MMBTU per LG&E 2017 Forecas
539	Owner Indire	- Fuel - Fuel Oil	0.0	ls	Owner														0	$0	Budget estimated by HDR|CB [Not Required]
540	Owner Indire	- Electric Transmission Firm Point to Point	1.0	ls	Owner														4,000,000	$4,000,000	Budget provided by LG&E
541	Owner Indire	- Startup Power	1.0	ls	Owner														391,104	$391,104	Budget estimated by HDR|CB [10,864 MWhr @$36/MWH]
542	Owner Indire	- Test Power Sales	1.0	ls	Owner														(15,552,000)	($15,552,000)	Budget estimated by HDR|CB [432,000 MWhr @$36/MWH
543	Owner Indire	- Variable O&M - Water, Chemicals, etc.	1.0	ls	Owner														1,200,000	$1,200,000	Budget estimated by HDR|CB
544	Owner Indire	Site Security	1.0	ls	Owner														50,000	$50,000	Budget estimated by HDR|CB
545	Owner Indire	Operating Spare Parts	1.0	ls	Owner														10,000,000	$10,000,000	Budget estimated by HDR|CB - Does NOT incl. CT LTSA
546	Owner Indire	Permanent Plant Equipment & Furnishings																		$0	
547	Owner Indire	- Office Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB

Estimate Details

2 x 1 GE 7F5 Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
548	Owner Indire	- Kitchen Furniture	1.0	ls	Owner														130,000	$130,000	Budget estimated by HDR|CB
549	Owner Indire	- Laboratory Equipment & Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
550	Owner Indire	- Locker Room Furniture	1.0	ls	Owner														180,000	$180,000	Budget estimated by HDR|CB
551	Owner Indire	- Warehouse Shelves	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
552	Owner Indire	- Workshop Tools & Test Equipment	1.0	ls	Owner														1,800,000	$1,800,000	Budget estimated by HDR|CB
553	Owner Indire	IT and Telecommunication Infrastructure	1.0	ls	Owner														250,000	$250,000	Budget estimated by HDR|CB
554	Owner Indire	NERC - Cyber Security	1.0	ls	Owner														1,000,000	$1,000,000	Budget estimated by HDR|CB
555	Owner Indire	Escalation - Owners Furnished Equipment	0.0	%	Owner														0	$0	N/A
556	Owner Indire	Builders Risk Insurance	0.0	ls	Owner														0	$0	Included with EPC Contractor Indirects
557	Owner Indire	Property Tax During Construction	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
558	Owner Indire	Financing Fees	0.0	ls	Owner														0	$0	N/A
559	Owner Indire	AFUDC	1.0	ls	Owner														5,350,000	$5,350,000	AFUDC Based on 78% KU Ownership
560		**Total Owner Indirects**																	**69,224,904**	**$69,224,904**	
561																					
562																					
563		**Owner Contingency**	10.00%	%	Owner														**49,387,126**	**$49,387,126**	
564																					
565																					
566		**Total Owner Indirects**																	**118,612,030**	**$118,612,030**	
567																					
568		**TOTAL PROJECT COST**										**0**	**314,311,121**			**75,147,680**	**1,115,713**	**389,458,802**	**223,024,489**	**$612,483,291**	
569																					
																			$/kW	**$1,025**	

LG&E KU

2 x 1 Siemens F Class Combined Cycle Unit

BUDGET ESTIMATE

5 x 10 Work Week

February 22, 2013

Rev 3

HDR

CONFIDENTIAL

2 x 1 Siemens F Class Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 670.4
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
Site Development	**$0**	**$1,787,885**	**$1,537,001**	**36,870**	**250,000**	**$3,574,886**	**0.7%**
Raw Water Intake/Discharge Facilities	**$0**	**$500,000**	**$578,649**	**10,850**	**0**	**$1,078,649**	**0.2%**
Foundations & Concrete	**$0**	**$6,415,575**	**$4,963,370**	**128,270**	**11,900,000**	**$23,278,945**	**4.7%**
Architectural & Metals	**$0**	**$5,385,510**	**$2,426,063**	**46,805**	**5,766,400**	**$13,577,973**	**2.7%**
Piping, Valves, Support, Accessories	**$0**	**$17,191,839**	**$12,217,857**	**226,564**	**225,000**	**$29,634,696**	**6.0%**
HRSG Equipment	**$0**	**$47,271,370**	**$9,963,361**	**144,305**	**0**	**$57,234,731**	**11.5%**
Steam Turbine Island Equipment	**$0**	**$40,968,521**	**$1,157,299**	**21,700**	**0**	**$42,125,819**	**8.5%**
Combustion Turbine Equipment	**$0**	**$106,923,337**	**$3,356,166**	**62,930**	**0**	**$110,279,503**	**22.2%**
Mechanical Draft Cooling Tower	**$0**	**$0**	**$0**	**0**	**5,390,000**	**$5,390,000**	**1.1%**
BOP Mechanical Equipment	**$0**	**$19,436,700**	**$1,534,034**	**26,213**	**1,346,000**	**$22,316,734**	**4.5%**
Electrical Equipment	**$0**	**$15,909,330**	**$1,319,501**	**26,340**	**0**	**$17,228,831**	**3.5%**
Electrical Commodities	**$0**	**$9,213,019**	**$9,788,760**	**195,408**	**0**	**$19,001,779**	**3.8%**
High Voltage Switchyard	**$0**	**$390,000**	**$227,500**	**4,021**	**0**	**$617,500**	**0.1%**
Instrumentation & Controls	**$0**	**$5,995,825**	**$1,949,043**	**37,754**	**0**	**$7,944,868**	**1.6%**
Sub-Total Direct Costs:	**$0**	**$277,388,911**	**$51,018,604**	**968,030**	**$24,877,400**	**$353,284,915**	**71.1%**
State Sales Tax (Non-Production Material Only)					**392,527**	**$392,527**	**0.1%**
Total Direct Cost	**$0**	**$277,388,911**	**$51,018,604**	**968,030**	**$25,269,927**	**$353,677,442**	**71.1%**
Construction Indirects & Services							
- Construction Field Staff			**$0**	**0**	**$11,522,855**	**$11,522,855**	**2.3%**
- Construction Field Staff Expenses			**$0**	**0**	**$1,870,168**	**$1,870,168**	**0.4%**
- Construction Equipment			**$0**	**0**	**$12,055,653**	**$12,055,653**	**2.4%**
- Small Tools			**$0**	**0**	**$1,936,059**	**$1,936,059**	**0.4%**
- Consumable Materials & Safety Supplies			**$0**	**0**	**$1,936,059**	**$1,936,059**	**0.4%**
- Field Office Expense		**$1,033,370**	**$65,849**	**1,485**	**$22,373**	**$1,121,592**	**0.2%**
- Temporary Facilities		**$2,336,753**	**$863,403**	**19,472**	**$82,500**	**$3,282,657**	**0.7%**
- Temporary Utilities		**$747,600**	**$1,396,697**	**31,500**	**$0**	**$2,144,297**	**0.4%**
- Support Craft & Site Services		**$459,400**	**$2,008,704**	**45,302**	**$775,014**	**$3,243,118**	**0.7%**
- Site Safety		**$658,040**	**$375,008**	**8,224**	**$0**	**$1,033,048**	**0.2%**
- Construction Permits		**$51,450**	**$0**	**0**	**$0**	**$51,450**	**0.0%**
- Construction Testing		**$117,000**	**$0**	**0**	**$0**	**$117,000**	**0.0%**
- Performance Testing		**$304,400**	**$0**	**0**	**$0**	**$304,400**	**0.1%**
- Start-up Supervision		**$0**	**$0**	**0**	**$1,296,911**	**$1,296,911**	**0.3%**
- Preop Testing, Start-up		**$1,113,000**	**$752,767**	**23,534**	**$0**	**$1,865,767**	**0.4%**
Sub-Total Construction Indirects and Services		**$6,821,013**	**$5,462,428**	**129,518**	**$31,497,593**	**$43,781,034**	**8.8%**
Total Construction Cost	**$0**	**$284,209,924**	**$56,481,032**	**1,097,547**	**$56,767,520**	**$397,458,476**	**79.9%**
Estimated Subcontract Labor Hours				**196,401**			
Project Indirects							
- Project Engineering (Eng, PM, CM & Procurement)					**$23,847,509**	**$23,847,509**	**4.8%**
Sub-Total Project Indirects	**$0**	**$0**	**$0**	**0**	**$23,847,509**	**$23,847,509**	**4.8%**
EPC Contractor Insurance & Misc Costs							
- Builders Risk					**$1,987,292**	**$1,987,292**	**0.4%**
- Comprehensive General Liability (CGL) Insurance					**$1,987,292**	**$1,987,292**	**0.4%**

2 x 1 Siemens F Class Combined Cycle Unit

LOCATION:	Kentucky
PROJECT #	189895
PLANT TYPE:	**NGCC**
CLIENT:	LG&E/KU
ESTIMATE TYPE:	Conceptual
LEAD ESTIMATOR:	

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013

NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018

TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 670.4
NO. OF UNITS: 1
FUEL TYPE: Nat Gas

BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
- Warranty Reserve					**$500,000**	**$500,000**	**0.1%**
Sub-Total EPC Contractor Insur. & Misc. Co	**$0**	**$0**	**$0**	**0**	**$4,474,585**	**$4,474,585**	**0.9%**
Total EPC Contractor Project Indirect Cost	**$0**	**$0**	**$0**	**0**	**$28,322,093**	**$28,322,093**	**5.7%**
- Escalation (Eqt, Materials & Labor)	**$0**	**$6,759,159**	**$8,908,957**		**$7,751,685**	**$23,419,802**	**4.7%**
Sub-Total	**0**	**290,969,084**	**65,389,989**	**1,293,948**	**92,841,298**	**449,200,371**	**90.3%**
- EPC Contractor Contingency	**$0**	**$4,452,335**	**$3,269,499**		**$4,342,565**	**$12,064,399**	**2.4%**
- EPC Contractor G&A and Profit	**$0**	**$23,277,527**	**$5,231,199**		**$7,427,304**	**$35,936,030**	**7.2%**
TOTAL EPC PROJECT COST	**$0**	**$318,698,945**	**$73,890,688**	**1,293,948**	**$104,611,167**	**$497,200,800**	**100.0%**
EPC Price per kW						**$742**	
Owner Indirect Costs							
- Total Owner Indirects						**$69,224,904**	
- Owner Contingency						**$49,720,080**	
TOTAL PROJECT COST						**$616,145,784**	
Total Project Cost per kW						**$919**	
Estimate Options (include 25 % markup for indirects)							
Fuel Oil System						**$11,250,000**	
Bypass Stack and Diverter Damper						**$12,500,013**	
Gas Compression						**Included in Base**	
SCR System to meet 12 ppm NOx						**Not Required**	
Optional SCR System						**$4,700,000**	

Total Craft Labor Hours	**1,293,948**	**erformance Guarantees:**		**Executive-in-Charge:**	**WHD**
Ave. Craft Wage without Escalation	**$52.44**	**Liquidated Damages:**		**Project Manager:**	**JPS**
Field Labor Type	**TBD**	**Special Insurance:**		**Construction Manager:**	**SMP**
Labor Productivity Factor	**1.084**	**Performance Bond:**		**Lead Estimator:**	**CDF**

Estimate Details

2 x 1 Siemens F Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
1	**Division #1.0 - Sitework**																				
2	Sitework	Roads - Asphalt paving main site rds & Parking lots	8,500.0	sy	Sub	Contr	20.00		44.43		1.09	0	0	YES	5,100	0	0	0	170,000	$170,000	HDR|CB Estimated Quantity
3	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Powerblock A	1,740.0	sy	Contr	Contr	5.00	0.055	44.43	96	1.09	0	8,700	YES	522	4,613	104	13,313	0	$13,313	HDR|CB Estimated Quantity
4	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Secondary Ar	6,945.0	sy	Contr	Contr	5.00	0.055	44.43	382	1.09	0	34,725	YES	2,084	18,412	414	53,137	0	$53,137	HDR|CB Estimated Quantity
5	Sitework	Roads - Haul/Construction Roads Treated Gravel	29,700.0	sy	Contr	Contr	8.00	0.1	44.43	2,970	1.09	0	237,600	YES	14,256	143,162	3,222	380,762	0	$380,762	HDR|CB Estimated Quantity
6	Sitework	Roads - Main Roads Crushed stone Base Course	8,500.0	sy	Contr	Contr	12.00	0.1	44.43	850	1.09	0	102,000	YES	6,120	40,972	922	142,972	0	$142,972	HDR|CB Estimated Quantity
7	Sitework	Roads - Drainage and culverts	90,000.0	sy	Contr	Contr	2.00	0.05	44.43	4,500	1.09	0	180,000	YES	10,800	216,912	4,883	396,912	0	$396,912	HDR|CB Estimated Quantity
8	Sitework	Soil Erosion Control Measures	2,160	lf	Contr	Contr	1	0.027	44.43	58	1.09	0	2,160	YES	130	2,811	58	4,971	0	4,971	HDR|CB Estimated Quantity
9	Sitework	Site - Topsoil stripping/stockpiling	10,125	cy	Contr	Contr		0.030	44.43	304	1.09	0	0	YES	0	14,642	304	14,642	0	$14,642	HDR|CB Estimated Quantity
10	Sitework	Site - Drainage - Pipe Culverts (Assume 12" dia)	3,000	lf	Contr	Contr	9.00	0.12	44.43	360	1.09	0	27,000	YES	1,620	17,353	360	44,353	0	$44,353	HDR|CB Estimated Quantity
11	Sitework	Site - Drainage - Manholes	25	ea	Contr	Contr	1,500	16	44.43	400	1.09	0	37,500	YES	2,250	19,281	400	56,781	0	$56,781	HDR|CB Estimated Quantity
14	Sitework	Site - Fire Protection hydrants, valve boxes, ductile iron	30.0	ea	Contr	Contr	3,000.00	20	39.54	600	1.09	0	90,000	YES	5,400	25,739	651	115,739	0	$115,739	HDR|CB Estimated Quantity
15	Sitework	Site - Fire Protection U/G piping, DI	4,500.0	lf	Contr	Contr	41.00	0.5	39.54	2,250	1.09	0	184,500	YES	11,070	96,520	2,441	281,020	0	$281,020	HDR|CB Estimated Quantity
16	Sitework	Pipe Utility Trench Excavation	10,500	cy	Contr	Contr		0.2	39.54	2,100	1.09	0	0	YES	0	90,086	2,100	90,086	0	$90,086	HDR|CB Estimated Quantity
17	Sitework	Pipe Utility Trench Backfill (including bedding)	9,000	cy	Contr	Contr		0.2	39.54	1,800	1.09	0	0	YES	0	77,216	1,800	77,216	0	$77,216	HDR|CB Estimated Quantity
20	Sitework	Spoil Disposal	11,250	cy	Contr	Contr		0.1	44.43	1,125	1.09	0	0	YES	0	54,228	1,125	54,228	0	$54,228	HDR|CB Estimated Quantity
21	Sitework	Site - Sanitary sewer lift stations	1.0	ea	Contr	Contr	11,700.00	40	39.54	40	1.09	0	11,700	YES	702	1,716	43	13,416	0	$13,416	HDR|CB Estimated Quantity
22	Sitework	Site - Sanitary waste piping and manholes	2,500.0	lf	Contr	Contr	20.00	1	39.54	2,500	1.09	0	50,000	YES	3,000	107,245	2,713	157,245	0	$157,245	HDR|CB Estimated Quantity
23	Sitework	Site - Storm drain piping and culverts	22,500.0	lf	Contr	Contr	12.00	0.25	39.54	5,625	1.09	0	270,000	YES	16,200	241,301	6,103	511,301	0	$511,301	HDR|CB Estimated Quantity
24	Sitework	Site Finishing - Seed Site Earthwork	6.0	ac	Contr	Contr	10,000.00	0.54	39.54	3	1.09	0	60,000	YES	3,600	139	4	60,139	0	$60,139	HDR|CB Estimated Quantity
25	Sitework	Site Finishing - Grading around foundations	7,500.0	sy	Contr	Contr		0.02	39.54	150	1.09	0	0	YES	0	6,435	163	6,435	0	$6,435	HDR|CB Estimated Quantity
26	Sitework	Site Finishing - Stone Surfacing	7,500.0	sy	Contr	Contr	10.00	0.015	39.54	113	1.09	0	75,000	YES	4,500	4,826	122	79,826	0	$79,826	HDR|CB Estimated Quantity
27	Sitework	Site Improvements - landscaping at admin building	1.0	ls	Contr	Contr	30,000.00	360	39.54	360	1.09	0	30,000	YES	1,800	15,443	391	45,443	0	$45,443	HDR|CB Estimated Quantity
28	Sitework	Site Improvements - Main Gate Security Facilities	1.0	lot	Contr	Contr	150,000.00	3600	39.54	3,600	1.09	0	150,000	YES	9,000	154,433	3,906	304,433	0	$304,433	HDR|CB Estimated Quantity
29	Sitework	Site Improvements - Site Entrance Sign and Landscaping	1.0	ls	Contr	Contr	18,750.00	240	39.54	240	1.09	0	18,750	YES	1,125	10,296	260	29,046	0	$29,046	HDR|CB Estimated Quantity
30	Sitework	Site Improvements - Site Security Boundary Fencing	18,750.0	lf	Contr	Contr	11.00	0.2	39.54	3,750	1.09	0	206,250	YES	12,375	160,867	4,069	367,117	0	$367,117	HDR|CB Estimated Quantity
31	Sitework	Site Improvements - Fencing Active gates	6.0	ea	Contr	Contr	2,000.00	48	39.54	288	1.09	0	12,000	YES	720	12,355	312	24,355	0	$24,355	HDR|CB Estimated Quantity
32	Sitework	Site Surveying	1.0	lot	Sub	Contr	80,000.00		44.43	0	1.09	0	0	YES	2,400	0	0	0	80,000	$80,000	HDR|CB Estimated Quantity
33																					
34		**Division #1 - Sitework Sub-Total**								**34,463**		**0**	**1,787,885**		**114,773**	**1,537,001**	**36,870**	**3,324,886**	**250,000**	**3,574,886**	
35																					
36	**Division #1.3 - Raw Water Intake and Discharge Facilities**																				HDR Allowance for Interconnection and Updgrage of
37		Raw Water River Intake and Discharge Facilities	1.0	ea	Contr	Contr	500,000.00	10,000	53.33	10,000	1.09	0	500,000	NO	0	578,649	10,850	1,078,649	0	$1,078,649	existing Unit 1 and 2 Intake Structure
38																					
39		**Division #1.3 - Raw Water Intake Clarification and Discharge Facilities Sub-Total**								**10,000**		**0**	**500,000**		**0**	**578,649**	**10,850**	**1,078,649**	**0**	**$1,078,649**	
40																					
41																					
42	**Division #2.0 - Earthwork and Concrete**																				
43	**Division #2.1 - Earthwork**																				
44	Earthwork	Structural Backfill Power Block (using imported material)	220,000.0	cy	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,500,000	$5,500,000	HDR|CB Estimated Quantity
45	Earthwork	Retaining Wall (MSE)	40,000.0	sf	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	1,000,000	$1,000,000	HDR|CB Estimated Quantity
46	Earthwork	Structural Excavation Main Power Block - Earth/Rock	300,000.0	cy	Sub	Contr	18.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,400,000	$5,400,000	HDR|CB Estimated Quantity
47																					
48			560,000.0	cy						0		0	0		0	0	0	0	11,900,000	11,900,000	
49	**Division # 2.2 - Concrete Main Power Block Area**																				
50																					
51		Includes Forms, Rebar, Placement, Finishing, Embeds																			
52	Concrete	HRSG and Stack	7,500	cy	Contr	Contr	250	4.5	38.69	33,750	1.09	0	1,875,000	NO	0	1,416,954	36,619	3,291,954	0	$3,291,954	HDR|CB Estimated Quantity
53	Concrete	Gas Turbine Foundation	4,000	cy	Contr	Contr	300	4.5	38.69	18,000	1.09	0	1,200,000	NO	0	755,709	19,530	1,955,709	0	$1,955,709	HDR|CB Estimated Quantity
54	Concrete	Steam Turbine building	800	cy	Contr	Contr	250	4.5	38.69	3,600	1.09	0	200,000	NO	0	151,142	3,906	351,142	0	$351,142	HDR|CB Estimated Quantity
55	Concrete	Spread Footings & Piers Pipe/Tray Trestle/Racks	400.0	cy	Contr	Contr	250	4.5	38.69	1,800	1.09	0	100,000	NO	0	75,571	1,953	175,571	0	$175,571	HDR|CB Estimated Quantity
56	Concrete	Steam Turbine Bldg fill slab	300.0	cy	Contr	Contr	210.00	4.5	38.69	1,350	1.09	0	63,000	NO	0	56,678	1,465	119,678	0	$119,678	HDR|CB Estimated Quantity
57	Concrete	Steam Turbine Bldg Mat Foundation	1,200.0	cy	Contr	Contr	250	4.5	38.69	5,400	1.09	0	300,000	NO	0	226,713	5,859	526,713	0	$526,713	HDR|CB Estimated Quantity
58	Concrete	Steam Turbine Bldg Elevated Slab	500.0	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	NO	0	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
59	Concrete	Steam Turbine Bldg sumps foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
60	Concrete	Steam Turbine Pedestal FDN (Columns & Tabletop, Mat)	2,500.0	cy	Contr	Contr	350.00	8	38.69	20,000	1.09	0	875,000	NO	0	839,677	21,700	1,714,677	0	$1,714,677	HDR|CB Estimated Quantity
61	Concrete	Aux. Equipment Foundations	500	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	YES	7,500	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
62	Concrete	Equip Fdn - Generator Breaker	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
63	Concrete	Equip Fdn - CT PEEC	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
64	Concrete	Equip Fdn - Power Distribution Center	80	cy	Contr	Contr	250	4.5	38.69	360	1.09	0	20,000	YES	1,200	15,114	391	35,114	0	$35,114	HDR|CB Estimated Quantity
65	Concrete	Equip Fdn - CEMS	40	cy	Contr	Contr	250	4.5	38.69	180	1.09	0	10,000	YES	600	7,557	195	17,557	0	$17,557	HDR|CB Estimated Quantity
66	Concrete	Equip Fdn - Boiler Feed Pump	120	cy	Contr	Contr	250	4.5	38.69	540	1.09	0	30,000	YES	1,800	22,671	586	52,671	0	$52,671	HDR|CB Estimated Quantity
67	Concrete	Equip Fdn - Main Step-up Transformer Fdn/Walls	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
68	Concrete	Equip Fdn - Plant Aux Power Transformers Fnd/Walls	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
69	Concrete	Equip Fdn - Misc off Base Equip fnds	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
70	Concrete	Elec. Ductbank (Tubes, Conc., Forms, Rebar) 12 Tubes	500.0	lf	Contr	Contr	125	0.57	38.69	285	1.09	0	62,500	NO	0	11,965	309	74,465	0	$74,465	HDR|CB Estimated Quantity
71	Concrete	Elec. Ductbank to Cooling Tower (Tubes, Conc., Forms, Rebar) 6 Tu	750.0	lf	Contr	Contr	100	0.45	38.69	338	1.09	0	75,000	NO	0	14,170	366	89,170	0	$89,170	HDR|CB Estimated Quantity
72	Concrete	Equip Fdn - Pumps & misc equipment	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
73	Concrete	Electrical Building Foundation	130.0	cy	Contr	Contr	250	4.5	38.69	585	1.09	0	32,500	NO	0	24,561	635	57,061	0	$57,061	HDR|CB Estimated Quantity
74	Concrete	Cooling Tower Basin	2,500.0	cy	Contr	Contr	250	5.5	38.69	13,750	1.09	0	625,000	NO	0	577,278	14,919	1,202,278	0	$1,202,278	HDR|CB Estimated Quantity
75	Concrete	Administration Building foundation	1,100.0	cy	Contr	Contr	250	4.5	38.69	4,950	1.09	0	275,000	YES	16,500	207,820	5,371	482,820	0	$482,820	HDR|CB Estimated Quantity
76	Concrete	Auxilary Boiler Building floor slab & foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
77	Concrete	Demineralized Water Tank Foundations	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
78	Concrete	Service water storage tank foundations	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	YES	3,000	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
79	Concrete	Main Gate Guard House	3.0	cy	Contr	Contr	250	4.5	38.69	14	1.09	0	750	YES	45	567	15	1,317	0	$1,317	HDR|CB Estimated Quantity
80	Concrete	Water Treatment Buildings, enclosures and tank fdns	0.0	cy	Contr	Contr	250	4.5	38.69	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
81	Concrete	Grouting (equipment & steel)	30.0	cy	Contr	Contr	2,227.50	81	38.69	2,430	1.09	0	66,825	NO	0	102,021	2,637	168,846	0	$168,846	HDR|CB Estimated Quantity
82																					
83		Sub Total Concrete	**24,373**				AVG MH/CY	5.15		118,221			6,415,575		32,445	4,963,370	128,270	11,378,945	0	11,378,945	
84																					
85		**Division #2 - Earthwork & Concrete Sub-Total**								**118,221**		**0**	**6,415,575**		**32,445**	**4,963,370**	**128,270**	**11,378,945**	**11,900,000**	**23,278,945**	
86																					
87	**Division #3.0 - Architectural**												-								
88																					
89	rchitectura	Exterior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
90	rchitectura	Fire extinguishers	36.0	ea	Contr	Contr	500.00	3	53.33	108	1.09	0	18,000	YES	1,080	6,249	117	24,249	0	$24,249	HDR|CB Estimated Quantity
91	rchitectura	Fire hose cabinets	26.0	ea	Contr	Contr	1,200.00	20	53.33	520	1.09	0	31,200	YES	1,872	30,090	564	61,290	0	$61,290	HDR|CB Estimated Quantity
92	rchitectura	Fire hydrants w/monitor nozzles	10.0	ea	Contr	Contr	2,550.00	12	54.96	120	1.09	0	25,500	YES	1,530	7,156	130	32,656	0	$32,656	HDR|CB Estimated Quantity
93	rchitectura	Fire protection control room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
94	rchitectura	Fire Protection Elect Equip & Cable Spreading Room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity

Estimate Details

2 x 1 Siemens F Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
Line #																					
95	rchitectura	Fire Protection GSU and Aux Transformers	1.0	ls	Sub	Contr	200,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	200,000	$200,000	HDR|CB Estimated Quantity
96	rchitectura	Fire Protection Turbine Building	1.0	ls	Sub	Contr	600,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
97	rchitectura	Fire Detection/Alarm	1.0	lot	Contr	Contr	410,000.00	1000	50.09	1,000	1.09	0	410,000	NO	0	54,352	1,085	464,352	0	$464,352	HDR|CB Estimated Quantity
98	rchitectura	HVAC System Allowance	1.0	ls	Sub	Contr	750,000.00		54.96	0	1.09	0	0	YES	22,500	0	0	0	750,000	$750,000	HDR|CB Estimated Quantity
99	rchitectura	Interior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
100	rchitectura	Masonry Walls 8" CMU	20,000.0	sf	Contr	Contr	4.00	0.15	32.95	3,000	1.09	0	80,000	yes	4,800	107,267	3,255	187,267	0	$187,267	HDR|CB Estimated Quantity
101	rchitectura	Overhead Rolling Doors - steel	4.0	ea	Contr	Contr	5,000.00	40	38.68	160	1.09	0	20,000	yes	1,200	6,715	174	26,715	0	$26,715	HDR|CB Estimated Quantity
102	rchitectura	Painting - equipment and piping	1.0	lot	Contr	Contr	100,000.00	3600	36.36	3,600	1.09	0	100,000	yes	6,000	142,016	3,906	242,016	0	$242,016	HDR|CB Estimated Quantity
103	rchitectura	Painting - structural steel, grating, handrail touch-up	250,000.0	sf	Contr	Contr	0.30	0.010	36.36	2,500	1.09	0	75,000	yes	4,500	98,622	2,713	173,622	0	$173,622	HDR|CB Estimated Quantity
104	rchitectura	Painting - turbine room floor epoxy finish	40,000.0	sf	Contr	Contr	0.80	0.045	36.36	1,805	1.09	0	32,000	yes	1,920	71,197	1,958	103,197	0	$103,197	HDR|CB Estimated Quantity
105	rchitectura	Restrooms, showers, locker rooms	1.0	lot	Contr	Contr	125,000.00	1200	53.33	1,200	1.09	0	125,000	YES	7,500	69,438	1,302	194,438	0	$194,438	HDR|CB Estimated Quantity
106	rchitectura	Roof Drains	1,700.0	lf	Contr	Contr	32.50	2.0	54.96	3,400	1.09	0	55,250	yes	3,315	202,758	3,689	258,008	0	$258,008	HDR|CB Estimated Quantity
107	rchitectura	Structural Steel - Misc Building Steel	25.0	ton	Contr	Contr	3,200.00	30	60.25	750	1.09	0	80,000	yes	4,800	49,026	814	129,026	0	$129,026	HDR|CB Estimated Quantity
108	rchitectura	Structural Steel - Pipe Rack	600.0	ton	Contr	Contr	3,400.00	20	60.25	12,000	1.09	0	2,040,000	NO	0	784,409	13,020	2,824,409	0	$2,824,409	HDR|CB Estimated Quantity
109	rchitectura	Structural Steel - Misc Platforms	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	NO	0	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
110	rchitectura	Structural Steel - Turbine Building Framing	500.0	ton	Contr	Contr	2,850.00	15	60.25	7,500	1.09	0	1,425,000	NO	0	490,255	8,138	1,915,255	0	$1,915,255	HDR|CB Estimated Quantity
111	rchitectura	Trench Floor Drain Cover	2,000.0	lf	Contr	Contr	60.45	0.4	54.96	800	1.09	0	120,900	yes	7,254	47,708	868	168,608	0	$168,608	HDR|CB Estimated Quantity
112	rchitectura	Turbine Building Built-up Roof	18,000.0	sf	Contr	Contr	0.75	0.035	35.31	630	1.09	0	13,500	NO	0	24,138	684	37,638	0	$37,638	HDR|CB Estimated Quantity
113	rchitectura	Turbine Building Metal Siding	52,900.0	sf	Contr	Contr	10.40	0.05	56.41	2,645	1.09	0	550,160	NO	0	161,876	2,870	712,036	0	$712,036	HDR|CB Estimated Quantity
114	rchitectura	Administration/Control/Maintenance Building	16,000.0	sf	Sub	Contr	140.00		38.68	0	1.09	0	0	YES	0	0	0	0	2,240,000	$2,240,000	HDR|CB Estimated Quantity
115	rchitectura	Cooling Tower, pre-engineered - Elect, Chem feed, I&C Bldg	3,000.0	sf	Sub	Contr	80.00		59.59	0	1.09	0	0	NO	0	0	0	0	240,000	$240,000	HDR|CB Estimated Quantity
116	rchitectura	Main Gate Guard House	80.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	YES	0	0	0	0	6,400	$6,400	HDR|CB Estimated Quantity
117	rchitectura	Auxilary Boiler Building	4,000.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	440,000	$440,000	HDR|CB Estimated Quantity
118	rchitectura	Water Treatment Building	0.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
119	rchitectura	Warehouse	8,000.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	NO	0	0	0	0	640,000	$640,000	HDR|CB Estimated Quantity
120	rchitectura	Boiler Feed Pump Buildings	2.0	ea	sub	Contr	300,000.00		38.68	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
121																					
122		**Division #3 - Architectural Sub-Total**								**43,138**	**1.05**	**0**	**5,385,510**		**75,471**	**2,426,063**	**46,805**	**7,811,573**	**5,766,400**	**$13,577,973**	
123																					
124	**Division #4.0 - Mechanical Piping**																				
125	**Division #4.1 - Mechanical Piping**																				
126																					
127	hanical Pip	Pipe - MS, HR, CR, BFW, LPS	**3,590.0**	lf																	
128	hanical Pip	- System - Cold Reheat (Carbon)	800.0	lf	Contr	Contr	2,600.00	7.2	54.96	5,790	1.09	0	2,080,000	NO	0	345,308	6,283	2,425,308	0	$2,425,308	HDR|CB Estimated Quantity
129	hanical Pip	- System - Feedwater (Carbon)	650.0	lf	Contr	Contr	790.00	5.6	54.96	3,666	1.09	0	513,500	NO	0	218,620	3,978	732,120	0	$732,120	HDR|CB Estimated Quantity
130	hanical Pip	- System - Hot Reheat (Alloy)	540.0	lf	Contr	Contr	3,170.00	14.4	54.96	7,766	1.09	0	1,711,800	NO	0	463,139	8,426	2,174,939	0	$2,174,939	HDR|CB Estimated Quantity
131	hanical Pip	- System - Main Steam (Alloy)	800.0	lf	Contr	Contr	3,480.00	14.4	54.96	11,506	1.09	0	2,784,000	NO	0	686,131	12,484	3,470,131	0	$3,470,131	HDR|CB Estimated Quantity
132	hanical Pip	- System - Low Pressure Steam Steam (Alloy)	800.0	lf	Contr	Contr	246.00	7.5	54.96	6,016	1.09	0	196,800	NO	0	358,762	6,527	555,562	0	$555,562	HDR|CB Estimated Quantity
133	hanical Pip	Pipe - Above Ground - Large Bore Average "	**29,610.0**	lf																	
134	hanical Pip	- System - Boilers, Vents and Drains	700.0	lf	Contr	Contr	300.00	4.14	54.96	2,895	1.09	0	210,000	NO	0	172,654	3,141	382,654	0	$382,654	HDR|CB Estimated Quantity
135	hanical Pip	- System - Aux steam drain returns	2,500.0	lf	Contr	Contr	30.00	1.22	54.96	3,055	1.09	0	75,000	NO	0	182,184	3,315	257,184	0	$257,184	HDR|CB Estimated Quantity
136	hanical Pip	- System - Building drains	1,350.0	lf	Contr	Contr	30.00	1.22	54.96	1,650	1.09	0	40,500	YES	2,430	98,379	1,790	138,879	0	$138,879	HDR|CB Estimated Quantity
137	hanical Pip	- System - Building fire protection	5,800.0	lf	Contr	Contr	18.00	1.50	54.96	8,723	1.09	0	104,400	YES	6,264	520,204	9,465	624,604	0	$624,604	HDR|CB Estimated Quantity
138	hanical Pip	- System - Building sump pumps	800.0	lf	Contr	Contr	47.00	1.55	54.96	1,241	1.09	0	37,600	YES	2,256	73,995	1,346	111,595	0	$111,595	HDR|CB Estimated Quantity
139	hanical Pip	- System - Circulating Water	1,000.0	lf	Contr	Contr	450.00	4.70	54.96	4,700	1.09	0	450,000	NO	0	280,282	5,100	730,282	0	$730,282	HDR|CB Estimated Quantity
140	hanical Pip	- System - Condensate	1,350.0	lf	Contr	Contr	190.00	2.35	54.96	3,173	1.09	0	256,500	NO	0	189,191	3,442	445,691	0	$445,691	HDR|CB Estimated Quantity
141	hanical Pip	- System - Condenser Air Extraction	300.0	lf	Contr	Contr	184.00	2.35	54.96	705	1.09	0	55,200	NO	0	42,042	765	97,242	0	$97,242	HDR|CB Estimated Quantity
142	hanical Pip	- System - Cooling water	600.0	lf	Contr	Contr	320.00	2.63	54.96	1,579	1.09	0	192,000	NO	0	94,175	1,713	286,175	0	$286,175	HDR|CB Estimated Quantity
143	hanical Pip	- System - Demineralized water	400.0	lf	Contr	Contr	27.00	0.39	54.96	154	1.09	0	10,800	NO	0	9,193	167	19,993	0	$19,993	HDR|CB Estimated Quantity
144	hanical Pip	- System - Fire Protection	300.0	lf	Contr	Contr	150.00	2.35	54.96	705	1.09	0	45,000	YES	2,700	42,042	765	87,042	0	$87,042	HDR|CB Estimated Quantity
145	hanical Pip	- System - Natural Gas High Pressure - SS	260.0	lf	Contr	Contr	52.40	0.85	54.96	220	1.09	0	13,624	YES	817	13,117	239	26,741	0	$26,741	HDR|CB Estimated Quantity
146	hanical Pip	- System - Potable water	1,000.0	lf	Contr	Contr	18.00	1.50	54.96	1,504	1.09	0	18,000	YES	1,080	89,690	1,632	107,690	0	$107,690	HDR|CB Estimated Quantity
147	hanical Pip	- System - Sanitary waste	3,000.0	lf	Contr	Contr	47.00	1.55	54.96	4,653	1.09	0	141,000	YES	8,460	277,480	5,049	418,480	0	$418,480	HDR|CB Estimated Quantity
148	hanical Pip	- System - Service Water	1,000.0	lf	Contr	Contr	184.00	1.97	54.96	1,974	1.09	0	184,000	YES	11,040	117,719	2,142	301,719	0	$301,719	HDR|CB Estimated Quantity
149	hanical Pip	- System - STG lube oil	200.0	lf	Contr	Contr	32.00	1.11	54.96	222	1.09	0	6,400	NO	0	13,239	241	19,639	0	$19,639	HDR|CB Estimated Quantity
150	hanical Pip	- System - STG oil purification	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
151	hanical Pip	- System - STG Seal Oil	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
152	hanical Pip	- System - STG Stator cooling	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
153	hanical Pip	- System - STG Steam Seal	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
154	hanical Pip	- System - Turbine drains	690.0	lf	Contr	Contr	47.00	1.55	54.96	1,070	1.09	0	32,430	NO	0	63,820	1,161	96,250	0	$96,250	HDR|CB Estimated Quantity
155	hanical Pip	- System - HRSG Blowdown	200.0	lf	Contr	Contr	18.00	1.50	54.96	301	1.09	0	3,600	NO	0	17,938	326	21,538	0	$21,538	HDR|CB Estimated Quantity
156	hanical Pip	- System - Cycle Makeup	360.0	lf	Contr	Contr	47.00	1.55	54.96	558	1.09	0	16,920	NO	0	33,298	606	50,218	0	$50,218	HDR|CB Estimated Quantity
157	hanical Pip	- System - Miscellaneous Systems Piping CS)	6,600.0	lf	Contr	Contr	47.00	1.55	54.96	10,237	1.09	0	310,200	YES	18,612	610,455	11,107	920,655	0	$920,655	HDR|CB Estimated Quantity
158	hanical Pip	Pipe - Above Ground - Small Bore	**26,055.0**	lf																	
159	hanical Pip	- System - Water Cycle Sample - Alloy	150.0	lf	Contr	Contr	13.00	0.85	54.96	127	1.09	0	1,950	NO	0	7,568	138	9,518	0	$9,518	HDR|CB Estimated Quantity
160	hanical Pip	- System - STG lube oil	300.0	lf	Contr	Contr	11.60	0.62	54.96	186	1.09	0	3,480	NO	0	11,092	202	14,572	0	$14,572	HDR|CB Estimated Quantity
161	hanical Pip	- System - CT Auxilarie	1,800.0	lf	Contr	Contr	18.00	1.13	54.96	2,030	1.09	0	32,400	NO	0	121,082	2,203	153,482	0	$153,482	HDR|CB Estimated Quantity
162	hanical Pip	- System - Instrument Air	3,100.0	lf	Contr	Contr	8.00	0.14	54.96	437	1.09	0	24,800	NO	0	26,066	474	50,866	0	$50,866	HDR|CB Estimated Quantity
163	hanical Pip	- System - Instrument Air supply	3,000.0	lf	Contr	Contr	35.00	0.28	54.96	846	1.09	0	105,000	NO	0	50,451	918	155,451	0	$155,451	HDR|CB Estimated Quantity
164	hanical Pip	- System - Service Air piping	1,300.0	lf	Contr	Contr	12.00	0.22	54.96	281	1.09	0	15,600	YES	936	16,761	305	32,361	0	$32,361	HDR|CB Estimated Quantity
165	hanical Pip	- System - Instrument Air	2,035.0	lf	Contr	Contr	11.50	0.52	54.96	1,052	1.09	0	23,403	YES	1,404	62,741	1,142	86,144	0	$86,144	HDR|CB Estimated Quantity
166	hanical Pip	- System - Service Water	900.0	lf	Contr	Contr	20.00	1.32	54.96	1,184	1.09	0	18,000	YES	1,080	70,631	1,285	88,631	0	$88,631	HDR|CB Estimated Quantity
167	hanical Pip	- System - Cycle Chemical Feed	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
168	hanical Pip	- System - Boiler Vents & Drains - Alloy	700.0	lf	Contr	Contr	20.00	1.32	54.96	921	1.09	0	14,000	YES	840	54,935	1,000	68,935	0	$68,935	HDR|CB Estimated Quantity
169	hanical Pip	- System - (HP) Main Steam - Alloy	600.0	lf	Contr	Contr	20.00	1.32	54.96	790	1.09	0	12,000	YES	720	47,087	857	59,087	0	$59,087	HDR|CB Estimated Quantity
170	hanical Pip	- System - (LP) Steam - Carbon	1,400.0	lf	Contr	Contr	18.00	1.13	54.96	1,579	1.09	0	25,200	YES	1,512	94,175	1,713	119,375	0	$119,375	HDR|CB Estimated Quantity
171	hanical Pip	- System - Hot Reheat Steam - Alloy	650.0	lf	Contr	Contr	20.00	1.32	54.96	855	1.09	0	13,000	YES	780	51,011	928	64,011	0	$64,011	HDR|CB Estimated Quantity
172	hanical Pip	- System - Cold Reheat Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
173	hanical Pip	- System - Cycle Makeup	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
174	hanical Pip	- System - Aux Steam - Carbon	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
175	hanical Pip	- System - STG Seals and Drains - Alloy	1,400.0	lf	Contr	Contr	20.00	1.32	54.96	1,842	1.09	0	28,000	YES	1,680	109,871	1,999	137,871	0	$137,871	HDR|CB Estimated Quantity
176	hanical Pip	- System - CT System - Carbon	250.0	lf	Contr	Contr	18.00	1.13	54.96	282	1.09	0	4,500	YES	270	16,817	306	21,317	0	$21,317	HDR|CB Estimated Quantity
177	hanical Pip	- System - Hydrogen - Carbon	0.0	lf	Contr	Contr	12.35	1.03	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
178	hanical Pip	- System - Carbon Dioxide - Carbon	0.0	lf	Contr	Contr	12.35	1.03	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
179	hanical Pip	- System - Miscellaneous	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
180	hanical Pip	- System - Condensate - Carbon	400.0	lf	Contr	Contr	18.00	1.13	54.96	451	1.09	0	7,200	YES	432	26,907	490	34,107	0	$34,107	HDR|CB Estimated Quantity
181	hanical Pip	- System - Closed Cycle Cooling Water - Carbon	900.0	lf	Contr	Contr	12.35	1.03	54.96	931	1.09	0	11,115	YES	667	55,496	1,010	66,611	0	$66,611	HDR|CB Estimated Quantity
182	hanical Pip	- System - Fuel Gas - Carbon	900.0	lf	Contr	Contr	18.00	1.13	54.96	1,015	1.09	0	16,200	YES	972	60,541	1,101	76,741	0	$76,741	HDR|CB Estimated Quantity
183	hanical Pip	- System - Condensed Air Extraction - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
184	hanical Pip	- System - CW Chemical Feed - Carbon	20.0	lf	Contr	Contr	18.00	1.13	54.96	23	1.09	0	360	YES	22	1,345	24	1,705	0	$1,705	HDR|CB Estimated Quantity
185	hanical Pip	- System - Nitrogen Gas System	200.0	lf	Contr	Contr	19.00	0.19	54.96	38	1.09	0	3,800	YES	228	2,242	41	6,042	0	$6,042	HDR|CB Estimated Quantity

Estimate Details

2 x 1 Siemens F Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
186	chanical Pip	- System - Waste Water Coll & Treatment - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
187	chanical Pip	- System - Chemical Waste Treatment	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
188	chanical Pip	- System - Miscellaneous Systems Piping	4,400.0	lf	Contr	Contr	12.35	1.03	54.96	4,550	1.09	0	54,340	YES	3,260	271,313	4,936	325,653	0	$325,653	HDR|CB Estimated Quantity
189	chanical Pip	Pipe - Below Ground - Large Bore	**22,195.0**	lf																	
190	chanical Pip	- System - Hydrogen	0.0	lf	Contr	Contr	20.00	0.71	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
191	chanical Pip	- System - Fuel Gas	800.0	lf	Contr	Contr	170.00	1.97	54.96	1,579	1.09	0	136,000	NO	0	94,175	1,713	230,175	0	$230,175	HDR|CB Estimated Quantity
192	chanical Pip	- System - Main Circ. - HDPE	400.0	lf	Contr	Contr	15.00	1.13	54.96	451	1.09	0	6,000	NO	0	26,907	490	32,907	0	$32,907	HDR|CB Estimated Quantity
192	chanical Pip	- System - Miscellaneous Systems Piping - HDPE	7,840.0	lf	Contr	Contr	15.00	1.13	54.96	8,844	1.09	0	117,600	NO	0	527,379	9,595	644,979	0	$644,979	HDR|CB Estimated Quantity
193	chanical Pip	- System - Waste Water Treatment Piping - HDPE (Sch 17)	2,565.0	lf	Contr	Contr	6.00	0.66	54.96	1,688	1.09	0	15,390	NO	0	100,649	1,831	116,039	0	$116,039	HDR|CB Estimated Quantity
193	chanical Pip	- System - Sanitary Sewer	3,000.0	lf	Contr	Contr	15.00	1.13	54.96	3,384	1.09	0	45,000	NO	0	201,803	3,672	246,803	0	$246,803	HDR|CB Estimated Quantity
194	chanical Pip	- System - Natural Gas Low Pressure - CS	850.0	lf	Contr	Contr	30.00	1.22	54.96	1,039	1.09	0	25,500	NO	0	61,942	1,127	87,442	0	$87,442	HDR|CB Estimated Quantity
195	chanical Pip	- System - Natural Gas High Pressure - CS	500.0	lf	Contr	Contr	30.00	1.22	54.96	611	1.09	0	15,000	NO	0	36,437	663	51,437	0	$51,437	HDR|CB Estimated Quantity
196	chanical Pip	- System - Potable Water to site facilities	500.0	lf	Contr	Contr	47.00	1.55	54.96	776	1.09	0	23,500	NO	0	46,247	841	69,747	0	$69,747	HDR|CB Estimated Quantity
197	chanical Pip	- System - Cooling tower blowdown	1,160.0	lf	Contr	Contr	115.00	1.69	54.96	1,963	1.09	0	133,400	NO	0	117,046	2,130	250,446	0	$250,446	HDR|CB Estimated Quantity
198	chanical Pip	- System - Cooling tower makeup water Pipe	1,000.0	lf	Contr	Contr	115.00	1.69	39.54	1,692	1.09	0	115,000	NO	0	72,583	1,836	187,583	0	$187,583	HDR|CB Estimated Quantity
199	chanical Pip	Pipe - Below Ground - Small Bore	**790.0**	lf																	
200	chanical Pip	- System - Miscellaneous Systems Piping	790.0	lf	Contr	Contr	12.35	1.03	54.96	817	1.09	0	9,757	NO	0	48,713	886	58,470	0	$58,470	HDR|CB Estimated Quantity
201	chanical Pip	Circulating water 96" RCP	2,000.0	lf	Contr	Contr	636.00	7.52	54.96	15,040	1.09	0	1,272,000	NO	0	896,904	16,318	2,168,904	0	$2,168,904	HDR|CB Estimated Quantity
202	chanical Pip	Piping Non Destructive Examination	1.0	lot	Sub	Contr	75,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	75,000	$75,000	HDR|CB Estimated Quantity
203	chanical Pip	Steam Blows	1.0	lot	Sub	Contr	150,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	150,000	$150,000	HDR|CB Estimated Quantity
204	chanical Pip	Stress relieving LB Alloy	50.0	ea	Contr	Contr	1,500.00	80.00	54.96	4,000	1.09	0	75,000	NO	0	238,538	4,340	313,538	0	$313,538	HDR|CB Estimated Quantity
205																					
206		**Division #4.1 - Mechanical Piping Sub-Total**	**82,240.0**	**LF**						148,495		0	11,943,118		69,683	8,827,101	161,117	20,770,219	225,000	$20,995,219	
207																					
208	**Division #4.2 - Mechanical Valves**																				
209																					
210	chanical Va	Valves - Large Bore General Service	500.0	ea	Contr	Contr	636.00	16.92	54.96	8,460	1.09	0	318,000	NO	0	504,508	9,179	822,508	0	$822,508	HDR|CB Estimated Quantity
211	chanical Va	Valves - Large Bore HP 900# to 3800#	100.0	ea	Contr	Contr	6,750.00	56.4	54.96	5,640	1.09	0	675,000	NO	0	336,339	6,119	1,011,339	0	$1,011,339	HDR|CB Estimated Quantity
212	chanical Va	Valves - Large Bore LP Circ Water	4.0	ea	Contr	Contr	197,500.00	112.8	54.96	451	1.09	0	790,000	NO	0	26,907	490	816,907	0	$816,907	HDR|CB Estimated Quantity
213	chanical Va	Valves - Small Bore - I/A supply	100.0	ea	Contr	Contr	17.50	1.88	54.96	188	1.09	0	1,750	NO	0	11,211	204	12,961	0	$12,961	HDR|CB Estimated Quantity
214	chanical Va	Valves - Small Bore - Instrument piping	500.0	ea	Contr	Contr	270.00	1.88	54.96	940	1.09	0	135,000	NO	0	56,056	1,020	191,056	0	$191,056	HDR|CB Estimated Quantity
215	chanical Va	Valves - Small Bore Bronze	40.0	ea	Contr	Contr	480.00	2.82	54.96	113	1.09	0	19,200	NO	0	6,727	122	25,927	0	$25,927	HDR|CB Estimated Quantity
216	chanical Va	Valves - Small Bore Class 800	250.0	ea	Contr	Contr	305.00	2.82	54.96	705	1.09	0	76,250	NO	0	42,042	765	118,292	0	$118,292	HDR|CB Estimated Quantity
217	chanical Va	Valves - Small Bore HP 1500# Alloy & CS	150.0	ea	Contr	Contr	670.00	15.04	54.96	2,256	1.09	0	100,500	NO	0	134,536	2,448	235,036	0	$235,036	HDR|CB Estimated Quantity
218	chanical Va	Valves - Small Bore HP 3800# Alloy	30.0	ea	Contr	Contr	3,050.00	22.56	54.96	677	1.09	0	91,500	NO	0	40,361	734	131,861	0	$131,861	HDR|CB Estimated Quantity
219	chanical Va	Valves - By Pass	1.0	ea	Contr	Contr	1,000,000.00	75.2	54.96	75	1.09	0	1,000,000	NO	0	4,485	82	1,004,485	0	$1,004,485	HDR|CB Estimated Quantity
220																					
221																					
222		**Division #4.2 - Mechanical Valves Sub-Total**	**1,675.0**	**ea**						19,505		$0	3,207,200		0	1,163,172	21,163	4,370,372	0	$4,370,372	
223																					
224	**Division #4.3 - Mechanical Insulation & Coatings**																				
225																					
226	Insulation	Insulation - BOP Equipment	16,000.0	sf	Contr	Contr	15.00	0.5	46.60	8,000	1.09	0	240,000	NO	0	404,462	8,680	644,462	0	$644,462	HDR|CB Estimated Quantity
227	Insulation	Insulation - Piping Freeze Protection	2,000.0	lf	Contr	Contr	3.50	0.2	46.60	400	1.09	0	7,000	NO	0	20,223	434	27,223	0	$27,223	HDR|CB Estimated Quantity
228	Insulation	Insulation - Piping Large Bore BOP	7,460.0	lf	Contr	Contr	15.00	0.5	46.60	3,730	1.09	0	111,900	NO	0	188,580	4,047	300,480	0	$300,480	HDR|CB Estimated Quantity
229	Insulation	Insulation - Piping Large Bore High Temp	3,590.0	lf	Contr	Contr	50.00	1.5	46.60	5,385	1.09	0	179,500	NO	0	272,253	5,843	451,753	0	$451,753	HDR|CB Estimated Quantity
230	Insulation	Insulation - Piping Small Bore	22,720.0	lf	Contr	Contr	8.00	0.23	46.60	5,226	1.09	0	181,760	NO	0	264,194	5,670	445,954	0	$445,954	HDR|CB Estimated Quantity
231																					
232																					
233		**Division #4.3 - Mechanical Insulation & Coatings Sub-Total**								22,741		0	720,160		0	1,149,713	24,674	1,869,873	0	$1,869,873	
234																					
235																					
236	**Division #4.4 - Mechanical Engineered Pipe Hangers (Including Supplemental Support Steel)**																				
237																					
238	hanical Pipe H	Hangers & Supports - (Large Bore Engineered)	200	ea	Contr	Contr	1,760.00	12.5	54.96	2,502	1.09	0	352,311	NO	0	149,218	2,715	501,529	0	$501,529	HDR|CB Estimated Quantity
239	hanical Pipe H	Hangers & Supports - (Large Bore Rigid)	1558	ea	Contr	Contr	192.50	7.1	54.96	11,065	1.09	0	299,996	NO	0	659,844	12,005	959,840	0	$959,840	HDR|CB Estimated Quantity
240	hanical Pipe H	Hangers & Supports - (Small Bore Rigid)	1861	ea	Contr	Contr	88.00	1.5	54.96	2,792	1.09	0	163,774	NO	0	166,476	3,029	330,251	0	$330,251	HDR|CB Estimated Quantity
241																					
242		**Division #4.4 - Mechanical Engineered Pipe Hangers Sub-Total**								16,359		0	816,081		0	975,538	17,749	1,791,619	0	$1,791,619	
243																					
244	**Division #4.5 - Mechanical Accessories**																				
245																					
246	nical Acces	Instr. Air Supply filter regulators	40.0	ea	Contr	Contr	132.00	2.4	54.96	96	1.09	0	5,280	NO	0	5,725	104	11,005	0	$11,005	HDR|CB Estimated Quantity
247	nical Acces	Expansion Joints - Circ Water	2.0	ea	Contr	Contr	75,000.00	210	54.96	420	1.09	0	150,000	NO	0	25,047	456	175,047	0	$175,047	HDR|CB Estimated Quantity
248	nical Acces	Miscellaneous Specialties	1.0	lot	Contr	Contr	75,000.00	600	54.96	600	1.09	0	75,000	NO	0	35,781	651	110,781	0	$110,781	HDR|CB Estimated Quantity
249	nical Acces	Miscellaneous Strainers, traps, Exp Joints	1.0	ls	Contr	Contr	125,000.00	120	54.96	120	1.09	0	125,000	NO	0	7,156	130	132,156	0	$132,156	HDR|CB Estimated Quantity
250	nical Acces	Miscellaneous Trolleys & Hoists	1.0	ls	Contr	Contr	150,000.00	480	54.96	480	1.09	0	150,000	NO	0	28,625	521	178,625	0	$178,625	HDR|CB Estimated Quantity
251																					
252		**Division #4.5 - Mechanical Accessories Sub-Total**								1,716		0	505,280		0	102,333	1,862	607,613	0	$607,613	
253																					
254		**Division #4 - Mechanical Piping**								**208,815**		**0**	**17,191,839**		**69,683**	**12,217,857**	**226,564**	**29,409,696**	**225,000**	**$29,634,696**	
255																					
256	**Division #5.0 - Mechanical Equipment**																				
257																					
258	**Division #5.1 - Boiler Equipment**																				
259																					
260	HRSG	Heat Recovery Steam Generator with Duct Burner/CO/Penthouse	2.0	ea	Contr	Contr	23,635,685.01		69.04	0	1.09	0	47,271,370	NO	0	0	0	47,271,370	0	$47,271,370	OEM Budget Proposal
261	HRSG	Steam Generator Erection	2.0	ea	Contr	Contr		66,500	69.04	133,000	1.09	0	0	NO	0	9,963,361	144,305	9,963,361	0	$9,963,361	HDR|CB Estimated cost
262																					
263		**Division #5.1 - Boiler Equipment Sub-Total**								**133,000**		**0**	**47,271,370**		**0**	**9,963,361**	**144,305**	**57,234,731**	**0**	**$57,234,731**	
264																					
265	**Division #5.2 - Turbine Equipment**																				
266																					
267	STG	Steam Turbine Generator	1.0	ea	Contr	Contr	40,968,520.68		53.33	0	1.09	0	40,968,521	NO	0	0	0	40,968,521	0	$40,968,521	Recent Vender quote
268	STG	Steam Turbine Generator, Erection	1.0	ea	Contr	Contr		20,000	53.33	20,000	1.09	0	0	NO	0	1,157,299	21,700	1,157,299	0	$1,157,299	HDR|CB Estimated cost
269																					
270		**Division #5.2 - Turbine Equipment Sub-Total**								**20,000**		**0**	**40,968,521**		**0**	**1,157,299**	**21,700**	**42,125,819**	**0**	**42,125,819**	
271																					
272	**Division #5.3 - Not Used**																				
273																					

Estimate Details

2 x 1 Siemens F Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
Line #																					
274	**Division #5.4 - Mechanical Draft Cooling Tower**																				
275																					
276	Cooling Tw	Cooling Tower - Mechanical Draft (F&E)	1.0	Is	Sub	Contr	5,390,000.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	5,390,000	$5,390,000	Recent Vender quote
277																					
278		**Division #5.4 - Mechanical Draft Cooling Tower Sub-Total**								**0**		**0**	**0**		**0**	**0**	**0**	**0**	**5,390,000**	**5,390,000**	
279																					
280	**Division #5.5 - Combustion Turbine Equipment**																				
281																					
282	CT	Combustion Turbine	2.0	ea	Contr	Contr	53,461,668.48		53.33	0	1.09	0	106,923,337	NO	0	0	0	106,923,337	0	$106,923,337	OEM Budget Proposal
283	CT	Combustion Turbine, Installation	2.0	ea	Contr	Contr		29,000	53.33	58,000	1.09	0	0	NO	0	3,356,166	62,930	3,356,166	0	$3,356,166	HDR|CB Estimated cost
284																					
285																					
286		**Division #5.4 - Combustion Turbine Equipment Sub-Total**								**58,000**		**0**	**106,923,337**		**0**	**3,356,166**	**62,930**	**110,279,503**	**0**	**110,279,503**	
287																					
288	**Division #5.6 - BOP Mechanical Equipment**																				
289																					
290	Equipment	Blowdown Tank	4.0	ea	Contr	Contr	16,600.00	20	54.96	80	1.09	0	66,400	NO	0	4,771	87	71,171	0	$71,171	HDR|CB Estimated cost
291	Equipment	Closed Cooling Water Exchanger	2.0	ea	Contr	Contr	1,039,500.00	300	54.96	600	1.09	0	2,079,000	NO	0	35,781	651	2,114,781	0	$2,114,781	HDR|CB Estimated cost
292	Equipment	Closed Cooling Water Inhibitor Mixing Pot	1.0	ea	Contr	Contr	3,000.00	8	54.96	8	1.09	0	3,000	NO	0	477	9	3,477	0	$3,477	HDR|CB Estimated cost
293	Equipment	Closed Cooling Water (CCW) Heat Exchanger Strainer (Shell & Tube	2.0	ea	Contr	Contr	34,000.00	10	54.96	20	1.09	0	68,000	NO	0	1,193	22	69,193	0	$69,193	HDR|CB Estimated cost
294	Equipment	Instrument Air Receivers	2.0	ea	Contr	Contr	5,000.00	44	54.96	88	1.09	0	10,000	NO	0	5,248	95	15,248	0	$15,248	HDR|CB Estimated cost
295	Equipment	Main Condenser	1.0	ea	Contr	Contr	4,400,000.00	9000	65.52	9,000	1.09	0	4,400,000	NO	0	639,756	9,765	5,039,756	0	$5,039,756	Recent Vender quote
296	Equipment	Oil/Water Separator	1.0	ea	Contr	Contr	50,000.00	244	54.96	244	1.09	0	50,000	NO	0	14,551	265	64,551	0	$64,551	HDR|CB Estimated cost
297	Equipment	Plant Air Compressors	2.0	ea	Contr	Contr	140,000.00	100	54.96	200	1.09	0	280,000	NO	0	11,927	217	291,927	0	$291,927	HDR|CB Estimated cost
298	Equipment	Plant Air Dryers	2.0	ea	Contr	Contr	30,000.00	100	54.96	200	1.09	0	60,000	NO	0	11,927	217	71,927	0	$71,927	HDR|CB Estimated cost
299	Equipment	Plant Air Receivers	2.0	ea	Contr	Contr	5,000.00	20	54.96	40	1.09	0	10,000	NO	0	2,385	43	12,385	0	$12,385	HDR|CB Estimated cost
302	Equipment	Pumps - Circulating Water	2.0	ea	Contr	Contr	750,000.00	500	54.96	1,000	1.09	0	1,500,000	NO	0	59,635	1,085	1,559,635	0	$1,559,635	HDR|CB Estimated cost
303	Equipment	Pumps - Auxiliary Cooling Water	1.0	ea	Contr	Contr	120,000.00	96	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
304	Equipment	Pumps - Closed Cooling Water	2.0	ea	Contr	Contr	134,000.00	200	53.33	400	1.09	0	268,000	NO	0	23,146	434	291,146	0	$291,146	HDR|CB Estimated cost
306	Equipment	Pumps - Boiler Feed	2.0	ea	Contr	Contr	663,000.00	1200	53.33	2,400	1.09	0	1,326,000	NO	0	138,876	2,604	1,464,876	0	$1,464,876	HDR|CB Estimated cost
307	Equipment	Pumps - Condensate	2.0	ea	Contr	Contr	195,000.00	200	53.33	400	1.09	0	390,000	NO	0	23,146	434	413,146	0	$413,146	HDR|CB Estimated cost
308	Equipment	Pumps - Service Water	2.0	ea	Contr	Contr	160,000.00	210	53.33	420	1.09	0	320,000	NO	0	24,303	456	344,303	0	$344,303	HDR|CB Estimated cost
309	Equipment	Pumps - Fire Water (Electric and Diesel)	0.0	lt	Contr	Contr	500,000.00	310	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
310	Equipment	Pumps - Sump - Blowdown, Waste Water	2.0	ea	Contr	Contr	30,000.00	24	53.33	48	1.09	0	60,000	NO	0	2,778	52	62,778	0	$62,778	HDR|CB Estimated cost
311	Equipment	Pumps - Sump - Power Island Misc Building Sumps	6.0	ea	Contr	Contr	30,000.00	24	53.33	144	1.09	0	180,000	NO	0	8,333	156	188,333	0	$188,333	HDR|CB Estimated cost
314	Equipment	Pumps - Demin Water Transfer	2.0	ea	Contr	Contr	66,000.00	48	53.33	96	1.09	0	132,000	NO	0	5,555	104	137,555	0	$137,555	HDR|CB Estimated cost
318	Equipment	Pumps - Treated Water Transfer to Serv Water Tank	2.0	ea	Contr	Contr	40,000.00	80	53.33	160	1.09	0	80,000	NO	0	9,258	174	89,258	0	$89,258	HDR|CB Estimated cost
319	Equipment	Pumps - Waste Water	2.0	ea	Contr	Contr	80,000.00	125	53.33	250	1.09	0	160,000	NO	0	14,466	271	174,466	0	$174,466	HDR|CB Estimated cost
320	Equipment	Pumps - Evaporative Cooling Water	2.0	ea	Contr	Contr	37,000.00	80	53.33	160	1.09	0	74,000	NO	0	9,258	174	83,258	0	$83,258	HDR|CB Estimated cost
321	Equipment	Sample Analysis Panel (water)	2.0	ea	Contr	Contr	200,000.00	139	54.96	278	1.09	0	400,000	NO	0	16,578	302	416,578	0	$416,578	HDR|CB Estimated cost
322	Equipment	Tank - 200,000 gal treated water/service water - (F&E)	0.0	ea	Sub	Contr	540,000.00	0		0	1.09	0	0	yes	0	0	0	0	0	$0	Furnish and Erect price
323	Equipment	Tank - Demin Water Storage 200,000 gal. (F&E)	1.0	ea	Sub	Contr	600,000.00	0		0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	Furnish and Erect Price
324	Equipment	Tank - Turbine Drains	2.0	ea	Contr	Contr	75,000.00	200	53.33	400	1.09	0	150,000	NO	0	23,146	434	173,146	0	$173,146	HDR|CB Estimated cost
325	Equipment	Tank - Closed Cooling Water Dispersant 10,000 gal.	1.0	ea	Contr	Contr	36,500.00	100	54.96	100	1.09	0	36,500	NO	0	5,963	109	42,463	0	$42,463	HDR|CB Estimated cost
326	Equipment	Tank - Closed Cooling Water Accumulator	1.0	ea	Contr	Contr	20,600.00	44	54.96	44	1.09	0	20,600	NO	0	2,624	48	23,224	0	$23,224	HDR|CB Estimated cost
329	Equipment	Aqueous Ammonia System Unloading, Storage Tank, Forwarding Pu	0.0	ea	Contr	Contr	0.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
331	Equipment	Auxiliary Boiler System	1.0	ea	Contr	Contr	1,600,000.00	400	53.33	400	1.09	0	1,600,000	NO	0	23,146	434	1,623,146	0	$1,623,146	HDR|CB Estimated cost
332	Equipment	Compressed Gas Storage System (CO2)	1.0	ea	Contr	Contr	40,000.00	475	54.96	475	1.09	0	40,000	NO	0	28,326	515	68,326	0	$68,326	HDR|CB Estimated cost
333	Equipment	Compressed Gas Storage System (H2)	1.0	ea	Contr	Contr	40,000.00	198	54.96	198	1.09	0	40,000	NO	0	11,808	215	51,808	0	$51,808	HDR|CB Estimated cost
334	Equipment	Compressed Gas Storage System (N2)	2.0	ea	Contr	Contr	20,000.00	370	54.96	740	1.09	0	40,000	NO	0	44,130	803	84,130	0	$84,130	HDR|CB Estimated cost
335	Equipment	Demineralized Water Treatment System Dual 100% Trains	0.0	ea	Contr	Contr	1,197,000.00	4000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
336	Equipment	Condensate Polisher and Related	1.0	ea	Contr	Contr	1,000,000.00	3600	54.96	3,600	1.09	0	1,000,000	NO	0	214,684	3,906	1,214,684	0	$1,214,684	HDR|CB Estimated cost
337	Equipment	Fuel Gas Filter Separators	2.0	ea	Contr	Contr	210,000.00	200	54.96	400	1.09	0	420,000	NO	0	23,854	434	443,854	0	$443,854	Sub Budgetary Quote
338	Equipment	Fuel Gas Performance Heater	2.0	ea	Contr	Contr	761,600.00	300	54.96	600	1.09	0	1,523,200	NO	0	35,781	651	1,558,981	0	$1,558,981	Sub Budgetary Quote
339	Equipment	Fuel Gas Electric Startup Heater	2.0	ea	Contr	Contr	84,000.00	40	54.96	80	1.09	0	168,000	NO	0	4,771	87	172,771	0	$172,771	HDR|CB Estimated cost
340	Equipment	Fuel Gas Drain Tank	2.0	ea	Contr	Contr	2,000.00	15	54.96	30	1.09	0	4,000	NO	0	1,789	33	5,789	0	$5,789	HDR|CB Estimated cost
341	Equipment	Fuel Gas Dewpoint Heater	1.0	ea	Contr	Contr	476,000.00	80	54.96	80	1.09	0	476,000	NO	0	4,771	87	480,771	0	$480,771	HDR|CB Estimated cost
342	Equipment	Fuel Gas Scrubber	1.0	ea	Contr	Contr	392,000.00	60	54.96	60	1.09	0	392,000	NO	0	3,578	65	395,578	0	$395,578	HDR|CB Estimated cost
343	Equipment	Fuel Gas Compressor Package 2 x 100% w/ Building	0.0	ea	Contr	Contr	2,500,000.00	3000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
344	Equipment	Hydrogen Generator	0.0	ea	Contr	Contr	194,000.00	40	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
345	Equipment	Steam Silencers	1.0	ea	Contr	Contr	150,000.00	20	54.96	20	1.09	0	150,000	NO	0	1,193	22	151,193	0	$151,193	HDR|CB Estimated cost
346	Equipment	Condensate Water Strainer	1.0	ea	Contr	Contr	150,000.00	40	54.96	40	1.09	0	150,000	NO	0	2,385	43	152,385	0	$152,385	HDR|CB Estimated cost
347	Equipment	Cycle Chem Feed	1.0	ea	Contr	Contr	200,000.00	100	54.96	100	1.09	0	200,000	NO	0	5,963	109	205,963	0	$205,963	HDR|CB Estimated cost
348	Equipment	Cooling Tower Chemical Feed	1.0	ea	Contr	Contr	250,000.00	300	54.96	300	1.09	0	250,000	NO	0	17,890	326	267,890	0	$267,890	HDR|CB Estimated cost
349	Equipment	Condeser Vaccum Pump/Air Removal Equipment	1.0	ea	Contr	Contr	350,000.00	40	54.96	40	1.09	0	350,000	NO	0	2,385	43	352,385	0	$352,385	HDR|CB Estimated cost
350	Equipment	Turbine Room Bridge Crane - 60T	1.0	ea	Contr	Contr	390,000.00	120	53.33	120	1.09	0	390,000	NO	0	6,944	130	396,944	0	$396,944	HDR|CB Estimated cost
351	Equipment	Elevator for 2 HRSG	1.0	ea	sub	contr	746,000.00	0		0	1.09	0	0	NO	0	0	0	0	746,000	$746,000	HDR|CB Estimated cost
352																					
353		**Division #5.6 BOP Mechanical Equipment Sub-Total**								**24,159**		**0**	**19,436,700**		**0**	**1,534,034**	**26,213**	**20,970,734**	**1,346,000**	**22,316,734**	
354																					
355	**Division #6.0 - Electrical Equipment**																				
356																					
357	Electrical	Eqpt - 24kv Bus Isolated Phase, 8000A	600.0	lf	Contr	Contr	750.00	8	50.09	4,800	1.09	0	450,000	NO	0	260,890	5,208	710,890	0	$710,890	HDR|CB Estimated cost
358	Electrical	Eqpt - 24kv Bus Isolated Phase, 9000A	300.0	lf	Contr	Contr	900.00	8	50.09	2,400	1.09	0	270,000	NO	0	130,445	2,604	400,445	0	$400,445	HDR|CB Estimated cost
359	Electrical	Eqpt - Bus 6.9kV non-seg	200.0	lf	Contr	Contr	510.00	4	50.09	800	1.09	0	102,000	NO	0	43,482	868	145,482	0	$145,482	HDR|CB Estimated cost
360	Electrical	Eqpt - Bus Duct 480V, 2500A	480.0	lf	Contr	Contr	610.00	3.2	50.09	1,536	1.09	0	292,800	NO	0	83,485	1,667	376,285	0	$376,285	HDR|CB Estimated cost
361	Electrical	Eqpt - Generator Breaker, 8000A, 24kV	3.0	ea	Contr	Contr	450,000.00	300	50.09	900	1.09	0	1,350,000	NO	0	48,917	977	1,398,917	0	$1,398,917	HDR|CB Estimated cost
362	Electrical	Eqpt - LV Switchgear - 480V, 4000A EO Main Ckt Bkr	6.0	ea	Contr	Contr	35,000.00	56	50.09	336	1.09	0	210,000	NO	0	18,262	365	228,262	0	$228,262	HDR|CB Estimated cost
363	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Main Ckt Bkr.	2.0	ea	Contr	Contr	15,400.00	30	50.09	60	1.09	0	30,800	NO	0	3,261	65	34,061	0	$34,061	HDR|CB Estimated cost
364	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Tie Ckt Bkr.	3.0	ea	Contr	Contr	15,400.00	30	50.09	90	1.09	0	46,200	NO	0	4,892	98	51,092	0	$51,092	HDR|CB Estimated cost
365	Electrical	Eqpt - LV Switchgear - 480V, 1200A EO Tie Ckt Bkr.	1.0	ea	Contr	Contr	10,780.00	26	50.09	26	1.09	0	10,780	NO	0	1,413	28	12,193	0	$12,193	HDR|CB Estimated cost
366	Electrical	Eqpt - LV Switchgear - 480V, 800A MO Fdr Ckt Bkr.	16.0	ea	Contr	Contr	4,575.00	22	50.09	352	1.09	0	73,200	NO	0	19,132	382	92,332	0	$92,332	HDR|CB Estimated cost
367	Electrical	Eqpt - LV Switchgear - 480V, 800A Equipped Space	6.0	ea	Contr	Contr	1,090.00	13.2	50.09	79	1.09	0	6,540	NO	0	4,305	86	10,845	0	$10,845	HDR|CB Estimated cost
368	Electrical	Eqpt - Motor Control Centers - 480V	16.0	ea	Contr	Contr	46,000.00	132	50.09	2,112	1.09	0	736,000	NO	0	114,792	2,292	850,792	0	$850,792	HDR|CB Estimated cost
369	Electrical	Eqpt - MV Switchgear - 7kV, 3000A Main Ckt Bkr.	1.00	ea	Contr	Contr	79,640.00	76	50.09	76	1.09	0	79,640	NO	0	4,131	82	83,771	0	$83,771	HDR|CB Estimated cost
370	Electrical	Eqpt - MV Switchgear - 7kV, 2000A Fdr Ckt Bkr.	2.00	ea	Contr	Contr	42,870.00	72	50.09	144	1.09	0	85,740	NO	0	7,827	156	93,567	0	$93,567	HDR|CB Estimated cost
371	Electrical	Eqpt - MV Switchgear - 7kV, 1200A Fdr Ckt Bkr.	20.00	ea	Contr	Contr	36,360.00	48	50.09	960	1.09	0	727,200	NO	0	52,178	1,042	779,378	0	$779,378	HDR|CB Estimated cost
372	Electrical	Eqpt - Relay panels and Metering	3.0	ea	Contr	Contr	34,500.00	120.00	50.09	360	1.09	0	103,500	NO	0	19,567	391	123,067	0	$123,067	HDR|CB Estimated cost
373	Electrical	Eqpt - Station Batteries 125 Volt DC/Charger	1.0	lot	Contr	Contr	350,000.00	635	50.09	635	1.09	0	350,000	NO	0	34,514	689	384,514	0	$384,514	HDR|CB Estimated cost

Estimate Details

2 x 1 Siemens F Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

														CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	TE BASIS	**ISCIPLIN**	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
Line #																						
374		Electrical	Eqpt - Transformer GSU - 283 MVA, 18kV-345kV	2.0	ea	Contr	Contr	2,100,000.00	950	50.09	1,900	1.09	0	4,200,000	NO	0	103,269	2,062	4,303,269	0	$4,303,269	HDR|CB Estimated cost
375		Electrical	Eqpt - Transformer GSU - 415 MVA, 18kV-345kV	1.0	ea	Contr	Contr	3,600,000.00	950	50.09	950	1.09	0	3,600,000	NO	0	51,634	1,031	3,651,634	0	$3,651,634	HDR|CB Estimated cost
376		Electrical	Eqpt - Transformer UAT 33 MVA, 18kV/6.9kV	2.0	ea	Contr	Contr	900,000.00	650	50.09	1,300	1.09	0	1,800,000	NO	0	70,658	1,411	1,870,658	0	$1,870,658	HDR|CB Estimated cost
377		Electrical	Eqpt - Emergency Diesel Gnerator packaged 750kW	1.0	ea	Contr	Contr	200,000.00	100	50.09	100	1.09	0	200,000	NO	0	5,435	109	205,435	0	$205,435	HDR|CB Estimated cost
378		Electrical	Eqpt - UPS (120VAC)	1.0	ea	Contr	Contr	300,000.00	528	50.09	528	1.09	0	300,000	NO	0	28,698	573	328,698	0	$328,698	HDR|CB Estimated cost
379		Electrical	Eqpt - Transformer Aux Power 2.5/3.3MVA, 7kV-480V	4.0	ea	Contr	Contr	104,500.00	210	50.09	840	1.09	0	418,000	NO	0	45,656	911	463,656	0	$463,656	HDR|CB Estimated cost
380		Electrical	Eqpt - Lighting Transformers	8.0	ea	Contr	Contr	916.27	9.09	50.09	73	1.09	0	7,330	YES	440	3,953	79	11,283	0	$11,283	HDR|CB Estimated cost
381		Electrical	Eqpt - Panelboards 480/120 & 480/277/120	8.0	ea	Contr	Contr	1,200.00	40.00	50.09	320	1.09	0	9,600	YES	576	17,393	347	26,993	0	$26,993	HDR|CB Estimated cost
382		Electrical	Eqpt - Plant Network System	1.0	ea	Contr	Contr	100,000.00	300	50.09	300	1.09	0	100,000	YES	6,000	16,306	326	116,306	0	$116,306	HDR|CB Estimated cost
383		Electrical	Eqpt - Plant Security System	1.0	lot	Contr	Contr	250,000.00	1800	50.09	1,800	1.09	0	250,000	YES	15,000	97,834	1,953	347,834	0	$347,834	HDR|CB Estimated cost
384		Electrical	Eqpt - Plant Telephone System	1.0	ea	Contr	Contr	100,000.00	500	50.09	500	1.09	0	100,000	YES	6,000	27,176	543	127,176	0	$127,176	HDR|CB Estimated cost
385																						
386			**Division #6.0 - Electrical Equipment Sub-Total**								**24,277**		**0**	**15,909,330**		**28,016**	**1,319,501**	**26,340**	**17,228,831**	**0**	**17,228,831**	
387																						
388	**Division #6.1 - Electrical/Control Commodities**																					
389																						
390		Electrical	Grounding - Buried Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
391		Electrical	Grounding - Above Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
392		Electrical	Grounding - Ground Rods Copper	96.0	ea	Contr	Contr	22.95	1.74	50.09	167	1.09	0	2,204	NO	0	9,079	181	11,283	0	$11,283	HDR|CB Estimated Quantity & Cost
393		Electrical	Grounding - Exothermic Connections	2,850.0	ea	Contr	Contr	9.75	1.14	50.09	3,249	1.09	0	27,788	NO	0	176,590	3,525	204,377	0	$204,377	HDR|CB Estimated Quantity & Cost
394		Electrical	Grounding - Servit Post	1,328.8	ea	Contr	Contr	30.00	1	50.09	1,107	1.09	0	39,864	NO	0	60,146	1,201	100,010	0	$100,010	HDR|CB Estimated Quantity & Cost
395		Electrical	Conduit A/G 5" RGS	1,000.0	lf	Contr	Contr	58.00	1.00	50.09	1,000	1.09	0	58,000	NO	0	54,352	1,085	112,352	0	$112,352	HDR|CB Estimated Quantity & Cost
396		Electrical	Conduit A/G 2" ave RGS	85,000.0	lf	Contr	Contr	8.50	0.30	50.09	25,500	1.09	0	722,500	NO	0	1,385,978	27,668	2,108,478	0	$2,108,478	HDR|CB Estimated Quantity & Cost
397		Electrical	Conduit U/G - 4 x 6 PVC 5"	8,000.0	lf	Contr	Contr	240.00	2.00	50.09	16,000	1.09	0	1,920,000	NO	0	869,633	17,360	2,789,633	0	$2,789,633	HDR|CB Estimated Quantity & Cost
398		Electrical	Conduit U/G - 8 x 8 PVC 5"	700.0	lf	Contr	Contr	530.00	5.00	50.09	3,500	1.09	0	371,000	NO	0	190,232	3,798	561,232	0	$561,232	HDR|CB Estimated Quantity & Cost
399		Electrical	Cable Tray, Raceway 24" Aluminum	5,200.0	lf	Contr	Contr	17.00	0.84	50.09	4,368	1.09	0	88,400	NO	0	237,410	4,739	325,810	0	$325,810	HDR|CB Estimated Quantity & Cost
400		Electrical	Cable Tray, Raceway 36" Aluminum	2,200.0	lf	Contr	Contr	20.00	1.05	50.09	2,310	1.09	0	44,000	NO	0	125,553	2,506	169,553	0	$169,553	HDR|CB Estimated Quantity & Cost
401		Electrical	Cable - Overhead Conductor to Substation	2,250.0	lf	Contr	Contr	8.50	0.50	50.09	1,125	1.09	0	19,125	NO	0	61,146	1,221	80,271	0	$80,271	HDR|CB Estimated Quantity & Cost
402		Electrical	Cable - Medium Voltage (7kV 1C Cable)	80,000.0	lf	Contr	Contr	14.60	0.127	50.09	10,160	1.09	0	1,168,000	NO	0	552,217	11,024	1,720,217	0	$1,720,217	HDR|CB Estimated Quantity & Cost
403		Electrical	Cable Terminations - 7kV	96.0	ea	Contr	Contr	195.00	12.00	50.09	1,152	1.09	0	18,720	NO	0	62,614	1,250	81,334	0	$81,334	HDR|CB Estimated Quantity & Cost
404		Electrical	Cable 600V Power 1/c No. 2/0 ave size	160,000.0	lf	Contr	Contr	3.55	0.041	50.09	6,560	1.09	0	568,000	NO	0	356,550	7,118	924,550	0	$924,550	HDR|CB Estimated Quantity & Cost
405		Electrical	Wire 600V Power 3/c # 10 ave. size	250,000.0	lf	Contr	Contr	0.27	0.0185	50.09	4,625	1.09	0	67,500	NO	0	251,378	5,018	318,878	0	$318,878	HDR|CB Estimated Quantity & Cost
406		Electrical	Cable - Fiber Optic	16,500.0	lf	Contr	Contr	6.00	0.025	50.09	413	1.09	0	99,000	NO	0	22,420	448	121,420	0	$121,420	HDR|CB Estimated Quantity & Cost
407		Electrical	Cable - Permanent Telephone Line	1.0	ls	Contr	Contr	10,000.00	240.000	50.09	240	1.09	0	10,000	NO	0	13,044	260	23,044	0	$23,044	HDR|CB Estimated Quantity & Cost
408		Electrical	Cable - Control	600,000.0	lf	Contr	Contr	1.10	0.040	50.09	24,000	1.09	0	660,000	NO	0	1,304,450	26,040	1,964,450	0	$1,964,450	HDR|CB Estimated Quantity & Cost
409		Electrical	Cable - Instrument 4pr tw/shld No. 18	400,000.0	lf	Contr	Contr	3.25	0.025	50.09	10,000	1.09	0	1,300,000	NO	0	543,521	10,850	1,843,521	0	$1,843,521	HDR|CB Estimated Quantity & Cost
410		Electrical	Cable - Thermocouple 2pr tw/shld No. 16	13,000.0	lf	Contr	Contr	0.33	0.030	50.09	390	1.09	0	4,290	NO	0	21,197	423	25,487	0	$25,487	HDR|CB Estimated Quantity & Cost
411		Electrical	Cable - Data Highway	24,068.0	lf	Contr	Contr	4.59	0.034	50.09	828	1.09	0	110,472	NO	0	45,000	898	155,472	0	$155,472	HDR|CB Estimated Quantity & Cost
412		Electrical	Cable Terminations - low voltage	30,500.0	ea	Contr	Contr	0.85	0.300	50.09	9,150	1.09	0	25,925	NO	0	497,321	9,928	523,246	0	$523,246	HDR|CB Estimated Quantity & Cost
413		Electrical	Cable Terminations - control	31,500.0	ea	Contr	Contr	0.54	0.300	50.09	9,450	1.09	0	17,010	NO	0	513,627	10,253	530,637	0	$530,637	HDR|CB Estimated Quantity & Cost
414		Electrical	Cable Terminations - instrument	32,800.0	ea	Contr	Contr	0.54	0.300	50.09	9,840	1.09	0	17,712	NO	0	534,824	10,676	552,536	0	$552,536	HDR|CB Estimated Quantity & Cost
415		Electrical	Conduit - Lighting A/G	33,000.0	lf	Contr	Contr	2.83	0.25	50.09	8,250	1.09	0	93,390	YES	5,603	448,405	8,951	541,795	0	$541,795	HDR|CB Estimated Quantity & Cost
416		Electrical	Wire - Lighting 1/C No 12	80,000.0	lf	Contr	Contr	0.176	0.018	50.09	1,440	1.09	0	14,080	YES	845	78,267	1,562	92,347	0	$92,347	HDR|CB Estimated Quantity & Cost
417		Electrical	Lighting - Outdoor Fixtures, pole	30.0	ea	Contr	Contr	1,600.00	12.00	50.09	360	1.09	0	48,000	YES	2,880	19,567	391	67,567	0	$67,567	HDR|CB Estimated Quantity & Cost
418		Electrical	Lighting - Outdoor Fixtures, 150W	320.0	ea	Contr	Contr	490.00	4.00	50.09	1,280	1.09	0	156,800	NO	0	69,571	1,389	226,371	0	$226,371	HDR|CB Estimated Quantity & Cost
419		Electrical	Lighting - Fixtures, 250W	80.0	ea	Contr	Contr	850.00	3.00	50.09	240	1.09	0	68,000	NO	0	13,044	260	81,044	0	$81,044	HDR|CB Estimated Quantity & Cost
420		Electrical	Lighting - Fixtures, fluorescent	180.0	ea	Contr	Contr	85.00	1.60	50.09	288	1.09	0	15,300	YES	918	15,653	312	30,953	0	$30,953	HDR|CB Estimated Quantity & Cost
421		Electrical	Lighting - Receptacles and switches	200.0	ea	Contr	Contr	32.00	1.37	50.09	273	1.09	0	6,400	YES	384	14,864	297	21,264	0	$21,264	HDR|CB Estimated Quantity & Cost
422		Electrical	Welding Receptacles	24.0	ea	Contr	Contr	1,800.00	4.00	50.09	96	1.09	0	43,200	NO	0	5,218	104	48,418	0	$48,418	HDR|CB Estimated Quantity & Cost
423		Electrical	Lighting - Exit	66.0	ea	Contr	Contr	150.00	2.00	50.09	132	1.09	0	9,900	YES	594	7,174	143	17,074	0	$17,074	HDR|CB Estimated Quantity & Cost
424		Electrical	Lighting - Emergency	120.0	ea	Contr	Contr	127.00	2.00	50.09	240	1.09	0	15,240	YES	914	13,044	260	28,284	0	$28,284	HDR|CB Estimated Quantity & Cost
425		Electrical	Cathodic Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
426		Electrical	Lightning Protection System	1.0	lot	Contr	Contr	100,000.00	200	50.09	200	1.09	0	100,000	YES	6,000	10,870	217	110,870	0	$110,870	HDR|CB Estimated Quantity & Cost
427		Electrical	Freeze Protection System	1.0	lot	Contr	Contr	800,000.00	5000	50.09	5,000	1.09	0	800,000	YES	48,000	271,760	5,425	1,071,760	0	$1,071,760	HDR|CB Estimated Quantity & Cost
428		Electrical	Electrical Circuit Testing	6,183.3	ea	Contr	Contr		2	50.09	12,367	1.09	0	0	NO	0	672,148	13,418	672,148	0	$672,148	HDR|CB Estimated Quantity & Cost
429			**Total Cable**	**1,545,819.0**	**LF**																	
430																						
431			**Division #6.1 - Electrical/Control Commodities Sub-Total**								**180,099**		**0**	**9,213,019**		**72,139**	**9,788,760**	**195,408**	**19,001,779**	**0**	**19,001,779**	
432																						
433	**Division #6.2 - Switchyard**																					
434																						
435		HV Electrica	138kV Dead End Towers 6 Legged (3 total)	150,000.0	lb	Contr	Contr	2.50	0.01	60.25	2,180	1.09	0	375,000	NO	0	142,500	2,365	517,500		$517,500	HDR|CB Estimated Quantity & Cost
436		HV Electrica	Interonnection Cabling and Termination Allowance	1.0	lot	Contr	Contr	15,000.00	1,526.36	51.33	1,526	1.09	0	15,000	NO	0	85,000	1,656	100,000		$100,000	HDR|CB Estimated Quantity & Cost
437																						
438			**Division #6.2 - Switchyard**								**3,706**		**0**	**$390,000**		**0**	**$227,500**	**$4,021**	**$617,500**	**$0**	**$617,500**	
439																						
440	**Division #7.0 - Instrumentation & Control**																					
441																						
442		I & C	BOP Instrument Devices	1,200.0	ea	Contr	Contr	750.00	12	50.09	14,400	1.09	0	900,000	NO	0	782,670	15,624	1,682,670	0	$1,682,670	HDR|CB Estimated Quantity & Cost
443		I & C	Auxiliary Boiler CEMS	1.0	lot	Contr	Contr	163,200.00	200	50.09	200	1.09	0	163,200	NO	0	10,870	217	174,070	0	$174,070	HDR|CB Estimated Quantity & Cost
444		I & C	Continuous Emissions Monitoring Equipment (CEMS)	2.0	ea	Contr	Contr	700,000.00	2000	53.33	4,000	1.09	0	1,400,000	NO	0	231,460	4,340	1,631,460	0	$1,631,460	HDR|CB Estimated Quantity & Cost
445		I & C	Control Valves	220.0	ea	Contr	Contr	4,000.00	24	54.96	5,280	1.09	0	880,000	NO	0	314,871	5,729	1,194,871	0	$1,194,871	HDR|CB Estimated Quantity & Cost
446		I & C	DCS w/ Configuration, Interfaces, Field Support, Interface, Bulks	1.0	ea	Contr	Contr	1,700,000.00	1691	50.09	1,691	1.09	0	1,700,000	NO	0	91,909	1,835	1,791,909	0	$1,791,909	HDR|CB Estimated Quantity & Cost
447		I & C	Emergency Trip sub Panel	1.0	ea	Contr	Contr	30,000.00	21	50.09	21	1.09	0	30,000	NO	0	1,141	23	31,141	0	$31,141	HDR|CB Estimated Quantity & Cost
448		I & C	Flow Element - Nozzle (Supply)	6.0	ea	Contr	Contr	30,000.00	20	54.96	120	1.09	0	180,000	NO	0	7,156	130	187,156	0	$187,156	HDR|CB Estimated Quantity & Cost
449		I & C	Instrument Calibration and loop check	1,500.0	ea	Contr	Contr	0.00	3	50.09	4,500	1.09	0	0	NO	0	244,584	4,883	244,584	0	$244,584	HDR|CB Estimated Quantity & Cost
450		I & C	Instrument piping 2&3-valve manifolds	284.0	ea	Contr	Contr	400.00	5.22	54.96	1,481	1.09	0	113,600	NO	0	88,331	1,607	201,931	0	$201,931	HDR|CB Estimated Quantity & Cost
451		I & C	Instrument Racks & Enclosures	1.0	lot	Contr	Contr	350,000.00	1450	50.09	1,450	1.09	0	350,000	NO	0	78,811	1,573	428,811	0	$428,811	HDR|CB Estimated Quantity & Cost
452		I & C	Instrument Tubing - copper	6,000.0	lf	Contr	Contr	3.70	0.15	54.96	900	1.09	0	22,200	NO	0	53,671	977	75,871	0	$75,871	HDR|CB Estimated Quantity & Cost
453		I & C	Instrument Tubing - Stainless Steel	2,500.0	lf	Contr	Contr	6.25	0.20	54.96	500	1.09	0	15,625	NO	0	29,817	543	45,442	0	$45,442	HDR|CB Estimated Quantity & Cost
454		I & C	PLC Hardware, Bulks, Aux Controls, Configuration	1.0	ls	Contr	Contr	241,200.00	253	50.09	253	1.09	0	241,200	NO	0	13,751	275	254,951	0	$254,951	HDR|CB Estimated Quantity & Cost
455																						
456			**Division #7.0 - Control Sub-Total**								**34,796**		**0**	**5,995,825**		**0**	**1,949,043**	**37,754**	**7,944,868**	**0**	**$7,944,868**	
457																						
458			**Sub-Total Direct Costs**								**892,675**		**0**	**277,388,911**	**0**		**51,018,604**	**968,030**	**328,407,515**	**24,877,400**	**353,284,915**	
459			Sales Tax - State (Plant Production Equipment is Exempt)	6.00%												**392,527**				**392,527**	**392,527**	Sales Tax Included for Non-Production Facilities

Estimate Details

2 x 1 Siemens F Class Combined Cycle Unit

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Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
Line #																					
460	Indirects																				
461		**TOTAL DIRECT COSTS**								**892,675**		**0**	**277,388,911**			**51,018,604**	**968,030**	**328,407,515**	**25,269,927**	**$353,677,442**	
462																					
463	**Division #8.0 - Construction and Indirect Services**																				
464																					
465	Const Indirec	Construction Equipment	1.0	ls	Contr	Contr	12,055,653			0	1.09					0	0	0	12,055,653	$12,055,653	See Construction Equipment worksheet
466	Const Indirec	Construction Field staff	1.0	ls	Contr	Contr	11,522,855			0	1.09					0	0	0	11,522,855	$11,522,855	See EPC Field Staff Worksheet for details
467	Const Indirec	Construction Field staff expenses	1.0	ls	Contr	Contr	1,870,168			0	1.09					0	0	0	1,870,168	$1,870,168	See EPC Field Staff Worksheet for details
468	Const Indirec	Construction Permits	1.0	ls	Contr	Contr				0	1.09		51,450			0	0	51,450	0	$51,450	See Const Indirects and Serv Worksheet
469	Const Indirec	Construction Testing	1.0	ls	Contr	Contr				0	1.09		117,000			0	0	117,000	0	$117,000	See Const Indirects and Serv Worksheet
470	Const Indirec	Consumable Materials & Safety Supplies	2.00	$/MH	Contr	Contr	1,936,059			0	1.09					0	0	0	1,936,059	$1,936,059	$2.00/Direct hour
471	Const Indirec	Field Office Expenses	1.0	ls	Contr	Contr				1,369	1.09		1,033,370			65,849	1,485	1,099,219	22,373	$1,121,592	See Const Indirects and Serv Worksheet
472	Const Indirec	Performance Testing	1.0	ls	Contr	Contr				0	1.09		304,400			0	0	304,400	0	$304,400	See Const Indirects and Serv Worksheet
473	Const Indirec	Preoperational Testing, Startup & Commissioning	2.0	ls	Contr	Contr				21,690	1.09		1,113,000			752,767	23,534	1,865,767	0	$1,865,767	See Const Indirects and Serv Worksheet
474	Const Indirec	Site Safety	1.0	ls	Contr	Contr				7,580	1.09		658,040			375,008	8,224	1,033,048	0	$1,033,048	See Const Indirects and Serv Worksheet
475	Const Indirec	Small Tools	2.00	$/MH	Contr	Contr	1,936,059			0	1.09					0	0	0	1,936,059	$1,936,059	$2.00/Direct hour
476	Const Indirec	Start-up Supervision	1.0	ls	Contr	Contr	1,296,911			0	1.09					0	0	0	1,296,911	$1,296,911	See EPC Field Staff Worksheet for details
477	Const Indirec	Support Craft, Site Services, Scaffolding	1.0	ls	Contr	Contr				41,753	1.09		459,400			2,008,704	45,302	2,468,104	775,014	$3,243,118	See Const Indirects and Serv Worksheet
478	Const Indirec	Temporary Facilities	1.0	ls	Contr	Contr				17,947	1.09		2,336,753			863,403	19,472	3,200,157	82,500	$3,282,657	See Const Indirects and Serv Worksheet
479	Const Indirec	Temporary Utilities	1.0	ls	Contr	Contr				29,032	1.09		747,600			1,396,697	31,500	2,144,297	0	$2,144,297	See Const Indirects and Serv Worksheet
480																					
481		**Division #8.0 - Construction Indirects and Services Sub-Total**								**119,371**		**0**	**6,821,013**			**5,462,428**	**129,518**	**12,283,441**	**31,497,593**	**$43,781,034**	
482																					
483		**SUB-TOTAL CONSTRUCTION COST**								**1,012,046**		**0**	**284,209,924**			**56,481,032**	**1,097,547**	**340,690,956**	**56,767,520**	**397,458,476**	
484		**Subcontract Labor Hours**																			
485		**Material Cost Excluding CT, HRSG and ST (escalation and EPC**											**89,046,697**								
486	**Division #9.0 - Project Indirects**																				
487																					
488	Project Indire	- Power Plant Design Engineering	1.0	ls	Contr	6.0%	23,847,509											0	23,847,509	$23,847,509	6.0% of the Total Construction Cost
489	Project Indire	- Project Management (Home Office)	0.0	ls	Contr	0.0%	0											0	0	$0	Included in Engineering
490																					
491																					
492		Sub-Total Project Indirects										**0**	**0**			**0**	**0**	**0**	**23,847,509**	**$23,847,509**	
493																					
494	EPC Indirect	EPC Contractor Insurance & Misc Costs (% of Total Const. Cost)																			
495																					
496	EPC Indirect	- Builders Risk Insurance	1.0	ls	Contr	0.50%	1,987,292												1,987,292	$1,987,292	Allowance based on info from other projects
497	EPC Indirect	- Comprehensive General Liability (CGL) Insurance	1.0	ls	Contr	0.50%	1,987,292											0	1,987,292	$1,987,292	Allowance based on info from other projects
498	EPC Indirect	- Warranty Reserve	1.0	ls	Contr		500,000											0	500,000	$500,000	Allowance based on info from other projects
499																					
500		Sub-Total EPC Contractor Indirects										**0**	**0**			**0**	**0**	**0**	**4,474,585**	**$4,474,585**	
501																					
502		**Total Project Indirects**										**0**	**0**			**0**	**0**	**0**	**28,322,093**	**28,322,093**	
503																					
504		Sub-Total										**0**	**284,209,924**			**56,481,032**	**1,097,547**	**340,690,956**	**85,089,613**	**$425,780,569**	
505							Equipment	Material	Labor	S/C											
506	Project Indire	Escalation - EPC Contractor Escalation Rates					2.4%	2.4%	4.0%	4.0%			6,759,159			8,908,957	0	15,668,117	7,751,685	23,419,802	Excludes CT, HRSG and ST
507																					
508		Sub-Total										**0**	**290,969,084**			**65,389,989**	**1,097,547**	**356,359,073**	**92,841,298**	**$449,200,371**	
509							Equip	Mat	Labor	S/C											
510	EPC Indirect	EPC Contractor Contingency	Varies	%	Contr		0%	5%	5%	5%		0	4,452,335			3,269,499		7,721,834	4,342,565	12,064,399	Excludes CT, HRSG and ST
511	EPC Indirect	EPC Contractor G&A and Fee	8.0%	%	Contr		1.0%	8.0%	8.0%	8.0%		0	23,277,527			5,231,199		28,508,726	7,427,304	35,936,030	
512																					
513		Sub-Total		ls								0	27,729,862			8,500,699	0	36,230,560	11,769,869	$48,000,429	
514																					
515		**TOTAL EPC PROJECT COST**								**1,012,046**		**0**	**318,698,945**			**73,890,688**	**1,097,547**	**392,589,633**	**104,611,167**	**$497,200,800**	
516																					
517	**OWNER INDIRECTS**																				
518	**Division #9.1 - Owner Indirects**																				
519																					
520		**Power Block 1 and Common**																			
521	Owner Indire	Project Development	1.0	ls	Owner														6,500,000	$6,500,000	Budget provided by LG&E
522	Owner Indire	Transmission Line Relocation	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
523	Owner Indire	Transmission Interconnection Facilities	1.0	ls	Owner														5,500,000	$5,500,000	To be estimated by Transmision Operator
524	Owner Indire	Natural Gas Pipeline Interconnection	1.0	ls	Owner														14,250,000	$14,250,000	Budget provided by LG&E
525	Owner Indire	Natural Gas Pipeline Fixed O&M (Startup Period)	1.0	ls	Owner														6,000,000	$6,000,000	Budget provided by LG&E
526	Owner Indire	Construction Power (Service Installation and Energy)	1.0	ls	Owner														750,000	$750,000	Budget estimated by HDR|CB
527	Owner Indire	Owner Operations Personnel (Prior to COD)	1.0	ls	Owner														2,340,000	$2,340,000	Budget estimated by HDR|CB 7 sal @ 12 mo, 26 hr @ 6 n
528	Owner Indire	Owners Project Management	1.0	ls	Owner														5,300,000	$5,300,000	Budget provided by LG&E
529	Owner Indire	Owners Engineer	1.0	ls	Owner														1,900,000	$1,900,000	Budget provided by LG&E
530	Owner Indire	Owners Legal Counsel	1.0	ls	Owner														1,300,000	$1,300,000	Budget provided by LG&E
531	Owner Indire	Operator Training	1.0	ls	Owner														225,000	$225,000	Budget estimated by HDR|CB
532	Owner Indire	Owner Startup Engineering	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
533	Owner Indire	Permitting, License Fees, & Environmental Compliance	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
534	Owner Indire	Highway Improvements, Miscellaneous Mitigation	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
535	Owner Indire	Land	1.0	ls	Owner														0	$0	Budget provided by LG&E
536	Owner Indire	Rolling Stock	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
537	Owner Indire	Water Infrastructure / Supply to Site	0.0	ls	Owner														0	$0	N/A (On site intake/pre-treatment/discharge incl. in EPC)
538	Owner Indire	Startup Testing (Includes Fuel & Power Sales)																			
539	Owner Indire	- Fuel - Natural Gas	1.0	ls	Owner														12,160,800	$12,160,800	HDR|CB [2,702,400 MMBTU @ $4.50/MMBTU per LG&E 2017 Forecas
540	Owner Indire	- Fuel - Fuel Oil	0.0	ls	Owner														0	$0	Budget estimated by HDR|CB [Not Required]
541	Owner Indire	- Electric Transmission Firm Point to Point	1.0	ls	Owner														4,000,000	$4,000,000	Budget provided by LG&E
542	Owner Indire	- Startup Power	1.0	ls	Owner														391,104	$391,104	Budget estimated by HDR|CB [10,864 MWhr @$36/MWH]
543	Owner Indire	- Test Power Sales	1.0	ls	Owner														(15,552,000)	($15,552,000)	Budget estimated by HDR|CB [432,000 MWhr @$36/MWH
544	Owner Indire	- Variable O&M - Water, Chemicals, etc.	1.0	ls	Owner														1,200,000	$1,200,000	Budget estimated by HDR|CB
545	Owner Indire	Site Security	1.0	ls	Owner														50,000	$50,000	Budget estimated by HDR|CB
546	Owner Indire	Operating Spare Parts	1.0	ls	Owner														10,000,000	$10,000,000	Budget estimated by HDR|CB
547	Owner Indire	Permanent Plant Equipment & Furnishings																		$0	

Estimate Details

2 x 1 Siemens F Class Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
TE BASIS	**ISCIPLIN**	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
Line #																					
548	Owner Indire	- Office Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
549	Owner Indire	- Kitchen Furniture	1.0	ls	Owner														130,000	$130,000	Budget estimated by HDR|CB
550	Owner Indire	- Laboratory Equipment & Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
551	Owner Indire	- Locker Room Furniture	1.0	ls	Owner														180,000	$180,000	Budget estimated by HDR|CB
552	Owner Indire	- Warehouse Shelves	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
553	Owner Indire	- Workshop Tools & Test Equipment	1.0	ls	Owner														1,800,000	$1,800,000	Budget estimated by HDR|CB
554	Owner Indire	IT and Telecommunication Infrastructure	1.0	ls	Owner														250,000	$250,000	Budget estimated by HDR|CB
555	Owner Indire	NERC - Cyber Security	1.0	ls	Owner														1,000,000	$1,000,000	Budget estimated by HDR|CB
556	Owner Indire	Escalation - Owners Furnished Equipment	0.0	%	Owner														0	$0	N/A
557	Owner Indire	Builders Risk Insurance	0.0	ls	Owner														0	$0	Included with EPC Contractor Indirects
558	Owner Indire	Property Tax During Construction	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
559	Owner Indire	Financing Fees	0.0	ls	Owner														0	$0	N/A
560	Owner Indire	AFUDC	1.0	ls	Owner														5,350,000	$5,350,000	AFUDC Based on 78% KU Ownership
561		**Total Owner Indirects**																	**69,224,904**	**$69,224,904**	
562																					
563																					
564		**Owner Contingency**	10.00%	%	Owner														**49,720,080**	**$49,720,080**	
565																					
566																					
567		**Total Owner Indirects**																	**118,944,984**	**$118,944,984**	
568																					
569		**TOTAL PROJECT COST**										**0**	**318,698,945**			**73,890,688**	**1,097,547**	**392,589,633**	**223,556,151**	**$616,145,784**	
																			$/kW	**$919**	

2 x 1 Siemens F Class 760 MW Combined Cycle Unit

BUDGET ESTIMATE

5 x 10 Work Week

February 22, 2013

Rev 1

CONFIDENTIAL

2 x 1 Siemens F Class 760 MW Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 761.359
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
Site Development	$0	$1,787,885	$1,537,001	36,870	250,000	$3,574,886	0.7%
Raw Water Intake/Discharge Facilities	$0	$500,000	$578,649	10,850	0	$1,078,649	0.2%
Foundations & Concrete	$0	$6,415,575	$4,963,370	128,270	11,900,000	$23,278,945	4.5%
Architectural & Metals	$0	$5,385,510	$2,426,063	46,805	5,766,400	$13,577,973	2.6%
Piping, Valves, Support, Accessories	$0	$19,968,039	$12,217,857	226,564	225,000	$32,410,896	6.3%
HRSG Equipment	$0	$50,000,000	$12,285,648	177,940	0	$62,285,648	12.1%
Steam Turbine Island Equipment	$0	$44,000,000	$1,562,353	29,295	0	$45,562,353	8.8%
Combustion Turbine Equipment	$0	$106,923,337	$3,356,166	62,930	0	$110,279,503	21.3%
Mechanical Draft Cooling Tower	$0	$0	$0	0	6,500,000	$6,500,000	1.3%
BOP Mechanical Equipment	$0	$21,940,700	$1,534,034	26,213	1,346,000	$24,820,734	4.8%
Electrical Equipment	$0	$16,509,330	$1,319,501	26,340	0	$17,828,831	3.5%
Electrical Commodities	$0	$9,213,019	$9,788,760	195,408	0	$19,001,779	3.7%
High Voltage Switchyard	$0	$390,000	$227,500	4,021	0	$617,500	0.1%
Instrumentation & Controls	$0	$5,995,825	$1,949,043	37,754	0	$7,944,868	1.5%
Sub-Total Direct Costs:	$0	$289,029,220	$53,745,945	1,009,260	$25,987,400	$368,762,566	71.4%
State Sales Tax (Non-Production Material Only)					392,527	$392,527	0.1%
Total Direct Cost	$0	$289,029,220	$53,745,945	1,009,260	$26,379,927	$369,155,093	71.4%
Construction Indirects & Services							
- Construction Field Staff			$0	0	$11,522,855	$11,522,855	2.2%
- Construction Field Staff Expenses			$0	0	$1,870,168	$1,870,168	0.4%
- Construction Equipment			$0	0	$12,055,653	$12,055,653	2.3%
- Small Tools			$0	0	$2,018,519	$2,018,519	0.4%
- Consumable Materials & Safety Supplies			$0	0	$2,018,519	$2,018,519	0.4%
- Field Office Expense		$1,033,370	$65,849	1,485	$22,373	$1,121,592	0.2%
- Temporary Facilities		$2,336,753	$863,403	19,472	$82,500	$3,282,657	0.6%
- Temporary Utilities		$747,600	$1,396,697	31,500	$0	$2,144,297	0.4%
- Support Craft & Site Services		$459,400	$2,008,704	45,302	$775,014	$3,243,118	0.6%
- Site Safety		$658,040	$375,008	8,224	$0	$1,033,048	0.2%
- Construction Permits		$51,450	$0	0	$0	$51,450	0.0%
- Construction Testing		$117,000	$0	0	$0	$117,000	0.0%
- Performance Testing		$304,400	$0	0	$0	$304,400	0.1%
- Start-up Supervision		$0	$0	0	$1,296,911	$1,296,911	0.3%
- Preop Testing, Start-up		$1,113,000	$752,767	23,534	$0	$1,865,767	0.4%
Sub-Total Construction Indirects and Services		$6,821,013	$5,462,428	129,518	$31,662,513	$43,945,954	8.5%
Total Construction Cost	$0	$295,850,234	$59,208,373	1,138,777	$58,042,440	$413,101,047	80.0%
Estimated Subcontract Labor Hours				205,164			
Project Indirects							
- Project Engineering (Eng, PM, CM & Procurement)					$24,786,063	$24,786,063	4.8%
Sub-Total Project Indirects	$0	$0	$0	0	$24,786,063	$24,786,063	4.8%
EPC Contractor Insurance & Misc Costs							
- Builders Risk					$2,065,505	$2,065,505	0.4%
- Comprehensive General Liability (CGL) Insurance					$2,065,505	$2,065,505	0.4%

2 x 1 Siemens F Class 760 MW Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 761.359
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
- Warranty Reserve					**$500,000**	**$500,000**	**0.1%**
Sub-Total EPC Contractor Insur. & Misc. Co	**$0**	**$0**	**$0**	**0**	**$4,631,010**	**$4,631,010**	**0.9%**
Total EPC Contractor Project Indirect Cost	**$0**	**$0**	**$0**	**0**	**$29,417,073**	**$29,417,073**	**5.7%**
- Escalation (Eqt, Materials & Labor)	**$0**	**$7,071,190**	**$9,309,942**		**$7,846,384**	**$24,227,516**	**4.7%**
Sub-Total	**0**	**302,921,424**	**68,518,315**	**1,343,941**	**95,305,897**	**466,745,636**	**90.3%**
- EPC Contractor Contingency	**$0**	**$4,746,345**	**$3,425,916**		**$4,410,295**	**$12,582,555**	**2.4%**
- EPC Contractor G&A and Profit	**$0**	**$24,233,714**	**$5,481,465**		**$7,624,472**	**$37,339,651**	**7.2%**
TOTAL EPC PROJECT COST	**$0**	**$331,901,482**	**$77,425,696**	**1,343,941**	**$107,340,664**	**$516,667,842**	**100.0%**
EPC Price per kW						**$679**	
Owner Indirect Costs							
- Total Owner Indirects						**$70,124,904**	
- Owner Contingency						**$51,666,784**	
TOTAL PROJECT COST						**$638,459,531**	
Total Project Cost per kW						**$839**	
Estimate Options (include 25 % markup for indirects)							
Fuel Oil System						**$11,250,000**	
Bypass Stack and Diverter Damper						**$12,500,013**	
Gas Compression						**Not Required**	
SCR System to meet 12 ppm NOx						**Not Required**	
Optional SCR System						**$4,700,000**	

Total Craft Labor Hours	**1,343,941**	**Performance Guarantees:**		**Executive-in-Charge:**	**WHD**
Ave. Craft Wage without Escalation	**$52.89**	**Liquidated Damages:**		**Project Manager:**	**JPS**
Field Labor Type	**TBD**	**Special Insurance:**		**Construction Manager:**	**SMP**
Labor Productivity Factor	**1.085**	**Performance Bond:**		**Lead Estimator:**	**CDF**

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Estimate Details

2 x 1 Siemens F Class 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
Line #																					
1	**Division #1.0 - Sitework**																				
2	Sitework	Roads - Asphalt paving main site rds & Parking lots	8,500.0	sy	Sub	Contr	20.00		44.43		1.09	0	0	YES	5,100	0	0	0	170,000	$170,000	HDR|CB Estimated Quantity
3	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Powerblock A	1,740.0	sy	Contr	Contr	5.00	0.055	44.43	96	1.09	0	8,700	YES	522	4,613	104	13,313	0	$13,313	HDR|CB Estimated Quantity
4	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Secondary Ar	6,945.0	sy	Contr	Contr	5.00	0.055	44.43	382	1.09	0	34,725	YES	2,084	18,412	414	53,137	0	$53,137	HDR|CB Estimated Quantity
5	Sitework	Roads - Haul/Construction Roads Treated Gravel	29,700.0	sy	Contr	Contr	8.00	0.1	44.43	2,970	1.09	0	237,600	YES	14,256	143,162	3,222	380,762	0	$380,762	HDR|CB Estimated Quantity
6	Sitework	Roads - Main Roads Crushed stone Base Course	8,500.0	sy	Contr	Contr	12.00	0.1	44.43	850	1.09	0	102,000	YES	6,120	40,972	922	142,972	0	$142,972	HDR|CB Estimated Quantity
7	Sitework	Roads - Drainage and culverts	90,000.0	sy	Contr	Contr	2.00	0.05	44.43	4,500	1.09	0	180,000	YES	10,800	216,912	4,883	396,912	0	$396,912	HDR|CB Estimated Quantity
8	Sitework	Soil Erosion Control Measures	2,160	lf	Contr	Contr	1	0.027	44.43	58	1.09	0	2,160	YES	130	2,811	58	4,971	0	4,971	HDR|CB Estimated Quantity
9	Sitework	Site - Topsoil stripping/stockpiling	10,125	cy	Contr	Contr		0.030	44.43	304	1.09	0	0	YES	0	14,642	304	14,642	0	$14,642	HDR|CB Estimated Quantity
10	Sitework	Site - Drainage - Pipe Culverts (Assume 12" dia)	3,000	lf	Contr	Contr	9.00	0.12	44.43	360	1.09	0	27,000	YES	1,620	17,353	360	44,353	0	$44,353	HDR|CB Estimated Quantity
11	Sitework	Site - Drainage - Manholes	25	ea	Contr	Contr	1,500	16	44.43	400	1.09	0	37,500	YES	2,250	19,281	400	56,781	0	$56,781	HDR|CB Estimated Quantity
14	Sitework	Site - Fire Protection hydrants, valve boxes, ductile iron	30.0	ea	Contr	Contr	3,000.00	20	39.54	600	1.09	0	90,000	YES	5,400	25,739	651	115,739	0	$115,739	HDR|CB Estimated Quantity
15	Sitework	Site - Fire Protection U/G piping, DI	4,500.0	lf	Contr	Contr	41.00	0.5	39.54	2,250	1.09	0	184,500	YES	11,070	96,520	2,441	281,020	0	$281,020	HDR|CB Estimated Quantity
16	Sitework	Pipe Utility Trench Excavation	10,500	cy	Contr	Contr		0.2	39.54	2,100	1.09	0	0	YES	0	90,086	2,100	90,086	0	$90,086	HDR|CB Estimated Quantity
17	Sitework	Pipe Utility Trench Backfill (including bedding)	9,000	cy	Contr	Contr		0.2	39.54	1,800	1.09	0	0	YES	0	77,216	1,800	77,216	0	$77,216	HDR|CB Estimated Quantity
20	Sitework	Spoil Disposal	11,250	cy	Contr	Contr		0.1	44.43	1,125	1.09	0	0	YES	0	54,228	1,125	54,228	0	$54,228	HDR|CB Estimated Quantity
21	Sitework	Site - Sanitary sewer lift stations	1.0	ea	Contr	Contr	11,700.00	40	39.54	40	1.09	0	11,700	YES	702	1,716	43	13,416	0	$13,416	HDR|CB Estimated Quantity
22	Sitework	Site - Sanitary waste piping and manholes	2,500.0	lf	Contr	Contr	20.00	1	39.54	2,500	1.09	0	50,000	YES	3,000	107,245	2,713	157,245	0	$157,245	HDR|CB Estimated Quantity
23	Sitework	Site - Storm drain piping and culverts	22,500.0	lf	Contr	Contr	12.00	0.25	39.54	5,625	1.09	0	270,000	YES	16,200	241,301	6,103	511,301	0	$511,301	HDR|CB Estimated Quantity
24	Sitework	Site Finishing - Seed Site Earthwork	6.0	ac	Contr	Contr	10,000.00	0.54	39.54	3	1.09	0	60,000	YES	3,600	139	4	60,139	0	$60,139	HDR|CB Estimated Quantity
25	Sitework	Site Finishing - Grading around foundations	7,500.0	sy	Contr	Contr		0.02	39.54	150	1.09	0	0	YES	0	6,435	163	6,435	0	$6,435	HDR|CB Estimated Quantity
26	Sitework	Site Finishing - Stone Surfacing	7,500.0	sy	Contr	Contr	10.00	0.015	39.54	113	1.09	0	75,000	YES	4,500	4,826	122	79,826	0	$79,826	HDR|CB Estimated Quantity
27	Sitework	Site Improvements - landscaping at admin building	1.0	ls	Contr	Contr	30,000.00	360	39.54	360	1.09	0	30,000	YES	1,800	15,443	391	45,443	0	$45,443	HDR|CB Estimated Quantity
28	Sitework	Site Improvements - Main Gate Security Facilities	1.0	lot	Contr	Contr	150,000.00	3600	39.54	3,600	1.09	0	150,000	YES	9,000	154,433	3,906	304,433	0	$304,433	HDR|CB Estimated Quantity
29	Sitework	Site Improvements - Site Entrance Sign and Landscaping	1.0	ls	Contr	Contr	18,750.00	240	39.54	240	1.09	0	18,750	YES	1,125	10,296	260	29,046	0	$29,046	HDR|CB Estimated Quantity
30	Sitework	Site Improvements - Site Security Boundary Fencing	18,750.0	lf	Contr	Contr	11.00	0.2	39.54	3,750	1.09	0	206,250	YES	12,375	160,867	4,069	367,117	0	$367,117	HDR|CB Estimated Quantity
31	Sitework	Site Improvements - Fencing Active gates	6.0	ea	Contr	Contr	2,000.00	48	39.54	288	1.09	0	12,000	YES	720	12,355	312	24,355	0	$24,355	HDR|CB Estimated Quantity
32	Sitework	Site Surveying	1.0	lot	Sub	Contr	80,000.00		44.43	0	1.09	0	0	YES	2,400	0	0	0	80,000	$80,000	HDR|CB Estimated Quantity
33																					
34		**Division #1 - Sitework Sub-Total**								**34,463**		**0**	**1,787,885**		**114,773**	**1,537,001**	**36,870**	**3,324,886**	**250,000**	**3,574,886**	
35																					
36	**Division #1.3 - Raw Water Intake and Discharge Facilities**																				HDR Allowance for Interconnection and Updgrage of
37		Raw Water River Intake and Discharge Facilities	1.0	ea	Contr	Contr	500,000.00	10,000	53.33	10,000	1.09	0	500,000	NO	0	578,649	10,850	1,078,649	0	$1,078,649	Unit 1 and 2 Intake Structure
38																					
39		**Division #1.3 - Raw Water Intake Clarification and Discharge Facilities Sub-Total**								**10,000**		**0**	**500,000**		**0**	**578,649**	**10,850**	**1,078,649**	**0**	**$1,078,649**	
40																					
41																					
42	**Division #2.0 - Earthwork and Concrete**																				
43	**Division #2.1 - Earthwork**																				
44	Earthwork	Structural Backfill Power Block (using imported material)	220,000.0	cy	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,500,000	$5,500,000	HDR|CB Estimated Quantity
45	Earthwork	Retaining Wall (MSE)	40,000.0	sf	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	1,000,000	$1,000,000	HDR|CB Estimated Quantity
46	Earthwork	Structural Excavation Main Power Block - Earth/Rock	300,000.0	cy	Sub	Contr	18.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,400,000	$5,400,000	HDR|CB Estimated Quantity
47																					
48			560,000.0	cy						0		0	0		0	0	0	0	11,900,000	11,900,000	
49	**Division # 2.2 - Concrete Main Power Block Area**																				
50																					
51		Includes Forms, Rebar, Placement, Finishing, Embeds																			
52	Concrete	HRSG and Stack	7,500	cy	Contr	Contr	250	4.5	38.69	33,750	1.09	0	1,875,000	NO	0	1,416,954	36,619	3,291,954	0	$3,291,954	HDR|CB Estimated Quantity
53	Concrete	Gas Turbine Foundation	4,000	cy	Contr	Contr	300	4.5	38.69	18,000	1.09	0	1,200,000	NO	0	755,709	19,530	1,955,709	0	$1,955,709	HDR|CB Estimated Quantity
54	Concrete	Steam Turbine building	800	cy	Contr	Contr	250	4.5	38.69	3,600	1.09	0	200,000	NO	0	151,142	3,906	351,142	0	$351,142	HDR|CB Estimated Quantity
55	Concrete	Spread Footings & Piers Pipe/Tray Trestle/Racks	400.0	cy	Contr	Contr	250	4.5	38.69	1,800	1.09	0	100,000	NO	0	75,571	1,953	175,571	0	$175,571	HDR|CB Estimated Quantity
56	Concrete	Steam Turbine Bldg fill slab	300.0	cy	Contr	Contr	210.00	4.5	38.69	1,350	1.09	0	63,000	NO	0	56,678	1,465	119,678	0	$119,678	HDR|CB Estimated Quantity
57	Concrete	Steam Turbine Bldg Mat Foundation	1,200.0	cy	Contr	Contr	250	4.5	38.69	5,400	1.09	0	300,000	NO	0	226,713	5,859	526,713	0	$526,713	HDR|CB Estimated Quantity
58	Concrete	Steam Turbine Bldg Elevated Slab	500.0	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	NO	0	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
59	Concrete	Steam Turbine Bldg sumps foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
60	Concrete	Steam Turbine Pedestal FDN (Columns & Tabletop, Mat)	2,500.0	cy	Contr	Contr	350.00	8	38.69	20,000	1.09	0	875,000	NO	0	839,677	21,700	1,714,677	0	$1,714,677	HDR|CB Estimated Quantity
61	Concrete	Aux. Equipment Foundations	500	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	YES	7,500	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
62	Concrete	Equip Fdn - Generator Breaker	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
63	Concrete	Equip Fdn - CT PEEC	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
64	Concrete	Equip Fdn - Power Distribution Center	80	cy	Contr	Contr	250	4.5	38.69	360	1.09	0	20,000	YES	1,200	15,114	391	35,114	0	$35,114	HDR|CB Estimated Quantity
65	Concrete	Equip Fdn - CEMS	40	cy	Contr	Contr	250	4.5	38.69	180	1.09	0	10,000	YES	600	7,557	195	17,557	0	$17,557	HDR|CB Estimated Quantity
66	Concrete	Equip Fdn - Boiler Feed Pump	120	cy	Contr	Contr	250	4.5	38.69	540	1.09	0	30,000	YES	1,800	22,671	586	52,671	0	$52,671	HDR|CB Estimated Quantity
67	Concrete	Equip Fdn - Main Step-up Transformer Fdn/Walls	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
68	Concrete	Equip Fdn - Plant Aux Power Transformers Fnd/Walls	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
69	Concrete	Equip Fdn - Misc off Base Equip fnds	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
70	Concrete	Elec. Ductbank (Tubes, Conc., Forms, Rebar) 12 Tubes	500.0	lf	Contr	Contr	125	0.57	38.69	285	1.09	0	62,500	NO	0	11,965	309	74,465	0	$74,465	HDR|CB Estimated Quantity
71	Concrete	Elec. Ductbank to Cooling Tower (Tubes, Conc., Forms, Rebar) 6 Tu	750.0	lf	Contr	Contr	100	0.45	38.69	338	1.09	0	75,000	NO	0	14,170	366	89,170	0	$89,170	HDR|CB Estimated Quantity
72	Concrete	Equip Fdn - Pumps & misc equipment	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
73	Concrete	Electrical Building Foundation	130.0	cy	Contr	Contr	250	4.5	38.69	585	1.09	0	32,500	NO	0	24,561	635	57,061	0	$57,061	HDR|CB Estimated Quantity
74	Concrete	Cooling Tower Basin	2,500.0	cy	Contr	Contr	250	5.5	38.69	13,750	1.09	0	625,000	NO	0	577,278	14,919	1,202,278	0	$1,202,278	HDR|CB Estimated Quantity
75	Concrete	Administration Building foundation	1,100.0	cy	Contr	Contr	250	4.5	38.69	4,950	1.09	0	275,000	YES	16,500	207,820	5,371	482,820	0	$482,820	HDR|CB Estimated Quantity
76	Concrete	Auxilary Boiler Building floor slab & foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
77	Concrete	Demineralized Water Tank Foundations	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
78	Concrete	Service water storage tank foundations	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	YES	3,000	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
79	Concrete	Main Gate Guard House	3.0	cy	Contr	Contr	250	4.5	38.69	14	1.09	0	750	YES	45	567	15	1,317	0	$1,317	HDR|CB Estimated Quantity
80	Concrete	Water Treatment Buildings, enclosures and tank fdns	0.0	cy	Contr	Contr	250	4.5	38.69	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
81	Concrete	Grouting (equipment & steel)	30.0	cy	Contr	Contr	2,227.50	81	38.69	2,430	1.09	0	66,825	NO	0	102,021	2,637	168,846	0	$168,846	HDR|CB Estimated Quantity
82																					
83		Sub Total Concrete	**24,373**				AVG MH/CY	5.15		118,221			6,415,575		32,445	4,963,370	128,270	11,378,945	0	11,378,945	
84																					
85		**Division #2 - Earthwork & Concrete Sub-Total**								**118,221**		**0**	**6,415,575**		**32,445**	**4,963,370**	**128,270**	**11,378,945**	**11,900,000**	**23,278,945**	
86																					
87	**Division #3.0 - Architectural**												-								
88																					
89	rchitectura	Exterior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
90	rchitectura	Fire extinguishers	36.0	ea	Contr	Contr	500.00	3	53.33	108	1.09	0	18,000	YES	1,080	6,249	117	24,249	0	$24,249	HDR|CB Estimated Quantity
91	rchitectura	Fire hose cabinets	26.0	ea	Contr	Contr	1,200.00	20	53.33	520	1.09	0	31,200	YES	1,872	30,090	564	61,290	0	$61,290	HDR|CB Estimated Quantity
92	rchitectura	Fire hydrants w/monitor nozzles	10.0	ea	Contr	Contr	2,550.00	12	54.96	120	1.09	0	25,500	YES	1,530	7,156	130	32,656	0	$32,656	HDR|CB Estimated Quantity
93	rchitectura	Fire protection control room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
94	rchitectura	Fire Protection Elect Equip & Cable Spreading Room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity

Estimate Details

2 x 1 Siemens F Class 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
95	rchitectura	Fire Protection GSU and Aux Transformers	1.0	ls	Sub	Contr	200,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	200,000	$200,000	HDR|CB Estimated Quantity
96	rchitectura	Fire Protection Turbine Building	1.0	ls	Sub	Contr	600,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
97	rchitectura	Fire Detection/Alarm	1.0	lot	Contr	Contr	410,000.00	1000	50.09	1,000	1.09	0	410,000	NO	0	54,352	1,085	464,352	0	$464,352	HDR|CB Estimated Quantity
98	rchitectura	HVAC System Allowance	1.0	ls	Sub	Contr	750,000.00		54.96	0	1.09	0	0	YES	22,500	0	0	0	750,000	$750,000	HDR|CB Estimated Quantity
99	rchitectura	Interior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
100	rchitectura	Masonry Walls 8" CMU	20,000.0	sf	Contr	Contr	4.00	0.15	32.95	3,000	1.09	0	80,000	yes	4,800	107,267	3,255	187,267	0	$187,267	HDR|CB Estimated Quantity
101	rchitectura	Overhead Rolling Doors - steel	4.0	ea	Contr	Contr	5,000.00	40	38.68	160	1.09	0	20,000	yes	1,200	6,715	174	26,715	0	$26,715	HDR|CB Estimated Quantity
102	rchitectura	Painting - equipment and piping	1.0	lot	Contr	Contr	100,000.00	3600	36.36	3,600	1.09	0	100,000	yes	6,000	142,016	3,906	242,016	0	$242,016	HDR|CB Estimated Quantity
103	rchitectura	Painting - structural steel, grating, handrail touch-up	250,000.0	sf	Contr	Contr	0.30	0.010	36.36	2,500	1.09	0	75,000	yes	4,500	98,622	2,713	173,622	0	$173,622	HDR|CB Estimated Quantity
104	rchitectura	Painting - turbine room floor epoxy finish	40,000.0	sf	Contr	Contr	0.80	0.045	36.36	1,805	1.09	0	32,000	yes	1,920	71,197	1,958	103,197	0	$103,197	HDR|CB Estimated Quantity
105	rchitectura	Restrooms, showers, locker rooms	1.0	lot	Contr	Contr	125,000.00	1200	53.33	1,200	1.09	0	125,000	YES	7,500	69,438	1,302	194,438	0	$194,438	HDR|CB Estimated Quantity
106	rchitectura	Roof Drains	1,700.0	lf	Contr	Contr	32.50	2.0	54.96	3,400	1.09	0	55,250	yes	3,315	202,758	3,689	258,008	0	$258,008	HDR|CB Estimated Quantity
107	rchitectura	Structural Steel - Misc Building Steel	25.0	ton	Contr	Contr	3,200.00	30	60.25	750	1.09	0	80,000	yes	4,800	49,026	814	129,026	0	$129,026	HDR|CB Estimated Quantity
108	rchitectura	Structural Steel - Pipe Rack	600.0	ton	Contr	Contr	3,400.00	20	60.25	12,000	1.09	0	2,040,000	NO	0	784,409	13,020	2,824,409	0	$2,824,409	HDR|CB Estimated Quantity
109	rchitectura	Structural Steel - Misc Platforms	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	NO	0	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
110	rchitectura	Structural Steel - Turbine Building Framing	500.0	ton	Contr	Contr	2,850.00	15	60.25	7,500	1.09	0	1,425,000	NO	0	490,255	8,138	1,915,255	0	$1,915,255	HDR|CB Estimated Quantity
111	rchitectura	Trench Floor Drain Cover	2,000.0	lf	Contr	Contr	60.45	0.4	54.96	800	1.09	0	120,900	yes	7,254	47,708	868	168,608	0	$168,608	HDR|CB Estimated Quantity
112	rchitectura	Turbine Building Built-up Roof	18,000.0	sf	Contr	Contr	0.75	0.035	35.31	630	1.09	0	13,500	NO	0	24,138	684	37,638	0	$37,638	HDR|CB Estimated Quantity
113	rchitectura	Turbine Building Metal Siding	52,900.0	sf	Contr	Contr	10.40	0.05	56.41	2,645	1.09	0	550,160	NO	0	161,876	2,870	712,036	0	$712,036	HDR|CB Estimated Quantity
114	rchitectura	Administration/Control/Maintenance Building	16,000.0	sf	Sub	Contr	140.00		38.68	0	1.09	0	0	YES	0	0	0	0	2,240,000	$2,240,000	HDR|CB Estimated Quantity
115	rchitectura	Cooling Tower, pre-engineered - Elect, Chem feed, I&C Bldg	3,000.0	sf	Sub	Contr	80.00		59.59	0	1.09	0	0	NO	0	0	0	0	240,000	$240,000	HDR|CB Estimated Quantity
116	rchitectura	Main Gate Guard House	80.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	YES	0	0	0	0	6,400	$6,400	HDR|CB Estimated Quantity
117	rchitectura	Auxilary Boiler Building	4,000.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	440,000	$440,000	HDR|CB Estimated Quantity
118	rchitectura	Water Treatment Building	0.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
119	rchitectura	Warehouse	8,000.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	NO	0	0	0	0	640,000	$640,000	HDR|CB Estimated Quantity
120	rchitectura	Boiler Feed Pump Buildings	2.0	ea	sub	Contr	300,000.00		38.68	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
121																					
122		**Division #3 - Architectural Sub-Total**								**43,138**	**1.05**	**0**	**5,385,510**		**75,471**	**2,426,063**	**46,805**	**7,811,573**	**5,766,400**	**$13,577,973**	
123																					
124	**Division #4.0 - Mechanical Piping**																				
125	**Division #4.1 - Mechanical Piping**																				
126																					
127	hanical Pip	Pipe - MS, HR, CR, BFW, LPS	**3,590.0**	lf																	
128	hanical Pip	- System - Cold Reheat (Carbon)	800.0	lf	Contr	Contr	3,510.00	7.2	54.96	5,790	1.09	0	2,808,000	NO	0	345,308	6,283	3,153,308	0	$3,153,308	HDR|CB Estimated Quantity
129	hanical Pip	- System - Feedwater (Carbon)	650.0	lf	Contr	Contr	1,060.00	5.6	54.96	3,666	1.09	0	689,000	NO	0	218,620	3,978	907,620	0	$907,620	HDR|CB Estimated Quantity
130	hanical Pip	- System - Hot Reheat (Alloy)	540.0	lf	Contr	Contr	4,275.00	14.4	54.96	7,766	1.09	0	2,308,500	NO	0	463,139	8,426	2,771,639	0	$2,771,639	HDR|CB Estimated Quantity
131	hanical Pip	- System - Main Steam (Alloy)	800.0	lf	Contr	Contr	4,700.00	14.4	54.96	11,506	1.09	0	3,760,000	NO	0	686,131	12,484	4,446,131	0	$4,446,131	HDR|CB Estimated Quantity
132	hanical Pip	- System - Low Pressure Steam Steam (Alloy)	800.0	lf	Contr	Contr	246.00	7.5	54.96	6,016	1.09	0	196,800	NO	0	358,762	6,527	555,562	0	$555,562	HDR|CB Estimated Quantity
133	hanical Pip	Pipe - Above Ground - Large Bore Average "	**29,610.0**	lf																	
134	hanical Pip	- System - Boilers, Vents and Drains	700.0	lf	Contr	Contr	300.00	4.14	54.96	2,895	1.09	0	210,000	NO	0	172,654	3,141	382,654	0	$382,654	HDR|CB Estimated Quantity
135	hanical Pip	- System - Aux steam drain returns	2,500.0	lf	Contr	Contr	30.00	1.22	54.96	3,055	1.09	0	75,000	NO	0	182,184	3,315	257,184	0	$257,184	HDR|CB Estimated Quantity
136	hanical Pip	- System - Building drains	1,350.0	lf	Contr	Contr	30.00	1.22	54.96	1,650	1.09	0	40,500	YES	2,430	98,379	1,790	138,879	0	$138,879	HDR|CB Estimated Quantity
137	hanical Pip	- System - Building fire protection	5,800.0	lf	Contr	Contr	18.00	1.50	54.96	8,723	1.09	0	104,400	YES	6,264	520,204	9,465	624,604	0	$624,604	HDR|CB Estimated Quantity
138	hanical Pip	- System - Building sump pumps	800.0	lf	Contr	Contr	47.00	1.55	54.96	1,241	1.09	0	37,600	YES	2,256	73,995	1,346	111,595	0	$111,595	HDR|CB Estimated Quantity
139	hanical Pip	- System - Circulating Water	1,000.0	lf	Contr	Contr	450.00	4.70	54.96	4,700	1.09	0	450,000	NO	0	280,282	5,100	730,282	0	$730,282	HDR|CB Estimated Quantity
140	hanical Pip	- System - Condensate	1,350.0	lf	Contr	Contr	190.00	2.35	54.96	3,173	1.09	0	256,500	NO	0	189,191	3,442	445,691	0	$445,691	HDR|CB Estimated Quantity
141	hanical Pip	- System - Condenser Air Extraction	300.0	lf	Contr	Contr	184.00	2.35	54.96	705	1.09	0	55,200	NO	0	42,042	765	97,242	0	$97,242	HDR|CB Estimated Quantity
142	hanical Pip	- System - Cooling water	600.0	lf	Contr	Contr	320.00	2.63	54.96	1,579	1.09	0	192,000	NO	0	94,175	1,713	286,175	0	$286,175	HDR|CB Estimated Quantity
143	hanical Pip	- System - Demineralized water	400.0	lf	Contr	Contr	27.00	0.39	54.96	154	1.09	0	10,800	NO	0	9,193	167	19,993	0	$19,993	HDR|CB Estimated Quantity
144	hanical Pip	- System - Fire Protection	300.0	lf	Contr	Contr	150.00	2.35	54.96	705	1.09	0	45,000	YES	2,700	42,042	765	87,042	0	$87,042	HDR|CB Estimated Quantity
145	hanical Pip	- System - Natural Gas High Pressure - SS	260.0	lf	Contr	Contr	52.40	0.85	54.96	220	1.09	0	13,624	YES	817	13,117	239	26,741	0	$26,741	HDR|CB Estimated Quantity
146	hanical Pip	- System - Potable water	1,000.0	lf	Contr	Contr	18.00	1.50	54.96	1,504	1.09	0	18,000	YES	1,080	89,690	1,632	107,690	0	$107,690	HDR|CB Estimated Quantity
147	hanical Pip	- System - Sanitary waste	3,000.0	lf	Contr	Contr	47.00	1.55	54.96	4,653	1.09	0	141,000	YES	8,460	277,480	5,049	418,480	0	$418,480	HDR|CB Estimated Quantity
148	hanical Pip	- System - Service Water	1,000.0	lf	Contr	Contr	184.00	1.97	54.96	1,974	1.09	0	184,000	YES	11,040	117,719	2,142	301,719	0	$301,719	HDR|CB Estimated Quantity
149	hanical Pip	- System - STG lube oil	200.0	lf	Contr	Contr	32.00	1.11	54.96	222	1.09	0	6,400	NO	0	13,239	241	19,639	0	$19,639	HDR|CB Estimated Quantity
150	hanical Pip	- System - STG oil purification	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
151	hanical Pip	- System - STG Seal Oil	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
152	hanical Pip	- System - STG Stator cooling	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
153	hanical Pip	- System - STG Steam Seal	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
154	hanical Pip	- System - Turbine drains	690.0	lf	Contr	Contr	47.00	1.55	54.96	1,070	1.09	0	32,430	NO	0	63,820	1,161	96,250	0	$96,250	HDR|CB Estimated Quantity
155	hanical Pip	- System - HRSG Blowdown	200.0	lf	Contr	Contr	18.00	1.50	54.96	301	1.09	0	3,600	NO	0	17,938	326	21,538	0	$21,538	HDR|CB Estimated Quantity
156	hanical Pip	- System - Cycle Makeup	360.0	lf	Contr	Contr	47.00	1.55	54.96	558	1.09	0	16,920	NO	0	33,298	606	50,218	0	$50,218	HDR|CB Estimated Quantity
157	hanical Pip	- System - Miscellaneous Systems Piping CS)	6,600.0	lf	Contr	Contr	47.00	1.55	54.96	10,237	1.09	0	310,200	YES	18,612	610,455	11,107	920,655	0	$920,655	HDR|CB Estimated Quantity
158	hanical Pip	Pipe - Above Ground - Small Bore	**26,055.0**	lf																	
159	hanical Pip	- System - Water Cycle Sample - Alloy	150.0	lf	Contr	Contr	13.00	0.85	54.96	127	1.09	0	1,950	NO	0	7,568	138	9,518	0	$9,518	HDR|CB Estimated Quantity
160	hanical Pip	- System - STG lube oil	300.0	lf	Contr	Contr	11.60	0.62	54.96	186	1.09	0	3,480	NO	0	11,092	202	14,572	0	$14,572	HDR|CB Estimated Quantity
161	hanical Pip	- System - CT Auxilarie	1,800.0	lf	Contr	Contr	18.00	1.13	54.96	2,030	1.09	0	32,400	NO	0	121,082	2,203	153,482	0	$153,482	HDR|CB Estimated Quantity
162	hanical Pip	- System - Instrument Air	3,100.0	lf	Contr	Contr	8.00	0.14	54.96	437	1.09	0	24,800	NO	0	26,066	474	50,866	0	$50,866	HDR|CB Estimated Quantity
163	hanical Pip	- System - Instrument Air supply	3,000.0	lf	Contr	Contr	35.00	0.28	54.96	846	1.09	0	105,000	NO	0	50,451	918	155,451	0	$155,451	HDR|CB Estimated Quantity
164	hanical Pip	- System - Service Air piping	1,300.0	lf	Contr	Contr	12.00	0.22	54.96	281	1.09	0	15,600	YES	936	16,761	305	32,361	0	$32,361	HDR|CB Estimated Quantity
165	hanical Pip	- System - Instrument Air	2,035.0	lf	Contr	Contr	11.50	0.52	54.96	1,052	1.09	0	23,403	YES	1,404	62,741	1,142	86,144	0	$86,144	HDR|CB Estimated Quantity
166	hanical Pip	- System - Service Water	900.0	lf	Contr	Contr	20.00	1.32	54.96	1,184	1.09	0	18,000	YES	1,080	70,631	1,285	88,631	0	$88,631	HDR|CB Estimated Quantity
167	hanical Pip	- System - Cycle Chemical Feed	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
168	hanical Pip	- System - Boiler Vents & Drains - Alloy	700.0	lf	Contr	Contr	20.00	1.32	54.96	921	1.09	0	14,000	YES	840	54,935	1,000	68,935	0	$68,935	HDR|CB Estimated Quantity
169	hanical Pip	- System - (HP) Main Steam - Alloy	600.0	lf	Contr	Contr	20.00	1.32	54.96	790	1.09	0	12,000	YES	720	47,087	857	59,087	0	$59,087	HDR|CB Estimated Quantity
170	hanical Pip	- System - (LP) Steam - Carbon	1,400.0	lf	Contr	Contr	18.00	1.13	54.96	1,579	1.09	0	25,200	YES	1,512	94,175	1,713	119,375	0	$119,375	HDR|CB Estimated Quantity
171	hanical Pip	- System - Hot Reheat Steam - Alloy	650.0	lf	Contr	Contr	20.00	1.32	54.96	855	1.09	0	13,000	YES	780	51,011	928	64,011	0	$64,011	HDR|CB Estimated Quantity
172	hanical Pip	- System - Cold Reheat Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
173	hanical Pip	- System - Cycle Makeup	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
174	hanical Pip	- System - Aux Steam - Carbon	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
175	hanical Pip	- System - STG Seals and Drains - Alloy	1,400.0	lf	Contr	Contr	20.00	1.32	54.96	1,842	1.09	0	28,000	YES	1,680	109,871	1,999	137,871	0	$137,871	HDR|CB Estimated Quantity
176	hanical Pip	- System - CT System - Carbon	250.0	lf	Contr	Contr	18.00	1.13	54.96	282	1.09	0	4,500	YES	270	16,817	306	21,317	0	$21,317	HDR|CB Estimated Quantity
177	hanical Pip	- System - Hydrogen - Carbon	0.0	lf	Contr	Contr	12.35	1.03	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
178	hanical Pip	- System - Carbon Dioxide - Carbon	0.0	lf	Contr	Contr	12.35	1.03	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
179	hanical Pip	- System - Miscellaneous	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
180	hanical Pip	- System - Condensate - Carbon	400.0	lf	Contr	Contr	18.00	1.13	54.96	451	1.09	0	7,200	YES	432	26,907	490	34,107	0	$34,107	HDR|CB Estimated Quantity
181	hanical Pip	- System - Closed Cycle Cooling Water - Carbon	900.0	lf	Contr	Contr	12.35	1.03	54.96	931	1.09	0	11,115	YES	667	55,496	1,010	66,611	0	$66,611	HDR|CB Estimated Quantity
182	hanical Pip	- System - Fuel Gas - Carbon	900.0	lf	Contr	Contr	18.00	1.13	54.96	1,015	1.09	0	16,200	YES	972	60,541	1,101	76,741	0	$76,741	HDR|CB Estimated Quantity
183	hanical Pip	- System - Condensed Air Extraction - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
184	hanical Pip	- System - CW Chemical Feed - Carbon	20.0	lf	Contr	Contr	18.00	1.13	54.96	23	1.09	0	360	YES	22	1,345	24	1,705	0	$1,705	HDR|CB Estimated Quantity
185	hanical Pip	- System - Nitrogen Gas System	200.0	lf	Contr	Contr	19.00	0.19	54.96	38	1.09	0	3,800	YES	228	2,242	41	6,042	0	$6,042	HDR|CB Estimated Quantity

Estimate Details

2 x 1 Siemens F Class 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

														CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	E BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																						
186		chanical Pip	- System - Waste Water Coll & Treatment - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
187		chanical Pip	- System - Chemical Waste Treatment	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
188		chanical Pip	- System - Miscellaneous Systems Piping	4,400.0	lf	Contr	Contr	12.35	1.03	54.96	4,550	1.09	0	54,340	YES	3,260	271,313	4,936	325,653	0	$325,653	HDR|CB Estimated Quantity
189		chanical Pip	Pipe - Below Ground - Large Bore	**22,195.0**	lf																	
190		chanical Pip	- System - Hydrogen	0.0	lf	Contr	Contr	20.00	0.71	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
191		chanical Pip	- System - Fuel Gas	800.0	lf	Contr	Contr	170.00	1.97	54.96	1,579	1.09	0	136,000	NO	0	94,175	1,713	230,175	0	$230,175	HDR|CB Estimated Quantity
192		chanical Pip	- System - Main Circ. - HDPE	400.0	lf	Contr	Contr	15.00	1.13	54.96	451	1.09	0	6,000	NO	0	26,907	490	32,907	0	$32,907	HDR|CB Estimated Quantity
192		chanical Pip	- System - Miscellaneous Systems Piping - HDPE	7,840.0	lf	Contr	Contr	15.00	1.13	54.96	8,844	1.09	0	117,600	NO	0	527,379	9,595	644,979	0	$644,979	HDR|CB Estimated Quantity
193		chanical Pip	- System - Waste Water Treatment Piping - HDPE (Sch 17)	2,565.0	lf	Contr	Contr	6.00	0.66	54.96	1,688	1.09	0	15,390	NO	0	100,649	1,831	116,039	0	$116,039	HDR|CB Estimated Quantity
193		chanical Pip	- System - Sanitary Sewer	3,000.0	lf	Contr	Contr	15.00	1.13	54.96	3,384	1.09	0	45,000	NO	0	201,803	3,672	246,803	0	$246,803	HDR|CB Estimated Quantity
194		chanical Pip	- System - Natural Gas Low Pressure - CS	850.0	lf	Contr	Contr	30.00	1.22	54.96	1,039	1.09	0	25,500	NO	0	61,942	1,127	87,442	0	$87,442	HDR|CB Estimated Quantity
195		chanical Pip	- System - Natural Gas High Pressure - CS	500.0	lf	Contr	Contr	30.00	1.22	54.96	611	1.09	0	15,000	NO	0	36,437	663	51,437	0	$51,437	HDR|CB Estimated Quantity
196		chanical Pip	- System - Potable Water to site facilities	500.0	lf	Contr	Contr	47.00	1.55	54.96	776	1.09	0	23,500	NO	0	46,247	841	69,747	0	$69,747	HDR|CB Estimated Quantity
197		chanical Pip	- System - Cooling tower blowdown	1,160.0	lf	Contr	Contr	115.00	1.69	54.96	1,963	1.09	0	133,400	NO	0	117,046	2,130	250,446	0	$250,446	HDR|CB Estimated Quantity
198		chanical Pip	- System - Cooling tower makeup water Pipe	1,000.0	lf	Contr	Contr	115.00	1.69	39.54	1,692	1.09	0	115,000	NO	0	72,583	1,836	187,583	0	$187,583	HDR|CB Estimated Quantity
199		chanical Pip	Pipe - Below Ground - Small Bore	**790.0**	lf																	HDR|CB Estimated Quantity
200		chanical Pip	- System - Miscellaneous Systems Piping	790.0	lf	Contr	Contr	12.35	1.03	54.96	817	1.09	0	9,757	NO	0	48,713	886	58,470	0	$58,470	Based on 1-1/2" dia with 1 fitting per 20 ft.
201		chanical Pip	Circulating water 96" RCP	2,000.0	lf	Contr	Contr	636.00	7.52	54.96	15,040	1.09	0	1,272,000	NO	0	896,904	16,318	2,168,904	0	$2,168,904	HDR|CB Estimated Quantity
202		chanical Pip	Piping Non Destructive Examination	1.0	lot	Sub	Contr	75,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	75,000	$75,000	HDR|CB Estimated Quantity
203		chanical Pip	Steam Blows	1.0	lot	Sub	Contr	150,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	150,000	$150,000	HDR|CB Estimated Quantity
204		chanical Pip	Stress relieving LB Alloy	50.0	ea	Contr	Contr	1,500.00	80.00	54.96	4,000	1.09	0	75,000	NO	0	238,538	4,340	313,538	0	$313,538	HDR|CB Estimated Quantity
205																						
206			**Division #4.1 - Mechanical Piping Sub-Total**	**82,240.0**	**LF**						148,495		0	14,419,318		69,683	8,827,101	161,117	23,246,419	225,000	$23,471,419	
207																						
208	**Division #4.2 - Mechanical Valves**																					
209																						
210		chanical Va	Valves - Large Bore General Service	500.0	ea	Contr	Contr	636.00	16.92	54.96	8,460	1.09	0	318,000	NO	0	504,508	9,179	822,508	0	$822,508	HDR|CB Estimated Quantity
211		chanical Va	Valves - Large Bore HP 900# to 3800#	100.0	ea	Contr	Contr	6,750.00	56.4	54.96	5,640	1.09	0	675,000	NO	0	336,339	6,119	1,011,339	0	$1,011,339	HDR|CB Estimated Quantity
212		chanical Va	Valves - Large Bore LP Circ Water	4.0	ea	Contr	Contr	197,500.00	112.8	54.96	451	1.09	0	790,000	NO	0	26,907	490	816,907	0	$816,907	HDR|CB Estimated Quantity
213		chanical Va	Valves - Small Bore - I/A supply	100.0	ea	Contr	Contr	17.50	1.88	54.96	188	1.09	0	1,750	NO	0	11,211	204	12,961	0	$12,961	HDR|CB Estimated Quantity
214		chanical Va	Valves - Small Bore - Instrument piping	500.0	ea	Contr	Contr	270.00	1.88	54.96	940	1.09	0	135,000	NO	0	56,056	1,020	191,056	0	$191,056	HDR|CB Estimated Quantity
215		chanical Va	Valves - Small Bore Bronze	40.0	ea	Contr	Contr	480.00	2.82	54.96	113	1.09	0	19,200	NO	0	6,727	122	25,927	0	$25,927	HDR|CB Estimated Quantity
216		chanical Va	Valves - Small Bore Class 800	250.0	ea	Contr	Contr	305.00	2.82	54.96	705	1.09	0	76,250	NO	0	42,042	765	118,292	0	$118,292	HDR|CB Estimated Quantity
217		chanical Va	Valves - Small Bore HP 1500# Alloy & CS	150.0	ea	Contr	Contr	670.00	15.04	54.96	2,256	1.09	0	100,500	NO	0	134,536	2,448	235,036	0	$235,036	HDR|CB Estimated Quantity
218		chanical Va	Valves - Small Bore HP 3800# Alloy	30.0	ea	Contr	Contr	3,050.00	22.56	54.96	677	1.09	0	91,500	NO	0	40,361	734	131,861	0	$131,861	HDR|CB Estimated Quantity
219		chanical Va	Valves - By Pass	1.0	ea	Contr	Contr	1,300,000.00	75.2	54.96	75	1.09	0	1,300,000	NO	0	4,485	82	1,304,485	0	$1,304,485	HDR|CB Estimated Quantity
220																						
221																						
222			**Division #4.2 - Mechanical Valves Sub-Total**	**1,675.0**	**ea**						19,505		$0	3,507,200		0	1,163,172	21,163	4,670,372	0	$4,670,372	
223																						
224	**Division #4.3 - Mechanical Insulation & Coatings**																					
225																						
226		Insulation	Insulation - BOP Equipment	16,000.0	sf	Contr	Contr	15.00	0.5	46.60	8,000	1.09	0	240,000	NO	0	404,462	8,680	644,462	0	$644,462	HDR|CB Estimated Quantity
227		Insulation	Insulation - Piping Freeze Protection	2,000.0	lf	Contr	Contr	3.50	0.2	46.60	400	1.09	0	7,000	NO	0	20,223	434	27,223	0	$27,223	HDR|CB Estimated Quantity
228		Insulation	Insulation - Piping Large Bore BOP	7,460.0	lf	Contr	Contr	15.00	0.5	46.60	3,730	1.09	0	111,900	NO	0	188,580	4,047	300,480	0	$300,480	HDR|CB Estimated Quantity
229		Insulation	Insulation - Piping Large Bore High Temp	3,590.0	lf	Contr	Contr	50.00	1.5	46.60	5,385	1.09	0	179,500	NO	0	272,253	5,843	451,753	0	$451,753	HDR|CB Estimated Quantity
230		Insulation	Insulation - Piping Small Bore	22,720.0	lf	Contr	Contr	8.00	0.23	46.60	5,226	1.09	0	181,760	NO	0	264,194	5,670	445,954	0	$445,954	HDR|CB Estimated Quantity
231																						
232																						
233			**Division #4.3 - Mechanical Insulation & Coatings Sub-Total**								22,741		0	720,160		0	1,149,713	24,674	1,869,873	0	$1,869,873	
234																						
235																						
236	**Division #4.4 - Mechanical Engineered Pipe Hangers (Including Supplemental Support Steel)**																					
237																						
238		hanical Pipe H	Hangers & Supports - (Large Bore Engineered)	200	ea	Contr	Contr	1,760.00	12.5	54.96	2,502	1.09	0	352,311	NO	0	149,218	2,715	501,529	0	$501,529	HDR|CB Estimated Quantity
239		hanical Pipe H	Hangers & Supports - (Large Bore Rigid)	1558	ea	Contr	Contr	192.50	7.1	54.96	11,065	1.09	0	299,996	NO	0	659,844	12,005	959,840	0	$959,840	HDR|CB Estimated Quantity
240		hanical Pipe H	Hangers & Supports - (Small Bore Rigid)	1861	ea	Contr	Contr	88.00	1.5	54.96	2,792	1.09	0	163,774	NO	0	166,476	3,029	330,251	0	$330,251	HDR|CB Estimated Quantity
241																						
242			**Division #4.4 - Mechanical Engineered Pipe Hangers Sub-Total**								16,359		0	816,081		0	975,538	17,749	1,791,619	0	$1,791,619	
243																						
244	**Division #4.5 - Mechanical Accessories**																					
245																						
246		nical Acces	Instr. Air Supply filter regulators	40.0	ea	Contr	Contr	132.00	2.4	54.96	96	1.09	0	5,280	NO	0	5,725	104	11,005	0	$11,005	HDR|CB Estimated Quantity
247		nical Acces	Expansion Joints - Circ Water	2.0	ea	Contr	Contr	75,000.00	210	54.96	420	1.09	0	150,000	NO	0	25,047	456	175,047	0	$175,047	HDR|CB Estimated Quantity
248		nical Acces	Miscellaneous Specialties	1.0	lot	Contr	Contr	75,000.00	600	54.96	600	1.09	0	75,000	NO	0	35,781	651	110,781	0	$110,781	HDR|CB Estimated Quantity
249		nical Acces	Miscellaneous Strainers, traps, Exp Joints	1.0	ls	Contr	Contr	125,000.00	120	54.96	120	1.09	0	125,000	NO	0	7,156	130	132,156	0	$132,156	HDR|CB Estimated Quantity
250		nical Acces	Miscellaneous Trolleys & Hoists	1.0	ls	Contr	Contr	150,000.00	480	54.96	480	1.09	0	150,000	NO	0	28,625	521	178,625	0	$178,625	HDR|CB Estimated Quantity
251																						
252			**Division #4.5 - Mechanical Accessories Sub-Total**								1,716		0	505,280		0	102,333	1,862	607,613	0	$607,613	
253																						
254			**Division #4 - Mechanical Piping**								**208,815**		**0**	**19,968,039**		**69,683**	**12,217,857**	**226,564**	**32,185,896**	**225,000**	**$32,410,896**	
255																						
256	**Division #5.0 - Mechanical Equipment**																					
257																						
258	**Division #5.1 - Boiler Equipment**																					
259																						
260		HRSG	Heat Recovery Steam Generator with Duct Burner/CO/Penthouse	2.0	ea	Contr	Contr	25,000,000.00		69.04	0	1.09	0	50,000,000	NO	0	0	0	50,000,000	0	$50,000,000	OEM Bidget Proposal
261		HRSG	Steam Generator Erection	2.0	ea	Contr	Contr		82,000	69.04	164,000	1.09	0	0	NO	0	12,285,648	177,940	12,285,648	0	$12,285,648	HDR|CB Estimated cost
262																						
263			**Division #5.1 - Boiler Equipment Sub-Total**								**164,000**		**0**	**50,000,000**		**0**	**12,285,648**	**177,940**	**62,285,648**	**0**	**$62,285,648**	
264																						
265	**Division #5.2 - Turbine Equipment**																					
266																						
267		STG	Steam Turbine Generator	1.0	ea	Contr	Contr	44,000,000.00		53.33	0	1.09	0	44,000,000	NO	0	0	0	44,000,000	0	$44,000,000	Recent Vender quote
268		STG	Steam Turbine Generator, Erection	1.0	ea	Contr	Contr		27,000	53.33	27,000	1.09	0	0	NO	0	1,562,353	29,295	1,562,353	0	$1,562,353	HDR|CB Estimated cost
269																						
270			**Division #5.2 - Turbine Equipment Sub-Total**								**27,000**		**0**	**44,000,000**		**0**	**1,562,353**	**29,295**	**45,562,353**	**0**	**45,562,353**	
271																						
272	**Division #5.3 - Not Used**																					
273																						

Confidential

Estimate Details

Print Date: 2/24/2013

2 x 1 Siemens F Class 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
274	**Division #5.4 - Mechanical Draft Cooling Tower**																				
275																					
276	Cooling Tw	Cooling Tower - Mechanical Draft (F&E)	1.0	Is	Sub	Contr	6,500,000.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	6,500,000	$6,500,000	Recent Vender quote
277																					
278		**Division #5.4 - Mechanical Draft Cooling Tower Sub-Total**								**0**		**0**	**0**		**0**	**0**	**0**	**0**	**6,500,000**	**6,500,000**	
279																					
280	**Division #5.5 - Combustion Turbine Equipment**																				
281																					
282	CT	Combustion Turbine	2.0	ea	Contr	Contr	53,461,668.48		53.33	0	1.09	0	106,923,337	NO	0	0	0	106,923,337	0	$106,923,337	OEM Bidget Proposal
283	CT	Combustion Turbine, Installation	2.0	ea	Contr	Contr		29,000	53.33	58,000	1.09	0	0	NO	0	3,356,166	62,930	3,356,166	0	$3,356,166	HDR|CB Estimated cost
284																					
285																					
286		**Division #5.4 - Combustion Turbine Equipment Sub-Total**								**58,000**		**0**	**106,923,337**		**0**	**3,356,166**	**62,930**	**110,279,503**	**0**	**110,279,503**	
287																					
288	**Division #5.6 - BOP Mechanical Equipment**																				
289																					
290	Equipment	Blowdown Tank	4.0	ea	Contr	Contr	16,600.00	20	54.96	80	1.09	0	66,400	NO	0	4,771	87	71,171	0	$71,171	HDR|CB Estimated cost
291	Equipment	Closed Cooling Water Exchanger	2.0	ea	Contr	Contr	1,039,500.00	300	54.96	600	1.09	0	2,079,000	NO	0	35,781	651	2,114,781	0	$2,114,781	HDR|CB Estimated cost
292	Equipment	Closed Cooling Water Inhibitor Mixing Pot	1.0	ea	Contr	Contr	3,000.00	8	54.96	8	1.09	0	3,000	NO	0	477	9	3,477	0	$3,477	HDR|CB Estimated cost
293	Equipment	Closed Cooling Water (CCW) Heat Exchanger Strainer (Shell & Tube	2.0	ea	Contr	Contr	34,000.00	10	54.96	20	1.09	0	68,000	NO	0	1,193	22	69,193	0	$69,193	HDR|CB Estimated cost
294	Equipment	Instrument Air Receivers	2.0	ea	Contr	Contr	5,000.00	44	54.96	88	1.09	0	10,000	NO	0	5,248	95	15,248	0	$15,248	HDR|CB Estimated cost
295	Equipment	Main Condenser	1.0	ea	Contr	Contr	5,800,000.00	9000	65.52	9,000	1.09	0	5,800,000	NO	0	639,756	9,765	6,439,756	0	$6,439,756	Recent Vender quote
296	Equipment	Oil/Water Separator	1.0	ea	Contr	Contr	50,000.00	244	54.96	244	1.09	0	50,000	NO	0	14,551	265	64,551	0	$64,551	HDR|CB Estimated cost
297	Equipment	Plant Air Compressors	2.0	ea	Contr	Contr	140,000.00	100	54.96	200	1.09	0	280,000	NO	0	11,927	217	291,927	0	$291,927	HDR|CB Estimated cost
298	Equipment	Plant Air Dryers	2.0	ea	Contr	Contr	30,000.00	100	54.96	200	1.09	0	60,000	NO	0	11,927	217	71,927	0	$71,927	HDR|CB Estimated cost
299	Equipment	Plant Air Receivers	2.0	ea	Contr	Contr	5,000.00	20	54.96	40	1.09	0	10,000	NO	0	2,385	43	12,385	0	$12,385	HDR|CB Estimated cost
302	Equipment	Pumps - Circulating Water	2.0	ea	Contr	Contr	1,000,000.00	500	54.96	1,000	1.09	0	2,000,000	NO	0	59,635	1,085	2,059,635	0	$2,059,635	HDR|CB Estimated cost
303	Equipment	Pumps - Auxiliary Cooling Water	1.0	ea	Contr	Contr	120,000.00	96	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
304	Equipment	Pumps - Closed Cooling Water	2.0	ea	Contr	Contr	134,000.00	200	53.33	400	1.09	0	268,000	NO	0	23,146	434	291,146	0	$291,146	HDR|CB Estimated cost
306	Equipment	Pumps - Boiler Feed	2.0	ea	Contr	Contr	900,000.00	1200	53.33	2,400	1.09	0	1,800,000	NO	0	138,876	2,604	1,938,876	0	$1,938,876	HDR|CB Estimated cost
307	Equipment	Pumps - Condensate	2.0	ea	Contr	Contr	260,000.00	200	53.33	400	1.09	0	520,000	NO	0	23,146	434	543,146	0	$543,146	HDR|CB Estimated cost
308	Equipment	Pumps - Service Water	2.0	ea	Contr	Contr	160,000.00	210	53.33	420	1.09	0	320,000	NO	0	24,303	456	344,303	0	$344,303	HDR|CB Estimated cost
309	Equipment	Pumps - Fire Water (Electric and Diesel)	0.0	lt	Contr	Contr	500,000.00	310	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
310	Equipment	Pumps - Sump - Blowdown, Waste Water	2.0	ea	Contr	Contr	30,000.00	24	53.33	48	1.09	0	60,000	NO	0	2,778	52	62,778	0	$62,778	HDR|CB Estimated cost
311	Equipment	Pumps - Sump - Power Island Misc Building Sumps	6.0	ea	Contr	Contr	30,000.00	24	53.33	144	1.09	0	180,000	NO	0	8,333	156	188,333	0	$188,333	HDR|CB Estimated cost
314	Equipment	Pumps - Demin Water Transfer	2.0	ea	Contr	Contr	66,000.00	48	53.33	96	1.09	0	132,000	NO	0	5,555	104	137,555	0	$137,555	HDR|CB Estimated cost
318	Equipment	Pumps - Treated Water Transfer to Serv Water Tank	2.0	ea	Contr	Contr	40,000.00	80	53.33	160	1.09	0	80,000	NO	0	9,258	174	89,258	0	$89,258	HDR|CB Estimated cost
319	Equipment	Pumps - Waste Water	2.0	ea	Contr	Contr	80,000.00	125	53.33	250	1.09	0	160,000	NO	0	14,466	271	174,466	0	$174,466	HDR|CB Estimated cost
320	Equipment	Pumps - Evaporative Cooling Water	2.0	ea	Contr	Contr	37,000.00	80	53.33	160	1.09	0	74,000	NO	0	9,258	174	83,258	0	$83,258	HDR|CB Estimated cost
321	Equipment	Sample Analysis Panel (water)	2.0	ea	Contr	Contr	200,000.00	139	54.96	278	1.09	0	400,000	NO	0	16,578	302	416,578	0	$416,578	HDR|CB Estimated cost
322	Equipment	Tank - 200,000 gal treated water/service water - (F&E)	0.0	ea	Sub	Contr	540,000.00	0		0	1.09	0	0	yes	0	0	0	0	0	$0	Furnish and Erect price
323	Equipment	Tank - Demin Water Storage 200,000 gal. (F&E)	1.0	ea	Sub	Contr	600,000.00	0		0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	Furnish and Erect Price
324	Equipment	Tank - Turbine Drains	2.0	ea	Contr	Contr	75,000.00	200	53.33	400	1.09	0	150,000	NO	0	23,146	434	173,146	0	$173,146	HDR|CB Estimated cost
325	Equipment	Tank - Closed Cooling Water Dispersant 10,000 gal.	1.0	ea	Contr	Contr	36,500.00	100	54.96	100	1.09	0	36,500	NO	0	5,963	109	42,463	0	$42,463	HDR|CB Estimated cost
326	Equipment	Tank - Closed Cooling Water Accumulator	1.0	ea	Contr	Contr	20,600.00	44	54.96	44	1.09	0	20,600	NO	0	2,624	48	23,224	0	$23,224	HDR|CB Estimated cost
329	Equipment	Aqueous Ammonia System Unloading, Storage Tank, Forwarding Pu	0.0	ea	Contr	Contr	0.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
331	Equipment	Auxiliary Boiler System	1.0	ea	Contr	Contr	1,600,000.00	400	53.33	400	1.09	0	1,600,000	NO	0	23,146	434	1,623,146	0	$1,623,146	HDR|CB Estimated cost
332	Equipment	Compressed Gas Storage System (CO2)	1.0	ea	Contr	Contr	40,000.00	475	54.96	475	1.09	0	40,000	NO	0	28,326	515	68,326	0	$68,326	HDR|CB Estimated cost
333	Equipment	Compressed Gas Storage System (H2)	1.0	ea	Contr	Contr	40,000.00	198	54.96	198	1.09	0	40,000	NO	0	11,808	215	51,808	0	$51,808	HDR|CB Estimated cost
334	Equipment	Compressed Gas Storage System (N2)	2.0	ea	Contr	Contr	20,000.00	370	54.96	740	1.09	0	40,000	NO	0	44,130	803	84,130	0	$84,130	HDR|CB Estimated cost
335	Equipment	Demineralized Water Treatment System Dual 100% Trains	0.0	ea	Contr	Contr	1,197,000.00	4000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
336	Equipment	Condensate Polisher and Related	1.0	ea	Contr	Contr	1,000,000.00	3600	54.96	3,600	1.09	0	1,000,000	NO	0	214,684	3,906	1,214,684	0	$1,214,684	HDR|CB Estimated cost
337	Equipment	Fuel Gas Filter Separators	2.0	ea	Contr	Contr	210,000.00	200	54.96	400	1.09	0	420,000	NO	0	23,854	434	443,854	0	$443,854	Sub Budgetary Quote
338	Equipment	Fuel Gas Performance Heater	2.0	ea	Contr	Contr	761,600.00	300	54.96	600	1.09	0	1,523,200	NO	0	35,781	651	1,558,981	0	$1,558,981	Sub Budgetary Quote
339	Equipment	Fuel Gas Electric Startup Heater	2.0	ea	Contr	Contr	84,000.00	40	54.96	80	1.09	0	168,000	NO	0	4,771	87	172,771	0	$172,771	HDR|CB Estimated cost
340	Equipment	Fuel Gas Drain Tank	2.0	ea	Contr	Contr	2,000.00	15	54.96	30	1.09	0	4,000	NO	0	1,789	33	5,789	0	$5,789	HDR|CB Estimated cost
341	Equipment	Fuel Gas Dewpoint Heater	1.0	ea	Contr	Contr	476,000.00	80	54.96	80	1.09	0	476,000	NO	0	4,771	87	480,771	0	$480,771	HDR|CB Estimated cost
342	Equipment	Fuel Gas Scrubber	1.0	ea	Contr	Contr	392,000.00	60	54.96	60	1.09	0	392,000	NO	0	3,578	65	395,578	0	$395,578	HDR|CB Estimated cost
343	Equipment	Fuel Gas Compressor Package 2 x 100% w/ Building	0.0	ea	Contr	Contr	2,500,000.00	3000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
344	Equipment	Hydrogen Generator	0.0	ea	Contr	Contr	194,000.00	40	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
345	Equipment	Steam Silencers	1.0	ea	Contr	Contr	150,000.00	20	54.96	20	1.09	0	150,000	NO	0	1,193	22	151,193	0	$151,193	HDR|CB Estimated cost
346	Equipment	Condensate Water Strainer	1.0	ea	Contr	Contr	150,000.00	40	54.96	40	1.09	0	150,000	NO	0	2,385	43	152,385	0	$152,385	HDR|CB Estimated cost
347	Equipment	Cycle Chem Feed	1.0	ea	Contr	Contr	200,000.00	100	54.96	100	1.09	0	200,000	NO	0	5,963	109	205,963	0	$205,963	HDR|CB Estimated cost
348	Equipment	Cooling Tower Chemical Feed	1.0	ea	Contr	Contr	250,000.00	300	54.96	300	1.09	0	250,000	NO	0	17,890	326	267,890	0	$267,890	HDR|CB Estimated cost
349	Equipment	Condeser Vaccum Pump/Air Removal Equipment	1.0	ea	Contr	Contr	350,000.00	40	54.96	40	1.09	0	350,000	NO	0	2,385	43	352,385	0	$352,385	HDR|CB Estimated cost
350	Equipment	Turbine Room Bridge Crane - 60T	1.0	ea	Contr	Contr	390,000.00	120	53.33	120	1.09	0	390,000	NO	0	6,944	130	396,944	0	$396,944	HDR|CB Estimated cost
351	Equipment	Elevator for 2 HRSG	1.0	ea	sub	contr	746,000.00	0		0	1.09	0	0	NO	0	0	0	0	746,000	$746,000	HDR|CB Estimated cost
352																					
353		**Division #5.6 BOP Mechanical Equipment Sub-Total**								**24,159**		**0**	**21,940,700**		**0**	**1,534,034**	**26,213**	**23,474,734**	**1,346,000**	**24,820,734**	
354																					
355	**Division #6.0 - Electrical Equipment**																				
356																					
357	Electrical	Eqpt - 24kv Bus Isolated Phase, 8000A	600.0	lf	Contr	Contr	750.00	8	50.09	4,800	1.09	0	450,000	NO	0	260,890	5,208	710,890	0	$710,890	HDR|CB Estimated cost
358	Electrical	Eqpt - 24kv Bus Isolated Phase, 9000A	300.0	lf	Contr	Contr	900.00	8	50.09	2,400	1.09	0	270,000	NO	0	130,445	2,604	400,445	0	$400,445	HDR|CB Estimated cost
359	Electrical	Eqpt - Bus 6.9kV non-seg	200.0	lf	Contr	Contr	510.00	4	50.09	800	1.09	0	102,000	NO	0	43,482	868	145,482	0	$145,482	HDR|CB Estimated cost
360	Electrical	Eqpt - Bus Duct 480V, 2500A	480.0	lf	Contr	Contr	610.00	3.2	50.09	1,536	1.09	0	292,800	NO	0	83,485	1,667	376,285	0	$376,285	HDR|CB Estimated cost
361	Electrical	Eqpt - Generator Breaker, 8000A, 24kV	3.0	ea	Contr	Contr	450,000.00	300	50.09	900	1.09	0	1,350,000	NO	0	48,917	977	1,398,917	0	$1,398,917	HDR|CB Estimated cost
362	Electrical	Eqpt - LV Switchgear - 480V, 4000A EO Main Ckt Bkr	6.0	ea	Contr	Contr	35,000.00	56	50.09	336	1.09	0	210,000	NO	0	18,262	365	228,262	0	$228,262	HDR|CB Estimated cost
363	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Main Ckt Bkr.	2.0	ea	Contr	Contr	15,400.00	30	50.09	60	1.09	0	30,800	NO	0	3,261	65	34,061	0	$34,061	HDR|CB Estimated cost
364	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Tie Ckt Bkr.	3.0	ea	Contr	Contr	15,400.00	30	50.09	90	1.09	0	46,200	NO	0	4,892	98	51,092	0	$51,092	HDR|CB Estimated cost
365	Electrical	Eqpt - LV Switchgear - 480V, 1200A EO Tie Ckt Bkr.	1.0	ea	Contr	Contr	10,780.00	26	50.09	26	1.09	0	10,780	NO	0	1,413	28	12,193	0	$12,193	HDR|CB Estimated cost
366	Electrical	Eqpt - LV Switchgear - 480V, 800A MO Fdr Ckt Bkr.	16.0	ea	Contr	Contr	4,575.00	22	50.09	352	1.09	0	73,200	NO	0	19,132	382	92,332	0	$92,332	HDR|CB Estimated cost
367	Electrical	Eqpt - LV Switchgear - 480V, 800A Equipped Space	6.0	ea	Contr	Contr	1,090.00	13.2	50.09	79	1.09	0	6,540	NO	0	4,305	86	10,845	0	$10,845	HDR|CB Estimated cost
368	Electrical	Eqpt - Motor Control Centers - 480V	16.0	ea	Contr	Contr	46,000.00	132	50.09	2,112	1.09	0	736,000	NO	0	114,792	2,292	850,792	0	$850,792	HDR|CB Estimated cost
369	Electrical	Eqpt - MV Switchgear - 7kV, 3000A Main Ckt Bkr.	1.00	ea	Contr	Contr	79,640.00	76	50.09	76	1.09	0	79,640	NO	0	4,131	82	83,771	0	$83,771	HDR|CB Estimated cost
370	Electrical	Eqpt - MV Switchgear - 7kV, 2000A Fdr Ckt Bkr.	2.00	ea	Contr	Contr	42,870.00	72	50.09	144	1.09	0	85,740	NO	0	7,827	156	93,567	0	$93,567	HDR|CB Estimated cost
371	Electrical	Eqpt - MV Switchgear - 7kV, 1200A Fdr Ckt Bkr.	20.00	ea	Contr	Contr	36,360.00	48	50.09	960	1.09	0	727,200	NO	0	52,178	1,042	779,378	0	$779,378	HDR|CB Estimated cost
372	Electrical	Eqpt - Relay panels and Metering	3.0	ea	Contr	Contr	34,500.00	120.00	50.09	360	1.09	0	103,500	NO	0	19,567	391	123,067	0	$123,067	HDR|CB Estimated cost
373	Electrical	Eqpt - Station Batteries 125 Volt DC/Charger	1.0	lot	Contr	Contr	350,000.00	635	50.09	635	1.09	0	350,000	NO	0	34,514	689	384,514	0	$384,514	HDR|CB Estimated cost

Confidential

2 x 1 Siemens F Class 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
374	Electrical	Eqpt - Transformer GSU - 283 MVA, 18kV-345kV	2.0	ea	Contr	Contr	2,100,000.00	950	50.09	1,900	1.09	0	4,200,000	NO	0	103,269	2,062	4,303,269	0	$4,303,269	HDR|CB Estimated cost
375	Electrical	Eqpt - Transformer GSU - 415 MVA, 18kV-345kV	1.0	ea	Contr	Contr	4,200,000.00	950	50.09	950	1.09	0	4,200,000	NO	0	51,634	1,031	4,251,634	0	$4,251,634	HDR|CB Estimated cost
376	Electrical	Eqpt - Transformer UAT 33 MVA, 18kV/6.9kV	2.0	ea	Contr	Contr	900,000.00	650	50.09	1,300	1.09	0	1,800,000	NO	0	70,658	1,411	1,870,658	0	$1,870,658	HDR|CB Estimated cost
377	Electrical	Eqpt - Emergency Diesel Gnerator packaged 750kW	1.0	ea	Contr	Contr	200,000.00	100	50.09	100	1.09	0	200,000	NO	0	5,435	109	205,435	0	$205,435	HDR|CB Estimated cost
378	Electrical	Eqpt - UPS (120VAC)	1.0	ea	Contr	Contr	300,000.00	528	50.09	528	1.09	0	300,000	NO	0	28,698	573	328,698	0	$328,698	HDR|CB Estimated cost
379	Electrical	Eqpt - Transformer Aux Power 2.5/3.3MVA, 7kV-480V	4.0	ea	Contr	Contr	104,500.00	210	50.09	840	1.09	0	418,000	NO	0	45,656	911	463,656	0	$463,656	HDR|CB Estimated cost
380	Electrical	Eqpt - Lighting Transformers	8.0	ea	Contr	Contr	916.27	9.09	50.09	73	1.09	0	7,330	YES	440	3,953	79	11,283	0	$11,283	HDR|CB Estimated cost
381	Electrical	Eqpt - Panelboards 480/120 & 480/277/120	8.0	ea	Contr	Contr	1,200.00	40.00	50.09	320	1.09	0	9,600	YES	576	17,393	347	26,993	0	$26,993	HDR|CB Estimated cost
382	Electrical	Eqpt - Plant Network System	1.0	ea	Contr	Contr	100,000.00	300	50.09	300	1.09	0	100,000	YES	6,000	16,306	326	116,306	0	$116,306	HDR|CB Estimated cost
383	Electrical	Eqpt - Plant Security System	1.0	lot	Contr	Contr	250,000.00	1800	50.09	1,800	1.09	0	250,000	YES	15,000	97,834	1,953	347,834	0	$347,834	HDR|CB Estimated cost
384	Electrical	Eqpt - Plant Telephone System	1.0	ea	Contr	Contr	100,000.00	500	50.09	500	1.09	0	100,000	YES	6,000	27,176	543	127,176	0	$127,176	HDR|CB Estimated cost
385																					
386		**Division #6.0 - Electrical Equipment Sub-Total**								**24,277**		**0**	**16,509,330**		**28,016**	**1,319,501**	**26,340**	**17,828,831**	**0**	**17,828,831**	
387																					
388	**Division #6.1 - Electrical/Control Commodities**																				
389																					
390	Electrical	Grounding - Buried Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
391	Electrical	Grounding - Above Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
392	Electrical	Grounding - Ground Rods Copper	96.0	ea	Contr	Contr	22.95	1.74	50.09	167	1.09	0	2,204	NO	0	9,079	181	11,283	0	$11,283	HDR|CB Estimated Quantity & Cost
393	Electrical	Grounding - Exothermic Connections	2,850.0	ea	Contr	Contr	9.75	1.14	50.09	3,249	1.09	0	27,788	NO	0	176,590	3,525	204,377	0	$204,377	HDR|CB Estimated Quantity & Cost
394	Electrical	Grounding - Servit Post	1,328.8	ea	Contr	Contr	30.00	1	50.09	1,107	1.09	0	39,864	NO	0	60,146	1,201	100,010	0	$100,010	HDR|CB Estimated Quantity & Cost
395	Electrical	Conduit A/G 5" RGS	1,000.0	lf	Contr	Contr	58.00	1.00	50.09	1,000	1.09	0	58,000	NO	0	54,352	1,085	112,352	0	$112,352	HDR|CB Estimated Quantity & Cost
396	Electrical	Conduit A/G 2" ave RGS	85,000.0	lf	Contr	Contr	8.50	0.30	50.09	25,500	1.09	0	722,500	NO	0	1,385,978	27,668	2,108,478	0	$2,108,478	HDR|CB Estimated Quantity & Cost
397	Electrical	Conduit U/G - 4 x 6 PVC 5"	8,000.0	lf	Contr	Contr	240.00	2.00	50.09	16,000	1.09	0	1,920,000	NO	0	869,633	17,360	2,789,633	0	$2,789,633	HDR|CB Estimated Quantity & Cost
398	Electrical	Conduit U/G - 8 x 8 PVC 5"	700.0	lf	Contr	Contr	530.00	5.00	50.09	3,500	1.09	0	371,000	NO	0	190,232	3,798	561,232	0	$561,232	HDR|CB Estimated Quantity & Cost
399	Electrical	Cable Tray, Raceway 24" Aluminum	5,200.0	lf	Contr	Contr	17.00	0.84	50.09	4,368	1.09	0	88,400	NO	0	237,410	4,739	325,810	0	$325,810	HDR|CB Estimated Quantity & Cost
400	Electrical	Cable Tray, Raceway 36" Aluminum	2,200.0	lf	Contr	Contr	20.00	1.05	50.09	2,310	1.09	0	44,000	NO	0	125,553	2,506	169,553	0	$169,553	HDR|CB Estimated Quantity & Cost
401	Electrical	Cable - Overhead Conductor to Substation	2,250.0	lf	Contr	Contr	8.50	0.50	50.09	1,125	1.09	0	19,125	NO	0	61,146	1,221	80,271	0	$80,271	HDR|CB Estimated Quantity & Cost
402	Electrical	Cable - Medium Voltage (7kV 1C Cable)	80,000.0	lf	Contr	Contr	14.60	0.127	50.09	10,160	1.09	0	1,168,000	NO	0	552,217	11,024	1,720,217	0	$1,720,217	HDR|CB Estimated Quantity & Cost
403	Electrical	Cable Terminations - 7kV	96.0	ea	Contr	Contr	195.00	12.00	50.09	1,152	1.09	0	18,720	NO	0	62,614	1,250	81,334	0	$81,334	HDR|CB Estimated Quantity & Cost
404	Electrical	Cable 600V Power 1/c No. 2/0 ave size	160,000.0	lf	Contr	Contr	3.55	0.041	50.09	6,560	1.09	0	568,000	NO	0	356,550	7,118	924,550	0	$924,550	HDR|CB Estimated Quantity & Cost
405	Electrical	Wire 600V Power 3/c # 10 ave. size	250,000.0	lf	Contr	Contr	0.27	0.0185	50.09	4,625	1.09	0	67,500	NO	0	251,378	5,018	318,878	0	$318,878	HDR|CB Estimated Quantity & Cost
406	Electrical	Cable - Fiber Optic	16,500.0	lf	Contr	Contr	6.00	0.025	50.09	413	1.09	0	99,000	NO	0	22,420	448	121,420	0	$121,420	HDR|CB Estimated Quantity & Cost
407	Electrical	Cable - Permanent Telephone Line	1.0	ls	Contr	Contr	10,000.00	240.000	50.09	240	1.09	0	10,000	NO	0	13,044	260	23,044	0	$23,044	HDR|CB Estimated Quantity & Cost
408	Electrical	Cable - Control	600,000.0	lf	Contr	Contr	1.10	0.040	50.09	24,000	1.09	0	660,000	NO	0	1,304,450	26,040	1,964,450	0	$1,964,450	HDR|CB Estimated Quantity & Cost
409	Electrical	Cable - Instrument 4pr tw/shld No. 18	400,000.0	lf	Contr	Contr	3.25	0.025	50.09	10,000	1.09	0	1,300,000	NO	0	543,521	10,850	1,843,521	0	$1,843,521	HDR|CB Estimated Quantity & Cost
410	Electrical	Cable - Thermocouple 2pr tw/shld No. 16	13,000.0	lf	Contr	Contr	0.33	0.030	50.09	390	1.09	0	4,290	NO	0	21,197	423	25,487	0	$25,487	HDR|CB Estimated Quantity & Cost
411	Electrical	Cable - Data Highway	24,068.0	lf	Contr	Contr	4.59	0.034	50.09	828	1.09	0	110,472	NO	0	45,000	898	155,472	0	$155,472	HDR|CB Estimated Quantity & Cost
412	Electrical	Cable Terminations - low voltage	30,500.0	ea	Contr	Contr	0.85	0.300	50.09	9,150	1.09	0	25,925	NO	0	497,321	9,928	523,246	0	$523,246	HDR|CB Estimated Quantity & Cost
413	Electrical	Cable Terminations - control	31,500.0	ea	Contr	Contr	0.54	0.300	50.09	9,450	1.09	0	17,010	NO	0	513,627	10,253	530,637	0	$530,637	HDR|CB Estimated Quantity & Cost
414	Electrical	Cable Terminations - instrument	32,800.0	ea	Contr	Contr	0.54	0.300	50.09	9,840	1.09	0	17,712	NO	0	534,824	10,676	552,536	0	$552,536	HDR|CB Estimated Quantity & Cost
415	Electrical	Conduit - Lighting A/G	33,000.0	lf	Contr	Contr	2.83	0.25	50.09	8,250	1.09	0	93,390	YES	5,603	448,405	8,951	541,795	0	$541,795	HDR|CB Estimated Quantity & Cost
416	Electrical	Wire - Lighting 1/C No 12	80,000.0	lf	Contr	Contr	0.176	0.018	50.09	1,440	1.09	0	14,080	YES	845	78,267	1,562	92,347	0	$92,347	HDR|CB Estimated Quantity & Cost
417	Electrical	Lighting - Outdoor Fixtures, pole	30.0	ea	Contr	Contr	1,600.00	12.00	50.09	360	1.09	0	48,000	YES	2,880	19,567	391	67,567	0	$67,567	HDR|CB Estimated Quantity & Cost
418	Electrical	Lighting - Outdoor Fixtures, 150W	320.0	ea	Contr	Contr	490.00	4.00	50.09	1,280	1.09	0	156,800	NO	0	69,571	1,389	226,371	0	$226,371	HDR|CB Estimated Quantity & Cost
419	Electrical	Lighting - Fixtures, 250W	80.0	ea	Contr	Contr	850.00	3.00	50.09	240	1.09	0	68,000	NO	0	13,044	260	81,044	0	$81,044	HDR|CB Estimated Quantity & Cost
420	Electrical	Lighting - Fixtures, fluorescent	180.0	ea	Contr	Contr	85.00	1.60	50.09	288	1.09	0	15,300	YES	918	15,653	312	30,953	0	$30,953	HDR|CB Estimated Quantity & Cost
421	Electrical	Lighting - Receptacles and switches	200.0	ea	Contr	Contr	32.00	1.37	50.09	273	1.09	0	6,400	YES	384	14,864	297	21,264	0	$21,264	HDR|CB Estimated Quantity & Cost
422	Electrical	Welding Receptacles	24.0	ea	Contr	Contr	1,800.00	4.00	50.09	96	1.09	0	43,200	NO	0	5,218	104	48,418	0	$48,418	HDR|CB Estimated Quantity & Cost
423	Electrical	Lighting - Exit	66.0	ea	Contr	Contr	150.00	2.00	50.09	132	1.09	0	9,900	YES	594	7,174	143	17,074	0	$17,074	HDR|CB Estimated Quantity & Cost
424	Electrical	Lighting - Emergency	120.0	ea	Contr	Contr	127.00	2.00	50.09	240	1.09	0	15,240	YES	914	13,044	260	28,284	0	$28,284	HDR|CB Estimated Quantity & Cost
425	Electrical	Cathodic Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
426	Electrical	Lightning Protection System	1.0	lot	Contr	Contr	100,000.00	200	50.09	200	1.09	0	100,000	YES	6,000	10,870	217	110,870	0	$110,870	HDR|CB Estimated Quantity & Cost
427	Electrical	Freeze Protection System	1.0	lot	Contr	Contr	800,000.00	5000	50.09	5,000	1.09	0	800,000	YES	48,000	271,760	5,425	1,071,760	0	$1,071,760	HDR|CB Estimated Quantity & Cost
428	Electrical	Electrical Circuit Testing	6,183.3	ea	Contr	Contr		2	50.09	12,367	1.09	0	0	NO	0	672,148	13,418	672,148	0	$672,148	HDR|CB Estimated Quantity & Cost
429		**Total Cable**	**1,545,819.0**	**LF**																	
430																					
431		**Division #6.1 - Electrical/Control Commodities Sub-Total**								**180,099**		**0**	**9,213,019**		**72,139**	**9,788,760**	**195,408**	**19,001,779**	**0**	**19,001,779**	
432																					
433	**Division #6.2 - Switchyard**																				
434																					
435	HV Electrica	138kV Dead End Towers 6 Legged (3 total)	150,000.0	lb	Contr	Contr	2.50	0.01	60.25	2,180	1.09	0	375,000	NO	0	142,500	2,365	517,500		$517,500	HDR|CB Estimated Quantity & Cost
436	HV Electrica	Interonnection Cabling and Termination Allowance	1.0	lot	Contr	Contr	15,000.00	1,526.36	51.33	1,526	1.09	0	15,000	NO	0	85,000	1,656	100,000		$100,000	HDR|CB Estimated Quantity & Cost
437																					
438		**Division #6.2 - Switchyard**								**3,706**		**0**	**$390,000**		**0**	**$227,500**	**$4,021**	**$617,500**	**$0**	**$617,500**	
439																					
440	**Division #7.0 - Instrumentation & Control**																				
441																					
442	I & C	BOP Instrument Devices	1,200.0	ea	Contr	Contr	750.00	12	50.09	14,400	1.09	0	900,000	NO	0	782,670	15,624	1,682,670	0	$1,682,670	HDR|CB Estimated Quantity & Cost
443	I & C	Auxiliary Boiler CEMS	1.0	lot	Contr	Contr	163,200.00	200	50.09	200	1.09	0	163,200	NO	0	10,870	217	174,070	0	$174,070	HDR|CB Estimated Quantity & Cost
444	I & C	Continuous Emissions Monitoring Equipment (CEMS)	2.0	ea	Contr	Contr	700,000.00	2000	53.33	4,000	1.09	0	1,400,000	NO	0	231,460	4,340	1,631,460	0	$1,631,460	HDR|CB Estimated Quantity & Cost
445	I & C	Control Valves	220.0	ea	Contr	Contr	4,000.00	24	54.96	5,280	1.09	0	880,000	NO	0	314,871	5,729	1,194,871	0	$1,194,871	HDR|CB Estimated Quantity & Cost
446	I & C	DCS w/ Configuration, Interfaces, Field Support, Interface, Bulks	1.0	ea	Contr	Contr	1,700,000.00	1691	50.09	1,691	1.09	0	1,700,000	NO	0	91,909	1,835	1,791,909	0	$1,791,909	HDR|CB Estimated Quantity & Cost
447	I & C	Emergency Trip sub Panel	1.0	ea	Contr	Contr	30,000.00	21	50.09	21	1.09	0	30,000	NO	0	1,141	23	31,141	0	$31,141	HDR|CB Estimated Quantity & Cost
448	I & C	Flow Element - Nozzle (Supply)	6.0	ea	Contr	Contr	30,000.00	20	54.96	120	1.09	0	180,000	NO	0	7,156	130	187,156	0	$187,156	HDR|CB Estimated Quantity & Cost
449	I & C	Instrument Calibration and loop check	1,500.0	ea	Contr	Contr	0.00	3	50.09	4,500	1.09	0	0	NO	0	244,584	4,883	244,584	0	$244,584	HDR|CB Estimated Quantity & Cost
450	I & C	Instrument piping 2&3-valve manifolds	284.0	ea	Contr	Contr	400.00	5.22	54.96	1,481	1.09	0	113,600	NO	0	88,331	1,607	201,931	0	$201,931	HDR|CB Estimated Quantity & Cost
451	I & C	Instrument Racks & Enclosures	1.0	lot	Contr	Contr	350,000.00	1450	50.09	1,450	1.09	0	350,000	NO	0	78,811	1,573	428,811	0	$428,811	HDR|CB Estimated Quantity & Cost
452	I & C	Instrument Tubing - copper	6,000.0	lf	Contr	Contr	3.70	0.15	54.96	900	1.09	0	22,200	NO	0	53,671	977	75,871	0	$75,871	HDR|CB Estimated Quantity & Cost
453	I & C	Instrument Tubing - Stainless Steel	2,500.0	lf	Contr	Contr	6.25	0.20	54.96	500	1.09	0	15,625	NO	0	29,817	543	45,442	0	$45,442	HDR|CB Estimated Quantity & Cost
454	I & C	PLC Hardware, Bulks, Aux Controls, Configuration	1.0	ls	Contr	Contr	241,200.00	253	50.09	253	1.09	0	241,200	NO	0	13,751	275	254,951	0	$254,951	HDR|CB Estimated Quantity & Cost
455																					
456		**Division #7.0 - Control Sub-Total**								**34,796**		**0**	**5,995,825**		**0**	**1,949,043**	**37,754**	**7,944,868**	**0**	**$7,944,868**	
457																					
458		**Sub-Total Direct Costs**								**930,675**		**0**	**289,029,220**	**0**		**53,745,945**	**1,009,260**	**342,775,166**	**25,987,400**	**368,762,566**	
459		Sales Tax - State (Plant Production Equipment is Exempt)	6.00%												**392,527**				**392,527**	**392,527**	Sales Tax Included for Non-Production Facilities

Estimate Details

2 x 1 Siemens F Class 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
Line #																					
460	Indirects																				
461		**TOTAL DIRECT COSTS**								**930,675**		**0**	**289,029,220**			**53,745,945**	**1,009,260**	**342,775,166**	**26,379,927**	**$369,155,093**	
462																					
463	**Division #8.0 - Construction and Indirect Services**																				
464																					
465	Const Indirec	Construction Equipment	1.0	ls	Contr	Contr	12,055,653			0	1.09					0	0	0	12,055,653	$12,055,653	See Construction Equipment worksheet
466	Const Indirec	Construction Field staff	1.0	ls	Contr	Contr	11,522,855			0	1.09					0	0	0	11,522,855	$11,522,855	See EPC Field Staff Worksheet for details
467	Const Indirec	Construction Field staff expenses	1.0	ls	Contr	Contr	1,870,168			0	1.09					0	0	0	1,870,168	$1,870,168	See EPC Field Staff Worksheet for details
468	Const Indirec	Construction Permits	1.0	ls	Contr	Contr				0	1.09		51,450			0	0	51,450	0	$51,450	See Const Indirects and Serv Worksheet
469	Const Indirec	Construction Testing	1.0	ls	Contr	Contr				0	1.09		117,000			0	0	117,000	0	$117,000	See Const Indirects and Serv Worksheet
470	Const Indirec	Consumable Materials & Safety Supplies	2.00	$/MH	Contr	Contr	2,018,519			0	1.09					0	0	0	2,018,519	$2,018,519	$2.00/Direct hour
471	Const Indirec	Field Office Expenses	1.0	ls	Contr	Contr				1,369	1.09		1,033,370			65,849	1,485	1,099,219	22,373	$1,121,592	See Const Indirects and Serv Worksheet
472	Const Indirec	Performance Testing	1.0	ls	Contr	Contr				0	1.09		304,400			0	0	304,400	0	$304,400	See Const Indirects and Serv Worksheet
473	Const Indirec	Preoperational Testing, Startup & Commissioning	2.0	ls	Contr	Contr				21,690	1.09		1,113,000			752,767	23,534	1,865,767	0	$1,865,767	See Const Indirects and Serv Worksheet
474	Const Indirec	Site Safety	1.0	ls	Contr	Contr				7,580	1.09		658,040			375,008	8,224	1,033,048	0	$1,033,048	See Const Indirects and Serv Worksheet
475	Const Indirec	Small Tools	2.00	$/MH	Contr	Contr	2,018,519			0	1.09					0	0	0	2,018,519	$2,018,519	$2.00/Direct hour
476	Const Indirec	Start-up Supervision	1.0	ls	Contr	Contr	1,296,911			0	1.09					0	0	0	1,296,911	$1,296,911	See EPC Field Staff Worksheet for details
477	Const Indirec	Support Craft, Site Services, Scaffolding	1.0	ls	Contr	Contr				41,753	1.09		459,400			2,008,704	45,302	2,468,104	775,014	$3,243,118	See Const Indirects and Serv Worksheet
478	Const Indirec	Temporary Facilities	1.0	ls	Contr	Contr				17,947	1.09		2,336,753			863,403	19,472	3,200,157	82,500	$3,282,657	See Const Indirects and Serv Worksheet
479	Const Indirec	Temporary Utilities	1.0	ls	Contr	Contr				29,032	1.09		747,600			1,396,697	31,500	2,144,297	0	$2,144,297	See Const Indirects and Serv Worksheet
480																					
481		**Division #8.0 - Construction Indirects and Services Sub-Total**								**119,371**		**0**	**6,821,013**			**5,462,428**	**129,518**	**12,283,441**	**31,662,513**	**$43,945,954**	
482																					
483		**SUB-TOTAL CONSTRUCTION COST**								**1,050,046**		**0**	**295,850,234**			**59,208,373**	**1,138,777**	**355,058,607**	**58,042,440**	**413,101,047**	
484		**Subcontract Labor Hours**																			
485		**Material Cost Excluding CT, HRSG and ST (escalation and EPC**											**94,926,897**								
486	**Division #9.0 - Project Indirects**																				
487																					
488	Project Indire	- Power Plant Design Engineering	1.0	ls	Contr	6.0%	24,786,063											0	24,786,063	$24,786,063	6.0% of the Total Construction Cost
489	Project Indire	- Project Management (Home Office)	0.0	ls	Contr	0.0%	0											0	0	$0	Included in Engineering
490																					
491																					
492		Sub-Total Project Indirects										**0**	**0**			**0**	**0**	**0**	**24,786,063**	**$24,786,063**	
493																					
494	EPC Indirect	EPC Contractor Insurance & Misc Costs (% of Total Const. Cost)																			
495																					
496	EPC Indirect	- Builders Risk Insurance	1.0	ls	Contr	0.50%	2,065,505												2,065,505	$2,065,505	Allowance based on info from other projects
497	EPC Indirect	- Comprehensive General Liability (CGL) Insurance	1.0	ls	Contr	0.50%	2,065,505											0	2,065,505	$2,065,505	Allowance based on info from other projects
498	EPC Indirect	- Warranty Reserve	1.0	ls	Contr		500,000											0	500,000	$500,000	Allowance based on info from other projects
499																					
500		Sub-Total EPC Contractor Indirects										**0**	**0**			**0**	**0**	**0**	**4,631,010**	**$4,631,010**	
501																					
502		**Total Project Indirects**										**0**	**0**			**0**	**0**	**0**	**29,417,073**	**29,417,073**	
503																					
504		Sub-Total										**0**	**295,850,234**			**59,208,373**	**1,138,777**	**355,058,607**	**87,459,513**	**$442,518,120**	
505							Equipment	Material	Labor	S/C											
506	Project Indire	Escalation - EPC Contractor Escalation Rates					2.4%	2.4%	4.0%	4.0%			7,071,190			9,309,942	0	16,381,132	7,846,384	24,227,516	Excludes CT, HRSG and ST
507																					
508		Sub-Total										**0**	**302,921,424**			**68,518,315**	**1,138,777**	**371,439,739**	**95,305,897**	**$466,745,636**	
509							Equip	Mat	Labor	S/C											
510	EPC Indirect	EPC Contractor Contingency	Varies	%	Contr		0%	5%	5%	5%		0	4,746,345			3,425,916		8,172,261	4,410,295	12,582,555	Excludes CT, HRSG and ST
511	EPC Indirect	EPC Contractor G&A and Fee	8.0%	%	Contr		1.0%	8.0%	8.0%	8.0%		0	24,233,714			5,481,465		29,715,179	7,624,472	37,339,651	
512																					
513		Sub-Total		ls								0	28,980,059			8,907,381	0	37,887,440	12,034,767	$49,922,206	
514																					
515		**TOTAL EPC PROJECT COST**								**1,050,046**		**0**	**331,901,482**			**77,425,696**	**1,138,777**	**409,327,178**	**107,340,664**	**$516,667,842**	
516																					
517	**OWNER INDIRECTS**																				
518	**Division #9.1 - Owner Indirects**																				
519																					
520		**Power Block 1 and Common**																			
521	Owner Indire	Project Development	1.0	ls	Owner														6,500,000	$6,500,000	Budget provided by LG&E
522	Owner Indire	Transmission Line Relocation	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
523	Owner Indire	Transmission Interconnection Facilities	1.0	ls	Owner														5,500,000	$5,500,000	To be estimated by Transmision Operator
524	Owner Indire	Natural Gas Pipeline Interconnection	1.0	ls	Owner														14,250,000	$14,250,000	Budget provided by LG&E
525	Owner Indire	Natural Gas Pipeline Fixed O&M (Startup Period)	1.0	ls	Owner														6,750,000	$6,750,000	Budget provided by LG&E
526	Owner Indire	Construction Power (Service Installation and Energy)	1.0	ls	Owner														750,000	$750,000	Budget estimated by HDR|CB
527	Owner Indire	Owner Operations Personnel (Prior to COD)	1.0	ls	Owner														2,340,000	$2,340,000	Budget estimated by HDR|CB 7 sal @ 12 mo, 26 hr @ 6 n
528	Owner Indire	Owners Project Management	1.0	ls	Owner														5,300,000	$5,300,000	Budget provided by LG&E
529	Owner Indire	Owners Engineer	1.0	ls	Owner														1,900,000	$1,900,000	Budget provided by LG&E
530	Owner Indire	Owners Legal Counsel	1.0	ls	Owner														1,300,000	$1,300,000	Budget provided by LG&E
531	Owner Indire	Operator Training	1.0	ls	Owner														225,000	$225,000	Budget estimated by HDR|CB
532	Owner Indire	Owner Startup Engineering	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
533	Owner Indire	Permitting, License Fees, & Environmental Compliance	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
534	Owner Indire	Highway Improvements, Miscellaneous Mitigation	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
535	Owner Indire	Land	1.0	ls	Owner														0	$0	Budget provided by LG&E
536	Owner Indire	Rolling Stock	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
537	Owner Indire	Water Infrastructure / Supply to Site	0.0	ls	Owner														0	$0	N/A (On site intake/pre-treatment/discharge incl. in EPC)
538	Owner Indire	Startup Testing (Includes Fuel & Power Sales)																			
539	Owner Indire	- Fuel - Natural Gas	1.0	ls	Owner														12,160,800	$12,160,800	HDR|CB [2,702,400 MMBTU @ $4.50/MMBTU per LG&E 2017 Forecas
540	Owner Indire	- Fuel - Fuel Oil	0.0	ls	Owner														0	$0	Budget estimated by HDR|CB [Not Required]
541	Owner Indire	- Electric Transmission Firm Point to Point	1.0	ls	Owner														4,000,000	$4,000,000	Budget provided by LG&E
542	Owner Indire	- Startup Power	1.0	ls	Owner														391,104	$391,104	Budget estimated by HDR|CB [10,864 MWhr @$36/MWH]
543	Owner Indire	- Test Power Sales	1.0	ls	Owner														(15,552,000)	($15,552,000)	Budget estimated by HDR|CB [432,000 MWhr @$36/MWH
544	Owner Indire	- Variable O&M - Water, Chemicals, etc.	1.0	ls	Owner														1,200,000	$1,200,000	Budget estimated by HDR|CB
545	Owner Indire	Site Security	1.0	ls	Owner														50,000	$50,000	Budget estimated by HDR|CB
546	Owner Indire	Operating Spare Parts	1.0	ls	Owner														10,000,000	$10,000,000	Budget estimated by HDR|CB
547	Owner Indire	Permanent Plant Equipment & Furnishings																		$0	

Estimate Details

2 x 1 Siemens F Class 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
548	Owner Indire	- Office Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
549	Owner Indire	- Kitchen Furniture	1.0	ls	Owner														130,000	$130,000	Budget estimated by HDR|CB
550	Owner Indire	- Laboratory Equipment & Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
551	Owner Indire	- Locker Room Furniture	1.0	ls	Owner														180,000	$180,000	Budget estimated by HDR|CB
552	Owner Indire	- Warehouse Shelves	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
553	Owner Indire	- Workshop Tools & Test Equipment	1.0	ls	Owner														1,800,000	$1,800,000	Budget estimated by HDR|CB
554	Owner Indire	IT and Telecommunication Infrastructure	1.0	ls	Owner														250,000	$250,000	Budget estimated by HDR|CB
555	Owner Indire	NERC - Cyber Security	1.0	ls	Owner														1,000,000	$1,000,000	Budget estimated by HDR|CB
556	Owner Indire	Escalation - Owners Furnished Equipment	0.0	%	Owner														0	$0	N/A
557	Owner Indire	Builders Risk Insurance	0.0	ls	Owner														0	$0	Included with EPC Contractor Indirects
558	Owner Indire	Property Tax During Construction	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
559	Owner Indire	Financing Fees	0.0	ls	Owner														0	$0	N/A
560	Owner Indire	AFUDC	1.0	ls	Owner														5,500,000	$5,500,000	AFUDC Based on 78% KU Ownership
561		**Total Owner Indirects**																	**70,124,904**	**$70,124,904**	
562																					
563																					
564		**Owner Contingency**	10.00%	%	Owner														**51,666,784**	**$51,666,784**	
565																					
566																					
567		**Total Owner Indirects**																	**121,791,688**	**$121,791,688**	
568																					
569		**TOTAL PROJECT COST**										**0**	**331,901,482**			**77,425,696**	**1,138,777**	**409,327,178**	**229,132,352**	**$638,459,531**	
																			$/kW	**$839**	

2 x 1 Siemens F Class 700 MW Combined Cycle Unit

BUDGET ESTIMATE

5 x 10 Work Week

February 22, 2013

Rev 1

CONFIDENTIAL

2 x 1 Siemens F Class 700 MW Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 701.509
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
Site Development	**$0**	**$1,787,885**	**$1,537,001**	**36,870**	**250,000**	**$3,574,886**	**0.7%**
Raw Water Intake/Discharge Facilities	**$0**	**$500,000**	**$578,649**	**10,850**	**0**	**$1,078,649**	**0.2%**
Foundations & Concrete	**$0**	**$6,415,575**	**$4,963,370**	**128,270**	**11,900,000**	**$23,278,945**	**4.6%**
Architectural & Metals	**$0**	**$5,385,510**	**$2,426,063**	**46,805**	**5,766,400**	**$13,577,973**	**2.7%**
Piping, Valves, Support, Accessories	**$0**	**$17,341,839**	**$12,217,857**	**226,564**	**225,000**	**$29,784,696**	**5.9%**
HRSG Equipment	**$0**	**$48,000,000**	**$10,937,223**	**158,410**	**0**	**$58,937,223**	**11.7%**
Steam Turbine Island Equipment	**$0**	**$42,500,000**	**$1,157,299**	**21,700**	**0**	**$43,657,299**	**8.7%**
Combustion Turbine Equipment	**$0**	**$106,923,337**	**$3,356,166**	**62,930**	**0**	**$110,279,503**	**21.9%**
Mechanical Draft Cooling Tower	**$0**	**$0**	**$0**	**0**	**5,600,000**	**$5,600,000**	**1.1%**
BOP Mechanical Equipment	**$0**	**$20,270,700**	**$1,534,034**	**26,213**	**1,346,000**	**$23,150,734**	**4.6%**
Electrical Equipment	**$0**	**$15,909,330**	**$1,319,501**	**26,340**	**0**	**$17,228,831**	**3.4%**
Electrical Commodities	**$0**	**$9,213,019**	**$9,788,760**	**195,408**	**0**	**$19,001,779**	**3.8%**
High Voltage Switchyard	**$0**	**$390,000**	**$227,500**	**4,021**	**0**	**$617,500**	**0.1%**
Instrumentation & Controls	**$0**	**$5,995,825**	**$1,949,043**	**37,754**	**0**	**$7,944,868**	**1.6%**
Sub-Total Direct Costs:	**$0**	**$280,633,020**	**$51,992,466**	**982,135**	**$25,087,400**	**$357,712,886**	**71.2%**
State Sales Tax (Non-Production Material Only)					**392,527**	**$392,527**	**0.1%**
Total Direct Cost	**$0**	**$280,633,020**	**$51,992,466**	**982,135**	**$25,479,927**	**$358,105,413**	**71.2%**
Construction Indirects & Services							
- Construction Field Staff			**$0**	**0**	**$11,522,855**	**$11,522,855**	**2.3%**
- Construction Field Staff Expenses			**$0**	**0**	**$1,870,168**	**$1,870,168**	**0.4%**
- Construction Equipment			**$0**	**0**	**$12,055,653**	**$12,055,653**	**2.4%**
- Small Tools			**$0**	**0**	**$1,964,269**	**$1,964,269**	**0.4%**
- Consumable Materials & Safety Supplies			**$0**	**0**	**$1,964,269**	**$1,964,269**	**0.4%**
- Field Office Expense		**$1,033,370**	**$65,849**	**1,485**	**$22,373**	**$1,121,592**	**0.2%**
- Temporary Facilities		**$2,336,753**	**$863,403**	**19,472**	**$82,500**	**$3,282,657**	**0.7%**
- Temporary Utilities		**$747,600**	**$1,396,697**	**31,500**	**$0**	**$2,144,297**	**0.4%**
- Support Craft & Site Services		**$459,400**	**$2,008,704**	**45,302**	**$775,014**	**$3,243,118**	**0.6%**
- Site Safety		**$658,040**	**$375,008**	**8,224**	**$0**	**$1,033,048**	**0.2%**
- Construction Permits		**$51,450**	**$0**	**0**	**$0**	**$51,450**	**0.0%**
- Construction Testing		**$117,000**	**$0**	**0**	**$0**	**$117,000**	**0.0%**
- Performance Testing		**$304,400**	**$0**	**0**	**$0**	**$304,400**	**0.1%**
- Start-up Supervision		**$0**	**$0**	**0**	**$1,296,911**	**$1,296,911**	**0.3%**
- Preop Testing, Start-up		**$1,113,000**	**$752,767**	**23,534**	**$0**	**$1,865,767**	**0.4%**
Sub-Total Construction Indirects and Services		**$6,821,013**	**$5,462,428**	**129,518**	**$31,554,013**	**$43,837,454**	**8.7%**
Total Construction Cost	**$0**	**$287,454,034**	**$57,454,894**	**1,111,652**	**$57,033,940**	**$401,942,868**	**80.0%**
Estimated Subcontract Labor Hours				**198,058**			
Project Indirects							
- Project Engineering (Eng, PM, CM & Procurement)					**$24,116,572**	**$24,116,572**	**4.8%**
Sub-Total Project Indirects	**$0**	**$0**	**$0**	**0**	**$24,116,572**	**$24,116,572**	**4.8%**
EPC Contractor Insurance & Misc Costs							
- Builders Risk					**$2,009,714**	**$2,009,714**	**0.4%**
- Comprehensive General Liability (CGL) Insurance					**$2,009,714**	**$2,009,714**	**0.4%**

2 x 1 Siemens F Class 700 MW Combined Cycle Unit

LOCATION:	Kentucky
PROJECT #	189895
PLANT TYPE:	**NGCC**
CLIENT:	LG&E/KU
ESTIMATE TYPE:	Conceptual
LEAD ESTIMATOR:	

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 701.509
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
- Warranty Reserve					$500,000	$500,000	0.1%
Sub-Total EPC Contractor Insur. & Misc. Co	$0	$0	$0	0	$4,519,429	$4,519,429	0.9%
Total EPC Contractor Project Indirect Cost	$0	$0	$0	0	$28,636,001	$28,636,001	5.7%
- Escalation (Eqt, Materials & Labor)	$0	$6,811,375	$9,052,138		$7,771,474	$23,634,988	4.7%
Sub-Total	0	294,265,408	66,507,033	1,309,711	93,441,415	454,213,856	90.3%
- EPC Contractor Contingency	$0	$4,501,535	$3,325,352		$4,362,071	$12,188,957	2.4%
- EPC Contractor G&A and Profit	$0	$23,541,233	$5,320,563		$7,475,313	$36,337,108	7.2%
TOTAL EPC PROJECT COST	**$0**	**$322,308,176**	**$75,152,947**	**1,309,711**	**$105,278,799**	**$502,739,922**	100.0%
EPC Price per kW						$717	
Owner Indirect Costs							
- Total Owner Indirects						$69,574,904	
- Owner Contingency						$50,273,992	
TOTAL PROJECT COST						**$622,588,818**	
Total Project Cost per kW						$887	
Estimate Options (include 25 % markup for indirects)							
Fuel Oil System						**$11,250,000**	
Bypass Stack and Diverter Damper						**$12,500,013**	
Gas Compression						**Not Required**	
SCR System to meet 12 ppm NOx						**Not Required**	
Optional SCR System						**$4,700,000**	

Total Craft Labor Hours	**1,309,711**	**erformance Guarantees:**		**Executive-in-Charge:**	**WHD**
Ave. Craft Wage without Escalation	**$52.62**	**Liquidated Damages:**		**Project Manager:**	**JPS**
Field Labor Type	**TBD**	**Special Insurance:**		**Construction Manager:**	**SMP**
Labor Productivity Factor	**1.084**	**Performance Bond:**		**Lead Estimator:**	**CDF**

2 x 1 Siemens F Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
1	**Division #1.0 - Sitework**																				
2	Sitework	Roads - Asphalt paving main site rds & Parking lots	8,500.0	sy	Sub	Contr	20.00		44.43		1.09	0	0	YES	5,100	0	0	0	170,000	$170,000	HDR|CB Estimated Quantity
3	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Powerblock A	1,740.0	sy	Contr	Contr	5.00	0.055	44.43	96	1.09	0	8,700	YES	522	4,613	104	13,313	0	$13,313	HDR|CB Estimated Quantity
4	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Secondary Ar	6,945.0	sy	Contr	Contr	5.00	0.055	44.43	382	1.09	0	34,725	YES	2,084	18,412	414	53,137	0	$53,137	HDR|CB Estimated Quantity
5	Sitework	Roads - Haul/Construction Roads Treated Gravel	29,700.0	sy	Contr	Contr	8.00	0.1	44.43	2,970	1.09	0	237,600	YES	14,256	143,162	3,222	380,762	0	$380,762	HDR|CB Estimated Quantity
6	Sitework	Roads - Main Roads Crushed stone Base Course	8,500.0	sy	Contr	Contr	12.00	0.1	44.43	850	1.09	0	102,000	YES	6,120	40,972	922	142,972	0	$142,972	HDR|CB Estimated Quantity
7	Sitework	Roads - Drainage and culverts	90,000.0	sy	Contr	Contr	2.00	0.05	44.43	4,500	1.09	0	180,000	YES	10,800	216,912	4,883	396,912	0	$396,912	HDR|CB Estimated Quantity
8	Sitework	Soil Erosion Control Measures	2,160	lf	Contr	Contr	1	0.027	44.43	58	1.09	0	2,160	YES	130	2,811	58	4,971	0	4,971	HDR|CB Estimated Quantity
9	Sitework	Site - Topsoil stripping/stockpiling	10,125	cy	Contr	Contr		0.030	44.43	304	1.09	0	0	YES	0	14,642	304	14,642	0	$14,642	HDR|CB Estimated Quantity
10	Sitework	Site - Drainage - Pipe Culverts (Assume 12" dia)	3,000	lf	Contr	Contr	9.00	0.12	44.43	360	1.09	0	27,000	YES	1,620	17,353	360	44,353	0	$44,353	HDR|CB Estimated Quantity
11	Sitework	Site - Drainage - Manholes	25	ea	Contr	Contr	1,500	16	44.43	400	1.09	0	37,500	YES	2,250	19,281	400	56,781	0	$56,781	HDR|CB Estimated Quantity
14	Sitework	Site - Fire Protection hydrants, valve boxes, ductile iron	30.0	ea	Contr	Contr	3,000.00	20	39.54	600	1.09	0	90,000	YES	5,400	25,739	651	115,739	0	$115,739	HDR|CB Estimated Quantity
15	Sitework	Site - Fire Protection U/G piping, DI	4,500.0	lf	Contr	Contr	41.00	0.5	39.54	2,250	1.09	0	184,500	YES	11,070	96,520	2,441	281,020	0	$281,020	HDR|CB Estimated Quantity
16	Sitework	Pipe Utility Trench Excavation	10,500	cy	Contr	Contr		0.2	39.54	2,100	1.09	0	0	YES	0	90,086	2,100	90,086	0	$90,086	HDR|CB Estimated Quantity
17	Sitework	Pipe Utility Trench Backfill (including bedding)	9,000	cy	Contr	Contr		0.2	39.54	1,800	1.09	0	0	YES	0	77,216	1,800	77,216	0	$77,216	HDR|CB Estimated Quantity
20	Sitework	Spoil Disposal	11,250	cy	Contr	Contr		0.1	44.43	1,125	1.09	0	0	YES	0	54,228	1,125	54,228	0	$54,228	HDR|CB Estimated Quantity
21	Sitework	Site - Sanitary sewer lift stations	1.0	ea	Contr	Contr	11,700.00	40	39.54	40	1.09	0	11,700	YES	702	1,716	43	13,416	0	$13,416	HDR|CB Estimated Quantity
22	Sitework	Site - Sanitary waste piping and manholes	2,500.0	lf	Contr	Contr	20.00	1	39.54	2,500	1.09	0	50,000	YES	3,000	107,245	2,713	157,245	0	$157,245	HDR|CB Estimated Quantity
23	Sitework	Site - Storm drain piping and culverts	22,500.0	lf	Contr	Contr	12.00	0.25	39.54	5,625	1.09	0	270,000	YES	16,200	241,301	6,103	511,301	0	$511,301	HDR|CB Estimated Quantity
24	Sitework	Site Finishing - Seed Site Earthwork	6.0	ac	Contr	Contr	10,000.00	0.54	39.54	3	1.09	0	60,000	YES	3,600	139	4	60,139	0	$60,139	HDR|CB Estimated Quantity
25	Sitework	Site Finishing - Grading around foundations	7,500.0	sy	Contr	Contr		0.02	39.54	150	1.09	0	0	YES	0	6,435	163	6,435	0	$6,435	HDR|CB Estimated Quantity
26	Sitework	Site Finishing - Stone Surfacing	7,500.0	sy	Contr	Contr	10.00	0.015	39.54	113	1.09	0	75,000	YES	4,500	4,826	122	79,826	0	$79,826	HDR|CB Estimated Quantity
27	Sitework	Site Improvements - landscaping at admin building	1.0	ls	Contr	Contr	30,000.00	360	39.54	360	1.09	0	30,000	YES	1,800	15,443	391	45,443	0	$45,443	HDR|CB Estimated Quantity
28	Sitework	Site Improvements - Main Gate Security Facilities	1.0	lot	Contr	Contr	150,000.00	3600	39.54	3,600	1.09	0	150,000	YES	9,000	154,433	3,906	304,433	0	$304,433	HDR|CB Estimated Quantity
29	Sitework	Site Improvements - Site Entrance Sign and Landscaping	1.0	ls	Contr	Contr	18,750.00	240	39.54	240	1.09	0	18,750	YES	1,125	10,296	260	29,046	0	$29,046	HDR|CB Estimated Quantity
30	Sitework	Site Improvements - Site Security Boundary Fencing	18,750.0	lf	Contr	Contr	11.00	0.2	39.54	3,750	1.09	0	206,250	YES	12,375	160,867	4,069	367,117	0	$367,117	HDR|CB Estimated Quantity
31	Sitework	Site Improvements - Fencing Active gates	6.0	ea	Contr	Contr	2,000.00	48	39.54	288	1.09	0	12,000	YES	720	12,355	312	24,355	0	$24,355	HDR|CB Estimated Quantity
32	Sitework	Site Surveying	1.0	lot	Sub	Contr	80,000.00		44.43	0	1.09	0	0	YES	2,400	0	0	0	80,000	$80,000	HDR|CB Estimated Quantity
33																					
34		**Division #1 - Sitework Sub-Total**								**34,463**		**0**	**1,787,885**		**114,773**	**1,537,001**	**36,870**	**3,324,886**	**250,000**	**3,574,886**	
35																					
36	**Division #1.3 - Raw Water Intake and Discharge Facilities**																				HDR Allowance for Interconnection and Updgrage of
37		Raw Water River Intake and Discharge Facilities	1.0	ea	Contr	Contr	500,000.00	10,000	53.33	10,000	1.09	0	500,000	NO	0	578,649	10,850	1,078,649	0	$1,078,649	Unit 1 and 2 Intake Structure
38																					
39		**Division #1.3 - Raw Water Intake Clarification and Discharge Facilities Sub-Total**								**10,000**		**0**	**500,000**		**0**	**578,649**	**10,850**	**1,078,649**	**0**	**$1,078,649**	
40																					
41																					
42	**Division #2.0 - Earthwork and Concrete**																				
43	**Division #2.1 - Earthwork**																				
44	Earthwork	Structural Backfill Power Block (using imported material)	220,000.0	cy	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,500,000	$5,500,000	HDR|CB Estimated Quantity
45	Earthwork	Retaining Wall (MSE)	40,000.0	sf	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	1,000,000	$1,000,000	HDR|CB Estimated Quantity
46	Earthwork	Structural Excavation Main Power Block - Earth/Rock	300,000.0	cy	Sub	Contr	18.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,400,000	$5,400,000	HDR|CB Estimated Quantity
47																					
48			560,000.0	cy						0		0	0		0	0	0	0	11,900,000	11,900,000	
49	**Division # 2.2 - Concrete Main Power Block Area**																				
50																					
51		Includes Forms, Rebar, Placement, Finishing, Embeds																			
52	Concrete	HRSG and Stack	7,500	cy	Contr	Contr	250	4.5	38.69	33,750	1.09	0	1,875,000	NO	0	1,416,954	36,619	3,291,954	0	$3,291,954	HDR|CB Estimated Quantity
53	Concrete	Gas Turbine Foundation	4,000	cy	Contr	Contr	300	4.5	38.69	18,000	1.09	0	1,200,000	NO	0	755,709	19,530	1,955,709	0	$1,955,709	HDR|CB Estimated Quantity
54	Concrete	Steam Turbine building	800	cy	Contr	Contr	250	4.5	38.69	3,600	1.09	0	200,000	NO	0	151,142	3,906	351,142	0	$351,142	HDR|CB Estimated Quantity
55	Concrete	Spread Footings & Piers Pipe/Tray Trestle/Racks	400.0	cy	Contr	Contr	250	4.5	38.69	1,800	1.09	0	100,000	NO	0	75,571	1,953	175,571	0	$175,571	HDR|CB Estimated Quantity
56	Concrete	Steam Turbine Bldg fill slab	300.0	cy	Contr	Contr	210.00	4.5	38.69	1,350	1.09	0	63,000	NO	0	56,678	1,465	119,678	0	$119,678	HDR|CB Estimated Quantity
57	Concrete	Steam Turbine Bldg Mat Foundation	1,200.0	cy	Contr	Contr	250	4.5	38.69	5,400	1.09	0	300,000	NO	0	226,713	5,859	526,713	0	$526,713	HDR|CB Estimated Quantity
58	Concrete	Steam Turbine Bldg Elevated Slab	500.0	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	NO	0	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
59	Concrete	Steam Turbine Bldg sumps foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
60	Concrete	Steam Turbine Pedestal FDN (Columns & Tabletop, Mat)	2,500.0	cy	Contr	Contr	350.00	8	38.69	20,000	1.09	0	875,000	NO	0	839,677	21,700	1,714,677	0	$1,714,677	HDR|CB Estimated Quantity
61	Concrete	Aux. Equipment Foundations	500	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	YES	7,500	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
62	Concrete	Equip Fdn - Generator Breaker	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
63	Concrete	Equip Fdn - CT PEEC	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
64	Concrete	Equip Fdn - Power Distribution Center	80	cy	Contr	Contr	250	4.5	38.69	360	1.09	0	20,000	YES	1,200	15,114	391	35,114	0	$35,114	HDR|CB Estimated Quantity
65	Concrete	Equip Fdn - CEMS	40	cy	Contr	Contr	250	4.5	38.69	180	1.09	0	10,000	YES	600	7,557	195	17,557	0	$17,557	HDR|CB Estimated Quantity
66	Concrete	Equip Fdn - Boiler Feed Pump	120	cy	Contr	Contr	250	4.5	38.69	540	1.09	0	30,000	YES	1,800	22,671	586	52,671	0	$52,671	HDR|CB Estimated Quantity
67	Concrete	Equip Fdn - Main Step-up Transformer Fdn/Walls	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
68	Concrete	Equip Fdn - Plant Aux Power Transformers Fnd/Walls	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
69	Concrete	Equip Fdn - Misc off Base Equip fnds	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
70	Concrete	Elec. Ductbank (Tubes, Conc., Forms, Rebar) 12 Tubes	500.0	lf	Contr	Contr	125	0.57	38.69	285	1.09	0	62,500	NO	0	11,965	309	74,465	0	$74,465	HDR|CB Estimated Quantity
71	Concrete	Elec. Ductbank to Cooling Tower (Tubes, Conc., Forms, Rebar) 6 Tul	750.0	lf	Contr	Contr	100	0.45	38.69	338	1.09	0	75,000	NO	0	14,170	366	89,170	0	$89,170	HDR|CB Estimated Quantity
72	Concrete	Equip Fdn - Pumps & misc equipment	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
73	Concrete	Electrical Building Foundation	130.0	cy	Contr	Contr	250	4.5	38.69	585	1.09	0	32,500	NO	0	24,561	635	57,061	0	$57,061	HDR|CB Estimated Quantity
74	Concrete	Cooling Tower Basin	2,500.0	cy	Contr	Contr	250	5.5	38.69	13,750	1.09	0	625,000	NO	0	577,278	14,919	1,202,278	0	$1,202,278	HDR|CB Estimated Quantity
75	Concrete	Administration Building foundation	1,100.0	cy	Contr	Contr	250	4.5	38.69	4,950	1.09	0	275,000	YES	16,500	207,820	5,371	482,820	0	$482,820	HDR|CB Estimated Quantity
76	Concrete	Auxilary Boiler Building floor slab & foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
77	Concrete	Demineralized Water Tank Foundations	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
78	Concrete	Service water storage tank foundations	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	YES	3,000	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
79	Concrete	Main Gate Guard House	3.0	cy	Contr	Contr	250	4.5	38.69	14	1.09	0	750	YES	45	567	15	1,317	0	$1,317	HDR|CB Estimated Quantity
80	Concrete	Water Treatment Buildings, enclosures and tank fdns	0.0	cy	Contr	Contr	250	4.5	38.69	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
81	Concrete	Grouting (equipment & steel)	30.0	cy	Contr	Contr	2,227.50	81	38.69	2,430	1.09	0	66,825	NO	0	102,021	2,637	168,846	0	$168,846	HDR|CB Estimated Quantity
82																					
83		Sub Total Concrete	**24,373**				AVG MH/CY	5.15		118,221			6,415,575		32,445	4,963,370	128,270	11,378,945	0	11,378,945	
84																					
85		**Division #2 - Earthwork & Concrete Sub-Total**								**118,221**		**0**	**6,415,575**		**32,445**	**4,963,370**	**128,270**	**11,378,945**	**11,900,000**	**23,278,945**	
86																					
87	**Division #3.0 - Architectural**												-								
88																					
89	rchitectura	Exterior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
90	rchitectura	Fire extinguishers	36.0	ea	Contr	Contr	500.00	3	53.33	108	1.09	0	18,000	YES	1,080	6,249	117	24,249	0	$24,249	HDR|CB Estimated Quantity
91	rchitectura	Fire hose cabinets	26.0	ea	Contr	Contr	1,200.00	20	53.33	520	1.09	0	31,200	YES	1,872	30,090	564	61,290	0	$61,290	HDR|CB Estimated Quantity
92	rchitectura	Fire hydrants w/monitor nozzles	10.0	ea	Contr	Contr	2,550.00	12	54.96	120	1.09	0	25,500	YES	1,530	7,156	130	32,656	0	$32,656	HDR|CB Estimated Quantity
93	rchitectura	Fire protection control room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity

CONFIDENTIAL

2 x 1 Siemens F Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS								
													CONTRACTOR								
TE BASIS	**ISCIPLIN**	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
Line #																					
94	rchitectura	Fire Protection Elect Equip & Cable Spreading Room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
95	rchitectura	Fire Protection GSU and Aux Transformers	1.0	ls	Sub	Contr	200,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	200,000	$200,000	HDR|CB Estimated Quantity
96	rchitectura	Fire Protection Turbine Building	1.0	ls	Sub	Contr	600,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
97	rchitectura	Fire Detection/Alarm	1.0	lot	Contr	Contr	410,000.00	1000	50.09	1,000	1.09	0	410,000	NO	0	54,352	1,085	464,352	0	$464,352	HDR|CB Estimated Quantity
98	rchitectura	HVAC System Allowance	1.0	ls	Sub	Contr	750,000.00		54.96	0	1.09	0	0	YES	22,500	0	0	0	750,000	$750,000	HDR|CB Estimated Quantity
99	rchitectura	Interior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
100	rchitectura	Masonry Walls 8" CMU	20,000.0	sf	Contr	Contr	4.00	0.15	32.95	3,000	1.09	0	80,000	yes	4,800	107,267	3,255	187,267	0	$187,267	HDR|CB Estimated Quantity
101	rchitectura	Overhead Rolling Doors - steel	4.0	ea	Contr	Contr	5,000.00	40	38.68	160	1.09	0	20,000	yes	1,200	6,715	174	26,715	0	$26,715	HDR|CB Estimated Quantity
102	rchitectura	Painting - equipment and piping	1.0	lot	Contr	Contr	100,000.00	3600	36.36	3,600	1.09	0	100,000	yes	6,000	142,016	3,906	242,016	0	$242,016	HDR|CB Estimated Quantity
103	rchitectura	Painting - structural steel, grating, handrail touch-up	250,000.0	sf	Contr	Contr	0.30	0.010	36.36	2,500	1.09	0	75,000	yes	4,500	98,622	2,713	173,622	0	$173,622	HDR|CB Estimated Quantity
104	rchitectura	Painting - turbine room floor epoxy finish	40,000.0	sf	Contr	Contr	0.80	0.045	36.36	1,805	1.09	0	32,000	yes	1,920	71,197	1,958	103,197	0	$103,197	HDR|CB Estimated Quantity
105	rchitectura	Restrooms, showers, locker rooms	1.0	lot	Contr	Contr	125,000.00	1200	53.33	1,200	1.09	0	125,000	YES	7,500	69,438	1,302	194,438	0	$194,438	HDR|CB Estimated Quantity
106	rchitectura	Roof Drains	1,700.0	lf	Contr	Contr	32.50	2.0	54.96	3,400	1.09	0	55,250	yes	3,315	202,758	3,689	258,008	0	$258,008	HDR|CB Estimated Quantity
107	rchitectura	Structural Steel - Misc Building Steel	25.0	ton	Contr	Contr	3,200.00	30	60.25	750	1.09	0	80,000	yes	4,800	49,026	814	129,026	0	$129,026	HDR|CB Estimated Quantity
108	rchitectura	Structural Steel - Pipe Rack	600.0	ton	Contr	Contr	3,400.00	20	60.25	12,000	1.09	0	2,040,000	NO	0	784,409	13,020	2,824,409	0	$2,824,409	HDR|CB Estimated Quantity
109	rchitectura	Structural Steel - Misc Platforms	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	NO	0	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
110	rchitectura	Structural Steel - Turbine Building Framing	500.0	ton	Contr	Contr	2,850.00	15	60.25	7,500	1.09	0	1,425,000	NO	0	490,255	8,138	1,915,255	0	$1,915,255	HDR|CB Estimated Quantity
111	rchitectura	Trench Floor Drain Cover	2,000.0	lf	Contr	Contr	60.45	0.4	54.96	800	1.09	0	120,900	yes	7,254	47,708	868	168,608	0	$168,608	HDR|CB Estimated Quantity
112	rchitectura	Turbine Building Built-up Roof	18,000.0	sf	Contr	Contr	0.75	0.035	35.31	630	1.09	0	13,500	NO	0	24,138	684	37,638	0	$37,638	HDR|CB Estimated Quantity
113	rchitectura	Turbine Building Metal Siding	52,900.0	sf	Contr	Contr	10.40	0.05	56.41	2,645	1.09	0	550,160	NO	0	161,876	2,870	712,036	0	$712,036	HDR|CB Estimated Quantity
114	rchitectura	Administration/Control/Maintenance Building	16,000.0	sf	Sub	Contr	140.00		38.68	0	1.09	0	0	YES	0	0	0	0	2,240,000	$2,240,000	HDR|CB Estimated Quantity
115	rchitectura	Cooling Tower, pre-engineered - Elect, Chem feed, I&C Bldg	3,000.0	sf	Sub	Contr	80.00		59.59	0	1.09	0	0	NO	0	0	0	0	240,000	$240,000	HDR|CB Estimated Quantity
116	rchitectura	Main Gate Guard House	80.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	YES	0	0	0	0	6,400	$6,400	HDR|CB Estimated Quantity
117	rchitectura	Auxilary Boiler Building	4,000.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	440,000	$440,000	HDR|CB Estimated Quantity
118	rchitectura	Water Treatment Building	0.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
119	rchitectura	Warehouse	8,000.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	NO	0	0	0	0	640,000	$640,000	HDR|CB Estimated Quantity
120	rchitectura	Boiler Feed Pump Buildings	2.0	ea	sub	Contr	300,000.00		38.68	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
121																					
122		**Division #3 - Architectural Sub-Total**								**43,138**	**1.05**	**0**	**5,385,510**		**75,471**	**2,426,063**	**46,805**	**7,811,573**	**5,766,400**	**$13,577,973**	
123																					
124	**Division #4.0 - Mechanical Piping**																				
125	**Division #4.1 - Mechanical Piping**																				
126																					
127	chanical Pi	Pipe - MS, HR, CR, BFW, LPS	**3,590.0**	lf																	
128	chanical Pi	- System - Cold Reheat (Carbon)	800.0	lf	Contr	Contr	2,600.00	7.2	54.96	5,790	1.09	0	2,080,000	NO	0	345,308	6,283	2,425,308	0	$2,425,308	HDR|CB Estimated Quantity
129	chanical Pi	- System - Feedwater (Carbon)	650.0	lf	Contr	Contr	790.00	5.6	54.96	3,666	1.09	0	513,500	NO	0	218,620	3,978	732,120	0	$732,120	HDR|CB Estimated Quantity
130	chanical Pi	- System - Hot Reheat (Alloy)	540.0	lf	Contr	Contr	3,170.00	14.4	54.96	7,766	1.09	0	1,711,800	NO	0	463,139	8,426	2,174,939	0	$2,174,939	HDR|CB Estimated Quantity
131	chanical Pi	- System - Main Steam (Alloy)	800.0	lf	Contr	Contr	3,480.00	14.4	54.96	11,506	1.09	0	2,784,000	NO	0	686,131	12,484	3,470,131	0	$3,470,131	HDR|CB Estimated Quantity
132	chanical Pi	- System - Low Pressure Steam Steam (Alloy)	800.0	lf	Contr	Contr	246.00	7.5	54.96	6,016	1.09	0	196,800	NO	0	358,762	6,527	555,562	0	$555,562	HDR|CB Estimated Quantity
133	chanical Pi	Pipe - Above Ground - Large Bore Average "	**29,610.0**	lf																	
134	chanical Pi	- System - Boilers, Vents and Drains	700.0	lf	Contr	Contr	300.00	4.14	54.96	2,895	1.09	0	210,000	NO	0	172,654	3,141	382,654	0	$382,654	HDR|CB Estimated Quantity
135	chanical Pi	- System - Aux steam drain returns	2,500.0	lf	Contr	Contr	30.00	1.22	54.96	3,055	1.09	0	75,000	NO	0	182,184	3,315	257,184	0	$257,184	HDR|CB Estimated Quantity
136	chanical Pi	- System - Building drains	1,350.0	lf	Contr	Contr	30.00	1.22	54.96	1,650	1.09	0	40,500	YES	2,430	98,379	1,790	138,879	0	$138,879	HDR|CB Estimated Quantity
137	chanical Pi	- System - Building fire protection	5,800.0	lf	Contr	Contr	18.00	1.50	54.96	8,723	1.09	0	104,400	YES	6,264	520,204	9,465	624,604	0	$624,604	HDR|CB Estimated Quantity
138	chanical Pi	- System - Building sump pumps	800.0	lf	Contr	Contr	47.00	1.55	54.96	1,241	1.09	0	37,600	YES	2,256	73,995	1,346	111,595	0	$111,595	HDR|CB Estimated Quantity
139	chanical Pi	- System - Circulating Water	1,000.0	lf	Contr	Contr	450.00	4.70	54.96	4,700	1.09	0	450,000	NO	0	280,282	5,100	730,282	0	$730,282	HDR|CB Estimated Quantity
140	chanical Pi	- System - Condensate	1,350.0	lf	Contr	Contr	190.00	2.35	54.96	3,173	1.09	0	256,500	NO	0	189,191	3,442	445,691	0	$445,691	HDR|CB Estimated Quantity
141	chanical Pi	- System - Condenser Air Extraction	300.0	lf	Contr	Contr	184.00	2.35	54.96	705	1.09	0	55,200	NO	0	42,042	765	97,242	0	$97,242	HDR|CB Estimated Quantity
142	chanical Pi	- System - Cooling water	600.0	lf	Contr	Contr	320.00	2.63	54.96	1,579	1.09	0	192,000	NO	0	94,175	1,713	286,175	0	$286,175	HDR|CB Estimated Quantity
143	chanical Pi	- System - Demineralized water	400.0	lf	Contr	Contr	27.00	0.39	54.96	154	1.09	0	10,800	NO	0	9,193	167	19,993	0	$19,993	HDR|CB Estimated Quantity
144	chanical Pi	- System - Fire Protection	300.0	lf	Contr	Contr	150.00	2.35	54.96	705	1.09	0	45,000	YES	2,700	42,042	765	87,042	0	$87,042	HDR|CB Estimated Quantity
145	chanical Pi	- System - Natural Gas High Pressure - SS	260.0	lf	Contr	Contr	52.40	0.85	54.96	220	1.09	0	13,624	YES	817	13,117	239	26,741	0	$26,741	HDR|CB Estimated Quantity
146	chanical Pi	- System - Potable water	1,000.0	lf	Contr	Contr	18.00	1.50	54.96	1,504	1.09	0	18,000	YES	1,080	89,690	1,632	107,690	0	$107,690	HDR|CB Estimated Quantity
147	chanical Pi	- System - Sanitary waste	3,000.0	lf	Contr	Contr	47.00	1.55	54.96	4,653	1.09	0	141,000	YES	8,460	277,480	5,049	418,480	0	$418,480	HDR|CB Estimated Quantity
148	chanical Pi	- System - Service Water	1,000.0	lf	Contr	Contr	184.00	1.97	54.96	1,974	1.09	0	184,000	YES	11,040	117,719	2,142	301,719	0	$301,719	HDR|CB Estimated Quantity
149	chanical Pi	- System - STG lube oil	200.0	lf	Contr	Contr	32.00	1.11	54.96	222	1.09	0	6,400	NO	0	13,239	241	19,639	0	$19,639	HDR|CB Estimated Quantity
150	chanical Pi	- System - STG oil purification	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
151	chanical Pi	- System - STG Seal Oil	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
152	chanical Pi	- System - STG Stator cooling	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
153	chanical Pi	- System - STG Steam Seal	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
154	chanical Pi	- System - Turbine drains	690.0	lf	Contr	Contr	47.00	1.55	54.96	1,070	1.09	0	32,430	NO	0	63,820	1,161	96,250	0	$96,250	HDR|CB Estimated Quantity
155	chanical Pi	- System - HRSG Blowdown	200.0	lf	Contr	Contr	18.00	1.50	54.96	301	1.09	0	3,600	NO	0	17,938	326	21,538	0	$21,538	HDR|CB Estimated Quantity
156	chanical Pi	- System - Cycle Makeup	360.0	lf	Contr	Contr	47.00	1.55	54.96	558	1.09	0	16,920	NO	0	33,298	606	50,218	0	$50,218	HDR|CB Estimated Quantity
157	chanical Pi	- System - Miscellaneous Systems Piping CS)	6,600.0	lf	Contr	Contr	47.00	1.55	54.96	10,237	1.09	0	310,200	YES	18,612	610,455	11,107	920,655	0	$920,655	HDR|CB Estimated Quantity
158	chanical Pi	Pipe - Above Ground - Small Bore	**26,055.0**	lf																	
159	chanical Pi	- System - Water Cycle Sample - Alloy	150.0	lf	Contr	Contr	13.00	0.85	54.96	127	1.09	0	1,950	NO	0	7,568	138	9,518	0	$9,518	HDR|CB Estimated Quantity
160	chanical Pi	- System - STG lube oil	300.0	lf	Contr	Contr	11.60	0.62	54.96	186	1.09	0	3,480	NO	0	11,092	202	14,572	0	$14,572	HDR|CB Estimated Quantity
161	chanical Pi	- System - CT Auxilarie	1,800.0	lf	Contr	Contr	18.00	1.13	54.96	2,030	1.09	0	32,400	NO	0	121,082	2,203	153,482	0	$153,482	HDR|CB Estimated Quantity
162	chanical Pi	- System - Instrument Air	3,100.0	lf	Contr	Contr	8.00	0.14	54.96	437	1.09	0	24,800	NO	0	26,066	474	50,866	0	$50,866	HDR|CB Estimated Quantity
163	chanical Pi	- System - Instrument Air supply	3,000.0	lf	Contr	Contr	35.00	0.28	54.96	846	1.09	0	105,000	NO	0	50,451	918	155,451	0	$155,451	HDR|CB Estimated Quantity
164	chanical Pi	- System - Service Air piping	1,300.0	lf	Contr	Contr	12.00	0.22	54.96	281	1.09	0	15,600	YES	936	16,761	305	32,361	0	$32,361	HDR|CB Estimated Quantity
165	chanical Pi	- System - Instrument Air	2,035.0	lf	Contr	Contr	11.50	0.52	54.96	1,052	1.09	0	23,403	YES	1,404	62,741	1,142	86,144	0	$86,144	HDR|CB Estimated Quantity
166	chanical Pi	- System - Service Water	900.0	lf	Contr	Contr	20.00	1.32	54.96	1,184	1.09	0	18,000	YES	1,080	70,631	1,285	88,631	0	$88,631	HDR|CB Estimated Quantity
167	chanical Pi	- System - Cycle Chemical Feed	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
168	chanical Pi	- System - Boiler Vents & Drains - Alloy	700.0	lf	Contr	Contr	20.00	1.32	54.96	921	1.09	0	14,000	YES	840	54,935	1,000	68,935	0	$68,935	HDR|CB Estimated Quantity
169	chanical Pi	- System - (HP) Main Steam - Alloy	600.0	lf	Contr	Contr	20.00	1.32	54.96	790	1.09	0	12,000	YES	720	47,087	857	59,087	0	$59,087	HDR|CB Estimated Quantity
170	chanical Pi	- System - (LP) Steam - Carbon	1,400.0	lf	Contr	Contr	18.00	1.13	54.96	1,579	1.09	0	25,200	YES	1,512	94,175	1,713	119,375	0	$119,375	HDR|CB Estimated Quantity
171	chanical Pi	- System - Hot Reheat Steam - Alloy	650.0	lf	Contr	Contr	20.00	1.32	54.96	855	1.09	0	13,000	YES	780	51,011	928	64,011	0	$64,011	HDR|CB Estimated Quantity
172	chanical Pi	- System - Cold Reheat Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
173	chanical Pi	- System - Cycle Makeup	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
174	chanical Pi	- System - Aux Steam - Carbon	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
175	chanical Pi	- System - STG Seals and Drains - Alloy	1,400.0	lf	Contr	Contr	20.00	1.32	54.96	1,842	1.09	0	28,000	YES	1,680	109,871	1,999	137,871	0	$137,871	HDR|CB Estimated Quantity
176	chanical Pi	- System - CT System - Carbon	250.0	lf	Contr	Contr	18.00	1.13	54.96	282	1.09	0	4,500	YES	270	16,817	306	21,317	0	$21,317	HDR|CB Estimated Quantity
177	chanical Pi	- System - Hydrogen - Carbon	0.0	lf	Contr	Contr	12.35	1.03	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
178	chanical Pi	- System - Carbon Dioxide - Carbon	0.0	lf	Contr	Contr	12.35	1.03	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
179	chanical Pi	- System - Miscellaneous	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
180	chanical Pi	- System - Condensate - Carbon	400.0	lf	Contr	Contr	18.00	1.13	54.96	451	1.09	0	7,200	YES	432	26,907	490	34,107	0	$34,107	HDR|CB Estimated Quantity
181	chanical Pi	- System - Closed Cycle Cooling Water - Carbon	900.0	lf	Contr	Contr	12.35	1.03	54.96	931	1.09	0	11,115	YES	667	55,496	1,010	66,611	0	$66,611	HDR|CB Estimated Quantity
182	chanical Pi	- System - Fuel Gas - Carbon	900.0	lf	Contr	Contr	18.00	1.13	54.96	1,015	1.09	0	16,200	YES	972	60,541	1,101	76,741	0	$76,741	HDR|CB Estimated Quantity
183	chanical Pi	- System - Condensed Air Extraction - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity

2 x 1 Siemens F Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
184	hanical Pi	- System - CW Chemical Feed - Carbon	20.0	lf	Contr	Contr	18.00	1.13	54.96	23	1.09	0	360	YES	22	1,345	24	1,705	0	$1,705	HDR|CB Estimated Quantity
185	hanical Pi	- System - Nitrogen Gas System	200.0	lf	Contr	Contr	19.00	0.19	54.96	38	1.09	0	3,800	YES	228	2,242	41	6,042	0	$6,042	HDR|CB Estimated Quantity
186	hanical Pi	- System - Waste Water Coll & Treatment - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
187	hanical Pi	- System - Chemical Waste Treatment	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
188	hanical Pi	- System - Miscellaneous Systems Piping	4,400.0	lf	Contr	Contr	12.35	1.03	54.96	4,550	1.09	0	54,340	YES	3,260	271,313	4,936	325,653	0	$325,653	HDR|CB Estimated Quantity
189	hanical Pi	Pipe - Below Ground - Large Bore	**22,195.0**	lf																	
190	hanical Pi	- System - Hydrogen	0.0	lf	Contr	Contr	20.00	0.71	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
191	hanical Pi	- System - Fuel Gas	800.0	lf	Contr	Contr	170.00	1.97	54.96	1,579	1.09	0	136,000	NO	0	94,175	1,713	230,175	0	$230,175	HDR|CB Estimated Quantity
192	hanical Pi	- System - Main Circ. - HDPE	400.0	lf	Contr	Contr	15.00	1.13	54.96	451	1.09	0	6,000	NO	0	26,907	490	32,907	0	$32,907	HDR|CB Estimated Quantity
192	hanical Pi	- System - Miscellaneous Systems Piping - HDPE	7,840.0	lf	Contr	Contr	15.00	1.13	54.96	8,844	1.09	0	117,600	NO	0	527,379	9,595	644,979	0	$644,979	HDR|CB Estimated Quantity
193	hanical Pi	- System - Waste Water Treatment Piping - HDPE (Sch 17)	2,565.0	lf	Contr	Contr	6.00	0.66	54.96	1,688	1.09	0	15,390	NO	0	100,649	1,831	116,039	0	$116,039	HDR|CB Estimated Quantity
193	hanical Pi	- System - Sanitary Sewer	3,000.0	lf	Contr	Contr	15.00	1.13	54.96	3,384	1.09	0	45,000	NO	0	201,803	3,672	246,803	0	$246,803	HDR|CB Estimated Quantity
194	hanical Pi	- System - Natural Gas Low Pressure - CS	850.0	lf	Contr	Contr	30.00	1.22	54.96	1,039	1.09	0	25,500	NO	0	61,942	1,127	87,442	0	$87,442	HDR|CB Estimated Quantity
195	hanical Pi	- System - Natural Gas High Pressure - CS	500.0	lf	Contr	Contr	30.00	1.22	54.96	611	1.09	0	15,000	NO	0	36,437	663	51,437	0	$51,437	HDR|CB Estimated Quantity
196	hanical Pi	- System - Potable Water to site facilities	500.0	lf	Contr	Contr	47.00	1.55	54.96	776	1.09	0	23,500	NO	0	46,247	841	69,747	0	$69,747	HDR|CB Estimated Quantity
197	hanical Pi	- System - Cooling tower blowdown	1,160.0	lf	Contr	Contr	115.00	1.69	54.96	1,963	1.09	0	133,400	NO	0	117,046	2,130	250,446	0	$250,446	HDR|CB Estimated Quantity
198	hanical Pi	- System - Cooling tower makeup water Pipe	1,000.0	lf	Contr	Contr	115.00	1.69	39.54	1,692	1.09	0	115,000	NO	0	72,583	1,836	187,583	0	$187,583	HDR|CB Estimated Quantity
199	hanical Pi	Pipe - Below Ground - Small Bore	**790.0**	lf																	HDR|CB Estimated Quantity
200	hanical Pi	- System - Miscellaneous Systems Piping	790.0	lf	Contr	Contr	12.35	1.03	54.96	817	1.09	0	9,757	NO	0	48,713	886	58,470	0	$58,470	Based on 1-1/2" dia with 1 fitting per 20 ft.
201	hanical Pi	Circulating water 96" RCP	2,000.0	lf	Contr	Contr	636.00	7.52	54.96	15,040	1.09	0	1,272,000	NO	0	896,904	16,318	2,168,904	0	$2,168,904	HDR|CB Estimated Quantity
202	hanical Pi	Piping Non Destructive Examination	1.0	lot	Sub	Contr	75,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	75,000	$75,000	HDR|CB Estimated Quantity
203	hanical Pi	Steam Blows	1.0	lot	Sub	Contr	150,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	150,000	$150,000	HDR|CB Estimated Quantity
204	hanical Pi	Stress relieving LB Alloy	50.0	ea	Contr	Contr	1,500.00	80.00	54.96	4,000	1.09	0	75,000	NO	0	238,538	4,340	313,538	0	$313,538	HDR|CB Estimated Quantity
205																					
206		**Division #4.1 - Mechanical Piping Sub-Total**	**82,240.0**	**LF**						148,495		0	11,943,118		69,683	8,827,101	161,117	20,770,219	225,000	$20,995,219	
207																					
208	**Division #4.2 - Mechanical Valves**																				
209																					
210	hanical Va	Valves - Large Bore General Service	500.0	ea	Contr	Contr	636.00	16.92	54.96	8,460	1.09	0	318,000	NO	0	504,508	9,179	822,508	0	$822,508	HDR|CB Estimated Quantity
211	hanical Va	Valves - Large Bore HP 900# to 3800#	100.0	ea	Contr	Contr	6,750.00	56.4	54.96	5,640	1.09	0	675,000	NO	0	336,339	6,119	1,011,339	0	$1,011,339	HDR|CB Estimated Quantity
212	hanical Va	Valves - Large Bore LP Circ Water	4.0	ea	Contr	Contr	197,500.00	112.8	54.96	451	1.09	0	790,000	NO	0	26,907	490	816,907	0	$816,907	HDR|CB Estimated Quantity
213	hanical Va	Valves - Small Bore - I/A supply	100.0	ea	Contr	Contr	17.50	1.88	54.96	188	1.09	0	1,750	NO	0	11,211	204	12,961	0	$12,961	HDR|CB Estimated Quantity
214	hanical Va	Valves - Small Bore - Instrument piping	500.0	ea	Contr	Contr	270.00	1.88	54.96	940	1.09	0	135,000	NO	0	56,056	1,020	191,056	0	$191,056	HDR|CB Estimated Quantity
215	hanical Va	Valves - Small Bore Bronze	40.0	ea	Contr	Contr	480.00	2.82	54.96	113	1.09	0	19,200	NO	0	6,727	122	25,927	0	$25,927	HDR|CB Estimated Quantity
216	hanical Va	Valves - Small Bore Class 800	250.0	ea	Contr	Contr	305.00	2.82	54.96	705	1.09	0	76,250	NO	0	42,042	765	118,292	0	$118,292	HDR|CB Estimated Quantity
217	hanical Va	Valves - Small Bore HP 1500# Alloy & CS	150.0	ea	Contr	Contr	670.00	15.04	54.96	2,256	1.09	0	100,500	NO	0	134,536	2,448	235,036	0	$235,036	HDR|CB Estimated Quantity
218	hanical Va	Valves - Small Bore HP 3800# Alloy	30.0	ea	Contr	Contr	3,050.00	22.56	54.96	677	1.09	0	91,500	NO	0	40,361	734	131,861	0	$131,861	HDR|CB Estimated Quantity
219	hanical Va	Valves - By Pass	1.0	ea	Contr	Contr	1,150,000.00	75.2	54.96	75	1.09	0	1,150,000	NO	0	4,485	82	1,154,485	0	$1,154,485	HDR|CB Estimated Quantity
220																					
221																					
222		**Division #4.2 - Mechanical Valves Sub-Total**	**1,675.0**	**ea**						19,505		$0	3,357,200		0	1,163,172	21,163	4,520,372	0	$4,520,372	
223																					
224	**Division #4.3 - Mechanical Insulation & Coatings**																				
225																					
226	Insulation	Insulation - BOP Equipment	16,000.0	sf	Contr	Contr	15.00	0.5	46.60	8,000	1.09	0	240,000	NO	0	404,462	8,680	644,462	0	$644,462	HDR|CB Estimated Quantity
227	Insulation	Insulation - Piping Freeze Protection	2,000.0	lf	Contr	Contr	3.50	0.2	46.60	400	1.09	0	7,000	NO	0	20,223	434	27,223	0	$27,223	HDR|CB Estimated Quantity
228	Insulation	Insulation - Piping Large Bore BOP	7,460.0	lf	Contr	Contr	15.00	0.5	46.60	3,730	1.09	0	111,900	NO	0	188,580	4,047	300,480	0	$300,480	HDR|CB Estimated Quantity
229	Insulation	Insulation - Piping Large Bore High Temp	3,590.0	lf	Contr	Contr	50.00	1.5	46.60	5,385	1.09	0	179,500	NO	0	272,253	5,843	451,753	0	$451,753	HDR|CB Estimated Quantity
230	Insulation	Insulation - Piping Small Bore	22,720.0	lf	Contr	Contr	8.00	0.23	46.60	5,226	1.09	0	181,760	NO	0	264,194	5,670	445,954	0	$445,954	HDR|CB Estimated Quantity
231																					
232																					
233		**Division #4.3 - Mechanical Insulation & Coatings Sub-Total**								22,741		0	720,160		0	1,149,713	24,674	1,869,873	0	$1,869,873	
234																					
235																					
236	**Division #4.4 - Mechanical Engineered Pipe Hangers (Including Supplemental Support Steel)**																				
237																					
238	anical Pipe H	Hangers & Supports - (Large Bore Engineered)	200	ea	Contr	Contr	1,760.00	12.5	54.96	2,502	1.09	0	352,311	NO	0	149,218	2,715	501,529	0	$501,529	HDR|CB Estimated Quantity
239	anical Pipe H	Hangers & Supports - (Large Bore Rigid)	1558	ea	Contr	Contr	192.50	7.1	54.96	11,065	1.09	0	299,996	NO	0	659,844	12,005	959,840	0	$959,840	HDR|CB Estimated Quantity
240	anical Pipe H	Hangers & Supports - (Small Bore Rigid)	1861	ea	Contr	Contr	88.00	1.5	54.96	2,792	1.09	0	163,774	NO	0	166,476	3,029	330,251	0	$330,251	HDR|CB Estimated Quantity
241																					
242		**Division #4.4 - Mechanical Engineered Pipe Hangers Sub-Total**								16,359		0	816,081		0	975,538	17,749	1,791,619	0	$1,791,619	
243																					
244	**Division #4.5 - Mechanical Accessories**																				
245																					
246	nical Acces	Instr. Air Supply filter regulators	40.0	ea	Contr	Contr	132.00	2.4	54.96	96	1.09	0	5,280	NO	0	5,725	104	11,005	0	$11,005	HDR|CB Estimated Quantity
247	nical Acces	Expansion Joints - Circ Water	2.0	ea	Contr	Contr	75,000.00	210	54.96	420	1.09	0	150,000	NO	0	25,047	456	175,047	0	$175,047	HDR|CB Estimated Quantity
248	nical Acces	Miscellaneous Specialties	1.0	lot	Contr	Contr	75,000.00	600	54.96	600	1.09	0	75,000	NO	0	35,781	651	110,781	0	$110,781	HDR|CB Estimated Quantity
249	nical Acces	Miscellaneous Strainers, traps, Exp Joints	1.0	ls	Contr	Contr	125,000.00	120	54.96	120	1.09	0	125,000	NO	0	7,156	130	132,156	0	$132,156	HDR|CB Estimated Quantity
250	nical Acces	Miscellaneous Trolleys & Hoists	1.0	ls	Contr	Contr	150,000.00	480	54.96	480	1.09	0	150,000	NO	0	28,625	521	178,625	0	$178,625	HDR|CB Estimated Quantity
251																					
252		**Division #4.5 - Mechanical Accessories Sub-Total**								1,716		0	505,280		0	102,333	1,862	607,613	0	$607,613	
253																					
254		**Division #4 - Mechanical Piping**								**208,815**		**0**	**17,341,839**		**69,683**	**12,217,857**	**226,564**	**29,559,696**	**225,000**	**$29,784,696**	
255																					
256	**Division #5.0 - Mechanical Equipment**																				
257																					
258	**Division #5.1 - Boiler Equipment**																				
259																					
260	HRSG	Heat Recovery Steam Generator with Duct Burner/CO/Penthouse	2.0	ea	Contr	Contr	24,000,000.00		69.04	0	1.09	0	48,000,000	NO	0	0	0	48,000,000	0	$48,000,000	OEM Bidget Proposal
261	HRSG	Steam Generator Erection	2.0	ea	Contr	Contr		73,000	69.04	146,000	1.09	0	0	NO	0	10,937,223	158,410	10,937,223	0	$10,937,223	HDR|CB Estimated cost
262																					
263		**Division #5.1 - Boiler Equipment Sub-Total**								**146,000**		**0**	**48,000,000**		**0**	**10,937,223**	**158,410**	**58,937,223**	**0**	**$58,937,223**	
264																					
265	**Division #5.2 - Turbine Equipment**																				
266																					
267	STG	Steam Turbine Generator	1.0	ea	Contr	Contr	42,500,000.00		53.33	0	1.09	0	42,500,000	NO	0	0	0	42,500,000	0	$42,500,000	Recent Vender quote
268	STG	Steam Turbine Generator, Erection	1.0	ea	Contr	Contr		20,000	53.33	20,000	1.09	0	0	NO	0	1,157,299	21,700	1,157,299	0	$1,157,299	HDR|CB Estimated cost
269																					
270		**Division #5.2 - Turbine Equipment Sub-Total**								**20,000**		**0**	**42,500,000**		**0**	**1,157,299**	**21,700**	**43,657,299**	**0**	**43,657,299**	

CONFIDENTIAL

2 x 1 Siemens F Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

E BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
Line #																					
271																					
272	**Division #5.3 - Not Used**																				
273																					
274	**Division #5.4 - Mechanical Draft Cooling Tower**																				
275																					
276	Cooling Tw	Cooling Tower - Mechanical Draft (F&E)	1.0	ls	Sub	Contr	5,600,000.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	5,600,000	$5,600,000	Recent Vender quote
277																					
278		**Division #5.4 - Mechanical Draft Cooling Tower Sub-Total**								**0**		**0**	**0**		**0**	**0**	**0**	**0**	**5,600,000**	**5,600,000**	
279																					
280	**Division #5.5 - Combustion Turbine Equipment**																				
281																					
282	CT	Combustion Turbine	2.0	ea	Contr	Contr	53,461,668.48		53.33	0	1.09	0	106,923,337	NO	0	0	0	106,923,337	0	$106,923,337	OEM Bidget Proposal
283	CT	Combustion Turbine, Installation	2.0	ea	Contr	Contr		29,000	53.33	58,000	1.09	0	0	NO	0	3,356,166	62,930	3,356,166	0	$3,356,166	HDR|CB Estimated cost
284																					
285																					
286		**Division #5.4 - Combustion Turbine Equipment Sub-Total**								**58,000**		**0**	**106,923,337**		**0**	**3,356,166**	**62,930**	**110,279,503**	**0**	**110,279,503**	
287																					
288	**Division #5.6 - BOP Mechanical Equipment**																				
289																					
290	Equipment	Blowdown Tank	4.0	ea	Contr	Contr	16,600.00	20	54.96	80	1.09	0	66,400	NO	0	4,771	87	71,171	0	$71,171	HDR|CB Estimated cost
291	Equipment	Closed Cooling Water Exchanger	2.0	ea	Contr	Contr	1,039,500.00	300	54.96	600	1.09	0	2,079,000	NO	0	35,781	651	2,114,781	0	$2,114,781	HDR|CB Estimated cost
292	Equipment	Closed Cooling Water Inhibitor Mixing Pot	1.0	ea	Contr	Contr	3,000.00	8	54.96	8	1.09	0	3,000	NO	0	477	9	3,477	0	$3,477	HDR|CB Estimated cost
293	Equipment	Closed Cooling Water (CCW) Heat Exchanger Strainer (Shell & Tube	2.0	ea	Contr	Contr	34,000.00	10	54.96	20	1.09	0	68,000	NO	0	1,193	22	69,193	0	$69,193	HDR|CB Estimated cost
294	Equipment	Instrument Air Receivers	2.0	ea	Contr	Contr	5,000.00	44	54.96	88	1.09	0	10,000	NO	0	5,248	95	15,248	0	$15,248	HDR|CB Estimated cost
295	Equipment	Main Condenser	1.0	ea	Contr	Contr	4,800,000.00	9000	65.52	9,000	1.09	0	4,800,000	NO	0	639,756	9,765	5,439,756	0	$5,439,756	Recent Vender quote
296	Equipment	Oil/Water Separator	1.0	ea	Contr	Contr	50,000.00	244	54.96	244	1.09	0	50,000	NO	0	14,551	265	64,551	0	$64,551	HDR|CB Estimated cost
297	Equipment	Plant Air Compressors	2.0	ea	Contr	Contr	140,000.00	100	54.96	200	1.09	0	280,000	NO	0	11,927	217	291,927	0	$291,927	HDR|CB Estimated cost
298	Equipment	Plant Air Dryers	2.0	ea	Contr	Contr	30,000.00	100	54.96	200	1.09	0	60,000	NO	0	11,927	217	71,927	0	$71,927	HDR|CB Estimated cost
299	Equipment	Plant Air Receivers	2.0	ea	Contr	Contr	5,000.00	20	54.96	40	1.09	0	10,000	NO	0	2,385	43	12,385	0	$12,385	HDR|CB Estimated cost
302	Equipment	Pumps - Circulating Water	2.0	ea	Contr	Contr	850,000.00	500	54.96	1,000	1.09	0	1,700,000	NO	0	59,635	1,085	1,759,635	0	$1,759,635	HDR|CB Estimated cost
303	Equipment	Pumps - Auxiliary Cooling Water	1.0	ea	Contr	Contr	120,000.00	96	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
304	Equipment	Pumps - Closed Cooling Water	2.0	ea	Contr	Contr	134,000.00	200	53.33	400	1.09	0	268,000	NO	0	23,146	434	291,146	0	$291,146	HDR|CB Estimated cost
306	Equipment	Pumps - Boiler Feed	2.0	ea	Contr	Contr	750,000.00	1200	53.33	2,400	1.09	0	1,500,000	NO	0	138,876	2,604	1,638,876	0	$1,638,876	HDR|CB Estimated cost
307	Equipment	Pumps - Condensate	2.0	ea	Contr	Contr	225,000.00	200	53.33	400	1.09	0	450,000	NO	0	23,146	434	473,146	0	$473,146	HDR|CB Estimated cost
308	Equipment	Pumps - Service Water	2.0	ea	Contr	Contr	160,000.00	210	53.33	420	1.09	0	320,000	NO	0	24,303	456	344,303	0	$344,303	HDR|CB Estimated cost
309	Equipment	Pumps - Fire Water (Electric and Diesel)	0.0	lt	Contr	Contr	500,000.00	310	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
310	Equipment	Pumps - Sump - Blowdown, Waste Water	2.0	ea	Contr	Contr	30,000.00	24	53.33	48	1.09	0	60,000	NO	0	2,778	52	62,778	0	$62,778	HDR|CB Estimated cost
311	Equipment	Pumps - Sump - Power Island Misc Building Sumps	6.0	ea	Contr	Contr	30,000.00	24	53.33	144	1.09	0	180,000	NO	0	8,333	156	188,333	0	$188,333	HDR|CB Estimated cost
314	Equipment	Pumps - Demin Water Transfer	2.0	ea	Contr	Contr	66,000.00	48	53.33	96	1.09	0	132,000	NO	0	5,555	104	137,555	0	$137,555	HDR|CB Estimated cost
318	Equipment	Pumps - Treated Water Transfer to Serv Water Tank	2.0	ea	Contr	Contr	40,000.00	80	53.33	160	1.09	0	80,000	NO	0	9,258	174	89,258	0	$89,258	HDR|CB Estimated cost
319	Equipment	Pumps - Waste Water	2.0	ea	Contr	Contr	80,000.00	125	53.33	250	1.09	0	160,000	NO	0	14,466	271	174,466	0	$174,466	HDR|CB Estimated cost
320	Equipment	Pumps - Evaporative Cooling Water	2.0	ea	Contr	Contr	37,000.00	80	53.33	160	1.09	0	74,000	NO	0	9,258	174	83,258	0	$83,258	HDR|CB Estimated cost
321	Equipment	Sample Analysis Panel (water)	2.0	ea	Contr	Contr	200,000.00	139	54.96	278	1.09	0	400,000	NO	0	16,578	302	416,578	0	$416,578	HDR|CB Estimated cost
322	Equipment	Tank - 200,000 gal treated water/service water - (F&E)	0.0	ea	Sub	Contr	540,000.00	0		0	1.09	0	0	yes	0	0	0	0	0	$0	Furnish and Erect price
323	Equipment	Tank - Demin Water Storage 200,000 gal. (F&E)	1.0	ea	Sub	Contr	600,000.00	0		0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	Furnish and Erect Price
324	Equipment	Tank - Turbine Drains	2.0	ea	Contr	Contr	75,000.00	200	53.33	400	1.09	0	150,000	NO	0	23,146	434	173,146	0	$173,146	HDR|CB Estimated cost
325	Equipment	Tank - Closed Cooling Water Dispersant 10,000 gal.	1.0	ea	Contr	Contr	36,500.00	100	54.96	100	1.09	0	36,500	NO	0	5,963	109	42,463	0	$42,463	HDR|CB Estimated cost
326	Equipment	Tank - Closed Cooling Water Accumulator	1.0	ea	Contr	Contr	20,600.00	44	54.96	44	1.09	0	20,600	NO	0	2,624	48	23,224	0	$23,224	HDR|CB Estimated cost
329	Equipment	Aqueous Ammonia System Unloading, Storage Tank, Forwarding Pu	0.0	ea	Contr	Contr	0.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
331	Equipment	Auxiliary Boiler System	1.0	ea	Contr	Contr	1,600,000.00	400	53.33	400	1.09	0	1,600,000	NO	0	23,146	434	1,623,146	0	$1,623,146	HDR|CB Estimated cost
332	Equipment	Compressed Gas Storage System (CO2)	1.0	ea	Contr	Contr	40,000.00	475	54.96	475	1.09	0	40,000	NO	0	28,326	515	68,326	0	$68,326	HDR|CB Estimated cost
333	Equipment	Compressed Gas Storage System (H2)	1.0	ea	Contr	Contr	40,000.00	198	54.96	198	1.09	0	40,000	NO	0	11,808	215	51,808	0	$51,808	HDR|CB Estimated cost
334	Equipment	Compressed Gas Storage System (N2)	2.0	ea	Contr	Contr	20,000.00	370	54.96	740	1.09	0	40,000	NO	0	44,130	803	84,130	0	$84,130	HDR|CB Estimated cost
335	Equipment	Demineralized Water Treatment System Dual 100% Trains	0.0	ea	Contr	Contr	1,197,000.00	4000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
336	Equipment	Condensate Polisher and Related	1.0	ea	Contr	Contr	1,000,000.00	3600	54.96	3,600	1.09	0	1,000,000	NO	0	214,684	3,906	1,214,684	0	$1,214,684	HDR|CB Estimated cost
337	Equipment	Fuel Gas Filter Separators	2.0	ea	Contr	Contr	210,000.00	200	54.96	400	1.09	0	420,000	NO	0	23,854	434	443,854	0	$443,854	Sub Budgetary Quote
338	Equipment	Fuel Gas Performance Heater	2.0	ea	Contr	Contr	761,600.00	300	54.96	600	1.09	0	1,523,200	NO	0	35,781	651	1,558,981	0	$1,558,981	Sub Budgetary Quote
339	Equipment	Fuel Gas Electric Startup Heater	2.0	ea	Contr	Contr	84,000.00	40	54.96	80	1.09	0	168,000	NO	0	4,771	87	172,771	0	$172,771	HDR|CB Estimated cost
340	Equipment	Fuel Gas Drain Tank	2.0	ea	Contr	Contr	2,000.00	15	54.96	30	1.09	0	4,000	NO	0	1,789	33	5,789	0	$5,789	HDR|CB Estimated cost
341	Equipment	Fuel Gas Dewpoint Heater	1.0	ea	Contr	Contr	476,000.00	80	54.96	80	1.09	0	476,000	NO	0	4,771	87	480,771	0	$480,771	HDR|CB Estimated cost
342	Equipment	Fuel Gas Scrubber	1.0	ea	Contr	Contr	392,000.00	60	54.96	60	1.09	0	392,000	NO	0	3,578	65	395,578	0	$395,578	HDR|CB Estimated cost
343	Equipment	Fuel Gas Compressor Package 2 x 100% w/ Building	0.0	ea	Contr	Contr	2,500,000.00	3000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
344	Equipment	Hydrogen Generator	0.0	ea	Contr	Contr	194,000.00	40	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
345	Equipment	Steam Silencers	1.0	ea	Contr	Contr	150,000.00	20	54.96	20	1.09	0	150,000	NO	0	1,193	22	151,193	0	$151,193	HDR|CB Estimated cost
346	Equipment	Condensate Water Strainer	1.0	ea	Contr	Contr	150,000.00	40	54.96	40	1.09	0	150,000	NO	0	2,385	43	152,385	0	$152,385	HDR|CB Estimated cost
347	Equipment	Cycle Chem Feed	1.0	ea	Contr	Contr	200,000.00	100	54.96	100	1.09	0	200,000	NO	0	5,963	109	205,963	0	$205,963	HDR|CB Estimated cost
348	Equipment	Cooling Tower Chemical Feed	1.0	ea	Contr	Contr	250,000.00	300	54.96	300	1.09	0	250,000	NO	0	17,890	326	267,890	0	$267,890	HDR|CB Estimated cost
349	Equipment	Condeser Vaccum Pump/Air Removal Equipment	1.0	ea	Contr	Contr	350,000.00	40	54.96	40	1.09	0	350,000	NO	0	2,385	43	352,385	0	$352,385	HDR|CB Estimated cost
350	Equipment	Turbine Room Bridge Crane - 60T	1.0	ea	Contr	Contr	390,000.00	120	53.33	120	1.09	0	390,000	NO	0	6,944	130	396,944	0	$396,944	HDR|CB Estimated cost
351	Equipment	Elevator for 2 HRSG	1.0	ea	sub	contr	746,000.00	0		0	1.09	0	0	NO	0	0	0	0	746,000	$746,000	HDR|CB Estimated cost
352																					
353		**Division #5.6 BOP Mechanical Equipment Sub-Total**								**24,159**		**0**	**20,270,700**		**0**	**1,534,034**	**26,213**	**21,804,734**	**1,346,000**	**23,150,734**	
354																					
355	**Division #6.0 - Electrical Equipment**																				
356																					
357	Electrical	Eqpt - 24kv Bus Isolated Phase, 8000A	600.0	lf	Contr	Contr	750.00	8	50.09	4,800	1.09	0	450,000	NO	0	260,890	5,208	710,890	0	$710,890	HDR|CB Estimated cost
358	Electrical	Eqpt - 24kv Bus Isolated Phase, 9000A	300.0	lf	Contr	Contr	900.00	8	50.09	2,400	1.09	0	270,000	NO	0	130,445	2,604	400,445	0	$400,445	HDR|CB Estimated cost
359	Electrical	Eqpt - Bus 6.9kV non-seg	200.0	lf	Contr	Contr	510.00	4	50.09	800	1.09	0	102,000	NO	0	43,482	868	145,482	0	$145,482	HDR|CB Estimated cost
360	Electrical	Eqpt - Bus Duct 480V, 2500A	480.0	lf	Contr	Contr	610.00	3.2	50.09	1,536	1.09	0	292,800	NO	0	83,485	1,667	376,285	0	$376,285	HDR|CB Estimated cost
361	Electrical	Eqpt - Generator Breaker, 8000A, 24kV	3.0	ea	Contr	Contr	450,000.00	300	50.09	900	1.09	0	1,350,000	NO	0	48,917	977	1,398,917	0	$1,398,917	HDR|CB Estimated cost
362	Electrical	Eqpt - LV Switchgear - 480V, 4000A EO Main Ckt Bkr	6.0	ea	Contr	Contr	35,000.00	56	50.09	336	1.09	0	210,000	NO	0	18,262	365	228,262	0	$228,262	HDR|CB Estimated cost
363	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Main Ckt Bkr.	2.0	ea	Contr	Contr	15,400.00	30	50.09	60	1.09	0	30,800	NO	0	3,261	65	34,061	0	$34,061	HDR|CB Estimated cost
364	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Tie Ckt Bkr.	3.0	ea	Contr	Contr	15,400.00	30	50.09	90	1.09	0	46,200	NO	0	4,892	98	51,092	0	$51,092	HDR|CB Estimated cost
365	Electrical	Eqpt - LV Switchgear - 480V, 1200A EO Tie Ckt Bkr.	1.0	ea	Contr	Contr	10,780.00	26	50.09	26	1.09	0	10,780	NO	0	1,413	28	12,193	0	$12,193	HDR|CB Estimated cost
366	Electrical	Eqpt - LV Switchgear - 480V, 800A MO Fdr Ckt Bkr.	16.0	ea	Contr	Contr	4,575.00	22	50.09	352	1.09	0	73,200	NO	0	19,132	382	92,332	0	$92,332	HDR|CB Estimated cost
367	Electrical	Eqpt - LV Switchgear - 480V, 800A Equipped Space	6.0	ea	Contr	Contr	1,090.00	13.2	50.09	79	1.09	0	6,540	NO	0	4,305	86	10,845	0	$10,845	HDR|CB Estimated cost
368	Electrical	Eqpt - Motor Control Centers - 480V	16.0	ea	Contr	Contr	46,000.00	132	50.09	2,112	1.09	0	736,000	NO	0	114,792	2,292	850,792	0	$850,792	HDR|CB Estimated cost
369	Electrical	Eqpt - MV Switchgear - 7kV, 3000A Main Ckt Bkr.	1.00	ea	Contr	Contr	79,640.00	76	50.09	76	1.09	0	79,640	NO	0	4,131	82	83,771	0	$83,771	HDR|CB Estimated cost

2 x 1 Siemens F Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
E BASIS Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
370	Electrical	Eqpt - MV Switchgear - 7kV, 2000A Fdr Ckt Bkr.	2.00	ea	Contr	Contr	42,870.00	72	50.09	144	1.09	0	85,740	NO	0	7,827	156	93,567	0	$93,567	HDR|CB Estimated cost
371	Electrical	Eqpt - MV Switchgear - 7kV, 1200A Fdr Ckt Bkr.	20.00	ea	Contr	Contr	36,360.00	48	50.09	960	1.09	0	727,200	NO	0	52,178	1,042	779,378	0	$779,378	HDR|CB Estimated cost
372	Electrical	Eqpt - Relay panels and Metering	3.0	ea	Contr	Contr	34,500.00	120.00	50.09	360	1.09	0	103,500	NO	0	19,567	391	123,067	0	$123,067	HDR|CB Estimated cost
373	Electrical	Eqpt - Station Batteries 125 Volt DC/Charger	1.0	lot	Contr	Contr	350,000.00	635	50.09	635	1.09	0	350,000	NO	0	34,514	689	384,514	0	$384,514	HDR|CB Estimated cost
374	Electrical	Eqpt - Transformer GSU - 283 MVA, 18kV-345kV	2.0	ea	Contr	Contr	2,100,000.00	950	50.09	1,900	1.09	0	4,200,000	NO	0	103,269	2,062	4,303,269	0	$4,303,269	HDR|CB Estimated cost
375	Electrical	Eqpt - Transformer GSU - 415 MVA, 18kV-345kV	1.0	ea	Contr	Contr	3,600,000.00	950	50.09	950	1.09	0	3,600,000	NO	0	51,634	1,031	3,651,634	0	$3,651,634	HDR|CB Estimated cost
376	Electrical	Eqpt - Transformer UAT 33 MVA, 18kV/6.9kV	2.0	ea	Contr	Contr	900,000.00	650	50.09	1,300	1.09	0	1,800,000	NO	0	70,658	1,411	1,870,658	0	$1,870,658	HDR|CB Estimated cost
377	Electrical	Eqpt - Emergency Diesel Gnerator packaged 750kW	1.0	ea	Contr	Contr	200,000.00	100	50.09	100	1.09	0	200,000	NO	0	5,435	109	205,435	0	$205,435	HDR|CB Estimated cost
378	Electrical	Eqpt - UPS (120VAC)	1.0	ea	Contr	Contr	300,000.00	528	50.09	528	1.09	0	300,000	NO	0	28,698	573	328,698	0	$328,698	HDR|CB Estimated cost
379	Electrical	Eqpt - Transformer Aux Power 2.5/3.3MVA, 7kV-480V	4.0	ea	Contr	Contr	104,500.00	210	50.09	840	1.09	0	418,000	NO	0	45,656	911	463,656	0	$463,656	HDR|CB Estimated cost
380	Electrical	Eqpt - Lighting Transformers	8.0	ea	Contr	Contr	916.27	9.09	50.09	73	1.09	0	7,330	YES	440	3,953	79	11,283	0	$11,283	HDR|CB Estimated cost
381	Electrical	Eqpt - Panelboards 480/120 & 480/277/120	8.0	ea	Contr	Contr	1,200.00	40.00	50.09	320	1.09	0	9,600	YES	576	17,393	347	26,993	0	$26,993	HDR|CB Estimated cost
382	Electrical	Eqpt - Plant Network System	1.0	ea	Contr	Contr	100,000.00	300	50.09	300	1.09	0	100,000	YES	6,000	16,306	326	116,306	0	$116,306	HDR|CB Estimated cost
383	Electrical	Eqpt - Plant Security System	1.0	lot	Contr	Contr	250,000.00	1800	50.09	1,800	1.09	0	250,000	YES	15,000	97,834	1,953	347,834	0	$347,834	HDR|CB Estimated cost
384	Electrical	Eqpt - Plant Telephone System	1.0	ea	Contr	Contr	100,000.00	500	50.09	500	1.09	0	100,000	YES	6,000	27,176	543	127,176	0	$127,176	HDR|CB Estimated cost
385																					
386		**Division #6.0 - Electrical Equipment Sub-Total**								**24,277**		**0**	**15,909,330**		**28,016**	**1,319,501**	**26,340**	**17,228,831**	**0**	**17,228,831**	
387																					
388	**Division #6.1 - Electrical/Control Commodities**																				
389																					
390	Electrical	Grounding - Buried Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
391	Electrical	Grounding - Above Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
392	Electrical	Grounding - Ground Rods Copper	96.0	ea	Contr	Contr	22.95	1.74	50.09	167	1.09	0	2,204	NO	0	9,079	181	11,283	0	$11,283	HDR|CB Estimated Quantity & Cost
393	Electrical	Grounding - Exothermic Connections	2,850.0	ea	Contr	Contr	9.75	1.14	50.09	3,249	1.09	0	27,788	NO	0	176,590	3,525	204,377	0	$204,377	HDR|CB Estimated Quantity & Cost
394	Electrical	Grounding - Servit Post	1,328.8	ea	Contr	Contr	30.00	1	50.09	1,107	1.09	0	39,864	NO	0	60,146	1,201	100,010	0	$100,010	HDR|CB Estimated Quantity & Cost
395	Electrical	Conduit A/G 5" RGS	1,000.0	lf	Contr	Contr	58.00	1.00	50.09	1,000	1.09	0	58,000	NO	0	54,352	1,085	112,352	0	$112,352	HDR|CB Estimated Quantity & Cost
396	Electrical	Conduit A/G 2" ave RGS	85,000.0	lf	Contr	Contr	8.50	0.30	50.09	25,500	1.09	0	722,500	NO	0	1,385,978	27,668	2,108,478	0	$2,108,478	HDR|CB Estimated Quantity & Cost
397	Electrical	Conduit U/G - 4 x 6 PVC 5"	8,000.0	lf	Contr	Contr	240.00	2.00	50.09	16,000	1.09	0	1,920,000	NO	0	869,633	17,360	2,789,633	0	$2,789,633	HDR|CB Estimated Quantity & Cost
398	Electrical	Conduit U/G - 8 x 8 PVC 5"	700.0	lf	Contr	Contr	530.00	5.00	50.09	3,500	1.09	0	371,000	NO	0	190,232	3,798	561,232	0	$561,232	HDR|CB Estimated Quantity & Cost
399	Electrical	Cable Tray, Raceway 24" Aluminum	5,200.0	lf	Contr	Contr	17.00	0.84	50.09	4,368	1.09	0	88,400	NO	0	237,410	4,739	325,810	0	$325,810	HDR|CB Estimated Quantity & Cost
400	Electrical	Cable Tray, Raceway 36" Aluminum	2,200.0	lf	Contr	Contr	20.00	1.05	50.09	2,310	1.09	0	44,000	NO	0	125,553	2,506	169,553	0	$169,553	HDR|CB Estimated Quantity & Cost
401	Electrical	Cable - Overhead Conductor to Substation	2,250.0	lf	Contr	Contr	8.50	0.50	50.09	1,125	1.09	0	19,125	NO	0	61,146	1,221	80,271	0	$80,271	HDR|CB Estimated Quantity & Cost
402	Electrical	Cable - Medium Voltage (7kV 1C Cable)	80,000.0	lf	Contr	Contr	14.60	0.127	50.09	10,160	1.09	0	1,168,000	NO	0	552,217	11,024	1,720,217	0	$1,720,217	HDR|CB Estimated Quantity & Cost
403	Electrical	Cable Terminations - 7kV	96.0	ea	Contr	Contr	195.00	12.00	50.09	1,152	1.09	0	18,720	NO	0	62,614	1,250	81,334	0	$81,334	HDR|CB Estimated Quantity & Cost
404	Electrical	Cable 600V Power 1/c No. 2/0 ave size	160,000.0	lf	Contr	Contr	3.55	0.041	50.09	6,560	1.09	0	568,000	NO	0	356,550	7,118	924,550	0	$924,550	HDR|CB Estimated Quantity & Cost
405	Electrical	Wire 600V Power 3/c # 10 ave. size	250,000.0	lf	Contr	Contr	0.27	0.0185	50.09	4,625	1.09	0	67,500	NO	0	251,378	5,018	318,878	0	$318,878	HDR|CB Estimated Quantity & Cost
406	Electrical	Cable - Fiber Optic	16,500.0	lf	Contr	Contr	6.00	0.025	50.09	413	1.09	0	99,000	NO	0	22,420	448	121,420	0	$121,420	HDR|CB Estimated Quantity & Cost
407	Electrical	Cable - Permanent Telephone Line	1.0	ls	Contr	Contr	10,000.00	240.000	50.09	240	1.09	0	10,000	NO	0	13,044	260	23,044	0	$23,044	HDR|CB Estimated Quantity & Cost
408	Electrical	Cable - Control	600,000.0	lf	Contr	Contr	1.10	0.040	50.09	24,000	1.09	0	660,000	NO	0	1,304,450	26,040	1,964,450	0	$1,964,450	HDR|CB Estimated Quantity & Cost
409	Electrical	Cable - Instrument 4pr tw/shld No. 18	400,000.0	lf	Contr	Contr	3.25	0.025	50.09	10,000	1.09	0	1,300,000	NO	0	543,521	10,850	1,843,521	0	$1,843,521	HDR|CB Estimated Quantity & Cost
410	Electrical	Cable - Thermocouple 2pr tw/shld No. 16	13,000.0	lf	Contr	Contr	0.33	0.030	50.09	390	1.09	0	4,290	NO	0	21,197	423	25,487	0	$25,487	HDR|CB Estimated Quantity & Cost
411	Electrical	Cable - Data Highway	24,068.0	lf	Contr	Contr	4.59	0.034	50.09	828	1.09	0	110,472	NO	0	45,000	898	155,472	0	$155,472	HDR|CB Estimated Quantity & Cost
412	Electrical	Cable Terminations - low voltage	30,500.0	ea	Contr	Contr	0.85	0.300	50.09	9,150	1.09	0	25,925	NO	0	497,321	9,928	523,246	0	$523,246	HDR|CB Estimated Quantity & Cost
413	Electrical	Cable Terminations - control	31,500.0	ea	Contr	Contr	0.54	0.300	50.09	9,450	1.09	0	17,010	NO	0	513,627	10,253	530,637	0	$530,637	HDR|CB Estimated Quantity & Cost
414	Electrical	Cable Terminations - instrument	32,800.0	ea	Contr	Contr	0.54	0.300	50.09	9,840	1.09	0	17,712	NO	0	534,824	10,676	552,536	0	$552,536	HDR|CB Estimated Quantity & Cost
415	Electrical	Conduit - Lighting A/G	33,000.0	lf	Contr	Contr	2.83	0.25	50.09	8,250	1.09	0	93,390	YES	5,603	448,405	8,951	541,795	0	$541,795	HDR|CB Estimated Quantity & Cost
416	Electrical	Wire - Lighting 1/C No 12	80,000.0	lf	Contr	Contr	0.176	0.018	50.09	1,440	1.09	0	14,080	YES	845	78,267	1,562	92,347	0	$92,347	HDR|CB Estimated Quantity & Cost
417	Electrical	Lighting - Outdoor Fixtures, pole	30.0	ea	Contr	Contr	1,600.00	12.00	50.09	360	1.09	0	48,000	YES	2,880	19,567	391	67,567	0	$67,567	HDR|CB Estimated Quantity & Cost
418	Electrical	Lighting - Outdoor Fixtures, 150W	320.0	ea	Contr	Contr	490.00	4.00	50.09	1,280	1.09	0	156,800	NO	0	69,571	1,389	226,371	0	$226,371	HDR|CB Estimated Quantity & Cost
419	Electrical	Lighting - Fixtures, 250W	80.0	ea	Contr	Contr	850.00	3.00	50.09	240	1.09	0	68,000	NO	0	13,044	260	81,044	0	$81,044	HDR|CB Estimated Quantity & Cost
420	Electrical	Lighting - Fixtures, fluorescent	180.0	ea	Contr	Contr	85.00	1.60	50.09	288	1.09	0	15,300	YES	918	15,653	312	30,953	0	$30,953	HDR|CB Estimated Quantity & Cost
421	Electrical	Lighting - Receptacles and switches	200.0	ea	Contr	Contr	32.00	1.37	50.09	273	1.09	0	6,400	YES	384	14,864	297	21,264	0	$21,264	HDR|CB Estimated Quantity & Cost
422	Electrical	Welding Receptacles	24.0	ea	Contr	Contr	1,800.00	4.00	50.09	96	1.09	0	43,200	NO	0	5,218	104	48,418	0	$48,418	HDR|CB Estimated Quantity & Cost
423	Electrical	Lighting - Exit	66.0	ea	Contr	Contr	150.00	2.00	50.09	132	1.09	0	9,900	YES	594	7,174	143	17,074	0	$17,074	HDR|CB Estimated Quantity & Cost
424	Electrical	Lighting - Emergency	120.0	ea	Contr	Contr	127.00	2.00	50.09	240	1.09	0	15,240	YES	914	13,044	260	28,284	0	$28,284	HDR|CB Estimated Quantity & Cost
425	Electrical	Cathodic Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
426	Electrical	Lightning Protection System	1.0	lot	Contr	Contr	100,000.00	200	50.09	200	1.09	0	100,000	YES	6,000	10,870	217	110,870	0	$110,870	HDR|CB Estimated Quantity & Cost
427	Electrical	Freeze Protection System	1.0	lot	Contr	Contr	800,000.00	5000	50.09	5,000	1.09	0	800,000	YES	48,000	271,760	5,425	1,071,760	0	$1,071,760	HDR|CB Estimated Quantity & Cost
428	Electrical	Electrical Circuit Testing	6,183.3	ea	Contr	Contr		2	50.09	12,367	1.09	0	0	NO	0	672,148	13,418	672,148	0	$672,148	HDR|CB Estimated Quantity & Cost
429		**Total Cable**	**1,545,819.0**	**LF**																	
430																					
431		**Division #6.1 - Electrical/Control Commodities Sub-Total**								**180,099**		**0**	**9,213,019**		**72,139**	**9,788,760**	**195,408**	**19,001,779**	**0**	**19,001,779**	
432																					
433	**Division #6.2 - Switchyard**																				
434																					
435	HV Electrica	138kV Dead End Towers 6 Legged (3 total)	150,000.0	lb	Contr	Contr	2.50	0.01	60.25	2,180	1.09	0	375,000	NO	0	142,500	2,365	517,500		$517,500	HDR|CB Estimated Quantity & Cost
436	HV Electrica	Interonnection Cabling and Termination Allowance	1.0	lot	Contr	Contr	15,000.00	1,526.36	51.33	1,526	1.09	0	15,000	NO	0	85,000	1,656	100,000		$100,000	HDR|CB Estimated Quantity & Cost
437																					
438		**Division #6.2 - Switchyard**								**3,706**		**0**	**$390,000**		**0**	**$227,500**	**$4,021**	**$617,500**	**$0**	**$617,500**	
439																					
440	**Division #7.0 - Instrumentation & Control**																				
441																					
442	I & C	BOP Instrument Devices	1,200.0	ea	Contr	Contr	750.00	12	50.09	14,400	1.09	0	900,000	NO	0	782,670	15,624	1,682,670	0	$1,682,670	HDR|CB Estimated Quantity & Cost
443	I & C	Auxiliary Boiler CEMS	1.0	lot	Contr	Contr	163,200.00	200	50.09	200	1.09	0	163,200	NO	0	10,870	217	174,070	0	$174,070	HDR|CB Estimated Quantity & Cost
444	I & C	Continuous Emissions Monitoring Equipment (CEMS)	2.0	ea	Contr	Contr	700,000.00	2000	53.33	4,000	1.09	0	1,400,000	NO	0	231,460	4,340	1,631,460	0	$1,631,460	HDR|CB Estimated Quantity & Cost
445	I & C	Control Valves	220.0	ea	Contr	Contr	4,000.00	24	54.96	5,280	1.09	0	880,000	NO	0	314,871	5,729	1,194,871	0	$1,194,871	HDR|CB Estimated Quantity & Cost
446	I & C	DCS w/ Configuration, Interfaces, Field Support, Interface, Bulks	1.0	ea	Contr	Contr	1,700,000.00	1691	50.09	1,691	1.09	0	1,700,000	NO	0	91,909	1,835	1,791,909	0	$1,791,909	HDR|CB Estimated Quantity & Cost
447	I & C	Emergency Trip sub Panel	1.0	ea	Contr	Contr	30,000.00	21	50.09	21	1.09	0	30,000	NO	0	1,141	23	31,141	0	$31,141	HDR|CB Estimated Quantity & Cost
448	I & C	Flow Element - Nozzle (Supply)	6.0	ea	Contr	Contr	30,000.00	20	54.96	120	1.09	0	180,000	NO	0	7,156	130	187,156	0	$187,156	HDR|CB Estimated Quantity & Cost
449	I & C	Instrument Calibration and loop check	1,500.0	ea	Contr	Contr	0.00	3	50.09	4,500	1.09	0	0	NO	0	244,584	4,883	244,584	0	$244,584	HDR|CB Estimated Quantity & Cost
450	I & C	Instrument piping 2&3-valve manifolds	284.0	ea	Contr	Contr	400.00	5.22	54.96	1,481	1.09	0	113,600	NO	0	88,331	1,607	201,931	0	$201,931	HDR|CB Estimated Quantity & Cost
451	I & C	Instrument Racks & Enclosures	1.0	lot	Contr	Contr	350,000.00	1450	50.09	1,450	1.09	0	350,000	NO	0	78,811	1,573	428,811	0	$428,811	HDR|CB Estimated Quantity & Cost
452	I & C	Instrument Tubing - copper	6,000.0	lf	Contr	Contr	3.70	0.15	54.96	900	1.09	0	22,200	NO	0	53,671	977	75,871	0	$75,871	HDR|CB Estimated Quantity & Cost
453	I & C	Instrument Tubing - Stainless Steel	2,500.0	lf	Contr	Contr	6.25	0.20	54.96	500	1.09	0	15,625	NO	0	29,817	543	45,442	0	$45,442	HDR|CB Estimated Quantity & Cost
454	I & C	PLC Hardware, Bulks, Aux Controls, Configuration	1.0	ls	Contr	Contr	241,200.00	253	50.09	253	1.09	0	241,200	NO	0	13,751	275	254,951	0	$254,951	HDR|CB Estimated Quantity & Cost

CONFIDENTIAL

2 x 1 Siemens F Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

														CONSTRUCTION PROJECT TOTALS CONTRACTOR								
E BASIS		**ISCIPLIN**	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
Line #																						
455																						
456			**Division #7.0 - Control Sub-Total**								**34,796**		**0**	**5,995,825**		**0**	**1,949,043**	**37,754**	**7,944,868**	**0**	**$7,944,868**	
457																						
458			**Sub-Total Direct Costs**								**905,675**		**0**	**280,633,020**	**0**		**51,992,466**	**982,135**	**332,625,486**	**25,087,400**	**357,712,886**	
459			Sales Tax - State (Plant Production Equipment is Exempt)	6.00%												**392,527**				**392,527**	**392,527**	Sales Tax Included for Non-Production Facilities
460		Indirects																				
461			**TOTAL DIRECT COSTS**								**905,675**		**0**	**280,633,020**			**51,992,466**	**982,135**	**332,625,486**	**25,479,927**	**$358,105,413**	
462																						
463	**Division #8.0 - Construction and Indirect Services**																					
464																						
465	Const Indirec		Construction Equipment	1.0	ls	Contr	Contr	12,055,653			0	1.09					0	0	0	12,055,653	$12,055,653	See Construction Equipment worksheet
466	Const Indirec		Construction Field staff	1.0	ls	Contr	Contr	11,522,855			0	1.09					0	0	0	11,522,855	$11,522,855	See EPC Field Staff Worksheet for details
467	Const Indirec		Construction Field staff expenses	1.0	ls	Contr	Contr	1,870,168			0	1.09					0	0	0	1,870,168	$1,870,168	See EPC Field Staff Worksheet for details
468	Const Indirec		Construction Permits	1.0	ls	Contr	Contr				0	1.09		51,450			0	0	51,450	0	$51,450	See Const Indirects and Serv Worksheet
469	Const Indirec		Construction Testing	1.0	ls	Contr	Contr				0	1.09		117,000			0	0	117,000	0	$117,000	See Const Indirects and Serv Worksheet
470	Const Indirec		Consumable Materials & Safety Supplies	2.00	$/MH	Contr	Contr	1,964,269			0	1.09					0	0	0	1,964,269	$1,964,269	$2.00/Direct hour
471	Const Indirec		Field Office Expenses	1.0	ls	Contr	Contr				1,369	1.09		1,033,370			65,849	1,485	1,099,219	22,373	$1,121,592	See Const Indirects and Serv Worksheet
472	Const Indirec		Performance Testing	1.0	ls	Contr	Contr				0	1.09		304,400			0	0	304,400	0	$304,400	See Const Indirects and Serv Worksheet
473	Const Indirec		Preoperational Testing, Startup & Commissioning	2.0	ls	Contr	Contr				21,690	1.09		1,113,000			752,767	23,534	1,865,767	0	$1,865,767	See Const Indirects and Serv Worksheet
474	Const Indirec		Site Safety	1.0	ls	Contr	Contr				7,580	1.09		658,040			375,008	8,224	1,033,048	0	$1,033,048	See Const Indirects and Serv Worksheet
475	Const Indirec		Small Tools	2.00	$/MH	Contr	Contr	1,964,269			0	1.09					0	0	0	1,964,269	$1,964,269	$2.00/Direct hour
476	Const Indirec		Start-up Supervision	1.0	ls	Contr	Contr	1,296,911			0	1.09					0	0	0	1,296,911	$1,296,911	See EPC Field Staff Worksheet for details
477	Const Indirec		Support Craft, Site Services, Scaffolding	1.0	ls	Contr	Contr				41,753	1.09		459,400			2,008,704	45,302	2,468,104	775,014	$3,243,118	See Const Indirects and Serv Worksheet
478	Const Indirec		Temporary Facilities	1.0	ls	Contr	Contr				17,947	1.09		2,336,753			863,403	19,472	3,200,157	82,500	$3,282,657	See Const Indirects and Serv Worksheet
479	Const Indirec		Temporary Utilities	1.0	ls	Contr	Contr				29,032	1.09		747,600			1,396,697	31,500	2,144,297	0	$2,144,297	See Const Indirects and Serv Worksheet
480																						
481			**Division #8.0 - Construction Indirects and Services Sub-Total**								**119,371**		**0**	**6,821,013**			**5,462,428**	**129,518**	**12,283,441**	**31,554,013**	**$43,837,454**	
482																						
483			**SUB-TOTAL CONSTRUCTION COST**								**1,025,046**		**0**	**287,454,034**			**57,454,894**	**1,111,652**	**344,908,928**	**57,033,940**	**401,942,868**	
484			**Subcontract Labor Hours**																			
485			**Material Cost Excluding CT, HRSG and ST (escalation and EPC**											**90,030,697**								
486	**Division #9.0 - Project Indirects**																					
487																						
488	Project Indire		- Power Plant Design Engineering	1.0	ls	Contr	6.0%	24,116,572											0	24,116,572	$24,116,572	6.0% of the Total Construction Cost
489	Project Indire		- Project Management (Home Office)	0.0	ls	Contr	0.0%	0											0	0	$0	Included in Engineering
490																						
491																						
492			Sub-Total Project Indirects										**0**	**0**			**0**	**0**	**0**	**24,116,572**	**$24,116,572**	
493																						
494	EPC Indirect		EPC Contractor Insurance & Misc Costs (% of Total Const. Cost)																			
495																						
496	EPC Indirect		- Builders Risk Insurance	1.0	ls	Contr	0.50%	2,009,714												2,009,714	$2,009,714	Allowance based on info from other projects
497	EPC Indirect		- Comprehensive General Liability (CGL) Insurance	1.0	ls	Contr	0.50%	2,009,714											0	2,009,714	$2,009,714	Allowance based on info from other projects
498	EPC Indirect		- Warranty Reserve	1.0	ls	Contr		500,000											0	500,000	$500,000	Allowance based on info from other projects
499																						
500			Sub-Total EPC Contractor Indirects										**0**	**0**			**0**	**0**	**0**	**4,519,429**	**$4,519,429**	
501																						
502			**Total Project Indirects**										**0**	**0**			**0**	**0**	**0**	**28,636,001**	**28,636,001**	
503																						
504			Sub-Total										**0**	**287,454,034**			**57,454,894**	**1,111,652**	**344,908,928**	**85,669,941**	**$430,578,868**	
505								Equipment	Material	Labor	S/C											
506	Project Indire		Escalation - EPC Contractor Escalation Rates					2.4%	2.4%	4.0%	4.0%			6,811,375			9,052,138	0	15,863,513	7,771,474	23,634,988	Excludes CT, HRSG and ST
507																						
508			Sub-Total										**0**	**294,265,408**			**66,507,033**	**1,111,652**	**360,772,441**	**93,441,415**	**$454,213,856**	
509								Equip	Mat	Labor	S/C											
510	EPC Indirect		EPC Contractor Contingency	Varies	%	Contr		0%	5%	5%	5%		0	4,501,535			3,325,352		7,826,886	4,362,071	12,188,957	Excludes CT, HRSG and ST
511	EPC Indirect		EPC Contractor G&A and Fee	8.0%	%	Contr		1.0%	8.0%	8.0%	8.0%		0	23,541,233			5,320,563		28,861,795	7,475,313	36,337,108	
512																						
513			Sub-Total		ls								0	28,042,768			8,645,914	0	36,688,682	11,837,384	$48,526,066	
514																						
515			**TOTAL EPC PROJECT COST**								**1,025,046**		**0**	**322,308,176**			**75,152,947**	**1,111,652**	**397,461,123**	**105,278,799**	**$502,739,922**	
516																						
517	**OWNER INDIRECTS**																					
518	**Division #9.1 - Owner Indirects**																					
519																						
520			**Power Block 1 and Common**																			
521	Owner Indire		Project Development	1.0	ls	Owner														6,500,000	$6,500,000	Budget provided by LG&E
522	Owner Indire		Transmission Line Relocation	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
523	Owner Indire		Transmission Interconnection Facilities	1.0	ls	Owner														5,500,000	$5,500,000	To be estimated by Transmision Operator
524	Owner Indire		Natural Gas Pipeline Interconnection	1.0	ls	Owner														14,250,000	$14,250,000	Budget provided by LG&E
525	Owner Indire		Natural Gas Pipeline Fixed O&M (Startup Period)	1.0	ls	Owner														6,300,000	$6,300,000	Budget provided by LG&E
526	Owner Indire		Construction Power (Service Installation and Energy)	1.0	ls	Owner														750,000	$750,000	Budget estimated by HDR|CB
527	Owner Indire		Owner Operations Personnel (Prior to COD)	1.0	ls	Owner														2,340,000	$2,340,000	Budget estimated by HDR|CB 7 sal @ 12 mo, 26 hr @ 6 m
528	Owner Indire		Owners Project Management	1.0	ls	Owner														5,300,000	$5,300,000	Budget provided by LG&E
529	Owner Indire		Owners Engineer	1.0	ls	Owner														1,900,000	$1,900,000	Budget provided by LG&E
530	Owner Indire		Owners Legal Counsel	1.0	ls	Owner														1,300,000	$1,300,000	Budget provided by LG&E
531	Owner Indire		Operator Training	1.0	ls	Owner														225,000	$225,000	Budget estimated by HDR|CB
532	Owner Indire		Owner Startup Engineering	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
533	Owner Indire		Permitting, License Fees, & Environmental Compliance	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
534	Owner Indire		Highway Improvements, Miscellaneous Mitigation	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
535	Owner Indire		Land	1.0	ls	Owner														0	$0	Budget provided by LG&E
536	Owner Indire		Rolling Stock	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
537	Owner Indire		Water Infrastructure / Supply to Site	0.0	ls	Owner														0	$0	N/A (On site intake/pre-treatment/discharge incl. in EPC)
538	Owner Indire		Startup Testing (Includes Fuel & Power Sales)																			
539	Owner Indire		- Fuel - Natural Gas	1.0	ls	Owner														12,160,800	$12,160,800	HDR|CB [2,702,400 MMBTU @ $4.50/MMBTU per LG&E 2017 Foreca
540	Owner Indire		- Fuel - Fuel Oil	0.0	ls	Owner														0	$0	Budget estimated by HDR|CB [Not Required]
541	Owner Indire		- Electric Transmission Firm Point to Point	1.0	ls	Owner														4,000,000	$4,000,000	Budget provided by LG&E

2 x 1 Siemens F Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
542	Owner Indire	- Startup Power	1.0	ls	Owner														391,104	$391,104	Budget estimated by HDR|CB [10,864 MWhr @$36/MWH]
543	Owner Indire	- Test Power Sales	1.0	ls	Owner														(15,552,000)	($15,552,000)	Budget estimated by HDR|CB [432,000 MWhr @$36/MWH
544	Owner Indire	- Variable O&M - Water, Chemicals, etc.	1.0	ls	Owner														1,200,000	$1,200,000	Budget estimated by HDR|CB
545	Owner Indire	Site Security	1.0	ls	Owner														50,000	$50,000	Budget estimated by HDR|CB
546	Owner Indire	Operating Spare Parts	1.0	ls	Owner														10,000,000	$10,000,000	Budget estimated by HDR|CB
547	Owner Indire	Permanent Plant Equipment & Furnishings																		$0	
548	Owner Indire	- Office Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
549	Owner Indire	- Kitchen Furniture	1.0	ls	Owner														130,000	$130,000	Budget estimated by HDR|CB
550	Owner Indire	- Laboratory Equipment & Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
551	Owner Indire	- Locker Room Furniture	1.0	ls	Owner														180,000	$180,000	Budget estimated by HDR|CB
552	Owner Indire	- Warehouse Shelves	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
553	Owner Indire	- Workshop Tools & Test Equipment	1.0	ls	Owner														1,800,000	$1,800,000	Budget estimated by HDR|CB
554	Owner Indire	IT and Telecommunication Infrastructure	1.0	ls	Owner														250,000	$250,000	Budget estimated by HDR|CB
555	Owner Indire	NERC - Cyber Security	1.0	ls	Owner														1,000,000	$1,000,000	Budget estimated by HDR|CB
556	Owner Indire	Escalation - Owners Furnished Equipment	0.0	%	Owner														0	$0	N/A
557	Owner Indire	Builders Risk Insurance	0.0	ls	Owner														0	$0	Included with EPC Contractor Indirects
558	Owner Indire	Property Tax During Construction	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
559	Owner Indire	Financing Fees	0.0	ls	Owner														0	$0	N/A
560	Owner Indire	AFUDC	1.0	ls	Owner														5,400,000	$5,400,000	AFUDC Based on 78% KU Ownership
561		**Total Owner Indirects**																	**69,574,904**	**$69,574,904**	
562																					
563																					
564		**Owner Contingency**	10.00%	%	Owner														**50,273,992**	**$50,273,992**	
565																					
566																					
567		**Total Owner Indirects**																	**119,848,896**	**$119,848,896**	
568																					
569		**TOTAL PROJECT COST**										**0**	**322,308,176**			**75,152,947**	**1,111,652**	**397,461,123**	**225,127,695**	**$622,588,818**	
																			$/kW	**$887**	

CONFIDENTIAL

2 x 1 GE 7F7 760 MW Combined Cycle Unit

BUDGET ESTIMATE

5 x 10 Work Week

February 22, 2013

Rev 1

CONFIDENTIAL

2 x 1 GE 7F7 760 MW Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 763.949
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
Site Development	$0	$1,787,885	$1,537,001	36,870	250,000	$3,574,886	0.6%
Raw Water Intake/Discharge Facilities	$0	$500,000	$578,649	10,850	0	$1,078,649	0.2%
Foundations & Concrete	$0	$6,415,575	$4,963,370	128,270	11,900,000	$23,278,945	4.1%
Architectural & Metals	$0	$5,385,510	$2,426,063	46,805	5,766,400	$13,577,973	2.4%
Piping, Valves, Support, Accessories	$0	$21,269,825	$12,317,297	228,411	225,000	$33,812,121	6.0%
HRSG Equipment	$0	$60,200,000	$12,285,648	177,940	0	$72,485,648	12.8%
Steam Turbine Island Equipment	$0	$44,000,000	$1,446,623	27,125	0	$45,446,623	8.0%
Combustion Turbine Equipment	$0	$132,200,000	$4,282,005	80,290	0	$136,482,005	24.1%
Mechanical Draft Cooling Tower	$0	$0	$0	0	6,450,000	$6,450,000	1.1%
BOP Mechanical Equipment	$0	$23,364,700	$1,536,419	26,256	1,346,000	$26,247,119	4.6%
Electrical Equipment	$0	$19,109,330	$1,319,501	26,340	0	$20,428,831	3.6%
Electrical Commodities	$0	$9,213,019	$9,788,760	195,408	0	$19,001,779	3.4%
High Voltage Switchyard	$0	$390,000	$227,500	4,021	0	$617,500	0.1%
Instrumentation & Controls	$0	$5,995,825	$1,949,043	37,754	0	$7,944,868	1.4%
Sub-Total Direct Costs:	$0	$329,831,669	$54,657,879	1,026,340	$25,937,400	$410,426,948	72.5%
State Sales Tax (Non-Production Material Only)					393,268	$393,268	0.1%
Total Direct Cost	$0	$329,831,669	$54,657,879	1,026,340	$26,330,668	$410,820,216	72.6%
Construction Indirects & Services							
- Construction Field Staff			$0	0	$11,522,855	$11,522,855	2.0%
- Construction Field Staff Expenses			$0	0	$1,870,168	$1,870,168	0.3%
- Construction Equipment			$0	0	$12,055,653	$12,055,653	2.1%
- Small Tools			$0	0	$2,052,681	$2,052,681	0.4%
- Consumable Materials & Safety Supplies			$0	0	$2,052,681	$2,052,681	0.4%
- Field Office Expense		$1,033,370	$65,849	1,485	$22,373	$1,121,592	0.2%
- Temporary Facilities		$2,336,753	$863,403	19,472	$82,500	$3,282,657	0.6%
- Temporary Utilities		$747,600	$1,396,697	31,500	$0	$2,144,297	0.4%
- Support Craft & Site Services		$459,400	$2,008,704	45,302	$775,014	$3,243,118	0.6%
- Site Safety		$658,040	$375,008	8,224	$0	$1,033,048	0.2%
- Construction Permits		$51,450	$0	0	$0	$51,450	0.0%
- Construction Testing		$117,000	$0	0	$0	$117,000	0.0%
- Performance Testing		$304,400	$0	0	$0	$304,400	0.1%
- Start-up Supervision		$0	$0	0	$1,296,911	$1,296,911	0.2%
- Preop Testing, Start-up		$1,113,000	$752,767	23,534	$0	$1,865,767	0.3%
Sub-Total Construction Indirects and Services		$6,821,013	$5,462,428	129,518	$31,730,835	$44,014,277	7.8%
Total Construction Cost	$0	$336,652,682	$60,120,308	1,155,858	$58,061,503	$454,834,493	80.4%
Estimated Subcontract Labor Hours				204,769			
Project Indirects							
- Project Engineering (Eng, PM, CM & Procurement)					$27,290,070	$27,290,070	4.8%
Sub-Total Project Indirects	$0	$0	$0	0	$27,290,070	$27,290,070	4.8%
EPC Contractor Insurance & Misc Costs							
- Builders Risk					$2,274,172	$2,274,172	0.4%
- Comprehensive General Liability (CGL) Insurance					$2,274,172	$2,274,172	0.4%

2 x 1 GE 7F7 760 MW Combined Cycle Unit

LOCATION:	Kentucky
PROJECT #	189895
PLANT TYPE:	**NGCC**
CLIENT:	LG&/KU
ESTIMATE TYPE:	Conceptual
LEAD ESTIMATOR:	

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013		TECHNOLOGY:	CT with HRSG & STG		
NTP PERIOD:		NET MW RATING:	763.949	BOILER:	Fired
CONSTRUCTION NTP - Mob:		NO. OF UNITS:	1	STEAM TURBINE:	Condensing
COMMERCIAL OPERATION DATE:	1-Jun-2018	FUEL TYPE:	Nat Gas	COOLING TYPE:	Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
- Warranty Reserve					**$500,000**	**$500,000**	**0.1%**
Sub-Total EPC Contractor Insur. & Misc. Co	**$0**	**$0**	**$0**	**0**	**$5,048,345**	**$5,048,345**	**0.9%**
Total EPC Contractor Project Indirect Cost	**$0**	**$0**	**$0**	**0**	**$32,338,415**	**$32,338,415**	**5.7%**
- Escalation (Eqt, Materials & Labor)	**$0**	**$7,353,801**	**$9,444,018**		**$7,847,800**	**$24,645,619**	**4.4%**
Sub-Total	**0**	**344,006,483**	**69,564,325**	**1,360,627**	**98,247,718**	**511,818,526**	**90.5%**
- EPC Contractor Contingency	**$0**	**$5,012,634**	**$3,478,216**		**$4,559,886**	**$13,050,736**	**2.3%**
- EPC Contractor G&A and Profit	**$0**	**$27,520,519**	**$5,565,146**		**$7,859,817**	**$40,945,482**	**7.2%**
TOTAL EPC PROJECT COST	**$0**	**$376,539,636**	**$78,607,688**	**1,360,627**	**$110,667,421**	**$565,814,745**	**100.0%**
EPC Price per kW						**$741**	
Owner Indirect Costs							
- Total Owner Indirects						**$70,724,904**	
- Owner Contingency						**$56,581,474**	
TOTAL PROJECT COST						**$693,121,123**	
Total Project Cost per kW						**$907**	
Estimate Options (include 25 % markup for indirects)							
Fuel Oil System						**$9,250,000**	
Bypass Stack and Diverter Damper						**N/A**	
Gas Compression						**Not Required**	
SCR System to meet 12 ppm NOx						**Not Required**	
Optional SCR System						**$4,700,000**	

Total Craft Labor Hours	**1,360,627**	**'erformance Guarantees:**		**Executive-in-Charge:**	**WHD**
Ave. Craft Wage without Escalation	**$52.89**	**Liquidated Damages:**		**Project Manager:**	**JPS**
Field Labor Type	**TBD**	**Special Insurance:**		**Construction Manager:**	**SMP**
Labor Productivity Factor	**1.085**	**Performance Bond:**		**Lead Estimator:**	**CDF**

2 x 1 GE 7F7 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
Line #																					
1	**Division #1.0 - Sitework**																				
2	Sitework	Roads - Asphalt paving main site rds & Parking lots	8,500.0	sy	Sub	Contr	20.00		44.43		1.09	0	0	YES	5,100	0	0	0	170,000	$170,000	HDR|CB Estimated Quantity
3	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Powerblock A	1,740.0	sy	Contr	Contr	5.00	0.055	44.43	96	1.09	0	8,700	YES	522	4,613	104	13,313	0	$13,313	HDR|CB Estimated Quantity
4	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Secondary Ar	6,945.0	sy	Contr	Contr	5.00	0.055	44.43	382	1.09	0	34,725	YES	2,084	18,412	414	53,137	0	$53,137	HDR|CB Estimated Quantity
5	Sitework	Roads - Haul/Construction Roads Treated Gravel	29,700.0	sy	Contr	Contr	8.00	0.1	44.43	2,970	1.09	0	237,600	YES	14,256	143,162	3,222	380,762	0	$380,762	HDR|CB Estimated Quantity
6	Sitework	Roads - Main Roads Crushed stone Base Course	8,500.0	sy	Contr	Contr	12.00	0.1	44.43	850	1.09	0	102,000	YES	6,120	40,972	922	142,972	0	$142,972	HDR|CB Estimated Quantity
7	Sitework	Roads - Drainage and culverts	90,000.0	sy	Contr	Contr	2.00	0.05	44.43	4,500	1.09	0	180,000	YES	10,800	216,912	4,883	396,912	0	$396,912	HDR|CB Estimated Quantity
8	Sitework	Soil Erosion Control Measures	2,160	lf	Contr	Contr	1	0.027	44.43	58	1.09	0	2,160	YES	130	2,811	58	4,971	0	4,971	HDR|CB Estimated Quantity
9	Sitework	Site - Topsoil stripping/stockpiling	10,125	cy	Contr	Contr		0.030	44.43	304	1.09	0	0	YES	0	14,642	304	14,642	0	$14,642	HDR|CB Estimated Quantity
10	Sitework	Site - Drainage - Pipe Culverts (Assume 12" dia)	3,000	lf	Contr	Contr	9.00	0.12	44.43	360	1.09	0	27,000	YES	1,620	17,353	360	44,353	0	$44,353	HDR|CB Estimated Quantity
11	Sitework	Site - Drainage - Manholes	25	ea	Contr	Contr	1,500	16	44.43	400	1.09	0	37,500	YES	2,250	19,281	400	56,781	0	$56,781	HDR|CB Estimated Quantity
14	Sitework	Site - Fire Protection hydrants, valve boxes, ductile iron	30.0	ea	Contr	Contr	3,000.00	20	39.54	600	1.09	0	90,000	YES	5,400	25,739	651	115,739	0	$115,739	HDR|CB Estimated Quantity
15	Sitework	Site - Fire Protection U/G piping, DI	4,500.0	lf	Contr	Contr	41.00	0.5	39.54	2,250	1.09	0	184,500	YES	11,070	96,520	2,441	281,020	0	$281,020	HDR|CB Estimated Quantity
16	Sitework	Pipe Utility Trench Excavation	10,500	cy	Contr	Contr		0.2	39.54	2,100	1.09	0	0	YES	0	90,086	2,100	90,086	0	$90,086	HDR|CB Estimated Quantity
17	Sitework	Pipe Utility Trench Backfill (including bedding)	9,000	cy	Contr	Contr		0.2	39.54	1,800	1.09	0	0	YES	0	77,216	1,800	77,216	0	$77,216	HDR|CB Estimated Quantity
20	Sitework	Spoil Disposal	11,250	cy	Contr	Contr		0.1	44.43	1,125	1.09	0	0	YES	0	54,228	1,125	54,228	0	$54,228	HDR|CB Estimated Quantity
21	Sitework	Site - Sanitary sewer lift stations	1.0	ea	Contr	Contr	11,700.00	40	39.54	40	1.09	0	11,700	YES	702	1,716	43	13,416	0	$13,416	HDR|CB Estimated Quantity
22	Sitework	Site - Sanitary waste piping and manholes	2,500.0	lf	Contr	Contr	20.00	1	39.54	2,500	1.09	0	50,000	YES	3,000	107,245	2,713	157,245	0	$157,245	HDR|CB Estimated Quantity
23	Sitework	Site - Storm drain piping and culverts	22,500.0	lf	Contr	Contr	12.00	0.25	39.54	5,625	1.09	0	270,000	YES	16,200	241,301	6,103	511,301	0	$511,301	HDR|CB Estimated Quantity
24	Sitework	Site Finishing - Seed Site Earthwork	6.0	ac	Contr	Contr	10,000.00	0.54	39.54	3	1.09	0	60,000	YES	3,600	139	4	60,139	0	$60,139	HDR|CB Estimated Quantity
25	Sitework	Site Finishing - Grading around foundations	7,500.0	sy	Contr	Contr		0.02	39.54	150	1.09	0	0	YES	0	6,435	163	6,435	0	$6,435	HDR|CB Estimated Quantity
26	Sitework	Site Finishing - Stone Surfacing	7,500.0	sy	Contr	Contr	10.00	0.015	39.54	113	1.09	0	75,000	YES	4,500	4,826	122	79,826	0	$79,826	HDR|CB Estimated Quantity
27	Sitework	Site Improvements - landscaping at admin building	1.0	ls	Contr	Contr	30,000.00	360	39.54	360	1.09	0	30,000	YES	1,800	15,443	391	45,443	0	$45,443	HDR|CB Estimated Quantity
28	Sitework	Site Improvements - Main Gate Security Facilities	1.0	lot	Contr	Contr	150,000.00	3600	39.54	3,600	1.09	0	150,000	YES	9,000	154,433	3,906	304,433	0	$304,433	HDR|CB Estimated Quantity
29	Sitework	Site Improvements - Site Entrance Sign and Landscaping	1.0	ls	Contr	Contr	18,750.00	240	39.54	240	1.09	0	18,750	YES	1,125	10,296	260	29,046	0	$29,046	HDR|CB Estimated Quantity
30	Sitework	Site Improvements - Site Security Boundary Fencing	18,750.0	lf	Contr	Contr	11.00	0.2	39.54	3,750	1.09	0	206,250	YES	12,375	160,867	4,069	367,117	0	$367,117	HDR|CB Estimated Quantity
31	Sitework	Site Improvements - Fencing Active gates	6.0	ea	Contr	Contr	2,000.00	48	39.54	288	1.09	0	12,000	YES	720	12,355	312	24,355	0	$24,355	HDR|CB Estimated Quantity
32	Sitework	Site Surveying	1.0	lot	Sub	Contr	80,000.00		44.43	0	1.09	0	0	YES	2,400	0	0	0	80,000	$80,000	HDR|CB Estimated Quantity
33																					
34		**Division #1 - Sitework Sub-Total**								**34,463**		**0**	**1,787,885**		**114,773**	**1,537,001**	**36,870**	**3,324,886**	**250,000**	**3,574,886**	
35																					
36	**Division #1.3 - Raw Water Intake and Discharge Facilities**																				HDR Allowance for Interconnection and Updgrage of
37		Raw Water River Intake and Discharge Facilities	1.0	ea	Contr	Contr	500,000.00	10,000	53.33	10,000	1.09	0	500,000	NO	0	578,649	10,850	1,078,649	0	$1,078,649	Unit 1 and 2 Intake Structure
38																					
39		**Division #1.3 - Raw Water Intake Clarification and Discharge Facilities Sub-Total**								**10,000**		**0**	**500,000**		**0**	**578,649**	**10,850**	**1,078,649**	**0**	**$1,078,649**	
40																					
41																					
42	**Division #2.0 - Earthwork and Concrete**																				
43	**Division #2.1 - Earthwork**																				
44	Earthwork	Structural Backfill Power Block (using imported material)	220,000.0	cy	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,500,000	$5,500,000	HDR|CB Estimated Quantity
45	Earthwork	Retaining Wall (MSE)	40,000.0	sf	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	1,000,000	$1,000,000	HDR|CB Estimated Quantity
46	Earthwork	Structural Excavation Main Power Block - Earth/Rock	300,000.0	cy	Sub	Contr	18.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,400,000	$5,400,000	HDR|CB Estimated Quantity
47																					
48				cy						0		0	0		0	0	0	0	11,900,000	11,900,000	
49	**Division # 2.2 - Concrete Main Power Block Area**																				
50																					
51		Includes Forms, Rebar, Placement, Finishing, Embeds																			
52	Concrete	HRSG and Stack	7,500	cy	Contr	Contr	250	4.5	38.69	33,750	1.09	0	1,875,000	NO	0	1,416,954	36,619	3,291,954	0	$3,291,954	HDR|CB Estimated Quantity
53	Concrete	Gas Turbine Foundation	4,000	cy	Contr	Contr	300	4.5	38.69	18,000	1.09	0	1,200,000	NO	0	755,709	19,530	1,955,709	0	$1,955,709	HDR|CB Estimated Quantity
54	Concrete	Steam Turbine building	800	cy	Contr	Contr	250	4.5	38.69	3,600	1.09	0	200,000	NO	0	151,142	3,906	351,142	0	$351,142	HDR|CB Estimated Quantity
55	Concrete	Spread Footings & Piers Pipe/Tray Trestle/Racks	400.0	cy	Contr	Contr	250	4.5	38.69	1,800	1.09	0	100,000	NO	0	75,571	1,953	175,571	0	$175,571	HDR|CB Estimated Quantity
56	Concrete	Steam Turbine Bldg fill slab	300.0	cy	Contr	Contr	210.00	4.5	38.69	1,350	1.09	0	63,000	NO	0	56,678	1,465	119,678	0	$119,678	HDR|CB Estimated Quantity
57	Concrete	Steam Turbine Bldg Mat Foundation	1,200.0	cy	Contr	Contr	250	4.5	38.69	5,400	1.09	0	300,000	NO	0	226,713	5,859	526,713	0	$526,713	HDR|CB Estimated Quantity
58	Concrete	Steam Turbine Bldg Elevated Slab	500.0	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	NO	0	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
59	Concrete	Steam Turbine Bldg sumps foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
60	Concrete	Steam Turbine Pedestal FDN (Columns & Tabletop, Mat)	2,500.0	cy	Contr	Contr	350.00	8	38.69	20,000	1.09	0	875,000	NO	0	839,677	21,700	1,714,677	0	$1,714,677	HDR|CB Estimated Quantity
61	Concrete	Aux. Equipment Foundations	500	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	YES	7,500	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
62	Concrete	Equip Fdn - Generator Breaker	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
63	Concrete	Equip Fdn - CT PEEC	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
64	Concrete	Equip Fdn - Power Distribution Center	80	cy	Contr	Contr	250	4.5	38.69	360	1.09	0	20,000	YES	1,200	15,114	391	35,114	0	$35,114	HDR|CB Estimated Quantity
65	Concrete	Equip Fdn - CEMS	40	cy	Contr	Contr	250	4.5	38.69	180	1.09	0	10,000	YES	600	7,557	195	17,557	0	$17,557	HDR|CB Estimated Quantity
66	Concrete	Equip Fdn - Boiler Feed Pump	120	cy	Contr	Contr	250	4.5	38.69	540	1.09	0	30,000	YES	1,800	22,671	586	52,671	0	$52,671	HDR|CB Estimated Quantity
67	Concrete	Equip Fdn - Main Step-up Transformer Fdn/Walls	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
68	Concrete	Equip Fdn - Plant Aux Power Transformers Fnd/Walls	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
69	Concrete	Equip Fdn - Misc off Base Equip fnds	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
70	Concrete	Elec. Ductbank (Tubes, Conc., Forms, Rebar) 12 Tubes	500.0	lf	Contr	Contr	125	0.57	38.69	285	1.09	0	62,500	NO	0	11,965	309	74,465	0	$74,465	HDR|CB Estimated Quantity
71	Concrete	Elec. Ductbank to Cooling Tower (Tubes, Conc., Forms, Rebar) 6 Tu	750.0	lf	Contr	Contr	100	0.45	38.69	338	1.09	0	75,000	NO	0	14,170	366	89,170	0	$89,170	HDR|CB Estimated Quantity
72	Concrete	Equip Fdn - Pumps & misc equipment	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
73	Concrete	Electrical Building Foundation	130.0	cy	Contr	Contr	250	4.5	38.69	585	1.09	0	32,500	NO	0	24,561	635	57,061	0	$57,061	HDR|CB Estimated Quantity
74	Concrete	Cooling Tower Basin	2,500.0	cy	Contr	Contr	250	5.5	38.69	13,750	1.09	0	625,000	NO	0	577,278	14,919	1,202,278	0	$1,202,278	HDR|CB Estimated Quantity
75	Concrete	Administration Building foundation	1,100.0	cy	Contr	Contr	250	4.5	38.69	4,950	1.09	0	275,000	YES	16,500	207,820	5,371	482,820	0	$482,820	HDR|CB Estimated Quantity
76	Concrete	Auxilary Boiler Building floor slab & foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
77	Concrete	Demineralized Water Tank Foundations	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
78	Concrete	Service water storage tank foundations	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	YES	3,000	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
79	Concrete	Main Gate Guard House	3.0	cy	Contr	Contr	250	4.5	38.69	14	1.09	0	750	YES	45	567	15	1,317	0	$1,317	HDR|CB Estimated Quantity
80	Concrete	Water Treatment Buildings, enclosures and tank fdns	0.0	cy	Contr	Contr	250	4.5	38.69	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
81	Concrete	Grouting (equipment & steel)	30.0	cy	Contr	Contr	2,227.50	81	38.69	2,430	1.09	0	66,825	NO	0	102,021	2,637	168,846	0	$168,846	HDR|CB Estimated Quantity
82																					
83		Sub Total Concrete	**24,373**				AVG MH/CY	5.15		118,221			6,415,575		32,445	4,963,370	128,270	11,378,945	0	11,378,945	
84																					
85		**Division #2 - Earthwork & Concrete Sub-Total**								**118,221**		**0**	**6,415,575**		**32,445**	**4,963,370**	**128,270**	**11,378,945**	**11,900,000**	**23,278,945**	
86																					
87	**Division #3.0 - Architectural**												-								
88																					
89	rchitectura	Exterior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
90	rchitectura	Fire extinguishers	36.0	ea	Contr	Contr	500.00	3	53.33	108	1.09	0	18,000	YES	1,080	6,249	117	24,249	0	$24,249	HDR|CB Estimated Quantity
91	rchitectura	Fire hose cabinets	26.0	ea	Contr	Contr	1,200.00	20	53.33	520	1.09	0	31,200	YES	1,872	30,090	564	61,290	0	$61,290	HDR|CB Estimated Quantity
92	rchitectura	Fire hydrants w/monitor nozzles	10.0	ea	Contr	Contr	2,550.00	12	54.96	120	1.09	0	25,500	YES	1,530	7,156	130	32,656	0	$32,656	HDR|CB Estimated Quantity
93	rchitectura	Fire protection control room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
94	rchitectura	Fire Protection Elect Equip & Cable Spreading Room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity

Estimate Details

Print Date: 2/24/2013

2 x 1 GE 7F7 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
95	rchitectura	Fire Protection GSU and Aux Transformers	1.0	ls	Sub	Contr	200,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	200,000	$200,000	HDR|CB Estimated Quantity
96	rchitectura	Fire Protection Turbine Building	1.0	ls	Sub	Contr	600,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
97	rchitectura	Fire Detection/Alarm	1.0	lot	Contr	Contr	410,000.00	1000	50.09	1,000	1.09	0	410,000	NO	0	54,352	1,085	464,352	0	$464,352	HDR|CB Estimated Quantity
98	rchitectura	HVAC System Allowance	1.0	ls	Sub	Contr	750,000.00		54.96	0	1.09	0	0	YES	22,500	0	0	0	750,000	$750,000	HDR|CB Estimated Quantity
99	rchitectura	Interior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
100	rchitectura	Masonry Walls 8" CMU	20,000.0	sf	Contr	Contr	4.00	0.15	32.95	3,000	1.09	0	80,000	yes	4,800	107,267	3,255	187,267	0	$187,267	HDR|CB Estimated Quantity
101	rchitectura	Overhead Rolling Doors - steel	4.0	ea	Contr	Contr	5,000.00	40	38.68	160	1.09	0	20,000	yes	1,200	6,715	174	26,715	0	$26,715	HDR|CB Estimated Quantity
102	rchitectura	Painting - equipment and piping	1.0	lot	Contr	Contr	100,000.00	3600	36.36	3,600	1.09	0	100,000	yes	6,000	142,016	3,906	242,016	0	$242,016	HDR|CB Estimated Quantity
103	rchitectura	Painting - structural steel, grating, handrail touch-up	250,000.0	sf	Contr	Contr	0.30	0.010	36.36	2,500	1.09	0	75,000	yes	4,500	98,622	2,713	173,622	0	$173,622	HDR|CB Estimated Quantity
104	rchitectura	Painting - turbine room floor epoxy finish	40,000.0	sf	Contr	Contr	0.80	0.045	36.36	1,805	1.09	0	32,000	yes	1,920	71,197	1,958	103,197	0	$103,197	HDR|CB Estimated Quantity
105	rchitectura	Restrooms, showers, locker rooms	1.0	lot	Contr	Contr	125,000.00	1200	53.33	1,200	1.09	0	125,000	YES	7,500	69,438	1,302	194,438	0	$194,438	HDR|CB Estimated Quantity
106	rchitectura	Roof Drains	1,700.0	lf	Contr	Contr	32.50	2.0	54.96	3,400	1.09	0	55,250	yes	3,315	202,758	3,689	258,008	0	$258,008	HDR|CB Estimated Quantity
107	rchitectura	Structural Steel - Misc Building Steel	25.0	ton	Contr	Contr	3,200.00	30	60.25	750	1.09	0	80,000	yes	4,800	49,026	814	129,026	0	$129,026	HDR|CB Estimated Quantity
108	rchitectura	Structural Steel - Pipe Rack	600.0	ton	Contr	Contr	3,400.00	20	60.25	12,000	1.09	0	2,040,000	NO	0	784,409	13,020	2,824,409	0	$2,824,409	HDR|CB Estimated Quantity
109	rchitectura	Structural Steel - Misc Platforms	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	NO	0	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
110	rchitectura	Structural Steel - Turbine Building Framing	500.0	ton	Contr	Contr	2,850.00	15	60.25	7,500	1.09	0	1,425,000	NO	0	490,255	8,138	1,915,255	0	$1,915,255	HDR|CB Estimated Quantity
111	rchitectura	Trench Floor Drain Cover	2,000.0	lf	Contr	Contr	60.45	0.4	54.96	800	1.09	0	120,900	yes	7,254	47,708	868	168,608	0	$168,608	HDR|CB Estimated Quantity
112	rchitectura	Turbine Building Built-up Roof	18,000.0	sf	Contr	Contr	0.75	0.035	35.31	630	1.09	0	13,500	NO	0	24,138	684	37,638	0	$37,638	HDR|CB Estimated Quantity
113	rchitectura	Turbine Building Metal Siding	52,900.0	sf	Contr	Contr	10.40	0.05	56.41	2,645	1.09	0	550,160	NO	0	161,876	2,870	712,036	0	$712,036	HDR|CB Estimated Quantity
114	rchitectura	Administration/Control/Maintenance Building	16,000.0	sf	Sub	Contr	140.00		38.68	0	1.09	0	0	YES	0	0	0	0	2,240,000	$2,240,000	HDR|CB Estimated Quantity
115	rchitectura	Cooling Tower, pre-engineered - Elect, Chem feed, I&C Bldg	3,000.0	sf	Sub	Contr	80.00		59.59	0	1.09	0	0	NO	0	0	0	0	240,000	$240,000	HDR|CB Estimated Quantity
116	rchitectura	Main Gate Guard House	80.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	YES	0	0	0	0	6,400	$6,400	HDR|CB Estimated Quantity
117	rchitectura	Auxilary Boiler Building	4,000.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	440,000	$440,000	HDR|CB Estimated Quantity
118	rchitectura	Water Treatment Building	0.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
119	rchitectura	Warehouse	8,000.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	NO	0	0	0	0	640,000	$640,000	HDR|CB Estimated Quantity
120	rchitectura	Boiler Feed Pump Buildings	2.0	ea	sub	Contr	300,000.00		38.68	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
121																					
122		**Division #3 - Architectural Sub-Total**								**43,138**	**1.05**	**0**	**5,385,510**		**75,471**	**2,426,063**	**46,805**	**7,811,573**	**5,766,400**	**$13,577,973**	
123																					
124	**Division #4.0 - Mechanical Piping**																				
125	**Division #4.1 - Mechanical Piping**																				
126																					
127	hanical Pip	Pipe - MS, HR, CR, BFW, LPS	**3,590.0**	lf																	
128	hanical Pip	- System - Cold Reheat (Carbon)	800.0	lf	Contr	Contr	3,900.00	7.2	54.96	5,790	1.09	0	3,120,000	NO	0	345,308	6,283	3,465,308	0	$3,465,308	HDR|CB Estimated Quantity
129	hanical Pip	- System - Feedwater (Carbon)	650.0	lf	Contr	Contr	1,185.00	5.6	54.96	3,666	1.09	0	770,250	NO	0	218,620	3,978	988,870	0	$988,870	HDR|CB Estimated Quantity
130	hanical Pip	- System - Hot Reheat (Alloy)	540.0	lf	Contr	Contr	4,750.00	14.4	54.96	7,766	1.09	0	2,565,000	NO	0	463,139	8,426	3,028,139	0	$3,028,139	HDR|CB Estimated Quantity
131	hanical Pip	- System - Main Steam (Alloy)	800.0	lf	Contr	Contr	5,220.00	14.4	54.96	11,506	1.09	0	4,176,000	NO	0	686,131	12,484	4,862,131	0	$4,862,131	HDR|CB Estimated Quantity
132	hanical Pip	- System - Low Pressure Steam Steam (Alloy)	800.0	lf	Contr	Contr	246.00	7.5	54.96	6,016	1.09	0	196,800	NO	0	358,762	6,527	555,562	0	$555,562	HDR|CB Estimated Quantity
133	hanical Pip	Pipe - Above Ground - Large Bore Average "	**29,610.0**	lf																	
134	hanical Pip	- System - Boilers, Vents and Drains	700.0	lf	Contr	Contr	300.00	4.14	54.96	2,895	1.09	0	210,000	NO	0	172,654	3,141	382,654	0	$382,654	HDR|CB Estimated Quantity
135	hanical Pip	- System - Aux steam drain returns	2,500.0	lf	Contr	Contr	30.00	1.22	54.96	3,055	1.09	0	75,000	NO	0	182,184	3,315	257,184	0	$257,184	HDR|CB Estimated Quantity
136	hanical Pip	- System - Building drains	1,350.0	lf	Contr	Contr	30.00	1.22	54.96	1,650	1.09	0	40,500	YES	2,430	98,379	1,790	138,879	0	$138,879	HDR|CB Estimated Quantity
137	hanical Pip	- System - Building fire protection	5,800.0	lf	Contr	Contr	18.00	1.50	54.96	8,723	1.09	0	104,400	YES	6,264	520,204	9,465	624,604	0	$624,604	HDR|CB Estimated Quantity
138	hanical Pip	- System - Building sump pumps	800.0	lf	Contr	Contr	47.00	1.55	54.96	1,241	1.09	0	37,600	YES	2,256	73,995	1,346	111,595	0	$111,595	HDR|CB Estimated Quantity
139	hanical Pip	- System - Circulating Water	1,000.0	lf	Contr	Contr	450.00	4.70	54.96	4,700	1.09	0	450,000	NO	0	280,282	5,100	730,282	0	$730,282	HDR|CB Estimated Quantity
140	hanical Pip	- System - Condensate	1,350.0	lf	Contr	Contr	190.00	2.35	54.96	3,173	1.09	0	256,500	NO	0	189,191	3,442	445,691	0	$445,691	HDR|CB Estimated Quantity
141	hanical Pip	- System - Condenser Air Extraction	300.0	lf	Contr	Contr	184.00	2.35	54.96	705	1.09	0	55,200	NO	0	42,042	765	97,242	0	$97,242	HDR|CB Estimated Quantity
142	hanical Pip	- System - Cooling water	600.0	lf	Contr	Contr	320.00	2.63	54.96	1,579	1.09	0	192,000	NO	0	94,175	1,713	286,175	0	$286,175	HDR|CB Estimated Quantity
143	hanical Pip	- System - Demineralized water	400.0	lf	Contr	Contr	27.00	0.39	54.96	154	1.09	0	10,800	NO	0	9,193	167	19,993	0	$19,993	HDR|CB Estimated Quantity
144	hanical Pip	- System - Fire Protection	300.0	lf	Contr	Contr	150.00	2.35	54.96	705	1.09	0	45,000	YES	2,700	42,042	765	87,042	0	$87,042	HDR|CB Estimated Quantity
145	hanical Pip	- System - Natural Gas High Pressure - SS	260.0	lf	Contr	Contr	52.40	0.85	54.96	220	1.09	0	13,624	YES	817	13,117	239	26,741	0	$26,741	HDR|CB Estimated Quantity
146	hanical Pip	- System - Potable water	1,000.0	lf	Contr	Contr	18.00	1.50	54.96	1,504	1.09	0	18,000	YES	1,080	89,690	1,632	107,690	0	$107,690	HDR|CB Estimated Quantity
147	hanical Pip	- System - Sanitary waste	3,000.0	lf	Contr	Contr	47.00	1.55	54.96	4,653	1.09	0	141,000	YES	8,460	277,480	5,049	418,480	0	$418,480	HDR|CB Estimated Quantity
148	hanical Pip	- System - Service Water	1,000.0	lf	Contr	Contr	184.00	1.97	54.96	1,974	1.09	0	184,000	YES	11,040	117,719	2,142	301,719	0	$301,719	HDR|CB Estimated Quantity
149	hanical Pip	- System - STG lube oil	200.0	lf	Contr	Contr	32.00	1.11	54.96	222	1.09	0	6,400	NO	0	13,239	241	19,639	0	$19,639	HDR|CB Estimated Quantity
150	hanical Pip	- System - STG oil purification	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
151	hanical Pip	- System - STG Seal Oil	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
152	hanical Pip	- System - STG Stator cooling	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
153	hanical Pip	- System - STG Steam Seal	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
154	hanical Pip	- System - Turbine drains	690.0	lf	Contr	Contr	47.00	1.55	54.96	1,070	1.09	0	32,430	NO	0	63,820	1,161	96,250	0	$96,250	HDR|CB Estimated Quantity
155	hanical Pip	- System - HRSG Blowdown	200.0	lf	Contr	Contr	18.00	1.50	54.96	301	1.09	0	3,600	NO	0	17,938	326	21,538	0	$21,538	HDR|CB Estimated Quantity
156	hanical Pip	- System - Cycle Makeup	360.0	lf	Contr	Contr	47.00	1.55	54.96	558	1.09	0	16,920	NO	0	33,298	606	50,218	0	$50,218	HDR|CB Estimated Quantity
157	hanical Pip	- System - Miscellaneous Systems Piping CS)	6,600.0	lf	Contr	Contr	47.00	1.55	54.96	10,237	1.09	0	310,200	YES	18,612	610,455	11,107	920,655	0	$920,655	HDR|CB Estimated Quantity
158	hanical Pip	Pipe - Above Ground - Small Bore	**27,055.0**	lf																	
159	hanical Pip	- System - Water Cycle Sample - Alloy	150.0	lf	Contr	Contr	13.00	0.85	54.96	127	1.09	0	1,950	NO	0	7,568	138	9,518	0	$9,518	HDR|CB Estimated Quantity
160	hanical Pip	- System - STG lube oil	300.0	lf	Contr	Contr	11.60	0.62	54.96	186	1.09	0	3,480	NO	0	11,092	202	14,572	0	$14,572	HDR|CB Estimated Quantity
161	hanical Pip	- System - CT Auxilarie	1,800.0	lf	Contr	Contr	18.00	1.13	54.96	2,030	1.09	0	32,400	NO	0	121,082	2,203	153,482	0	$153,482	HDR|CB Estimated Quantity
162	hanical Pip	- System - Instrument Air	3,100.0	lf	Contr	Contr	8.00	0.14	54.96	437	1.09	0	24,800	NO	0	26,066	474	50,866	0	$50,866	HDR|CB Estimated Quantity
163	hanical Pip	- System - Instrument Air supply	3,000.0	lf	Contr	Contr	35.00	0.28	54.96	846	1.09	0	105,000	NO	0	50,451	918	155,451	0	$155,451	HDR|CB Estimated Quantity
164	hanical Pip	- System - Service Air piping	1,300.0	lf	Contr	Contr	12.00	0.22	54.96	281	1.09	0	15,600	YES	936	16,761	305	32,361	0	$32,361	HDR|CB Estimated Quantity
165	hanical Pip	- System - Instrument Air	2,035.0	lf	Contr	Contr	11.50	0.52	54.96	1,052	1.09	0	23,403	YES	1,404	62,741	1,142	86,144	0	$86,144	HDR|CB Estimated Quantity
166	hanical Pip	- System - Service Water	900.0	lf	Contr	Contr	20.00	1.32	54.96	1,184	1.09	0	18,000	YES	1,080	70,631	1,285	88,631	0	$88,631	HDR|CB Estimated Quantity
167	hanical Pip	- System - Cycle Chemical Feed	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
168	hanical Pip	- System - Boiler Vents & Drains - Alloy	700.0	lf	Contr	Contr	20.00	1.32	54.96	921	1.09	0	14,000	YES	840	54,935	1,000	68,935	0	$68,935	HDR|CB Estimated Quantity
169	hanical Pip	- System - (HP) Main Steam - Alloy	600.0	lf	Contr	Contr	20.00	1.32	54.96	790	1.09	0	12,000	YES	720	47,087	857	59,087	0	$59,087	HDR|CB Estimated Quantity
170	hanical Pip	- System - (LP) Steam - Carbon	1,400.0	lf	Contr	Contr	18.00	1.13	54.96	1,579	1.09	0	25,200	YES	1,512	94,175	1,713	119,375	0	$119,375	HDR|CB Estimated Quantity
171	hanical Pip	- System - Hot Reheat Steam - Alloy	650.0	lf	Contr	Contr	20.00	1.32	54.96	855	1.09	0	13,000	YES	780	51,011	928	64,011	0	$64,011	HDR|CB Estimated Quantity
172	hanical Pip	- System - Cold Reheat Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
173	hanical Pip	- System - Cycle Makeup	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
174	hanical Pip	- System - Aux Steam - Carbon	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
175	hanical Pip	- System - STG Seals and Drains - Alloy	1,400.0	lf	Contr	Contr	20.00	1.32	54.96	1,842	1.09	0	28,000	YES	1,680	109,871	1,999	137,871	0	$137,871	HDR|CB Estimated Quantity
176	hanical Pip	- System - CT System - Carbon	250.0	lf	Contr	Contr	18.00	1.13	54.96	282	1.09	0	4,500	YES	270	16,817	306	21,317	0	$21,317	HDR|CB Estimated Quantity
177	hanical Pip	- System - Hydrogen - Carbon	700.0	lf	Contr	Contr	12.35	1.03	54.96	724	1.09	0	8,645	YES	519	43,164	785	51,809	0	$51,809	HDR|CB Estimated Quantity
178	hanical Pip	- System - Carbon Dioxide - Carbon	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
179	hanical Pip	- System - Miscellaneous	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
180	hanical Pip	- System - Condensate - Carbon	400.0	lf	Contr	Contr	18.00	1.13	54.96	451	1.09	0	7,200	YES	432	26,907	490	34,107	0	$34,107	HDR|CB Estimated Quantity
181	hanical Pip	- System - Closed Cycle Cooling Water - Carbon	900.0	lf	Contr	Contr	12.35	1.03	54.96	931	1.09	0	11,115	YES	667	55,496	1,010	66,611	0	$66,611	HDR|CB Estimated Quantity
182	hanical Pip	- System - Fuel Gas - Carbon	900.0	lf	Contr	Contr	18.00	1.13	54.96	1,015	1.09	0	16,200	YES	972	60,541	1,101	76,741	0	$76,741	HDR|CB Estimated Quantity
183	hanical Pip	- System - Condensed Air Extraction - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
184	hanical Pip	- System - CW Chemical Feed - Carbon	20.0	lf	Contr	Contr	18.00	1.13	54.96	23	1.09	0	360	YES	22	1,345	24	1,705	0	$1,705	HDR|CB Estimated Quantity
185	hanical Pip	- System - Nitrogen Gas System	200.0	lf	Contr	Contr	19.00	0.19	54.96	38	1.09	0	3,800	YES	228	2,242	41	6,042	0	$6,042	HDR|CB Estimated Quantity

2 x 1 GE 7F7 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
186	chanical Pip	- System - Waste Water Coll & Treatment - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
187	chanical Pip	- System - Chemical Waste Treatment	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
188	chanical Pip	- System - Miscellaneous Systems Piping	4,400.0	lf	Contr	Contr	12.35	1.03	54.96	4,550	1.09	0	54,340	YES	3,260	271,313	4,936	325,653	0	$325,653	HDR|CB Estimated Quantity
189	chanical Pip	Pipe - Below Ground - Large Bore	**22,665.0**	lf																	
190	chanical Pip	- System - Hydrogen	470.0	lf	Contr	Contr	20.00	0.71	54.96	331	1.09	0	9,400	NO	0	19,760	360	29,160	0	$29,160	HDR|CB Estimated Quantity
191	chanical Pip	- System - Fuel Gas	800.0	lf	Contr	Contr	170.00	1.97	54.96	1,579	1.09	0	136,000	NO	0	94,175	1,713	230,175	0	$230,175	HDR|CB Estimated Quantity
192	chanical Pip	- System - Main Circ. - HDPE	400.0	lf	Contr	Contr	15.00	1.13	54.96	451	1.09	0	6,000	NO	0	26,907	490	32,907	0	$32,907	HDR|CB Estimated Quantity
192	chanical Pip	- System - Miscellaneous Systems Piping - HDPE	7,840.0	lf	Contr	Contr	15.00	1.13	54.96	8,844	1.09	0	117,600	NO	0	527,379	9,595	644,979	0	$644,979	HDR|CB Estimated Quantity
193	chanical Pip	- System - Waste Water Treatment Piping - HDPE (Sch 17)	2,565.0	lf	Contr	Contr	6.00	0.66	54.96	1,688	1.09	0	15,390	NO	0	100,649	1,831	116,039	0	$116,039	HDR|CB Estimated Quantity
193	chanical Pip	- System - Sanitary Sewer	3,000.0	lf	Contr	Contr	15.00	1.13	54.96	3,384	1.09	0	45,000	NO	0	201,803	3,672	246,803	0	$246,803	HDR|CB Estimated Quantity
194	chanical Pip	- System - Natural Gas Low Pressure - CS	850.0	lf	Contr	Contr	30.00	1.22	54.96	1,039	1.09	0	25,500	NO	0	61,942	1,127	87,442	0	$87,442	HDR|CB Estimated Quantity
195	chanical Pip	- System - Natural Gas High Pressure - CS	500.0	lf	Contr	Contr	30.00	1.22	54.96	611	1.09	0	15,000	NO	0	36,437	663	51,437	0	$51,437	HDR|CB Estimated Quantity
196	chanical Pip	- System - Potable Water to site facilities	500.0	lf	Contr	Contr	47.00	1.55	54.96	776	1.09	0	23,500	NO	0	46,247	841	69,747	0	$69,747	HDR|CB Estimated Quantity
197	chanical Pip	- System - Cooling tower blowdown	1,160.0	lf	Contr	Contr	115.00	1.69	54.96	1,963	1.09	0	133,400	NO	0	117,046	2,130	250,446	0	$250,446	HDR|CB Estimated Quantity
198	chanical Pip	- System - Cooling tower makeup water Pipe	1,000.0	lf	Contr	Contr	115.00	1.69	39.54	1,692	1.09	0	115,000	NO	0	72,583	1,836	187,583	0	$187,583	HDR|CB Estimated Quantity
199	chanical Pip	Pipe - Below Ground - Small Bore	**790.0**	lf																	HDR|CB Estimated Quantity
200	chanical Pip	- System - Miscellaneous Systems Piping	790.0	lf	Contr	Contr	12.35	1.03	54.96	817	1.09	0	9,757	NO	0	48,713	886	58,470	0	$58,470	Based on 1-1/2" dia with 1 fitting per 20 ft.
201	chanical Pip	Circulating water 96" RCP	2,000.0	lf	Contr	Contr	636.00	7.52	54.96	15,040	1.09	0	1,272,000	NO	0	896,904	16,318	2,168,904	0	$2,168,904	HDR|CB Estimated Quantity
202	chanical Pip	Piping Non Destructive Examination	1.0	lot	Sub	Contr	75,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	75,000	$75,000	HDR|CB Estimated Quantity
203	chanical Pip	Steam Blows	1.0	lot	Sub	Contr	150,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	150,000	$150,000	HDR|CB Estimated Quantity
204	chanical Pip	Stress relieving LB Alloy	50.0	ea	Contr	Contr	1,500.00	80.00	54.96	4,000	1.09	0	75,000	NO	0	238,538	4,340	313,538	0	$313,538	HDR|CB Estimated Quantity
205																					
206		**Division #4.1 - Mechanical Piping Sub-Total**	**83,710.0**	**LF**						149,860		0	15,506,818		70,424	8,908,523	162,598	24,415,341	225,000	$24,640,341	
207																					
208	**Division #4.2 - Mechanical Valves**																				
209																					
210	chanical Va	Valves - Large Bore General Service	500.0	ea	Contr	Contr	636.00	16.92	54.96	8,460	1.09	0	318,000	NO	0	504,508	9,179	822,508	0	$822,508	HDR|CB Estimated Quantity
211	chanical Va	Valves - Large Bore HP 900# to 3800#	100.0	ea	Contr	Contr	6,750.00	56.4	54.96	5,640	1.09	0	675,000	NO	0	336,339	6,119	1,011,339	0	$1,011,339	HDR|CB Estimated Quantity
212	chanical Va	Valves - Large Bore LP Circ Water	4.0	ea	Contr	Contr	197,500.00	112.8	54.96	451	1.09	0	790,000	NO	0	26,907	490	816,907	0	$816,907	HDR|CB Estimated Quantity
213	chanical Va	Valves - Small Bore - I/A supply	100.0	ea	Contr	Contr	17.50	1.88	54.96	188	1.09	0	1,750	NO	0	11,211	204	12,961	0	$12,961	HDR|CB Estimated Quantity
214	chanical Va	Valves - Small Bore - Instrument piping	500.0	ea	Contr	Contr	270.00	1.88	54.96	940	1.09	0	135,000	NO	0	56,056	1,020	191,056	0	$191,056	HDR|CB Estimated Quantity
215	chanical Va	Valves - Small Bore Bronze	40.0	ea	Contr	Contr	480.00	2.82	54.96	113	1.09	0	19,200	NO	0	6,727	122	25,927	0	$25,927	HDR|CB Estimated Quantity
216	chanical Va	Valves - Small Bore Class 800	250.0	ea	Contr	Contr	305.00	2.82	54.96	705	1.09	0	76,250	NO	0	42,042	765	118,292	0	$118,292	HDR|CB Estimated Quantity
217	chanical Va	Valves - Small Bore HP 1500# Alloy & CS	150.0	ea	Contr	Contr	670.00	15.04	54.96	2,256	1.09	0	100,500	NO	0	134,536	2,448	235,036	0	$235,036	HDR|CB Estimated Quantity
218	chanical Va	Valves - Small Bore HP 3800# Alloy	30.0	ea	Contr	Contr	3,050.00	22.56	54.96	677	1.09	0	91,500	NO	0	40,361	734	131,861	0	$131,861	HDR|CB Estimated Quantity
219	chanical Va	Valves - By Pass	1.0	ea	Contr	Contr	1,500,000.00	75.2	54.96	75	1.09	0	1,500,000	NO	0	4,485	82	1,504,485	0	$1,504,485	HDR|CB Estimated Quantity
220																					
221																					
222		**Division #4.2 - Mechanical Valves Sub-Total**	**1,675.0**	**ea**						19,505		$0	3,707,200		0	1,163,172	21,163	4,870,372	0	$4,870,372	
223																					
224	**Division #4.3 - Mechanical Insulation & Coatings**																				
225																					
226	Insulation	Insulation - BOP Equipment	16,000.0	sf	Contr	Contr	15.00	0.5	46.60	8,000	1.09	0	240,000	NO	0	404,462	8,680	644,462	0	$644,462	HDR|CB Estimated Quantity
227	Insulation	Insulation - Piping Freeze Protection	2,000.0	lf	Contr	Contr	3.50	0.2	46.60	400	1.09	0	7,000	NO	0	20,223	434	27,223	0	$27,223	HDR|CB Estimated Quantity
228	Insulation	Insulation - Piping Large Bore BOP	7,460.0	lf	Contr	Contr	15.00	0.5	46.60	3,730	1.09	0	111,900	NO	0	188,580	4,047	300,480	0	$300,480	HDR|CB Estimated Quantity
229	Insulation	Insulation - Piping Large Bore High Temp	3,590.0	lf	Contr	Contr	50.00	1.5	46.60	5,385	1.09	0	179,500	NO	0	272,253	5,843	451,753	0	$451,753	HDR|CB Estimated Quantity
230	Insulation	Insulation - Piping Small Bore	23,720.0	lf	Contr	Contr	8.00	0.23	46.60	5,456	1.09	0	189,760	NO	0	275,823	5,919	465,583	0	$465,583	HDR|CB Estimated Quantity
231																					
232																					
233		**Division #4.3 - Mechanical Insulation & Coatings Sub-Total**								22,971		0	728,160		0	1,161,341	24,923	1,889,501	0	$1,889,501	
234																					
235																					
236	**Division #4.4 - Mechanical Engineered Pipe Hangers (Including Supplemental Support Steel)**																				
237																					
238	hanical Pipe H	Hangers & Supports - (Large Bore Engineered)	200	ea	Contr	Contr	1,760.00	12.5	54.96	2,502	1.09	0	352,311	NO	0	149,218	2,715	501,529	0	$501,529	HDR|CB Estimated Quantity
239	hanical Pipe H	Hangers & Supports - (Large Bore Rigid)	1558	ea	Contr	Contr	192.50	7.1	54.96	11,065	1.09	0	299,996	NO	0	659,844	12,005	959,840	0	$959,840	HDR|CB Estimated Quantity
240	hanical Pipe H	Hangers & Supports - (Small Bore Rigid)	1933	ea	Contr	Contr	88.00	1.5	54.96	2,899	1.09	0	170,060	NO	0	172,866	3,145	342,926	0	$342,926	HDR|CB Estimated Quantity
241																					
242		**Division #4.4 - Mechanical Engineered Pipe Hangers Sub-Total**								16,466		0	822,367		0	981,928	17,865	1,804,294	0	$1,804,294	
243																					
244	**Division #4.5 - Mechanical Accessories**																				
245																					
246	nical Acces	Instr. Air Supply filter regulators	40.0	ea	Contr	Contr	132.00	2.4	54.96	96	1.09	0	5,280	NO	0	5,725	104	11,005	0	$11,005	HDR|CB Estimated Quantity
247	nical Acces	Expansion Joints - Circ Water	2.0	ea	Contr	Contr	75,000.00	210	54.96	420	1.09	0	150,000	NO	0	25,047	456	175,047	0	$175,047	HDR|CB Estimated Quantity
248	nical Acces	Miscellaneous Specialties	1.0	lot	Contr	Contr	75,000.00	600	54.96	600	1.09	0	75,000	NO	0	35,781	651	110,781	0	$110,781	HDR|CB Estimated Quantity
249	nical Acces	Miscellaneous Strainers, traps, Exp Joints	1.0	ls	Contr	Contr	125,000.00	120	54.96	120	1.09	0	125,000	NO	0	7,156	130	132,156	0	$132,156	HDR|CB Estimated Quantity
250	nical Acces	Miscellaneous Trolleys & Hoists	1.0	ls	Contr	Contr	150,000.00	480	54.96	480	1.09	0	150,000	NO	0	28,625	521	178,625	0	$178,625	HDR|CB Estimated Quantity
251																					
252		**Division #4.5 - Mechanical Accessories Sub-Total**								1,716		0	505,280		0	102,333	1,862	607,613	0	$607,613	
253																					
254		**Division #4 - Mechanical Piping**								**210,517**		**0**	**21,269,825**		**70,424**	**12,317,297**	**228,411**	**33,587,121**	**225,000**	**$33,812,121**	
255																					
256	**Division #5.0 - Mechanical Equipment**																				
257																					
258	**Division #5.1 - Boiler Equipment**																				
259																					
260	HRSG	Heat Recovery Steam Generator with Duct Burner/CO/Penthouse	2.0	ea	Contr	Contr	30,100,000.00		69.04	0	1.09	0	60,200,000	NO	0	0	0	60,200,000	0	$60,200,000	OEM Bidget Proposal
261	HRSG	Steam Generator Erection	2.0	ea	Contr	Contr		82,000	69.04	164,000	1.09	0	0	NO	0	12,285,648	177,940	12,285,648	0	$12,285,648	HDR|CB Estimated cost
262																					
263		**Division #5.1 - Boiler Equipment Sub-Total**								**164,000**		**0**	**60,200,000**		**0**	**12,285,648**	**177,940**	**72,485,648**	**0**	**$72,485,648**	
264																					
265	**Division #5.2 - Turbine Equipment**																				
266																					
267	STG	Steam Turbine Generator	1.0	ea	Contr	Contr	44,000,000.00		53.33	0	1.09	0	44,000,000	NO	0	0	0	44,000,000	0	$44,000,000	Recent Vender quote
268	STG	Steam Turbine Generator, Erection	1.0	ea	Contr	Contr		25,000	53.33	25,000	1.09	0	0	NO	0	1,446,623	27,125	1,446,623	0	$1,446,623	HDR|CB Estimated cost
269																					
270		**Division #5.2 - Turbine Equipment Sub-Total**								**25,000**		**0**	**44,000,000**		**0**	**1,446,623**	**27,125**	**45,446,623**	**0**	**45,446,623**	
271																					
272	**Division #5.3 - Not Used**																				
273																					

Estimate Details

2 x 1 GE 7F7 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
274	**Division #5.4 - Mechanical Draft Cooling Tower**																				
275																					
276	Cooling Tw	Cooling Tower - Mechanical Draft (F&E)	1.0	Is	Sub	Contr	6,450,000.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	6,450,000	$6,450,000	Recent Vender quote
277																					
278		**Division #5.4 - Mechanical Draft Cooling Tower Sub-Total**								**0**		**0**	**0**		**0**	**0**	**0**	**0**	**6,450,000**	**6,450,000**	
279																					
280	**Division #5.5 - Combustion Turbine Equipment**																				
281																					
282	CT	Combustion Turbine	2.0	ea	Contr	Contr	66,100,000.00		53.33	0	1.09	0	132,200,000	NO	0	0	0	132,200,000	0	$132,200,000	OEM Bidget Proposal
283	CT	Combustion Turbine, Installation	2.0	ea	Contr	Contr		37,000	53.33	74,000	1.09	0	0	NO	0	4,282,005	80,290	4,282,005	0	$4,282,005	HDR|CB Estimated cost
284																					
285																					
286		**Division #5.4 - Combustion Turbine Equipment Sub-Total**								**74,000**		**0**	**132,200,000**		**0**	**4,282,005**	**80,290**	**136,482,005**	**0**	**136,482,005**	
287																					
288	**Division #5.6 - BOP Mechanical Equipment**																				
289																					
290	Equipment	Blowdown Tank	4.0	ea	Contr	Contr	16,600.00	20	54.96	80	1.09	0	66,400	NO	0	4,771	87	71,171	0	$71,171	HDR|CB Estimated cost
291	Equipment	Closed Cooling Water Exchanger	2.0	ea	Contr	Contr	1,039,500.00	300	54.96	600	1.09	0	2,079,000	NO	0	35,781	651	2,114,781	0	$2,114,781	HDR|CB Estimated cost
292	Equipment	Closed Cooling Water Inhibitor Mixing Pot	1.0	ea	Contr	Contr	3,000.00	8	54.96	8	1.09	0	3,000	NO	0	477	9	3,477	0	$3,477	HDR|CB Estimated cost
293	Equipment	Closed Cooling Water (CCW) Heat Exchanger Strainer (Shell & Tube	2.0	ea	Contr	Contr	34,000.00	10	54.96	20	1.09	0	68,000	NO	0	1,193	22	69,193	0	$69,193	HDR|CB Estimated cost
294	Equipment	Instrument Air Receivers	2.0	ea	Contr	Contr	5,000.00	44	54.96	88	1.09	0	10,000	NO	0	5,248	95	15,248	0	$15,248	HDR|CB Estimated cost
295	Equipment	Main Condenser	1.0	ea	Contr	Contr	6,600,000.00	9000	65.52	9,000	1.09	0	6,600,000	NO	0	639,756	9,765	7,239,756	0	$7,239,756	Recent Vender quote
296	Equipment	Oil/Water Separator	1.0	ea	Contr	Contr	50,000.00	244	54.96	244	1.09	0	50,000	NO	0	14,551	265	64,551	0	$64,551	HDR|CB Estimated cost
297	Equipment	Plant Air Compressors	2.0	ea	Contr	Contr	140,000.00	100	54.96	200	1.09	0	280,000	NO	0	11,927	217	291,927	0	$291,927	HDR|CB Estimated cost
298	Equipment	Plant Air Dryers	2.0	ea	Contr	Contr	30,000.00	100	54.96	200	1.09	0	60,000	NO	0	11,927	217	71,927	0	$71,927	HDR|CB Estimated cost
299	Equipment	Plant Air Receivers	2.0	ea	Contr	Contr	5,000.00	20	54.96	40	1.09	0	10,000	NO	0	2,385	43	12,385	0	$12,385	HDR|CB Estimated cost
302	Equipment	Pumps - Circulating Water	2.0	ea	Contr	Contr	1,125,000.00	500	54.96	1,000	1.09	0	2,250,000	NO	0	59,635	1,085	2,309,635	0	$2,309,635	HDR|CB Estimated cost
303	Equipment	Pumps - Auxiliary Cooling Water	1.0	ea	Contr	Contr	120,000.00	96	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
304	Equipment	Pumps - Closed Cooling Water	2.0	ea	Contr	Contr	134,000.00	200	53.33	400	1.09	0	268,000	NO	0	23,146	434	291,146	0	$291,146	HDR|CB Estimated cost
306	Equipment	Pumps - Boiler Feed	2.0	ea	Contr	Contr	950,000.00	1200	53.33	2,400	1.09	0	1,900,000	NO	0	138,876	2,604	2,038,876	0	$2,038,876	HDR|CB Estimated cost
307	Equipment	Pumps - Condensate	2.0	ea	Contr	Contr	300,000.00	200	53.33	400	1.09	0	600,000	NO	0	23,146	434	623,146	0	$623,146	HDR|CB Estimated cost
308	Equipment	Pumps - Service water	2.0	ea	Contr	Contr	160,000.00	210	53.33	420	1.09	0	320,000	NO	0	24,303	456	344,303	0	$344,303	HDR|CB Estimated cost
309	Equipment	Pumps - Fire Water (Electric and Diesel)	0.0	lt	Contr	Contr	500,000.00	310	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
310	Equipment	Pumps - Sump - Blowdown, Waste Water	2.0	ea	Contr	Contr	30,000.00	24	53.33	48	1.09	0	60,000	NO	0	2,778	52	62,778	0	$62,778	HDR|CB Estimated cost
311	Equipment	Pumps - Sump - Power Island Misc Building Sumps	6.0	ea	Contr	Contr	30,000.00	24	53.33	144	1.09	0	180,000	NO	0	8,333	156	188,333	0	$188,333	HDR|CB Estimated cost
314	Equipment	Pumps - Demin Water Transfer	2.0	ea	Contr	Contr	66,000.00	48	53.33	96	1.09	0	132,000	NO	0	5,555	104	137,555	0	$137,555	HDR|CB Estimated cost
318	Equipment	Pumps - Treated Water Transfer to Serv Water Tank	2.0	ea	Contr	Contr	40,000.00	80	53.33	160	1.09	0	80,000	NO	0	9,258	174	89,258	0	$89,258	HDR|CB Estimated cost
319	Equipment	Pumps - Waste Water	2.0	ea	Contr	Contr	80,000.00	125	53.33	250	1.09	0	160,000	NO	0	14,466	271	174,466	0	$174,466	HDR|CB Estimated cost
320	Equipment	Pumps - Evaporative Cooling Water	2.0	ea	Contr	Contr	37,000.00	80	53.33	160	1.09	0	74,000	NO	0	9,258	174	83,258	0	$83,258	HDR|CB Estimated cost
321	Equipment	Sample Analysis Panel (water)	2.0	ea	Contr	Contr	200,000.00	139	54.96	278	1.09	0	400,000	NO	0	16,578	302	416,578	0	$416,578	HDR|CB Estimated cost
322	Equipment	Tank - 200,000 gal treated water/service water - (F&E)	0.0	ea	Sub	Contr	540,000.00	0		0	1.09	0	0	yes	0	0	0	0	0	$0	Furnish and Erect price
323	Equipment	Tank - Demin Water Storage 200,000 gal. (F&E)	1.0	ea	Sub	Contr	600,000.00	0		0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	Furnish and Erect Price
324	Equipment	Tank - Turbine Drains	2.0	ea	Contr	Contr	75,000.00	200	53.33	400	1.09	0	150,000	NO	0	23,146	434	173,146	0	$173,146	HDR|CB Estimated cost
325	Equipment	Tank - Closed Cooling Water Dispersant 10,000 gal.	1.0	ea	Contr	Contr	36,500.00	100	54.96	100	1.09	0	36,500	NO	0	5,963	109	42,463	0	$42,463	HDR|CB Estimated cost
326	Equipment	Tank - Closed Cooling Water Accumulator	1.0	ea	Contr	Contr	20,600.00	44	54.96	44	1.09	0	20,600	NO	0	2,624	48	23,224	0	$23,224	HDR|CB Estimated cost
329	Equipment	Aqueous Ammonia System Unloading, Storage Tank, Forwarding Pu	0.0	ea	Contr	Contr	0.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
331	Equipment	Auxiliary Boiler System	1.0	ea	Contr	Contr	1,600,000.00	400	53.33	400	1.09	0	1,600,000	NO	0	23,146	434	1,623,146	0	$1,623,146	HDR|CB Estimated cost
332	Equipment	Compressed Gas Storage System (CO2)	1.0	ea	Contr	Contr	40,000.00	475	54.96	475	1.09	0	40,000	NO	0	28,326	515	68,326	0	$68,326	HDR|CB Estimated cost
333	Equipment	Compressed Gas Storage System (H2)	1.0	ea	Contr	Contr	40,000.00	198	54.96	198	1.09	0	40,000	NO	0	11,808	215	51,808	0	$51,808	HDR|CB Estimated cost
334	Equipment	Compressed Gas Storage System (N2)	2.0	ea	Contr	Contr	20,000.00	370	54.96	740	1.09	0	40,000	NO	0	44,130	803	84,130	0	$84,130	HDR|CB Estimated cost
335	Equipment	Demineralized Water Treatment System Dual 100% Trains	0.0	ea	Contr	Contr	1,197,000.00	4000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
336	Equipment	Condensate Polisher and Related	1.0	ea	Contr	Contr	1,000,000.00	3600	54.96	3,600	1.09	0	1,000,000	NO	0	214,684	3,906	1,214,684	0	$1,214,684	HDR|CB Estimated cost
337	Equipment	Fuel Gas Filter Separators	2.0	ea	Contr	Contr	210,000.00	200	54.96	400	1.09	0	420,000	NO	0	23,854	434	443,854	0	$443,854	Sub Budgetary Quote
338	Equipment	Fuel Gas Performance Heater	2.0	ea	Contr	Contr	761,600.00	300	54.96	600	1.09	0	1,523,200	NO	0	35,781	651	1,558,981	0	$1,558,981	Sub Budgetary Quote
339	Equipment	Fuel Gas Electric Startup Heater	2.0	ea	Contr	Contr	84,000.00	40	54.96	80	1.09	0	168,000	NO	0	4,771	87	172,771	0	$172,771	HDR|CB Estimated cost
340	Equipment	Fuel Gas Drain Tank	2.0	ea	Contr	Contr	2,000.00	15	54.96	30	1.09	0	4,000	NO	0	1,789	33	5,789	0	$5,789	HDR|CB Estimated cost
341	Equipment	Fuel Gas Dewpoint Heater	1.0	ea	Contr	Contr	476,000.00	80	54.96	80	1.09	0	476,000	NO	0	4,771	87	480,771	0	$480,771	HDR|CB Estimated cost
342	Equipment	Fuel Gas Scrubber	1.0	ea	Contr	Contr	392,000.00	60	54.96	60	1.09	0	392,000	NO	0	3,578	65	395,578	0	$395,578	HDR|CB Estimated cost
343	Equipment	Hydrogen Generator	1.0	ea	Contr	Contr	194,000.00	40	54.96	40	1.09	0	194,000	NO	0	2,385	43	196,385	0	$196,385	HDR|CB Estimated cost
344	Equipment	Steam Silencers	1.0	ea	Contr	Contr	150,000.00	20	54.96	20	1.09	0	150,000	NO	0	1,193	22	151,193	0	$151,193	HDR|CB Estimated cost
345	Equipment	Condensate Water Strainer	1.0	ea	Contr	Contr	150,000.00	40	54.96	40	1.09	0	150,000	NO	0	2,385	43	152,385	0	$152,385	HDR|CB Estimated cost
346	Equipment	Cycle Chem Feed	1.0	ea	Contr	Contr	200,000.00	100	54.96	100	1.09	0	200,000	NO	0	5,963	109	205,963	0	$205,963	HDR|CB Estimated cost
347	Equipment	Cooling Tower Chemical Feed	1.0	ea	Contr	Contr	250,000.00	300	54.96	300	1.09	0	250,000	NO	0	17,890	326	267,890	0	$267,890	HDR|CB Estimated cost
348	Equipment	Condeser Vaccum Pump/Air Removal Equipment	1.0	ea	Contr	Contr	350,000.00	40	54.96	40	1.09	0	350,000	NO	0	2,385	43	352,385	0	$352,385	HDR|CB Estimated cost
349	Equipment	Turbine Room Bridge Crane - 60T	1.0	ea	Contr	Contr	390,000.00	120	53.33	120	1.09	0	390,000	NO	0	6,944	130	396,944	0	$396,944	HDR|CB Estimated cost
350	Equipment	Elevator for 2 HRSG	1.0	ea	sub	contr	746,000.00	0		0	1.09	0	0	NO	0	0	0	0	746,000	$746,000	HDR|CB Estimated cost
351																					HDR|CB Estimated cost
352		**Division #5.6 BOP Mechanical Equipment Sub-Total**								**24,199**		**0**	**23,364,700**		**0**	**1,536,419**	**26,256**	**24,901,119**	**1,346,000**	**26,247,119**	
353																					
354	**Division #6.0 - Electrical Equipment**																				
355																					
356	Electrical	Eqpt - 24kv Bus Isolated Phase, 8000A	600.0	lf	Contr	Contr	750.00	8	50.09	4,800	1.09	0	450,000	NO	0	260,890	5,208	710,890	0	$710,890	
357	Electrical	Eqpt - 24kv Bus Isolated Phase, 9000A	300.0	lf	Contr	Contr	900.00	8	50.09	2,400	1.09	0	270,000	NO	0	130,445	2,604	400,445	0	$400,445	HDR|CB Estimated cost
358	Electrical	Eqpt - Bus 6.9kV non-seg	200.0	lf	Contr	Contr	510.00	4	50.09	800	1.09	0	102,000	NO	0	43,482	868	145,482	0	$145,482	HDR|CB Estimated cost
359	Electrical	Eqpt - Bus Duct 480V, 2500A	480.0	lf	Contr	Contr	610.00	3.2	50.09	1,536	1.09	0	292,800	NO	0	83,485	1,667	376,285	0	$376,285	HDR|CB Estimated cost
360	Electrical	Eqpt - Generator Breaker, 8000A, 24kV	3.0	ea	Contr	Contr	450,000.00	300	50.09	900	1.09	0	1,350,000	NO	0	48,917	977	1,398,917	0	$1,398,917	HDR|CB Estimated cost
361	Electrical	Eqpt - LV Switchgear - 480V, 4000A EO Main Ckt Bkr	6.0	ea	Contr	Contr	35,000.00	56	50.09	336	1.09	0	210,000	NO	0	18,262	365	228,262	0	$228,262	HDR|CB Estimated cost
362	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Main Ckt Bkr.	2.0	ea	Contr	Contr	15,400.00	30	50.09	60	1.09	0	30,800	NO	0	3,261	65	34,061	0	$34,061	HDR|CB Estimated cost
363	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Tie Ckt Bkr.	3.0	ea	Contr	Contr	15,400.00	30	50.09	90	1.09	0	46,200	NO	0	4,892	98	51,092	0	$51,092	HDR|CB Estimated cost
364	Electrical	Eqpt - LV Switchgear - 480V, 1200A EO Tie Ckt Bkr.	1.0	ea	Contr	Contr	10,780.00	26	50.09	26	1.09	0	10,780	NO	0	1,413	28	12,193	0	$12,193	HDR|CB Estimated cost
365	Electrical	Eqpt - LV Switchgear - 480V, 800A MO Fdr Ckt Bkr.	16.0	ea	Contr	Contr	4,575.00	22	50.09	352	1.09	0	73,200	NO	0	19,132	382	92,332	0	$92,332	HDR|CB Estimated cost
366	Electrical	Eqpt - LV Switchgear - 480V, 800A Equipped Space	6.0	ea	Contr	Contr	1,090.00	13.2	50.09	79	1.09	0	6,540	NO	0	4,305	86	10,845	0	$10,845	HDR|CB Estimated cost
367	Electrical	Eqpt - Motor Control Centers - 480V	16.0	ea	Contr	Contr	46,000.00	132	50.09	2,112	1.09	0	736,000	NO	0	114,792	2,292	850,792	0	$850,792	HDR|CB Estimated cost
368	Electrical	Eqpt - MV Switchgear - 7kV, 3000A Main Ckt Bkr.	1.00	ea	Contr	Contr	79,640.00	76	50.09	76	1.09	0	79,640	NO	0	4,131	82	83,771	0	$83,771	HDR|CB Estimated cost
369	Electrical	Eqpt - MV Switchgear - 7kV, 2000A Fdr Ckt Bkr.	2.00	ea	Contr	Contr	42,870.00	72	50.09	144	1.09	0	85,740	NO	0	7,827	156	93,567	0	$93,567	HDR|CB Estimated cost
370	Electrical	Eqpt - MV Switchgear - 7kV, 1200A Fdr Ckt Bkr.	20.00	ea	Contr	Contr	36,360.00	48	50.09	960	1.09	0	727,200	NO	0	52,178	1,042	779,378	0	$779,378	HDR|CB Estimated cost
371	Electrical	Eqpt - Relay panels and Metering	3.0	ea	Contr	Contr	34,500.00	120.00	50.09	360	1.09	0	103,500	NO	0	19,567	391	123,067	0	$123,067	HDR|CB Estimated cost
372	Electrical	Eqpt - Station Batteries 125 Volt DC/Charger	1.0	lot	Contr	Contr	350,000.00	635	50.09	635	1.09	0	350,000	NO	0	34,514	689	384,514	0	$384,514	HDR|CB Estimated cost
373	Electrical	Eqpt - Transformer GSU - 300 MVA, 18kV-345kV	2.0	ea	Contr	Contr	3,000,000.00	950	50.09	1,900	1.09	0	6,000,000	NO	0	103,269	2,062	6,103,269	0	$6,103,269	HDR|CB Estimated cost

Estimate Details

2 x 1 GE 7F7 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
Line #																					
374	Electrical	Eqpt - Transformer GSU - 415 MVA, 18kV-345kV	1.0	ea	Contr	Contr	5,000,000.00	950	50.09	950	1.09	0	5,000,000	NO	0	51,634	1,031	5,051,634	0	$5,051,634	HDR|CB Estimated cost
375	Electrical	Eqpt - Transformer UAT 33 MVA, 18kV/6.9kV	2.0	ea	Contr	Contr	900,000.00	650	50.09	1,300	1.09	0	1,800,000	NO	0	70,658	1,411	1,870,658	0	$1,870,658	HDR|CB Estimated cost
376	Electrical	Eqpt - Emergency Diesel Gnerator packaged 750kW	1.0	ea	Contr	Contr	200,000.00	100	50.09	100	1.09	0	200,000	NO	0	5,435	109	205,435	0	$205,435	HDR|CB Estimated cost
377	Electrical	Eqpt - UPS (120VAC)	1.0	ea	Contr	Contr	300,000.00	528	50.09	528	1.09	0	300,000	NO	0	28,698	573	328,698	0	$328,698	HDR|CB Estimated cost
378	Electrical	Eqpt - Transformer Aux Power 2.5/3.3MVA, 7kV-480V	4.0	ea	Contr	Contr	104,500.00	210	50.09	840	1.09	0	418,000	NO	0	45,656	911	463,656	0	$463,656	HDR|CB Estimated cost
379	Electrical	Eqpt - Lighting Transformers	8.0	ea	Contr	Contr	916.27	9.09	50.09	73	1.09	0	7,330	YES	440	3,953	79	11,283	0	$11,283	HDR|CB Estimated cost
380	Electrical	Eqpt - Panelboards 480/120 & 480/277/120	8.0	ea	Contr	Contr	1,200.00	40.00	50.09	320	1.09	0	9,600	YES	576	17,393	347	26,993	0	$26,993	HDR|CB Estimated cost
381	Electrical	Eqpt - Plant Network System	1.0	ea	Contr	Contr	100,000.00	300	50.09	300	1.09	0	100,000	YES	6,000	16,306	326	116,306	0	$116,306	HDR|CB Estimated cost
382	Electrical	Eqpt - Plant Security System	1.0	lot	Contr	Contr	250,000.00	1800	50.09	1,800	1.09	0	250,000	YES	15,000	97,834	1,953	347,834	0	$347,834	HDR|CB Estimated cost
383	Electrical	Eqpt - Plant Telephone System	1.0	ea	Contr	Contr	100,000.00	500	50.09	500	1.09	0	100,000	YES	6,000	27,176	543	127,176	0	$127,176	HDR|CB Estimated cost
384																					HDR|CB Estimated cost
385		**Division #6.0 - Electrical Equipment Sub-Total**								**24,277**		**0**	**19,109,330**		**28,016**	**1,319,501**	**26,340**	**20,428,831**	**0**	**20,428,831**	
386																					
387	**Division #6.1 - Electrical/Control Commodities**																				
388																					
389	Electrical	Grounding - Buried Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	
390	Electrical	Grounding - Above Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
391	Electrical	Grounding - Ground Rods Copper	96.0	ea	Contr	Contr	22.95	1.74	50.09	167	1.09	0	2,204	NO	0	9,079	181	11,283	0	$11,283	HDR|CB Estimated Quantity & Cost
392	Electrical	Grounding - Exothermic Connections	2,850.0	ea	Contr	Contr	9.75	1.14	50.09	3,249	1.09	0	27,788	NO	0	176,590	3,525	204,377	0	$204,377	HDR|CB Estimated Quantity & Cost
393	Electrical	Grounding - Servit Post	1,328.8	ea	Contr	Contr	30.00	1	50.09	1,107	1.09	0	39,864	NO	0	60,146	1,201	100,010	0	$100,010	HDR|CB Estimated Quantity & Cost
394	Electrical	Conduit A/G 5" RGS	1,000.0	lf	Contr	Contr	58.00	1.00	50.09	1,000	1.09	0	58,000	NO	0	54,352	1,085	112,352	0	$112,352	HDR|CB Estimated Quantity & Cost
395	Electrical	Conduit A/G 2" ave RGS	85,000.0	lf	Contr	Contr	8.50	0.30	50.09	25,500	1.09	0	722,500	NO	0	1,385,978	27,668	2,108,478	0	$2,108,478	HDR|CB Estimated Quantity & Cost
396	Electrical	Conduit U/G - 4 x 6 PVC 5"	8,000.0	lf	Contr	Contr	240.00	2.00	50.09	16,000	1.09	0	1,920,000	NO	0	869,633	17,360	2,789,633	0	$2,789,633	HDR|CB Estimated Quantity & Cost
397	Electrical	Conduit U/G - 8 x 8 PVC 5"	700.0	lf	Contr	Contr	530.00	5.00	50.09	3,500	1.09	0	371,000	NO	0	190,232	3,798	561,232	0	$561,232	HDR|CB Estimated Quantity & Cost
398	Electrical	Cable Tray, Raceway 24" Aluminum	5,200.0	lf	Contr	Contr	17.00	0.84	50.09	4,368	1.09	0	88,400	NO	0	237,410	4,739	325,810	0	$325,810	HDR|CB Estimated Quantity & Cost
399	Electrical	Cable Tray, Raceway 36" Aluminum	2,200.0	lf	Contr	Contr	20.00	1.05	50.09	2,310	1.09	0	44,000	NO	0	125,553	2,506	169,553	0	$169,553	HDR|CB Estimated Quantity & Cost
400	Electrical	Cable - Overhead Conductor to Substation	2,250.0	lf	Contr	Contr	8.50	0.50	50.09	1,125	1.09	0	19,125	NO	0	61,146	1,221	80,271	0	$80,271	HDR|CB Estimated Quantity & Cost
401	Electrical	Cable - Medium Voltage (7kV 1C Cable)	80,000.0	lf	Contr	Contr	14.60	0.127	50.09	10,160	1.09	0	1,168,000	NO	0	552,217	11,024	1,720,217	0	$1,720,217	HDR|CB Estimated Quantity & Cost
402	Electrical	Cable Terminations - 7kV	96.0	ea	Contr	Contr	195.00	12.00	50.09	1,152	1.09	0	18,720	NO	0	62,614	1,250	81,334	0	$81,334	HDR|CB Estimated Quantity & Cost
403	Electrical	Cable 600V Power 1/c No. 2/0 ave size	160,000.0	lf	Contr	Contr	3.55	0.041	50.09	6,560	1.09	0	568,000	NO	0	356,550	7,118	924,550	0	$924,550	HDR|CB Estimated Quantity & Cost
404	Electrical	Wire 600V Power 3/c # 10 ave. size	250,000.0	lf	Contr	Contr	0.27	0.0185	50.09	4,625	1.09	0	67,500	NO	0	251,378	5,018	318,878	0	$318,878	HDR|CB Estimated Quantity & Cost
405	Electrical	Cable - Fiber Optic	16,500.0	lf	Contr	Contr	6.00	0.025	50.09	413	1.09	0	99,000	NO	0	22,420	448	121,420	0	$121,420	HDR|CB Estimated Quantity & Cost
406	Electrical	Cable - Permanent Telephone Line	1.0	ls	Contr	Contr	10,000.00	240.000	50.09	240	1.09	0	10,000	NO	0	13,044	260	23,044	0	$23,044	HDR|CB Estimated Quantity & Cost
407	Electrical	Cable - Control	600,000.0	lf	Contr	Contr	1.10	0.040	50.09	24,000	1.09	0	660,000	NO	0	1,304,450	26,040	1,964,450	0	$1,964,450	HDR|CB Estimated Quantity & Cost
408	Electrical	Cable - Instrument 4pr tw/shld No. 18	400,000.0	lf	Contr	Contr	3.25	0.025	50.09	10,000	1.09	0	1,300,000	NO	0	543,521	10,850	1,843,521	0	$1,843,521	HDR|CB Estimated Quantity & Cost
409	Electrical	Cable - Thermocouple 2pr tw/shld No. 16	13,000.0	lf	Contr	Contr	0.33	0.030	50.09	390	1.09	0	4,290	NO	0	21,197	423	25,487	0	$25,487	HDR|CB Estimated Quantity & Cost
410	Electrical	Cable - Data Highway	24,068.0	lf	Contr	Contr	4.59	0.034	50.09	828	1.09	0	110,472	NO	0	45,000	898	155,472	0	$155,472	HDR|CB Estimated Quantity & Cost
411	Electrical	Cable Terminations - low voltage	30,500.0	ea	Contr	Contr	0.85	0.300	50.09	9,150	1.09	0	25,925	NO	0	497,321	9,928	523,246	0	$523,246	HDR|CB Estimated Quantity & Cost
412	Electrical	Cable Terminations - control	31,500.0	ea	Contr	Contr	0.54	0.300	50.09	9,450	1.09	0	17,010	NO	0	513,627	10,253	530,637	0	$530,637	HDR|CB Estimated Quantity & Cost
413	Electrical	Cable Terminations - instrument	32,800.0	ea	Contr	Contr	0.54	0.300	50.09	9,840	1.09	0	17,712	NO	0	534,824	10,676	552,536	0	$552,536	HDR|CB Estimated Quantity & Cost
414	Electrical	Conduit - Lighting A/G	33,000.0	lf	Contr	Contr	2.83	0.25	50.09	8,250	1.09	0	93,390	YES	5,603	448,405	8,951	541,795	0	$541,795	HDR|CB Estimated Quantity & Cost
415	Electrical	Wire - Lighting 1/C No 12	80,000.0	lf	Contr	Contr	0.176	0.018	50.09	1,440	1.09	0	14,080	YES	845	78,267	1,562	92,347	0	$92,347	HDR|CB Estimated Quantity & Cost
416	Electrical	Lighting - Outdoor Fixtures, pole	30.0	ea	Contr	Contr	1,600.00	12.00	50.09	360	1.09	0	48,000	YES	2,880	19,567	391	67,567	0	$67,567	HDR|CB Estimated Quantity & Cost
417	Electrical	Lighting - Outdoor Fixtures, 150W	320.0	ea	Contr	Contr	490.00	4.00	50.09	1,280	1.09	0	156,800	NO	0	69,571	1,389	226,371	0	$226,371	HDR|CB Estimated Quantity & Cost
418	Electrical	Lighting - Fixtures, 250W	80.0	ea	Contr	Contr	850.00	3.00	50.09	240	1.09	0	68,000	NO	0	13,044	260	81,044	0	$81,044	HDR|CB Estimated Quantity & Cost
419	Electrical	Lighting - Fixtures, fluorescent	180.0	ea	Contr	Contr	85.00	1.60	50.09	288	1.09	0	15,300	YES	918	15,653	312	30,953	0	$30,953	HDR|CB Estimated Quantity & Cost
420	Electrical	Lighting - Receptacles and switches	200.0	ea	Contr	Contr	32.00	1.37	50.09	273	1.09	0	6,400	YES	384	14,864	297	21,264	0	$21,264	HDR|CB Estimated Quantity & Cost
421	Electrical	Welding Receptacles	24.0	ea	Contr	Contr	1,800.00	4.00	50.09	96	1.09	0	43,200	NO	0	5,218	104	48,418	0	$48,418	HDR|CB Estimated Quantity & Cost
422	Electrical	Lighting - Exit	66.0	ea	Contr	Contr	150.00	2.00	50.09	132	1.09	0	9,900	YES	594	7,174	143	17,074	0	$17,074	HDR|CB Estimated Quantity & Cost
423	Electrical	Lighting - Emergency	120.0	ea	Contr	Contr	127.00	2.00	50.09	240	1.09	0	15,240	YES	914	13,044	260	28,284	0	$28,284	HDR|CB Estimated Quantity & Cost
424	Electrical	Cathodic Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
425	Electrical	Lightning Protection System	1.0	lot	Contr	Contr	100,000.00	200	50.09	200	1.09	0	100,000	YES	6,000	10,870	217	110,870	0	$110,870	HDR|CB Estimated Quantity & Cost
426	Electrical	Freeze Protection System	1.0	lot	Contr	Contr	800,000.00	5000	50.09	5,000	1.09	0	800,000	YES	48,000	271,760	5,425	1,071,760	0	$1,071,760	HDR|CB Estimated Quantity & Cost
427	Electrical	Electrical Circuit Testing	6,183.3	ea	Contr	Contr		2	50.09	12,367	1.09	0	0	NO	0	672,148	13,418	672,148	0	$672,148	HDR|CB Estimated Quantity & Cost
428		**Total Cable**	**1,545,819.0**	**LF**																	HDR|CB Estimated Quantity & Cost
429																					
430		**Division #6.1 - Electrical/Control Commodities Sub-Total**								**180,099**		**0**	**9,213,019**		**72,139**	**9,788,760**	**195,408**	**19,001,779**	**0**	**19,001,779**	
431																					
432	**Division #6.2 - Switchyard**																				
433																					
434	IV Electrica	138kV Dead End Towers 6 Legged (3 total)	150,000.0	lb	Contr	Contr	2.50	0.01	60.25	2,180	1.09	0	375,000	NO	0	142,500	2,365	517,500		$517,500	
435	IV Electrica	Interonnection Cabling and Termination Allowance	1.0	lot	Contr	Contr	15,000.00	1,526.36	51.33	1,526	1.09	0	15,000	NO	0	85,000	1,656	100,000		$100,000	HDR|CB Estimated Quantity & Cost
436																					HDR|CB Estimated Quantity & Cost
437		**Division #6.2 - Switchyard**								**3,706**		**0**	**$390,000**		**0**	**$227,500**	**$4,021**	**$617,500**	**$0**	**$617,500**	
438																					
439	**Division #7.0 - Instrumentation & Control**																				
440																					
441	I & C	BOP Instrument Devices	1,200.0	ea	Contr	Contr	750.00	12	50.09	14,400	1.09	0	900,000	NO	0	782,670	15,624	1,682,670	0	$1,682,670	
442	I & C	Auxiliary Boiler CEMS	1.0	lot	Contr	Contr	163,200.00	200	50.09	200	1.09	0	163,200	NO	0	10,870	217	174,070	0	$174,070	HDR|CB Estimated Quantity & Cost
443	I & C	Continuous Emissions Monitoring Equipment (CEMS)	2.0	ea	Contr	Contr	700,000.00	2000	53.33	4,000	1.09	0	1,400,000	NO	0	231,460	4,340	1,631,460	0	$1,631,460	HDR|CB Estimated Quantity & Cost
444	I & C	Control Valves	220.0	ea	Contr	Contr	4,000.00	24	54.96	5,280	1.09	0	880,000	NO	0	314,871	5,729	1,194,871	0	$1,194,871	HDR|CB Estimated Quantity & Cost
445	I & C	DCS w/ Configuration, Interfaces, Field Support, Interface, Bulks	1.0	ea	Contr	Contr	1,700,000.00	1691	50.09	1,691	1.09	0	1,700,000	NO	0	91,909	1,835	1,791,909	0	$1,791,909	HDR|CB Estimated Quantity & Cost
446	I & C	Emergency Trip sub Panel	1.0	ea	Contr	Contr	30,000.00	21	50.09	21	1.09	0	30,000	NO	0	1,141	23	31,141	0	$31,141	HDR|CB Estimated Quantity & Cost
447	I & C	Flow Element - Nozzle (Supply)	6.0	ea	Contr	Contr	30,000.00	20	54.96	120	1.09	0	180,000	NO	0	7,156	130	187,156	0	$187,156	HDR|CB Estimated Quantity & Cost
448	I & C	Instrument Calibration and loop check	1,500.0	ea	Contr	Contr	0.00	3	50.09	4,500	1.09	0	0	NO	0	244,584	4,883	244,584	0	$244,584	HDR|CB Estimated Quantity & Cost
449	I & C	Instrument piping 2&3-valve manifolds	284.0	ea	Contr	Contr	400.00	5.22	54.96	1,481	1.09	0	113,600	NO	0	88,331	1,607	201,931	0	$201,931	HDR|CB Estimated Quantity & Cost
450	I & C	Instrument Racks & Enclosures	1.0	lot	Contr	Contr	350,000.00	1450	50.09	1,450	1.09	0	350,000	NO	0	78,811	1,573	428,811	0	$428,811	HDR|CB Estimated Quantity & Cost
451	I & C	Instrument Tubing - copper	6,000.0	lf	Contr	Contr	3.70	0.15	54.96	900	1.09	0	22,200	NO	0	53,671	977	75,871	0	$75,871	HDR|CB Estimated Quantity & Cost
452	I & C	Instrument Tubing - Stainless Steel	2,500.0	lf	Contr	Contr	6.25	0.20	54.96	500	1.09	0	15,625	NO	0	29,817	543	45,442	0	$45,442	HDR|CB Estimated Quantity & Cost
453	I & C	PLC Hardware, Bulks, Aux Controls, Configuration	1.0	ls	Contr	Contr	241,200.00	253	50.09	253	1.09	0	241,200	NO	0	13,751	275	254,951	0	$254,951	HDR|CB Estimated Quantity & Cost
454																					HDR|CB Estimated Quantity & Cost
455		**Division #7.0 - Control Sub-Total**								**34,796**		**0**	**5,995,825**		**0**	**1,949,043**	**37,754**	**7,944,868**	**0**	**$7,944,868**	
456																					
457		**Sub-Total Direct Costs**								**946,417**		**0**	**329,831,669**	**0**		**54,657,879**	**1,026,340**	**384,489,548**	**25,937,400**	**410,426,948**	
458		Sales Tax - State (Plant Production Equipment is Exempt)	6.00%												**393,268**				**393,268**	**393,268**	
459	Indirects																				Sales Tax Included for Non-Production Facilities

Estimate Details

2 x 1 GE 7F7 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
460		**TOTAL DIRECT COSTS**								**946,417**		**0**	**329,831,669**			**54,657,879**	**1,026,340**	**384,489,548**	**26,330,668**	**$410,820,216**	
461																					
462	**Division #8.0 - Construction and Indirect Services**																				
463																					
464	Const Indirec	Construction Equipment	1.0	ls	Contr	Contr	12,055,653			0	1.09					0	0	0	12,055,653	$12,055,653	
465	Const Indirec	Construction Field staff	1.0	ls	Contr	Contr	11,522,855			0	1.09					0	0	0	11,522,855	$11,522,855	See Construction Equipment worksheet
466	Const Indirec	Construction Field staff expenses	1.0	ls	Contr	Contr	1,870,168			0	1.09					0	0	0	1,870,168	$1,870,168	See EPC Field Staff Worksheet for details
467	Const Indirec	Construction Permits	1.0	ls	Contr	Contr				0	1.09		51,450			0	0	51,450	0	$51,450	See EPC Field Staff Worksheet for details
468	Const Indirec	Construction Testing	1.0	ls	Contr	Contr				0	1.09		117,000			0	0	117,000	0	$117,000	See Const Indirects and Serv Worksheet
469	Const Indirec	Consumable Materials & Safety Supplies	2.00	$/MH	Contr	Contr	2,052,681			0	1.09					0	0	0	2,052,681	$2,052,681	See Const Indirects and Serv Worksheet
470	Const Indirec	Field Office Expenses	1.0	ls	Contr	Contr				1,369	1.09		1,033,370			65,849	1,485	1,099,219	22,373	$1,121,592	$2.00/Direct hour
471	Const Indirec	Performance Testing	1.0	ls	Contr	Contr				0	1.09		304,400			0	0	304,400	0	$304,400	See Const Indirects and Serv Worksheet
472	Const Indirec	Preoperational Testing, Startup & Commissioning	2.0	ls	Contr	Contr				21,690	1.09		1,113,000			752,767	23,534	1,865,767	0	$1,865,767	See Const Indirects and Serv Worksheet
473	Const Indirec	Site Safety	1.0	ls	Contr	Contr				7,580	1.09		658,040			375,008	8,224	1,033,048	0	$1,033,048	See Const Indirects and Serv Worksheet
474	Const Indirec	Small Tools	2.00	$/MH	Contr	Contr	2,052,681			0	1.09					0	0	0	2,052,681	$2,052,681	See Const Indirects and Serv Worksheet
475	Const Indirec	Start-up Supervision	1.0	ls	Contr	Contr	1,296,911			0	1.09					0	0	0	1,296,911	$1,296,911	$2.00/Direct hour
476	Const Indirec	Support Craft, Site Services, Scaffolding	1.0	ls	Contr	Contr				41,753	1.09		459,400			2,008,704	45,302	2,468,104	775,014	$3,243,118	See EPC Field Staff Worksheet for details
477	Const Indirec	Temporary Facilities	1.0	ls	Contr	Contr				17,947	1.09		2,336,753			863,403	19,472	3,200,157	82,500	$3,282,657	See Const Indirects and Serv Worksheet
478	Const Indirec	Temporary Utilities	1.0	ls	Contr	Contr				29,032	1.09		747,600			1,396,697	31,500	2,144,297	0	$2,144,297	See Const Indirects and Serv Worksheet
479																					See Const Indirects and Serv Worksheet
480		**Division #8.0 - Construction Indirects and Services Sub-Total**								**119,371**		**0**	**6,821,013**			**5,462,428**	**129,518**	**12,283,441**	**31,730,835**	**$44,014,277**	
481																					
482		**SUB-TOTAL CONSTRUCTION COST**								**1,065,788**		**0**	**336,652,682**			**60,120,308**	**1,155,858**	**396,772,990**	**58,061,503**	**454,834,493**	
483		**Subcontract Labor Hours**																			
484		**Material Cost Excluding CT, HRSG and ST (escalation and EPC**											**100,252,682**								
485	**Division #9.0 - Project Indirects**																				
486																					
487	Project Indire	- Power Plant Design Engineering	1.0	ls	Contr	6.0%	27,290,070											0	27,290,070	$27,290,070	
488	Project Indire	- Project Management (Home Office)	0.0	ls	Contr	0.0%	0											0	0	$0	6.0% of the Total Construction Cost
489																					Included in Engineering
490																					
491		Sub-Total Project Indirects										**0**	**0**			**0**	**0**	**0**	**27,290,070**	**$27,290,070**	
492																					
493	EPC Indirect	EPC Contractor Insurance & Misc Costs (% of Total Const. Cost)																			
494																					
495	EPC Indirect	- Builders Risk Insurance	1.0	ls	Contr	0.50%	2,274,172												2,274,172	$2,274,172	
496	EPC Indirect	- Comprehensive General Liability (CGL) Insurance	1.0	ls	Contr	0.50%	2,274,172											0	2,274,172	$2,274,172	Allowance based on info from other projects
497	EPC Indirect	- Warranty Reserve	1.0	ls	Contr		500,000											0	500,000	$500,000	Allowance based on info from other projects
498																					Allowance based on info from other projects
499		Sub-Total EPC Contractor Indirects										**0**	**0**			**0**	**0**	**0**	**5,048,345**	**$5,048,345**	
500																					
501		**Total Project Indirects**										**0**	**0**			**0**	**0**	**0**	**32,338,415**	**32,338,415**	
502																					
503		Sub-Total										**0**	**336,652,682**			**60,120,308**	**1,155,858**	**396,772,990**	**90,399,918**	**$487,172,908**	
504							Equipment	Material	Labor	S/C											
505	Project Indire	Escalation - EPC Contractor Escalation Rates					2.4%	2.4%	4.0%	4.0%			7,353,801			9,444,018	0	16,797,819	7,847,800	24,645,619	
506																					Excludes CT, HRSG and ST
507		Sub-Total										**0**	**344,006,483**			**69,564,325**	**1,155,858**	**413,570,809**	**98,247,718**	**$511,818,526**	
508							Equip	Mat	Labor	S/C											
509	EPC Indirect	EPC Contractor Contingency	Varies	%	Contr		0%	5%	5%	5%		0	5,012,634			3,478,216		8,490,850	4,559,886	13,050,736	
510	EPC Indirect	EPC Contractor G&A and Fee	8.0%	%	Contr		1.0%	8.0%	8.0%	8.0%		0	27,520,519			5,565,146		33,085,665	7,859,817	40,945,482	Excludes CT, HRSG and ST
511																					
512		Sub-Total		ls								0	32,533,153			9,043,362	0	41,576,515	12,419,703	$53,996,218	
513																					
514		**TOTAL EPC PROJECT COST**								**1,065,788**		**0**	**376,539,636**			**78,607,688**	**1,155,858**	**455,147,324**	**110,667,421**	**$565,814,745**	
515																					
516	**OWNER INDIRECTS**																				
517	**Division #9.1 - Owner Indirects**																				
518																					
519		**Power Block 1 and Common**																			
520	Owner Indire	Project Development	1.0	ls	Owner														6,500,000	$6,500,000	
521	Owner Indire	Transmission Line Relocation	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
522	Owner Indire	Transmission Interconnection Facilities	1.0	ls	Owner														5,500,000	$5,500,000	Budget provided by LG&E
523	Owner Indire	Natural Gas Pipeline Interconnection	1.0	ls	Owner														14,250,000	$14,250,000	To be estimated by Transmision Operator
524	Owner Indire	Natural Gas Pipeline Fixed O&M (Startup Period)	1.0	ls	Owner														6,750,000	$6,750,000	Budget provided by LG&E
525	Owner Indire	Construction Power (Service Installation and Energy)	1.0	ls	Owner														750,000	$750,000	Budget provided by LG&E
526	Owner Indire	Owner Operations Personnel (Prior to COD)	1.0	ls	Owner														2,340,000	$2,340,000	Budget estimated by HDR|CB
527	Owner Indire	Owners Project Management	1.0	ls	Owner														5,300,000	$5,300,000	Budget estimated by HDR|CB 7 sal @ 12 mo, 26 hr @ 6 m
528	Owner Indire	Owners Engineer	1.0	ls	Owner														1,900,000	$1,900,000	Budget provided by LG&E
529	Owner Indire	Owners Legal Counsel	1.0	ls	Owner														1,300,000	$1,300,000	Budget provided by LG&E
530	Owner Indire	Operator Training	1.0	ls	Owner														225,000	$225,000	Budget provided by LG&E
531	Owner Indire	Owner Startup Engineering	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
532	Owner Indire	Permitting, License Fees, & Environmental Compliance	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
533	Owner Indire	Highway Improvements, Miscellaneous Mitigation	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
534	Owner Indire	Land	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
535	Owner Indire	Rolling Stock	1.0	ls	Owner														0	$0	Budget provided by LG&E
536	Owner Indire	Water Infrastructure / Supply to Site	0.0	ls	Owner														0	$0	Budget estimated by HDR|CB
537	Owner Indire	Startup Testing (Includes Fuel & Power Sales)																			N/A (On site intake/pre-treatment/discharge incl. in EPC)
538	Owner Indire	- Fuel - Natural Gas	1.0	ls	Owner														12,160,800	$12,160,800	
539	Owner Indire	- Fuel - Fuel Oil	0.0	ls	Owner														0	$0	HDR|CB [2,702,400 MMBTU @ $4.50/MMBTU per LG&E 2017 Forecas
540	Owner Indire	- Electric Transmission Firm Point to Point	1.0	ls	Owner														4,000,000	$4,000,000	Budget estimated by HDR|CB [Not Required]
541	Owner Indire	- Startup Power	1.0	ls	Owner														391,104	$391,104	Budget provided by LG&E
542	Owner Indire	- Test Power Sales	1.0	ls	Owner														(15,552,000)	($15,552,000)	Budget estimated by HDR|CB [10,864 MWhr @$36/MWH]
543	Owner Indire	- Variable O&M - Water, Chemicals, etc.	1.0	ls	Owner														1,200,000	$1,200,000	Budget estimated by HDR|CB [432,000 MWhr @$36/MWH
544	Owner Indire	Site Security	1.0	ls	Owner														50,000	$50,000	Budget estimated by HDR|CB
545	Owner Indire	Operating Spare Parts	1.0	ls	Owner														10,000,000	$10,000,000	Budget estimated by HDR|CB
546	Owner Indire	Permanent Plant Equipment & Furnishings																		$0	Budget estimated by HDR|CB
547	Owner Indire	- Office Furniture	1.0	ls	Owner														350,000	$350,000	

Estimate Details

2 x 1 GE 7F7 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
Line #																					
548	Owner Indire	- Kitchen Furniture	1.0	ls	Owner														130,000	$130,000	Budget estimated by HDR|CB
549	Owner Indire	- Laboratory Equipment & Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
550	Owner Indire	- Locker Room Furniture	1.0	ls	Owner														180,000	$180,000	Budget estimated by HDR|CB
551	Owner Indire	- Warehouse Shelves	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
552	Owner Indire	- Workshop Tools & Test Equipment	1.0	ls	Owner														1,800,000	$1,800,000	Budget estimated by HDR|CB
553	Owner Indire	IT and Telecommunication Infrastructure	1.0	ls	Owner														250,000	$250,000	Budget estimated by HDR|CB
554	Owner Indire	NERC - Cyber Security	1.0	ls	Owner														1,000,000	$1,000,000	Budget estimated by HDR|CB
555	Owner Indire	Escalation - Owners Furnished Equipment	0.0	%	Owner														0	$0	Budget estimated by HDR|CB
556	Owner Indire	Builders Risk Insurance	0.0	ls	Owner														0	$0	N/A
557	Owner Indire	Property Tax During Construction	1.0	ls	Owner														1,750,000	$1,750,000	Included with EPC Contractor Indirects
558	Owner Indire	Financing Fees	0.0	ls	Owner														0	$0	Budget provided by LG&E
559	Owner Indire	AFUDC	1.0	ls	Owner														6,100,000	$6,100,000	N/A
560		**Total Owner Indirects**																	**70,724,904**	**$70,724,904**	AFUDC Based on 78% KU Ownership
561																					
562																					
563		**Owner Contingency**	10.00%	%	Owner														**56,581,474**	**$56,581,474**	
564																					
565																					
566		**Total Owner Indirects**																	**127,306,378**	**$127,306,378**	
567																					
568		**TOTAL PROJECT COST**										**0**	**376,539,636**			**78,607,688**	**1,155,858**	**455,147,324**	**237,973,800**	**$693,121,123**	
569																					
																			$/kW	**$907**	

2 x 1 GE 7F7 700 MW Combined Cycle Unit

BUDGET ESTIMATE

5 x 10 Work Week

February 22, 2013

Rev 1

CONFIDENTIAL

2 x 1 GE 7F7 700 MW Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 703.275
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
Site Development	**$0**	**$1,787,885**	**$1,537,001**	**36,870**	**250,000**	**$3,574,886**	**0.6%**
Raw Water Intake/Discharge Facilities	**$0**	**$500,000**	**$578,649**	**10,850**	**0**	**$1,078,649**	**0.2%**
Foundations & Concrete	**$0**	**$6,415,575**	**$4,963,370**	**128,270**	**11,900,000**	**$23,278,945**	**4.2%**
Architectural & Metals	**$0**	**$5,385,510**	**$2,426,063**	**46,805**	**5,766,400**	**$13,577,973**	**2.4%**
Piping, Valves, Support, Accessories	**$0**	**$19,178,975**	**$12,317,297**	**228,411**	**225,000**	**$31,721,271**	**5.7%**
HRSG Equipment	**$0**	**$57,600,000**	**$12,285,648**	**177,940**	**0**	**$69,885,648**	**12.6%**
Steam Turbine Island Equipment	**$0**	**$42,000,000**	**$1,435,050**	**26,908**	**0**	**$43,435,050**	**7.8%**
Combustion Turbine Equipment	**$0**	**$132,200,000**	**$4,282,005**	**80,290**	**0**	**$136,482,005**	**24.6%**
Mechanical Draft Cooling Tower	**$0**	**$0**	**$0**	**0**	**6,680,000**	**$6,680,000**	**1.2%**
BOP Mechanical Equipment	**$0**	**$21,524,700**	**$1,536,419**	**26,256**	**1,346,000**	**$24,407,119**	**4.4%**
Electrical Equipment	**$0**	**$18,509,330**	**$1,319,501**	**26,340**	**0**	**$19,828,831**	**3.6%**
Electrical Commodities	**$0**	**$9,213,019**	**$9,788,760**	**195,408**	**0**	**$19,001,779**	**3.4%**
High Voltage Switchyard	**$0**	**$390,000**	**$227,500**	**4,021**	**0**	**$617,500**	**0.1%**
Instrumentation & Controls	**$0**	**$5,995,825**	**$1,949,043**	**37,754**	**0**	**$7,944,868**	**1.4%**
Sub-Total Direct Costs:	**$0**	**$320,700,819**	**$54,646,306**	**1,026,123**	**$26,167,400**	**$401,514,525**	**72.3%**
State Sales Tax (Non-Production Material Only)					**393,268**	**$393,268**	**0.1%**
Total Direct Cost	**$0**	**$320,700,819**	**$54,646,306**	**1,026,123**	**$26,560,668**	**$401,907,793**	**72.4%**
Construction Indirects & Services							
- Construction Field Staff			**$0**	**0**	**$11,522,855**	**$11,522,855**	**2.1%**
- Construction Field Staff Expenses			**$0**	**0**	**$1,870,168**	**$1,870,168**	**0.3%**
- Construction Equipment			**$0**	**0**	**$12,055,653**	**$12,055,653**	**2.2%**
- Small Tools			**$0**	**0**	**$2,052,247**	**$2,052,247**	**0.4%**
- Consumable Materials & Safety Supplies			**$0**	**0**	**$2,052,247**	**$2,052,247**	**0.4%**
- Field Office Expense		**$1,033,370**	**$65,849**	**1,485**	**$22,373**	**$1,121,592**	**0.2%**
- Temporary Facilities		**$2,336,753**	**$863,403**	**19,472**	**$82,500**	**$3,282,657**	**0.6%**
- Temporary Utilities		**$747,600**	**$1,396,697**	**31,500**	**$0**	**$2,144,297**	**0.4%**
- Support Craft & Site Services		**$459,400**	**$2,008,704**	**45,302**	**$775,014**	**$3,243,118**	**0.6%**
- Site Safety		**$658,040**	**$375,008**	**8,224**	**$0**	**$1,033,048**	**0.2%**
- Construction Permits		**$51,450**	**$0**	**0**	**$0**	**$51,450**	**0.0%**
- Construction Testing		**$117,000**	**$0**	**0**	**$0**	**$117,000**	**0.0%**
- Performance Testing		**$304,400**	**$0**	**0**	**$0**	**$304,400**	**0.1%**
- Start-up Supervision		**$0**	**$0**	**0**	**$1,296,911**	**$1,296,911**	**0.2%**
- Preop Testing, Start-up		**$1,113,000**	**$752,767**	**23,534**	**$0**	**$1,865,767**	**0.3%**
Sub-Total Construction Indirects and Services		**$6,821,013**	**$5,462,428**	**129,518**	**$31,729,967**	**$44,013,409**	**7.9%**
Total Construction Cost	**$0**	**$327,521,832**	**$60,108,735**	**1,155,641**	**$58,290,635**	**$445,921,202**	**80.3%**
Estimated Subcontract Labor Hours				**206,585**			
Project Indirects							
- Project Engineering (Eng, PM, CM & Procurement)					**$26,755,272**	**$26,755,272**	**4.8%**
Sub-Total Project Indirects	**$0**	**$0**	**$0**	**0**	**$26,755,272**	**$26,755,272**	**4.8%**
EPC Contractor Insurance & Misc Costs							
- Builders Risk					**$2,229,606**	**$2,229,606**	**0.4%**
- Comprehensive General Liability (CGL) Insurance					**$2,229,606**	**$2,229,606**	**0.4%**

2 x 1 GE 7F7 700 MW Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013		TECHNOLOGY:	CT with HRSG & STG		
NTP PERIOD:		NET MW RATING:	703.275	BOILER:	Fired
CONSTRUCTION NTP - Mob:		NO. OF UNITS:	1	STEAM TURBINE:	Condensing
COMMERCIAL OPERATION DATE:	1-Jun-2018	FUEL TYPE:	Nat Gas	COOLING TYPE:	Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
- Warranty Reserve					**$500,000**	**$500,000**	**0.1%**
Sub-Total EPC Contractor Insur. & Misc. Co	**$0**	**$0**	**$0**	**0**	**$4,959,212**	**$4,959,212**	**0.9%**
Total EPC Contractor Project Indirect Cost	**$0**	**$0**	**$0**	**0**	**$31,714,484**	**$31,714,484**	**5.7%**
- Escalation (Eqt, Materials & Labor)	**$0**	**$7,113,373**	**$9,442,316**		**$7,864,820**	**$24,420,509**	**4.4%**
Sub-Total	**0**	**334,635,205**	**69,551,051**	**1,362,226**	**97,869,939**	**502,056,195**	**90.5%**
- EPC Contractor Contingency	**$0**	**$4,786,092**	**$3,477,553**		**$4,529,497**	**$12,793,141**	**2.3%**
- EPC Contractor G&A and Profit	**$0**	**$26,770,816**	**$5,564,084**		**$7,829,595**	**$40,164,496**	**7.2%**
TOTAL EPC PROJECT COST	**$0**	**$366,192,113**	**$78,592,687**	**1,362,226**	**$110,229,031**	**$555,013,832**	**100.0%**
EPC Price per kW						**$789**	
Owner Indirect Costs							
- Total Owner Indirects						**$70,174,904**	
- Owner Contingency						**$55,501,383**	
TOTAL PROJECT COST						**$680,690,119**	
Total Project Cost per kW						**$968**	
Estimate Options **(include 25 % markup for indirects)**							
Fuel Oil System						**$9,250,000**	
Bypass Stack and Diverter Damper						**N/A**	
Gas Compression						**Not Required**	
SCR System to meet 12 ppm NOx						**Not Required**	
Optional SCR System						**$4,700,000**	

Total Craft Labor Hours	**1,362,226**	**'erformance Guarantees:**		**Executive-in-Charge:**	**WHD**
Ave. Craft Wage without Escalation	**$52.90**	**Liquidated Damages:**		**Project Manager:**	**JPS**
Field Labor Type	**TBD**	**Special Insurance:**		**Construction Manager:**	**SMP**
Labor Productivity Factor	**1.085**	**Performance Bond:**		**Lead Estimator:**	**CDF**

Estimate Details

2 x 1 GE 7F7 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
1	**Division #1.0 - Sitework**																				
2	Sitework	Roads - Asphalt paving main site rds & Parking lots	8,500.0	sy	Sub	Contr	20.00		44.43		1.09	0	0	YES	5,100	0	0	0	170,000	$170,000	HDR|CB Estimated Quantity
3	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Powerblock A	1,740.0	sy	Contr	Contr	5.00	0.055	44.43	96	1.09	0	8,700	YES	522	4,613	104	13,313	0	$13,313	HDR|CB Estimated Quantity
4	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Secondary Ar	6,945.0	sy	Contr	Contr	5.00	0.055	44.43	382	1.09	0	34,725	YES	2,084	18,412	414	53,137	0	$53,137	HDR|CB Estimated Quantity
5	Sitework	Roads - Haul/Construction Roads Treated Gravel	29,700.0	sy	Contr	Contr	8.00	0.1	44.43	2,970	1.09	0	237,600	YES	14,256	143,162	3,222	380,762	0	$380,762	HDR|CB Estimated Quantity
6	Sitework	Roads - Main Roads Crushed stone Base Course	8,500.0	sy	Contr	Contr	12.00	0.1	44.43	850	1.09	0	102,000	YES	6,120	40,972	922	142,972	0	$142,972	HDR|CB Estimated Quantity
7	Sitework	Roads - Drainage and culverts	90,000.0	sy	Contr	Contr	2.00	0.05	44.43	4,500	1.09	0	180,000	YES	10,800	216,912	4,883	396,912	0	$396,912	HDR|CB Estimated Quantity
8	Sitework	Soil Erosion Control Measures	2,160	lf	Contr	Contr	1	0.027	44.43	58	1.09	0	2,160	YES	130	2,811	58	4,971	0	4,971	HDR|CB Estimated Quantity
9	Sitework	Site - Topsoil stripping/stockpiling	10,125	cy	Contr	Contr		0.030	44.43	304	1.09	0	0	YES	0	14,642	304	14,642	0	$14,642	HDR|CB Estimated Quantity
10	Sitework	Site - Drainage - Pipe Culverts (Assume 12" dia)	3,000	lf	Contr	Contr	9.00	0.12	44.43	360	1.09	0	27,000	YES	1,620	17,353	360	44,353	0	$44,353	HDR|CB Estimated Quantity
11	Sitework	Site - Drainage - Manholes	25	ea	Contr	Contr	1,500	16	44.43	400	1.09	0	37,500	YES	2,250	19,281	400	56,781	0	$56,781	HDR|CB Estimated Quantity
14	Sitework	Site - Fire Protection hydrants, valve boxes, ductile iron	30.0	ea	Contr	Contr	3,000.00	20	39.54	600	1.09	0	90,000	YES	5,400	25,739	651	115,739	0	$115,739	HDR|CB Estimated Quantity
15	Sitework	Site - Fire Protection U/G piping, DI	4,500.0	lf	Contr	Contr	41.00	0.5	39.54	2,250	1.09	0	184,500	YES	11,070	96,520	2,441	281,020	0	$281,020	HDR|CB Estimated Quantity
16	Sitework	Pipe Utility Trench Excavation	10,500	cy	Contr	Contr		0.2	39.54	2,100	1.09	0	0	YES	0	90,086	2,100	90,086	0	$90,086	HDR|CB Estimated Quantity
17	Sitework	Pipe Utility Trench Backfill (including bedding)	9,000	cy	Contr	Contr		0.2	39.54	1,800	1.09	0	0	YES	0	77,216	1,800	77,216	0	$77,216	HDR|CB Estimated Quantity
20	Sitework	Spoil Disposal	11,250	cy	Contr	Contr		0.1	44.43	1,125	1.09	0	0	YES	0	54,228	1,125	54,228	0	$54,228	HDR|CB Estimated Quantity
21	Sitework	Site - Sanitary sewer lift stations	1.0	ea	Contr	Contr	11,700.00	40	39.54	40	1.09	0	11,700	YES	702	1,716	43	13,416	0	$13,416	HDR|CB Estimated Quantity
22	Sitework	Site - Sanitary waste piping and manholes	2,500.0	lf	Contr	Contr	20.00	1	39.54	2,500	1.09	0	50,000	YES	3,000	107,245	2,713	157,245	0	$157,245	HDR|CB Estimated Quantity
23	Sitework	Site - Storm drain piping and culverts	22,500.0	lf	Contr	Contr	12.00	0.25	39.54	5,625	1.09	0	270,000	YES	16,200	241,301	6,103	511,301	0	$511,301	HDR|CB Estimated Quantity
24	Sitework	Site Finishing - Seed Site Earthwork	6.0	ac	Contr	Contr	10,000.00	0.54	39.54	3	1.09	0	60,000	YES	3,600	139	4	60,139	0	$60,139	HDR|CB Estimated Quantity
25	Sitework	Site Finishing - Grading around foundations	7,500.0	sy	Contr	Contr		0.02	39.54	150	1.09	0	0	YES	0	6,435	163	6,435	0	$6,435	HDR|CB Estimated Quantity
26	Sitework	Site Finishing - Stone Surfacing	7,500.0	sy	Contr	Contr	10.00	0.015	39.54	113	1.09	0	75,000	YES	4,500	4,826	122	79,826	0	$79,826	HDR|CB Estimated Quantity
27	Sitework	Site Improvements - landscaping at admin building	1.0	ls	Contr	Contr	30,000.00	360	39.54	360	1.09	0	30,000	YES	1,800	15,443	391	45,443	0	$45,443	HDR|CB Estimated Quantity
28	Sitework	Site Improvements - Main Gate Security Facilities	1.0	lot	Contr	Contr	150,000.00	3600	39.54	3,600	1.09	0	150,000	YES	9,000	154,433	3,906	304,433	0	$304,433	HDR|CB Estimated Quantity
29	Sitework	Site Improvements - Site Entrance Sign and Landscaping	1.0	ls	Contr	Contr	18,750.00	240	39.54	240	1.09	0	18,750	YES	1,125	10,296	260	29,046	0	$29,046	HDR|CB Estimated Quantity
30	Sitework	Site Improvements - Site Security Boundary Fencing	18,750.0	lf	Contr	Contr	11.00	0.2	39.54	3,750	1.09	0	206,250	YES	12,375	160,867	4,069	367,117	0	$367,117	HDR|CB Estimated Quantity
31	Sitework	Site Improvements - Fencing Active gates	6.0	ea	Contr	Contr	2,000.00	48	39.54	288	1.09	0	12,000	YES	720	12,355	312	24,355	0	$24,355	HDR|CB Estimated Quantity
32	Sitework	Site Surveying	1.0	lot	Sub	Contr	80,000.00		44.43	0	1.09	0	0	YES	2,400	0	0	0	80,000	$80,000	HDR|CB Estimated Quantity
33																					
34		**Division #1 - Sitework Sub-Total**								**34,463**		**0**	**1,787,885**		**114,773**	**1,537,001**	**36,870**	**3,324,886**	**250,000**	**3,574,886**	
35																					
36	**Division #1.3 - Raw Water Intake and Discharge Facilities**																				HDR Allowance for Interconnection and Updgrage of
37		Raw Water River Intake and Discharge Facilities	1.0	ea	Contr	Contr	500,000.00	10,000	53.33	10,000	1.09	0	500,000	NO	0	578,649	10,850	1,078,649	0	$1,078,649	Unit 1 and 2 Intake Structure
38																					
39		**Division #1.3 - Raw Water Intake Clarification and Discharge Facilities Sub-Total**								**10,000**		**0**	**500,000**		**0**	**578,649**	**10,850**	**1,078,649**	**0**	**$1,078,649**	
40																					
41																					
42	**Division #2.0 - Earthwork and Concrete**																				
43	**Division #2.1 - Earthwork**																				
44	Earthwork	Structural Backfill Power Block (using imported material)	220,000.0	cy	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,500,000	$5,500,000	HDR|CB Estimated Quantity
45	Earthwork	Retaining Wall (MSE)	40,000.0	sf	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	1,000,000	$1,000,000	HDR|CB Estimated Quantity
46	Earthwork	Structural Excavation Main Power Block - Earth/Rock	300,000.0	cy	Sub	Contr	18.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,400,000	$5,400,000	HDR|CB Estimated Quantity
47																					
48				cy						0		0	0		0	0	0	0	11,900,000	11,900,000	
49	**Division # 2.2 - Concrete Main Power Block Area**																				
50																					
51		Includes Forms, Rebar, Placement, Finishing, Embeds																			
52	Concrete	HRSG and Stack	7,500	cy	Contr	Contr	250	4.5	38.69	33,750	1.09	0	1,875,000	NO	0	1,416,954	36,619	3,291,954	0	$3,291,954	HDR|CB Estimated Quantity
53	Concrete	Gas Turbine Foundation	4,000	cy	Contr	Contr	300	4.5	38.69	18,000	1.09	0	1,200,000	NO	0	755,709	19,530	1,955,709	0	$1,955,709	HDR|CB Estimated Quantity
54	Concrete	Steam Turbine building	800	cy	Contr	Contr	250	4.5	38.69	3,600	1.09	0	200,000	NO	0	151,142	3,906	351,142	0	$351,142	HDR|CB Estimated Quantity
55	Concrete	Spread Footings & Piers Pipe/Tray Trestle/Racks	400.0	cy	Contr	Contr	250	4.5	38.69	1,800	1.09	0	100,000	NO	0	75,571	1,953	175,571	0	$175,571	HDR|CB Estimated Quantity
56	Concrete	Steam Turbine Bldg fill slab	300.0	cy	Contr	Contr	210.00	4.5	38.69	1,350	1.09	0	63,000	NO	0	56,678	1,465	119,678	0	$119,678	HDR|CB Estimated Quantity
57	Concrete	Steam Turbine Bldg Mat Foundation	1,200.0	cy	Contr	Contr	250	4.5	38.69	5,400	1.09	0	300,000	NO	0	226,713	5,859	526,713	0	$526,713	HDR|CB Estimated Quantity
58	Concrete	Steam Turbine Bldg Elevated Slab	500.0	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	NO	0	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
59	Concrete	Steam Turbine Bldg sumps foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
60	Concrete	Steam Turbine Pedestal FDN (Columns & Tabletop, Mat)	2,500.0	cy	Contr	Contr	350.00	8	38.69	20,000	1.09	0	875,000	NO	0	839,677	21,700	1,714,677	0	$1,714,677	HDR|CB Estimated Quantity
61	Concrete	Aux. Equipment Foundations	500	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	YES	7,500	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
62	Concrete	Equip Fdn - Generator Breaker	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
63	Concrete	Equip Fdn - CT PEEC	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
64	Concrete	Equip Fdn - Power Distribution Center	80	cy	Contr	Contr	250	4.5	38.69	360	1.09	0	20,000	YES	1,200	15,114	391	35,114	0	$35,114	HDR|CB Estimated Quantity
65	Concrete	Equip Fdn - CEMS	40	cy	Contr	Contr	250	4.5	38.69	180	1.09	0	10,000	YES	600	7,557	195	17,557	0	$17,557	HDR|CB Estimated Quantity
66	Concrete	Equip Fdn - Boiler Feed Pump	120	cy	Contr	Contr	250	4.5	38.69	540	1.09	0	30,000	YES	1,800	22,671	586	52,671	0	$52,671	HDR|CB Estimated Quantity
67	Concrete	Equip Fdn - Main Step-up Transformer Fdn/Walls	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
68	Concrete	Equip Fdn - Plant Aux Power Transformers Fnd/Walls	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
69	Concrete	Equip Fdn - Misc off Base Equip fnds	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
70	Concrete	Elec. Ductbank (Tubes, Conc., Forms, Rebar) 12 Tubes	500.0	lf	Contr	Contr	125	0.57	38.69	285	1.09	0	62,500	NO	0	11,965	309	74,465	0	$74,465	HDR|CB Estimated Quantity
71	Concrete	Elec. Ductbank to Cooling Tower (Tubes, Conc., Forms, Rebar) 6 Tu	750.0	lf	Contr	Contr	100	0.45	38.69	338	1.09	0	75,000	NO	0	14,170	366	89,170	0	$89,170	HDR|CB Estimated Quantity
72	Concrete	Equip Fdn - Pumps & misc equipment	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
73	Concrete	Electrical Building Foundation	130.0	cy	Contr	Contr	250	4.5	38.69	585	1.09	0	32,500	NO	0	24,561	635	57,061	0	$57,061	HDR|CB Estimated Quantity
74	Concrete	Cooling Tower Basin	2,500.0	cy	Contr	Contr	250	5.5	38.69	13,750	1.09	0	625,000	NO	0	577,278	14,919	1,202,278	0	$1,202,278	HDR|CB Estimated Quantity
75	Concrete	Administration Building foundation	1,100.0	cy	Contr	Contr	250	4.5	38.69	4,950	1.09	0	275,000	YES	16,500	207,820	5,371	482,820	0	$482,820	HDR|CB Estimated Quantity
76	Concrete	Auxilary Boiler Building floor slab & foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
77	Concrete	Demineralized Water Tank Foundations	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
78	Concrete	Service water storage tank foundations	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	YES	3,000	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
79	Concrete	Main Gate Guard House	3.0	cy	Contr	Contr	250	4.5	38.69	14	1.09	0	750	YES	45	567	15	1,317	0	$1,317	HDR|CB Estimated Quantity
80	Concrete	Water Treatment Buildings, enclosures and tank fdns	0.0	cy	Contr	Contr	250	4.5	38.69	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
81	Concrete	Grouting (equipment & steel)	30.0	cy	Contr	Contr	2,227.50	81	38.69	2,430	1.09	0	66,825	NO	0	102,021	2,637	168,846	0	$168,846	HDR|CB Estimated Quantity
82																					
83		Sub Total Concrete	**24,373**				AVG MH/CY	5.15		118,221			6,415,575		32,445	4,963,370	128,270	11,378,945	0	11,378,945	
84																					
85		**Division #2 - Earthwork & Concrete Sub-Total**								**118,221**		**0**	**6,415,575**		**32,445**	**4,963,370**	**128,270**	**11,378,945**	**11,900,000**	**23,278,945**	
86																					
87	**Division #3.0 - Architectural**												-								
88																					
89	rchitectura	Exterior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
90	rchitectura	Fire extinguishers	36.0	ea	Contr	Contr	500.00	3	53.33	108	1.09	0	18,000	YES	1,080	6,249	117	24,249	0	$24,249	HDR|CB Estimated Quantity
91	rchitectura	Fire hose cabinets	26.0	ea	Contr	Contr	1,200.00	20	53.33	520	1.09	0	31,200	YES	1,872	30,090	564	61,290	0	$61,290	HDR|CB Estimated Quantity
92	rchitectura	Fire hydrants w/monitor nozzles	10.0	ea	Contr	Contr	2,550.00	12	54.96	120	1.09	0	25,500	YES	1,530	7,156	130	32,656	0	$32,656	HDR|CB Estimated Quantity
93	rchitectura	Fire protection control room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
94	rchitectura	Fire Protection Elect Equip & Cable Spreading Room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity

2 x 1 GE 7F7 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
95	rchitectura	Fire Protection GSU and Aux Transformers	1.0	ls	Sub	Contr	200,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	200,000	$200,000	HDR|CB Estimated Quantity
96	rchitectura	Fire Protection Turbine Building	1.0	ls	Sub	Contr	600,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
97	rchitectura	Fire Detection/Alarm	1.0	lot	Contr	Contr	410,000.00	1000	50.09	1,000	1.09	0	410,000	NO	0	54,352	1,085	464,352	0	$464,352	HDR|CB Estimated Quantity
98	rchitectura	HVAC System Allowance	1.0	ls	Sub	Contr	750,000.00		54.96	0	1.09	0	0	YES	22,500	0	0	0	750,000	$750,000	HDR|CB Estimated Quantity
99	rchitectura	Interior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
100	rchitectura	Masonry Walls 8" CMU	20,000.0	sf	Contr	Contr	4.00	0.15	32.95	3,000	1.09	0	80,000	yes	4,800	107,267	3,255	187,267	0	$187,267	HDR|CB Estimated Quantity
101	rchitectura	Overhead Rolling Doors - steel	4.0	ea	Contr	Contr	5,000.00	40	38.68	160	1.09	0	20,000	yes	1,200	6,715	174	26,715	0	$26,715	HDR|CB Estimated Quantity
102	rchitectura	Painting - equipment and piping	1.0	lot	Contr	Contr	100,000.00	3600	36.36	3,600	1.09	0	100,000	yes	6,000	142,016	3,906	242,016	0	$242,016	HDR|CB Estimated Quantity
103	rchitectura	Painting - structural steel, grating, handrail touch-up	250,000.0	sf	Contr	Contr	0.30	0.010	36.36	2,500	1.09	0	75,000	yes	4,500	98,622	2,713	173,622	0	$173,622	HDR|CB Estimated Quantity
104	rchitectura	Painting - turbine room floor epoxy finish	40,000.0	sf	Contr	Contr	0.80	0.045	36.36	1,805	1.09	0	32,000	yes	1,920	71,197	1,958	103,197	0	$103,197	HDR|CB Estimated Quantity
105	rchitectura	Restrooms, showers, locker rooms	1.0	lot	Contr	Contr	125,000.00	1200	53.33	1,200	1.09	0	125,000	YES	7,500	69,438	1,302	194,438	0	$194,438	HDR|CB Estimated Quantity
106	rchitectura	Roof Drains	1,700.0	lf	Contr	Contr	32.50	2.0	54.96	3,400	1.09	0	55,250	yes	3,315	202,758	3,689	258,008	0	$258,008	HDR|CB Estimated Quantity
107	rchitectura	Structural Steel - Misc Building Steel	25.0	ton	Contr	Contr	3,200.00	30	60.25	750	1.09	0	80,000	yes	4,800	49,026	814	129,026	0	$129,026	HDR|CB Estimated Quantity
108	rchitectura	Structural Steel - Pipe Rack	600.0	ton	Contr	Contr	3,400.00	20	60.25	12,000	1.09	0	2,040,000	NO	0	784,409	13,020	2,824,409	0	$2,824,409	HDR|CB Estimated Quantity
109	rchitectura	Structural Steel - Misc Platforms	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	NO	0	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
110	rchitectura	Structural Steel - Turbine Building Framing	500.0	ton	Contr	Contr	2,850.00	15	60.25	7,500	1.09	0	1,425,000	NO	0	490,255	8,138	1,915,255	0	$1,915,255	HDR|CB Estimated Quantity
111	rchitectura	Trench Floor Drain Cover	2,000.0	lf	Contr	Contr	60.45	0.4	54.96	800	1.09	0	120,900	yes	7,254	47,708	868	168,608	0	$168,608	HDR|CB Estimated Quantity
112	rchitectura	Turbine Building Built-up Roof	18,000.0	sf	Contr	Contr	0.75	0.035	35.31	630	1.09	0	13,500	NO	0	24,138	684	37,638	0	$37,638	HDR|CB Estimated Quantity
113	rchitectura	Turbine Building Metal Siding	52,900.0	sf	Contr	Contr	10.40	0.05	56.41	2,645	1.09	0	550,160	NO	0	161,876	2,870	712,036	0	$712,036	HDR|CB Estimated Quantity
114	rchitectura	Administration/Control/Maintenance Building	16,000.0	sf	Sub	Contr	140.00		38.68	0	1.09	0	0	YES	0	0	0	0	2,240,000	$2,240,000	HDR|CB Estimated Quantity
115	rchitectura	Cooling Tower, pre-engineered - Elect, Chem feed, I&C Bldg	3,000.0	sf	Sub	Contr	80.00		59.59	0	1.09	0	0	NO	0	0	0	0	240,000	$240,000	HDR|CB Estimated Quantity
116	rchitectura	Main Gate Guard House	80.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	YES	0	0	0	0	6,400	$6,400	HDR|CB Estimated Quantity
117	rchitectura	Auxilary Boiler Building	4,000.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	440,000	$440,000	HDR|CB Estimated Quantity
118	rchitectura	Water Treatment Building	0.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
119	rchitectura	Warehouse	8,000.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	NO	0	0	0	0	640,000	$640,000	HDR|CB Estimated Quantity
120	rchitectura	Boiler Feed Pump Buildings	2.0	ea	sub	Contr	300,000.00		38.68	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
121																					
122		**Division #3 - Architectural Sub-Total**								**43,138**	**1.05**	**0**	**5,385,510**		**75,471**	**2,426,063**	**46,805**	**7,811,573**	**5,766,400**	**$13,577,973**	
123																					
124	**Division #4.0 - Mechanical Piping**																				
125	**Division #4.1 - Mechanical Piping**																				
126																					
127	hanical Pip	Pipe - MS, HR, CR, BFW, LPS	**3,590.0**	lf																	
128	hanical Pip	- System - Cold Reheat (Carbon)	800.0	lf	Contr	Contr	3,224.00	7.2	54.96	5,790	1.09	0	2,579,200	NO	0	345,308	6,283	2,924,508	0	$2,924,508	HDR|CB Estimated Quantity
129	hanical Pip	- System - Feedwater (Carbon)	650.0	lf	Contr	Contr	980.00	5.6	54.96	3,666	1.09	0	637,000	NO	0	218,620	3,978	855,620	0	$855,620	HDR|CB Estimated Quantity
130	hanical Pip	- System - Hot Reheat (Alloy)	540.0	lf	Contr	Contr	3,930.00	14.4	54.96	7,766	1.09	0	2,122,200	NO	0	463,139	8,426	2,585,339	0	$2,585,339	HDR|CB Estimated Quantity
131	hanical Pip	- System - Main Steam (Alloy)	800.0	lf	Contr	Contr	4,315.00	14.4	54.96	11,506	1.09	0	3,452,000	NO	0	686,131	12,484	4,138,131	0	$4,138,131	HDR|CB Estimated Quantity
132	hanical Pip	- System - Low Pressure Steam Steam (Alloy)	800.0	lf	Contr	Contr	246.00	7.5	54.96	6,016	1.09	0	196,800	NO	0	358,762	6,527	555,562	0	$555,562	HDR|CB Estimated Quantity
133	hanical Pip	Pipe - Above Ground - Large Bore Average "	**29,610.0**	lf																	
134	hanical Pip	- System - Boilers, Vents and Drains	700.0	lf	Contr	Contr	300.00	4.14	54.96	2,895	1.09	0	210,000	NO	0	172,654	3,141	382,654	0	$382,654	HDR|CB Estimated Quantity
135	hanical Pip	- System - Aux steam drain returns	2,500.0	lf	Contr	Contr	30.00	1.22	54.96	3,055	1.09	0	75,000	NO	0	182,184	3,315	257,184	0	$257,184	HDR|CB Estimated Quantity
136	hanical Pip	- System - Building drains	1,350.0	lf	Contr	Contr	30.00	1.22	54.96	1,650	1.09	0	40,500	YES	2,430	98,379	1,790	138,879	0	$138,879	HDR|CB Estimated Quantity
137	hanical Pip	- System - Building fire protection	5,800.0	lf	Contr	Contr	18.00	1.50	54.96	8,723	1.09	0	104,400	YES	6,264	520,204	9,465	624,604	0	$624,604	HDR|CB Estimated Quantity
138	hanical Pip	- System - Building sump pumps	800.0	lf	Contr	Contr	47.00	1.55	54.96	1,241	1.09	0	37,600	YES	2,256	73,995	1,346	111,595	0	$111,595	HDR|CB Estimated Quantity
139	hanical Pip	- System - Circulating Water	1,000.0	lf	Contr	Contr	450.00	4.70	54.96	4,700	1.09	0	450,000	NO	0	280,282	5,100	730,282	0	$730,282	HDR|CB Estimated Quantity
140	hanical Pip	- System - Condensate	1,350.0	lf	Contr	Contr	190.00	2.35	54.96	3,173	1.09	0	256,500	NO	0	189,191	3,442	445,691	0	$445,691	HDR|CB Estimated Quantity
141	hanical Pip	- System - Condenser Air Extraction	300.0	lf	Contr	Contr	184.00	2.35	54.96	705	1.09	0	55,200	NO	0	42,042	765	97,242	0	$97,242	HDR|CB Estimated Quantity
142	hanical Pip	- System - Cooling water	600.0	lf	Contr	Contr	320.00	2.63	54.96	1,579	1.09	0	192,000	NO	0	94,175	1,713	286,175	0	$286,175	HDR|CB Estimated Quantity
143	hanical Pip	- System - Demineralized water	400.0	lf	Contr	Contr	27.00	0.39	54.96	154	1.09	0	10,800	NO	0	9,193	167	19,993	0	$19,993	HDR|CB Estimated Quantity
144	hanical Pip	- System - Fire Protection	300.0	lf	Contr	Contr	150.00	2.35	54.96	705	1.09	0	45,000	YES	2,700	42,042	765	87,042	0	$87,042	HDR|CB Estimated Quantity
145	hanical Pip	- System - Natural Gas High Pressure - SS	260.0	lf	Contr	Contr	52.40	0.85	54.96	220	1.09	0	13,624	YES	817	13,117	239	26,741	0	$26,741	HDR|CB Estimated Quantity
146	hanical Pip	- System - Potable water	1,000.0	lf	Contr	Contr	18.00	1.50	54.96	1,504	1.09	0	18,000	YES	1,080	89,690	1,632	107,690	0	$107,690	HDR|CB Estimated Quantity
147	hanical Pip	- System - Sanitary waste	3,000.0	lf	Contr	Contr	47.00	1.55	54.96	4,653	1.09	0	141,000	YES	8,460	277,480	5,049	418,480	0	$418,480	HDR|CB Estimated Quantity
148	hanical Pip	- System - Service Water	1,000.0	lf	Contr	Contr	184.00	1.97	54.96	1,974	1.09	0	184,000	YES	11,040	117,719	2,142	301,719	0	$301,719	HDR|CB Estimated Quantity
149	hanical Pip	- System - STG lube oil	200.0	lf	Contr	Contr	32.00	1.11	54.96	222	1.09	0	6,400	NO	0	13,239	241	19,639	0	$19,639	HDR|CB Estimated Quantity
150	hanical Pip	- System - STG oil purification	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
151	hanical Pip	- System - STG Seal Oil	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
152	hanical Pip	- System - STG Stator cooling	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
153	hanical Pip	- System - STG Steam Seal	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
154	hanical Pip	- System - Turbine drains	690.0	lf	Contr	Contr	47.00	1.55	54.96	1,070	1.09	0	32,430	NO	0	63,820	1,161	96,250	0	$96,250	HDR|CB Estimated Quantity
155	hanical Pip	- System - HRSG Blowdown	200.0	lf	Contr	Contr	18.00	1.50	54.96	301	1.09	0	3,600	NO	0	17,938	326	21,538	0	$21,538	HDR|CB Estimated Quantity
156	hanical Pip	- System - Cycle Makeup	360.0	lf	Contr	Contr	47.00	1.55	54.96	558	1.09	0	16,920	NO	0	33,298	606	50,218	0	$50,218	HDR|CB Estimated Quantity
157	hanical Pip	- System - Miscellaneous Systems Piping CS)	6,600.0	lf	Contr	Contr	47.00	1.55	54.96	10,237	1.09	0	310,200	YES	18,612	610,455	11,107	920,655	0	$920,655	HDR|CB Estimated Quantity
158	hanical Pip	Pipe - Above Ground - Small Bore	**27,055.0**	lf																	
159	hanical Pip	- System - Water Cycle Sample - Alloy	150.0	lf	Contr	Contr	13.00	0.85	54.96	127	1.09	0	1,950	NO	0	7,568	138	9,518	0	$9,518	HDR|CB Estimated Quantity
160	hanical Pip	- System - STG lube oil	300.0	lf	Contr	Contr	11.60	0.62	54.96	186	1.09	0	3,480	NO	0	11,092	202	14,572	0	$14,572	HDR|CB Estimated Quantity
161	hanical Pip	- System - CT Auxilarie	1,800.0	lf	Contr	Contr	18.00	1.13	54.96	2,030	1.09	0	32,400	NO	0	121,082	2,203	153,482	0	$153,482	HDR|CB Estimated Quantity
162	hanical Pip	- System - Instrument Air	3,100.0	lf	Contr	Contr	8.00	0.14	54.96	437	1.09	0	24,800	NO	0	26,066	474	50,866	0	$50,866	HDR|CB Estimated Quantity
163	hanical Pip	- System - Instrument Air supply	3,000.0	lf	Contr	Contr	35.00	0.28	54.96	846	1.09	0	105,000	NO	0	50,451	918	155,451	0	$155,451	HDR|CB Estimated Quantity
164	hanical Pip	- System - Service Air piping	1,300.0	lf	Contr	Contr	12.00	0.22	54.96	281	1.09	0	15,600	YES	936	16,761	305	32,361	0	$32,361	HDR|CB Estimated Quantity
165	hanical Pip	- System - Instrument Air	2,035.0	lf	Contr	Contr	11.50	0.52	54.96	1,052	1.09	0	23,403	YES	1,404	62,741	1,142	86,144	0	$86,144	HDR|CB Estimated Quantity
166	hanical Pip	- System - Service Water	900.0	lf	Contr	Contr	20.00	1.32	54.96	1,184	1.09	0	18,000	YES	1,080	70,631	1,285	88,631	0	$88,631	HDR|CB Estimated Quantity
167	hanical Pip	- System - Cycle Chemical Feed	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
168	hanical Pip	- System - Boiler Vents & Drains - Alloy	700.0	lf	Contr	Contr	20.00	1.32	54.96	921	1.09	0	14,000	YES	840	54,935	1,000	68,935	0	$68,935	HDR|CB Estimated Quantity
169	hanical Pip	- System - (HP) Main Steam - Alloy	600.0	lf	Contr	Contr	20.00	1.32	54.96	790	1.09	0	12,000	YES	720	47,087	857	59,087	0	$59,087	HDR|CB Estimated Quantity
170	hanical Pip	- System - (LP) Steam - Carbon	1,400.0	lf	Contr	Contr	18.00	1.13	54.96	1,579	1.09	0	25,200	YES	1,512	94,175	1,713	119,375	0	$119,375	HDR|CB Estimated Quantity
171	hanical Pip	- System - Hot Reheat Steam - Alloy	650.0	lf	Contr	Contr	20.00	1.32	54.96	855	1.09	0	13,000	YES	780	51,011	928	64,011	0	$64,011	HDR|CB Estimated Quantity
172	hanical Pip	- System - Cold Reheat Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
173	hanical Pip	- System - Cycle Makeup	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
174	hanical Pip	- System - Aux Steam - Carbon	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
175	hanical Pip	- System - STG Seals and Drains - Alloy	1,400.0	lf	Contr	Contr	20.00	1.32	54.96	1,842	1.09	0	28,000	YES	1,680	109,871	1,999	137,871	0	$137,871	HDR|CB Estimated Quantity
176	hanical Pip	- System - CT System - Carbon	250.0	lf	Contr	Contr	18.00	1.13	54.96	282	1.09	0	4,500	YES	270	16,817	306	21,317	0	$21,317	HDR|CB Estimated Quantity
177	hanical Pip	- System - Hydrogen - Carbon	700.0	lf	Contr	Contr	12.35	1.03	54.96	724	1.09	0	8,645	YES	519	43,164	785	51,809	0	$51,809	HDR|CB Estimated Quantity
178	hanical Pip	- System - Carbon Dioxide - Carbon	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
179	hanical Pip	- System - Miscellaneous	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
180	hanical Pip	- System - Condensate - Carbon	400.0	lf	Contr	Contr	18.00	1.13	54.96	451	1.09	0	7,200	YES	432	26,907	490	34,107	0	$34,107	HDR|CB Estimated Quantity
181	hanical Pip	- System - Closed Cycle Cooling Water - Carbon	900.0	lf	Contr	Contr	12.35	1.03	54.96	931	1.09	0	11,115	YES	667	55,496	1,010	66,611	0	$66,611	HDR|CB Estimated Quantity
182	hanical Pip	- System - Fuel Gas - Carbon	900.0	lf	Contr	Contr	18.00	1.13	54.96	1,015	1.09	0	16,200	YES	972	60,541	1,101	76,741	0	$76,741	HDR|CB Estimated Quantity
183	hanical Pip	- System - Condensed Air Extraction - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
184	hanical Pip	- System - CW Chemical Feed - Carbon	20.0	lf	Contr	Contr	18.00	1.13	54.96	23	1.09	0	360	YES	22	1,345	24	1,705	0	$1,705	HDR|CB Estimated Quantity
185	hanical Pip	- System - Nitrogen Gas System	200.0	lf	Contr	Contr	19.00	0.19	54.96	38	1.09	0	3,800	YES	228	2,242	41	6,042	0	$6,042	HDR|CB Estimated Quantity

2 x 1 GE 7F7 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
186	hanical Pip	- System - Waste Water Coll & Treatment - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
187	hanical Pip	- System - Chemical Waste Treatment	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
188	hanical Pip	- System - Miscellaneous Systems Piping	4,400.0	lf	Contr	Contr	12.35	1.03	54.96	4,550	1.09	0	54,340	YES	3,260	271,313	4,936	325,653	0	$325,653	HDR|CB Estimated Quantity
189	hanical Pip	Pipe - Below Ground - Large Bore	**22,665.0**	lf																	
190	hanical Pip	- System - Hydrogen	470.0	lf	Contr	Contr	20.00	0.71	54.96	331	1.09	0	9,400	NO	0	19,760	360	29,160	0	$29,160	HDR|CB Estimated Quantity
191	hanical Pip	- System - Fuel Gas	800.0	lf	Contr	Contr	170.00	1.97	54.96	1,579	1.09	0	136,000	NO	0	94,175	1,713	230,175	0	$230,175	HDR|CB Estimated Quantity
192	hanical Pip	- System - Main Circ. - HDPE	400.0	lf	Contr	Contr	15.00	1.13	54.96	451	1.09	0	6,000	NO	0	26,907	490	32,907	0	$32,907	HDR|CB Estimated Quantity
192	hanical Pip	- System - Miscellaneous Systems Piping - HDPE	7,840.0	lf	Contr	Contr	15.00	1.13	54.96	8,844	1.09	0	117,600	NO	0	527,379	9,595	644,979	0	$644,979	HDR|CB Estimated Quantity
193	hanical Pip	- System - Waste Water Treatment Piping - HDPE (Sch 17)	2,565.0	lf	Contr	Contr	6.00	0.66	54.96	1,688	1.09	0	15,390	NO	0	100,649	1,831	116,039	0	$116,039	HDR|CB Estimated Quantity
193	hanical Pip	- System - Sanitary Sewer	3,000.0	lf	Contr	Contr	15.00	1.13	54.96	3,384	1.09	0	45,000	NO	0	201,803	3,672	246,803	0	$246,803	HDR|CB Estimated Quantity
194	hanical Pip	- System - Natural Gas Low Pressure - CS	850.0	lf	Contr	Contr	30.00	1.22	54.96	1,039	1.09	0	25,500	NO	0	61,942	1,127	87,442	0	$87,442	HDR|CB Estimated Quantity
195	hanical Pip	- System - Natural Gas High Pressure - CS	500.0	lf	Contr	Contr	30.00	1.22	54.96	611	1.09	0	15,000	NO	0	36,437	663	51,437	0	$51,437	HDR|CB Estimated Quantity
196	hanical Pip	- System - Potable Water to site facilities	500.0	lf	Contr	Contr	47.00	1.55	54.96	776	1.09	0	23,500	NO	0	46,247	841	69,747	0	$69,747	HDR|CB Estimated Quantity
197	hanical Pip	- System - Cooling tower blowdown	1,160.0	lf	Contr	Contr	115.00	1.69	54.96	1,963	1.09	0	133,400	NO	0	117,046	2,130	250,446	0	$250,446	HDR|CB Estimated Quantity
198	hanical Pip	- System - Cooling tower makeup water Pipe	1,000.0	lf	Contr	Contr	115.00	1.69	39.54	1,692	1.09	0	115,000	NO	0	72,583	1,836	187,583	0	$187,583	HDR|CB Estimated Quantity
199	hanical Pip	Pipe - Below Ground - Small Bore	**790.0**	lf																	HDR|CB Estimated Quantity
200	hanical Pip	- System - Miscellaneous Systems Piping	790.0	lf	Contr	Contr	12.35	1.03	54.96	817	1.09	0	9,757	NO	0	48,713	886	58,470	0	$58,470	Based on 1-1/2" dia with 1 fitting per 20 ft.
201	hanical Pip	Circulating water 96" RCP	2,000.0	lf	Contr	Contr	636.00	7.52	54.96	15,040	1.09	0	1,272,000	NO	0	896,904	16,318	2,168,904	0	$2,168,904	HDR|CB Estimated Quantity
202	hanical Pip	Piping Non Destructive Examination	1.0	lot	Sub	Contr	75,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	75,000	$75,000	HDR|CB Estimated Quantity
203	hanical Pip	Steam Blows	1.0	lot	Sub	Contr	150,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	150,000	$150,000	HDR|CB Estimated Quantity
204	hanical Pip	Stress relieving LB Alloy	50.0	ea	Contr	Contr	1,500.00	80.00	54.96	4,000	1.09	0	75,000	NO	0	238,538	4,340	313,538	0	$313,538	HDR|CB Estimated Quantity
205																					
206		**Division #4.1 - Mechanical Piping Sub-Total**	**83,710.0**	**LF**						149,860		0	13,665,968		70,424	8,908,523	162,598	22,574,491	225,000	$22,799,491	
207																					
208	**Division #4.2 - Mechanical Valves**																				
209																					
210	hanical Va	Valves - Large Bore General Service	500.0	ea	Contr	Contr	636.00	16.92	54.96	8,460	1.09	0	318,000	NO	0	504,508	9,179	822,508	0	$822,508	HDR|CB Estimated Quantity
211	hanical Va	Valves - Large Bore HP 900# to 3800#	100.0	ea	Contr	Contr	6,750.00	56.4	54.96	5,640	1.09	0	675,000	NO	0	336,339	6,119	1,011,339	0	$1,011,339	HDR|CB Estimated Quantity
212	hanical Va	Valves - Large Bore LP Circ Water	4.0	ea	Contr	Contr	197,500.00	112.8	54.96	451	1.09	0	790,000	NO	0	26,907	490	816,907	0	$816,907	HDR|CB Estimated Quantity
213	hanical Va	Valves - Small Bore - I/A supply	100.0	ea	Contr	Contr	17.50	1.88	54.96	188	1.09	0	1,750	NO	0	11,211	204	12,961	0	$12,961	HDR|CB Estimated Quantity
214	hanical Va	Valves - Small Bore - Instrument piping	500.0	ea	Contr	Contr	270.00	1.88	54.96	940	1.09	0	135,000	NO	0	56,056	1,020	191,056	0	$191,056	HDR|CB Estimated Quantity
215	hanical Va	Valves - Small Bore Bronze	40.0	ea	Contr	Contr	480.00	2.82	54.96	113	1.09	0	19,200	NO	0	6,727	122	25,927	0	$25,927	HDR|CB Estimated Quantity
216	hanical Va	Valves - Small Bore Class 800	250.0	ea	Contr	Contr	305.00	2.82	54.96	705	1.09	0	76,250	NO	0	42,042	765	118,292	0	$118,292	HDR|CB Estimated Quantity
217	hanical Va	Valves - Small Bore HP 1500# Alloy & CS	150.0	ea	Contr	Contr	670.00	15.04	54.96	2,256	1.09	0	100,500	NO	0	134,536	2,448	235,036	0	$235,036	HDR|CB Estimated Quantity
218	hanical Va	Valves - Small Bore HP 3800# Alloy	30.0	ea	Contr	Contr	3,050.00	22.56	54.96	677	1.09	0	91,500	NO	0	40,361	734	131,861	0	$131,861	HDR|CB Estimated Quantity
219	hanical Va	Valves - By Pass	1.0	ea	Contr	Contr	1,250,000.00	75.2	54.96	75	1.09	0	1,250,000	NO	0	4,485	82	1,254,485	0	$1,254,485	HDR|CB Estimated Quantity
220																					
221																					
222		**Division #4.2 - Mechanical Valves Sub-Total**	**1,675.0**	**ea**						19,505		$0	3,457,200		0	1,163,172	21,163	4,620,372	0	$4,620,372	
223																					
224	**Division #4.3 - Mechanical Insulation & Coatings**																				
225																					
226	Insulation	Insulation - BOP Equipment	16,000.0	sf	Contr	Contr	15.00	0.5	46.60	8,000	1.09	0	240,000	NO	0	404,462	8,680	644,462	0	$644,462	HDR|CB Estimated Quantity
227	Insulation	Insulation - Piping Freeze Protection	2,000.0	lf	Contr	Contr	3.50	0.2	46.60	400	1.09	0	7,000	NO	0	20,223	434	27,223	0	$27,223	HDR|CB Estimated Quantity
228	Insulation	Insulation - Piping Large Bore BOP	7,460.0	lf	Contr	Contr	15.00	0.5	46.60	3,730	1.09	0	111,900	NO	0	188,580	4,047	300,480	0	$300,480	HDR|CB Estimated Quantity
229	Insulation	Insulation - Piping Large Bore High Temp	3,590.0	lf	Contr	Contr	50.00	1.5	46.60	5,385	1.09	0	179,500	NO	0	272,253	5,843	451,753	0	$451,753	HDR|CB Estimated Quantity
230	Insulation	Insulation - Piping Small Bore	23,720.0	lf	Contr	Contr	8.00	0.23	46.60	5,456	1.09	0	189,760	NO	0	275,823	5,919	465,583	0	$465,583	HDR|CB Estimated Quantity
231																					
232																					
233		**Division #4.3 - Mechanical Insulation & Coatings Sub-Total**								22,971		0	728,160		0	1,161,341	24,923	1,889,501	0	$1,889,501	
234																					
235																					
236	**Division #4.4 - Mechanical Engineered Pipe Hangers (Including Supplemental Support Steel)**																				
237																					
238	anical Pipe H	Hangers & Supports - (Large Bore Engineered)	200	ea	Contr	Contr	1,760.00	12.5	54.96	2,502	1.09	0	352,311	NO	0	149,218	2,715	501,529	0	$501,529	HDR|CB Estimated Quantity
239	anical Pipe H	Hangers & Supports - (Large Bore Rigid)	1558	ea	Contr	Contr	192.50	7.1	54.96	11,065	1.09	0	299,996	NO	0	659,844	12,005	959,840	0	$959,840	HDR|CB Estimated Quantity
240	anical Pipe H	Hangers & Supports - (Small Bore Rigid)	1933	ea	Contr	Contr	88.00	1.5	54.96	2,899	1.09	0	170,060	NO	0	172,866	3,145	342,926	0	$342,926	HDR|CB Estimated Quantity
241																					
242		**Division #4.4 - Mechanical Engineered Pipe Hangers Sub-Total**								16,466		0	822,367		0	981,928	17,865	1,804,294	0	$1,804,294	
243																					
244	**Division #4.5 - Mechanical Accessories**																				
245																					
246	nical Acces	Instr. Air Supply filter regulators	40.0	ea	Contr	Contr	132.00	2.4	54.96	96	1.09	0	5,280	NO	0	5,725	104	11,005	0	$11,005	HDR|CB Estimated Quantity
247	nical Acces	Expansion Joints - Circ Water	2.0	ea	Contr	Contr	75,000.00	210	54.96	420	1.09	0	150,000	NO	0	25,047	456	175,047	0	$175,047	HDR|CB Estimated Quantity
248	nical Acces	Miscellaneous Specialties	1.0	lot	Contr	Contr	75,000.00	600	54.96	600	1.09	0	75,000	NO	0	35,781	651	110,781	0	$110,781	HDR|CB Estimated Quantity
249	nical Acces	Miscellaneous Strainers, traps, Exp Joints	1.0	ls	Contr	Contr	125,000.00	120	54.96	120	1.09	0	125,000	NO	0	7,156	130	132,156	0	$132,156	HDR|CB Estimated Quantity
250	nical Acces	Miscellaneous Trolleys & Hoists	1.0	ls	Contr	Contr	150,000.00	480	54.96	480	1.09	0	150,000	NO	0	28,625	521	178,625	0	$178,625	HDR|CB Estimated Quantity
251																					
252		**Division #4.5 - Mechanical Accessories Sub-Total**								1,716		0	505,280		0	102,333	1,862	607,613	0	$607,613	
253																					
254		**Division #4 - Mechanical Piping**								**210,517**		**0**	**19,178,975**		**70,424**	**12,317,297**	**228,411**	**31,496,271**	**225,000**	**$31,721,271**	
255																					
256	**Division #5.0 - Mechanical Equipment**																				
257																					
258	**Division #5.1 - Boiler Equipment**																				
259																					
260	HRSG	Heat Recovery Steam Generator with Duct Burner/CO/Penthouse	2.0	ea	Contr	Contr	28,800,000.00		69.04	0	1.09	0	57,600,000	NO	0	0	0	57,600,000	0	$57,600,000	OEM Bidget Proposal
261	HRSG	Steam Generator Erection	2.0	ea	Contr	Contr		82,000	69.04	164,000	1.09	0	0	NO	0	12,285,648	177,940	12,285,648	0	$12,285,648	HDR|CB Estimated cost
262																					
263		**Division #5.1 - Boiler Equipment Sub-Total**								**164,000**		**0**	**57,600,000**		**0**	**12,285,648**	**177,940**	**69,885,648**	**0**	**$69,885,648**	
264																					
265	**Division #5.2 - Turbine Equipment**																				
266																					
267	STG	Steam Turbine Generator	1.0	ea	Contr	Contr	42,000,000.00		53.33	0	1.09	0	42,000,000	NO	0	0	0	42,000,000	0	$42,000,000	Recent Vender quote
268	STG	Steam Turbine Generator, Erection	1.0	ea	Contr	Contr		24,800	53.33	24,800	1.09	0	0	NO	0	1,435,050	26,908	1,435,050	0	$1,435,050	HDR|CB Estimated cost
269																					
270		**Division #5.2 - Turbine Equipment Sub-Total**								**24,800**		**0**	**42,000,000**		**0**	**1,435,050**	**26,908**	**43,435,050**	**0**	**43,435,050**	
271																					
272	**Division #5.3 - Not Used**																				
273																					

Estimate Details

2 x 1 GE 7F7 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
274	**Division #5.4 - Mechanical Draft Cooling Tower**																				
275																					
276	Cooling Tw	Cooling Tower - Mechanical Draft (F&E)	1.0	Is	Sub	Contr	6,680,000.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	6,680,000	$6,680,000	Recent Vender quote
277																					
278		**Division #5.4 - Mechanical Draft Cooling Tower Sub-Total**								**0**		**0**	**0**		**0**	**0**	**0**	**0**	**6,680,000**	**6,680,000**	
279																					
280	**Division #5.5 - Combustion Turbine Equipment**																				
281																					
282	CT	Combustion Turbine	2.0	ea	Contr	Contr	66,100,000.00		53.33	0	1.09	0	132,200,000	NO	0	0	0	132,200,000	0	$132,200,000	OEM Bidget Proposal
283	CT	Combustion Turbine, Installation	2.0	ea	Contr	Contr		37,000	53.33	74,000	1.09	0	0	NO	0	4,282,005	80,290	4,282,005	0	$4,282,005	HDR|CB Estimated cost
284																					
285																					
286		**Division #5.4 - Combustion Turbine Equipment Sub-Total**								**74,000**		**0**	**132,200,000**		**0**	**4,282,005**	**80,290**	**136,482,005**	**0**	**136,482,005**	
287																					
288	**Division #5.6 - BOP Mechanical Equipment**																				
289																					
290	Equipment	Blowdown Tank	4.0	ea	Contr	Contr	16,600.00	20	54.96	80	1.09	0	66,400	NO	0	4,771	87	71,171	0	$71,171	HDR|CB Estimated cost
291	Equipment	Closed Cooling Water Exchanger	2.0	ea	Contr	Contr	1,039,500.00	300	54.96	600	1.09	0	2,079,000	NO	0	35,781	651	2,114,781	0	$2,114,781	HDR|CB Estimated cost
292	Equipment	Closed Cooling Water Inhibitor Mixing Pot	1.0	ea	Contr	Contr	3,000.00	8	54.96	8	1.09	0	3,000	NO	0	477	9	3,477	0	$3,477	HDR|CB Estimated cost
293	Equipment	Closed Cooling Water (CCW) Heat Exchanger Strainer (Shell & Tube	2.0	ea	Contr	Contr	34,000.00	10	54.96	20	1.09	0	68,000	NO	0	1,193	22	69,193	0	$69,193	HDR|CB Estimated cost
294	Equipment	Instrument Air Receivers	2.0	ea	Contr	Contr	5,000.00	44	54.96	88	1.09	0	10,000	NO	0	5,248	95	15,248	0	$15,248	HDR|CB Estimated cost
295	Equipment	Main Condenser	1.0	ea	Contr	Contr	5,500,000.00	9000	65.52	9,000	1.09	0	5,500,000	NO	0	639,756	9,765	6,139,756	0	$6,139,756	Recent Vender quote
296	Equipment	Oil/Water Separator	1.0	ea	Contr	Contr	50,000.00	244	54.96	244	1.09	0	50,000	NO	0	14,551	265	64,551	0	$64,551	HDR|CB Estimated cost
297	Equipment	Plant Air Compressors	2.0	ea	Contr	Contr	140,000.00	100	54.96	200	1.09	0	280,000	NO	0	11,927	217	291,927	0	$291,927	HDR|CB Estimated cost
298	Equipment	Plant Air Dryers	2.0	ea	Contr	Contr	30,000.00	100	54.96	200	1.09	0	60,000	NO	0	11,927	217	71,927	0	$71,927	HDR|CB Estimated cost
299	Equipment	Plant Air Receivers	2.0	ea	Contr	Contr	5,000.00	20	54.96	40	1.09	0	10,000	NO	0	2,385	43	12,385	0	$12,385	HDR|CB Estimated cost
302	Equipment	Pumps - Circulating Water	2.0	ea	Contr	Contr	930,000.00	500	54.96	1,000	1.09	0	1,860,000	NO	0	59,635	1,085	1,919,635	0	$1,919,635	HDR|CB Estimated cost
303	Equipment	Pumps - Auxiliary Cooling Water	1.0	ea	Contr	Contr	120,000.00	96	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
304	Equipment	Pumps - Closed Cooling Water	2.0	ea	Contr	Contr	134,000.00	200	53.33	400	1.09	0	268,000	NO	0	23,146	434	291,146	0	$291,146	HDR|CB Estimated cost
306	Equipment	Pumps - Boiler Feed	2.0	ea	Contr	Contr	825,000.00	1200	53.33	2,400	1.09	0	1,650,000	NO	0	138,876	2,604	1,788,876	0	$1,788,876	HDR|CB Estimated cost
307	Equipment	Pumps - Condensate	2.0	ea	Contr	Contr	250,000.00	200	53.33	400	1.09	0	500,000	NO	0	23,146	434	523,146	0	$523,146	HDR|CB Estimated cost
308	Equipment	Pumps - Service water	2.0	ea	Contr	Contr	160,000.00	210	53.33	420	1.09	0	320,000	NO	0	24,303	456	344,303	0	$344,303	HDR|CB Estimated cost
309	Equipment	Pumps - Fire Water (Electric and Diesel)	0.0	lt	Contr	Contr	500,000.00	310	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
310	Equipment	Pumps - Sump - Blowdown, Waste Water	2.0	ea	Contr	Contr	30,000.00	24	53.33	48	1.09	0	60,000	NO	0	2,778	52	62,778	0	$62,778	HDR|CB Estimated cost
311	Equipment	Pumps - Sump - Power Island Misc Building Sumps	6.0	ea	Contr	Contr	30,000.00	24	53.33	144	1.09	0	180,000	NO	0	8,333	156	188,333	0	$188,333	HDR|CB Estimated cost
314	Equipment	Pumps - Demin Water Transfer	2.0	ea	Contr	Contr	66,000.00	48	53.33	96	1.09	0	132,000	NO	0	5,555	104	137,555	0	$137,555	HDR|CB Estimated cost
318	Equipment	Pumps - Treated Water Transfer to Serv Water Tank	2.0	ea	Contr	Contr	40,000.00	80	53.33	160	1.09	0	80,000	NO	0	9,258	174	89,258	0	$89,258	HDR|CB Estimated cost
319	Equipment	Pumps - Waste Water	2.0	ea	Contr	Contr	80,000.00	125	53.33	250	1.09	0	160,000	NO	0	14,466	271	174,466	0	$174,466	HDR|CB Estimated cost
320	Equipment	Pumps - Evaporative Cooling Water	2.0	ea	Contr	Contr	37,000.00	80	53.33	160	1.09	0	74,000	NO	0	9,258	174	83,258	0	$83,258	HDR|CB Estimated cost
321	Equipment	Sample Analysis Panel (water)	2.0	ea	Contr	Contr	200,000.00	139	54.96	278	1.09	0	400,000	NO	0	16,578	302	416,578	0	$416,578	HDR|CB Estimated cost
322	Equipment	Tank - 200,000 gal treated water/service water - (F&E)	0.0	ea	Sub	Contr	540,000.00	0		0	1.09	0	0	yes	0	0	0	0	0	$0	Furnish and Erect price
323	Equipment	Tank - Demin Water Storage 200,000 gal. (F&E)	1.0	ea	Sub	Contr	600,000.00	0		0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	Furnish and Erect Price
324	Equipment	Tank - Turbine Drains	2.0	ea	Contr	Contr	75,000.00	200	53.33	400	1.09	0	150,000	NO	0	23,146	434	173,146	0	$173,146	HDR|CB Estimated cost
325	Equipment	Tank - Closed Cooling Water Dispersant 10,000 gal.	1.0	ea	Contr	Contr	36,500.00	100	54.96	100	1.09	0	36,500	NO	0	5,963	109	42,463	0	$42,463	HDR|CB Estimated cost
326	Equipment	Tank - Closed Cooling Water Accumulator	1.0	ea	Contr	Contr	20,600.00	44	54.96	44	1.09	0	20,600	NO	0	2,624	48	23,224	0	$23,224	HDR|CB Estimated cost
329	Equipment	Aqueous Ammonia System Unloading, Storage Tank, Forwarding Pu	0.0	ea	Contr	Contr	0.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
331	Equipment	Auxiliary Boiler System	1.0	ea	Contr	Contr	1,600,000.00	400	53.33	400	1.09	0	1,600,000	NO	0	23,146	434	1,623,146	0	$1,623,146	HDR|CB Estimated cost
332	Equipment	Compressed Gas Storage System (CO2)	1.0	ea	Contr	Contr	40,000.00	475	54.96	475	1.09	0	40,000	NO	0	28,326	515	68,326	0	$68,326	HDR|CB Estimated cost
333	Equipment	Compressed Gas Storage System (H2)	1.0	ea	Contr	Contr	40,000.00	198	54.96	198	1.09	0	40,000	NO	0	11,808	215	51,808	0	$51,808	HDR|CB Estimated cost
334	Equipment	Compressed Gas Storage System (N2)	2.0	ea	Contr	Contr	20,000.00	370	54.96	740	1.09	0	40,000	NO	0	44,130	803	84,130	0	$84,130	HDR|CB Estimated cost
335	Equipment	Demineralized Water Treatment System Dual 100% Trains	0.0	ea	Contr	Contr	1,197,000.00	4000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
336	Equipment	Condensate Polisher and Related	1.0	ea	Contr	Contr	1,000,000.00	3600	54.96	3,600	1.09	0	1,000,000	NO	0	214,684	3,906	1,214,684	0	$1,214,684	HDR|CB Estimated cost
337	Equipment	Fuel Gas Filter Separators	2.0	ea	Contr	Contr	210,000.00	200	54.96	400	1.09	0	420,000	NO	0	23,854	434	443,854	0	$443,854	Sub Budgetary Quote
338	Equipment	Fuel Gas Performance Heater	2.0	ea	Contr	Contr	761,600.00	300	54.96	600	1.09	0	1,523,200	NO	0	35,781	651	1,558,981	0	$1,558,981	Sub Budgetary Quote
339	Equipment	Fuel Gas Electric Startup Heater	2.0	ea	Contr	Contr	84,000.00	40	54.96	80	1.09	0	168,000	NO	0	4,771	87	172,771	0	$172,771	HDR|CB Estimated cost
340	Equipment	Fuel Gas Drain Tank	2.0	ea	Contr	Contr	2,000.00	15	54.96	30	1.09	0	4,000	NO	0	1,789	33	5,789	0	$5,789	HDR|CB Estimated cost
341	Equipment	Fuel Gas Dewpoint Heater	1.0	ea	Contr	Contr	476,000.00	80	54.96	80	1.09	0	476,000	NO	0	4,771	87	480,771	0	$480,771	HDR|CB Estimated cost
342	Equipment	Fuel Gas Scrubber	1.0	ea	Contr	Contr	392,000.00	60	54.96	60	1.09	0	392,000	NO	0	3,578	65	395,578	0	$395,578	HDR|CB Estimated cost
343	Equipment	Hydrogen Generator	1.0	ea	Contr	Contr	194,000.00	40	54.96	40	1.09	0	194,000	NO	0	2,385	43	196,385	0	$196,385	HDR|CB Estimated cost
344	Equipment	Steam Silencers	1.0	ea	Contr	Contr	150,000.00	20	54.96	20	1.09	0	150,000	NO	0	1,193	22	151,193	0	$151,193	HDR|CB Estimated cost
345	Equipment	Condensate Water Strainer	1.0	ea	Contr	Contr	150,000.00	40	54.96	40	1.09	0	150,000	NO	0	2,385	43	152,385	0	$152,385	HDR|CB Estimated cost
346	Equipment	Cycle Chem Feed	1.0	ea	Contr	Contr	200,000.00	100	54.96	100	1.09	0	200,000	NO	0	5,963	109	205,963	0	$205,963	HDR|CB Estimated cost
347	Equipment	Cooling Tower Chemical Feed	1.0	ea	Contr	Contr	250,000.00	300	54.96	300	1.09	0	250,000	NO	0	17,890	326	267,890	0	$267,890	HDR|CB Estimated cost
348	Equipment	Condeser Vaccum Pump/Air Removal Equipment	1.0	ea	Contr	Contr	350,000.00	40	54.96	40	1.09	0	350,000	NO	0	2,385	43	352,385	0	$352,385	HDR|CB Estimated cost
349	Equipment	Turbine Room Bridge Crane - 60T	1.0	ea	Contr	Contr	390,000.00	120	53.33	120	1.09	0	390,000	NO	0	6,944	130	396,944	0	$396,944	HDR|CB Estimated cost
350	Equipment	Elevator for 2 HRSG	1.0	ea	sub	contr	746,000.00	0		0	1.09	0	0	NO	0	0	0	0	746,000	$746,000	HDR|CB Estimated cost
351																					HDR|CB Estimated cost
352		**Division #5.6 BOP Mechanical Equipment Sub-Total**								**24,199**		**0**	**21,524,700**		**0**	**1,536,419**	**26,256**	**23,061,119**	**1,346,000**	**24,407,119**	
353																					
354	**Division #6.0 - Electrical Equipment**																				
355																					
356	Electrical	Eqpt - 24kv Bus Isolated Phase, 8000A	600.0	lf	Contr	Contr	750.00	8	50.09	4,800	1.09	0	450,000	NO	0	260,890	5,208	710,890	0	$710,890	
357	Electrical	Eqpt - 24kv Bus Isolated Phase, 9000A	300.0	lf	Contr	Contr	900.00	8	50.09	2,400	1.09	0	270,000	NO	0	130,445	2,604	400,445	0	$400,445	HDR|CB Estimated cost
358	Electrical	Eqpt - Bus 6.9kV non-seg	200.0	lf	Contr	Contr	510.00	4	50.09	800	1.09	0	102,000	NO	0	43,482	868	145,482	0	$145,482	HDR|CB Estimated cost
359	Electrical	Eqpt - Bus Duct 480V, 2500A	480.0	lf	Contr	Contr	610.00	3.2	50.09	1,536	1.09	0	292,800	NO	0	83,485	1,667	376,285	0	$376,285	HDR|CB Estimated cost
360	Electrical	Eqpt - Generator Breaker, 8000A, 24kV	3.0	ea	Contr	Contr	450,000.00	300	50.09	900	1.09	0	1,350,000	NO	0	48,917	977	1,398,917	0	$1,398,917	HDR|CB Estimated cost
361	Electrical	Eqpt - LV Switchgear - 480V, 4000A EO Main Ckt Bkr	6.0	ea	Contr	Contr	35,000.00	56	50.09	336	1.09	0	210,000	NO	0	18,262	365	228,262	0	$228,262	HDR|CB Estimated cost
362	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Main Ckt Bkr.	2.0	ea	Contr	Contr	15,400.00	30	50.09	60	1.09	0	30,800	NO	0	3,261	65	34,061	0	$34,061	HDR|CB Estimated cost
363	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Tie Ckt Bkr.	3.0	ea	Contr	Contr	15,400.00	30	50.09	90	1.09	0	46,200	NO	0	4,892	98	51,092	0	$51,092	HDR|CB Estimated cost
364	Electrical	Eqpt - LV Switchgear - 480V, 1200A EO Tie Ckt Bkr.	1.0	ea	Contr	Contr	10,780.00	26	50.09	26	1.09	0	10,780	NO	0	1,413	28	12,193	0	$12,193	HDR|CB Estimated cost
365	Electrical	Eqpt - LV Switchgear - 480V, 800A MO Fdr Ckt Bkr.	16.0	ea	Contr	Contr	4,575.00	22	50.09	352	1.09	0	73,200	NO	0	19,132	382	92,332	0	$92,332	HDR|CB Estimated cost
366	Electrical	Eqpt - LV Switchgear - 480V, 800A Equipped Space	6.0	ea	Contr	Contr	1,090.00	13.2	50.09	79	1.09	0	6,540	NO	0	4,305	86	10,845	0	$10,845	HDR|CB Estimated cost
367	Electrical	Eqpt - Motor Control Centers - 480V	16.0	ea	Contr	Contr	46,000.00	132	50.09	2,112	1.09	0	736,000	NO	0	114,792	2,292	850,792	0	$850,792	HDR|CB Estimated cost
368	Electrical	Eqpt - MV Switchgear - 7kV, 3000A Main Ckt Bkr.	1.00	ea	Contr	Contr	79,640.00	76	50.09	76	1.09	0	79,640	NO	0	4,131	82	83,771	0	$83,771	HDR|CB Estimated cost
369	Electrical	Eqpt - MV Switchgear - 7kV, 2000A Fdr Ckt Bkr.	2.00	ea	Contr	Contr	42,870.00	72	50.09	144	1.09	0	85,740	NO	0	7,827	156	93,567	0	$93,567	HDR|CB Estimated cost
370	Electrical	Eqpt - MV Switchgear - 7kV, 1200A Fdr Ckt Bkr.	20.00	ea	Contr	Contr	36,360.00	48	50.09	960	1.09	0	727,200	NO	0	52,178	1,042	779,378	0	$779,378	HDR|CB Estimated cost
371	Electrical	Eqpt - Relay panels and Metering	3.0	ea	Contr	Contr	34,500.00	120.00	50.09	360	1.09	0	103,500	NO	0	19,567	391	123,067	0	$123,067	HDR|CB Estimated cost
372	Electrical	Eqpt - Station Batteries 125 Volt DC/Charger	1.0	lot	Contr	Contr	350,000.00	635	50.09	635	1.09	0	350,000	NO	0	34,514	689	384,514	0	$384,514	HDR|CB Estimated cost
373	Electrical	Eqpt - Transformer GSU - 300 MVA, 18kV-345kV	2.0	ea	Contr	Contr	3,000,000.00	950	50.09	1,900	1.09	0	6,000,000	NO	0	103,269	2,062	6,103,269	0	$6,103,269	HDR|CB Estimated cost

Estimate Details

2 x 1 GE 7F7 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
374	Electrical	Eqpt - Transformer GSU - 415 MVA, 18kV-345kV	1.0	ea	Contr	Contr	4,400,000.00	950	50.09	950	1.09	0	4,400,000	NO	0	51,634	1,031	4,451,634	0	$4,451,634	HDR|CB Estimated cost
375	Electrical	Eqpt - Transformer UAT 33 MVA, 18kV/6.9kV	2.0	ea	Contr	Contr	900,000.00	650	50.09	1,300	1.09	0	1,800,000	NO	0	70,658	1,411	1,870,658	0	$1,870,658	HDR|CB Estimated cost
376	Electrical	Eqpt - Emergency Diesel Gnerator packaged 750kW	1.0	ea	Contr	Contr	200,000.00	100	50.09	100	1.09	0	200,000	NO	0	5,435	109	205,435	0	$205,435	HDR|CB Estimated cost
377	Electrical	Eqpt - UPS (120VAC)	1.0	ea	Contr	Contr	300,000.00	528	50.09	528	1.09	0	300,000	NO	0	28,698	573	328,698	0	$328,698	HDR|CB Estimated cost
378	Electrical	Eqpt - Transformer Aux Power 2.5/3.3MVA, 7kV-480V	4.0	ea	Contr	Contr	104,500.00	210	50.09	840	1.09	0	418,000	NO	0	45,656	911	463,656	0	$463,656	HDR|CB Estimated cost
379	Electrical	Eqpt - Lighting Transformers	8.0	ea	Contr	Contr	916.27	9.09	50.09	73	1.09	0	7,330	YES	440	3,953	79	11,283	0	$11,283	HDR|CB Estimated cost
380	Electrical	Eqpt - Panelboards 480/120 & 480/277/120	8.0	ea	Contr	Contr	1,200.00	40.00	50.09	320	1.09	0	9,600	YES	576	17,393	347	26,993	0	$26,993	HDR|CB Estimated cost
381	Electrical	Eqpt - Plant Network System	1.0	ea	Contr	Contr	100,000.00	300	50.09	300	1.09	0	100,000	YES	6,000	16,306	326	116,306	0	$116,306	HDR|CB Estimated cost
382	Electrical	Eqpt - Plant Security System	1.0	lot	Contr	Contr	250,000.00	1800	50.09	1,800	1.09	0	250,000	YES	15,000	97,834	1,953	347,834	0	$347,834	HDR|CB Estimated cost
383	Electrical	Eqpt - Plant Telephone System	1.0	ea	Contr	Contr	100,000.00	500	50.09	500	1.09	0	100,000	YES	6,000	27,176	543	127,176	0	$127,176	HDR|CB Estimated cost
384																					HDR|CB Estimated cost
385		**Division #6.0 - Electrical Equipment Sub-Total**								**24,277**		**0**	**18,509,330**		**28,016**	**1,319,501**	**26,340**	**19,828,831**	**0**	**19,828,831**	
386																					
387	**Division #6.1 - Electrical/Control Commodities**																				
388																					
389	Electrical	Grounding - Buried Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	
390	Electrical	Grounding - Above Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
391	Electrical	Grounding - Ground Rods Copper	96.0	ea	Contr	Contr	22.95	1.74	50.09	167	1.09	0	2,204	NO	0	9,079	181	11,283	0	$11,283	HDR|CB Estimated Quantity & Cost
392	Electrical	Grounding - Exothermic Connections	2,850.0	ea	Contr	Contr	9.75	1.14	50.09	3,249	1.09	0	27,788	NO	0	176,590	3,525	204,377	0	$204,377	HDR|CB Estimated Quantity & Cost
393	Electrical	Grounding - Servit Post	1,328.8	ea	Contr	Contr	30.00	1	50.09	1,107	1.09	0	39,864	NO	0	60,146	1,201	100,010	0	$100,010	HDR|CB Estimated Quantity & Cost
394	Electrical	Conduit A/G 5" RGS	1,000.0	lf	Contr	Contr	58.00	1.00	50.09	1,000	1.09	0	58,000	NO	0	54,352	1,085	112,352	0	$112,352	HDR|CB Estimated Quantity & Cost
395	Electrical	Conduit A/G 2" ave RGS	85,000.0	lf	Contr	Contr	8.50	0.30	50.09	25,500	1.09	0	722,500	NO	0	1,385,978	27,668	2,108,478	0	$2,108,478	HDR|CB Estimated Quantity & Cost
396	Electrical	Conduit U/G - 4 x 6 PVC 5"	8,000.0	lf	Contr	Contr	240.00	2.00	50.09	16,000	1.09	0	1,920,000	NO	0	869,633	17,360	2,789,633	0	$2,789,633	HDR|CB Estimated Quantity & Cost
397	Electrical	Conduit U/G - 8 x 8 PVC 5"	700.0	lf	Contr	Contr	530.00	5.00	50.09	3,500	1.09	0	371,000	NO	0	190,232	3,798	561,232	0	$561,232	HDR|CB Estimated Quantity & Cost
398	Electrical	Cable Tray, Raceway 24" Aluminum	5,200.0	lf	Contr	Contr	17.00	0.84	50.09	4,368	1.09	0	88,400	NO	0	237,410	4,739	325,810	0	$325,810	HDR|CB Estimated Quantity & Cost
399	Electrical	Cable Tray, Raceway 36" Aluminum	2,200.0	lf	Contr	Contr	20.00	1.05	50.09	2,310	1.09	0	44,000	NO	0	125,553	2,506	169,553	0	$169,553	HDR|CB Estimated Quantity & Cost
400	Electrical	Cable - Overhead Conductor to Substation	2,250.0	lf	Contr	Contr	8.50	0.50	50.09	1,125	1.09	0	19,125	NO	0	61,146	1,221	80,271	0	$80,271	HDR|CB Estimated Quantity & Cost
401	Electrical	Cable - Medium Voltage (7kV 1C Cable)	80,000.0	lf	Contr	Contr	14.60	0.127	50.09	10,160	1.09	0	1,168,000	NO	0	552,217	11,024	1,720,217	0	$1,720,217	HDR|CB Estimated Quantity & Cost
402	Electrical	Cable Terminations - 7kV	96.0	ea	Contr	Contr	195.00	12.00	50.09	1,152	1.09	0	18,720	NO	0	62,614	1,250	81,334	0	$81,334	HDR|CB Estimated Quantity & Cost
403	Electrical	Cable 600V Power 1/c No. 2/0 ave size	160,000.0	lf	Contr	Contr	3.55	0.041	50.09	6,560	1.09	0	568,000	NO	0	356,550	7,118	924,550	0	$924,550	HDR|CB Estimated Quantity & Cost
404	Electrical	Wire 600V Power 3/c # 10 ave. size	250,000.0	lf	Contr	Contr	0.27	0.0185	50.09	4,625	1.09	0	67,500	NO	0	251,378	5,018	318,878	0	$318,878	HDR|CB Estimated Quantity & Cost
405	Electrical	Cable - Fiber Optic	16,500.0	lf	Contr	Contr	6.00	0.025	50.09	413	1.09	0	99,000	NO	0	22,420	448	121,420	0	$121,420	HDR|CB Estimated Quantity & Cost
406	Electrical	Cable - Permanent Telephone Line	1.0	ls	Contr	Contr	10,000.00	240.000	50.09	240	1.09	0	10,000	NO	0	13,044	260	23,044	0	$23,044	HDR|CB Estimated Quantity & Cost
407	Electrical	Cable - Control	600,000.0	lf	Contr	Contr	1.10	0.040	50.09	24,000	1.09	0	660,000	NO	0	1,304,450	26,040	1,964,450	0	$1,964,450	HDR|CB Estimated Quantity & Cost
408	Electrical	Cable - Instrument 4pr tw/shld No. 18	400,000.0	lf	Contr	Contr	3.25	0.025	50.09	10,000	1.09	0	1,300,000	NO	0	543,521	10,850	1,843,521	0	$1,843,521	HDR|CB Estimated Quantity & Cost
409	Electrical	Cable - Thermocouple 2pr tw/shld No. 16	13,000.0	lf	Contr	Contr	0.33	0.030	50.09	390	1.09	0	4,290	NO	0	21,197	423	25,487	0	$25,487	HDR|CB Estimated Quantity & Cost
410	Electrical	Cable - Data Highway	24,068.0	lf	Contr	Contr	4.59	0.034	50.09	828	1.09	0	110,472	NO	0	45,000	898	155,472	0	$155,472	HDR|CB Estimated Quantity & Cost
411	Electrical	Cable Terminations - low voltage	30,500.0	ea	Contr	Contr	0.85	0.300	50.09	9,150	1.09	0	25,925	NO	0	497,321	9,928	523,246	0	$523,246	HDR|CB Estimated Quantity & Cost
412	Electrical	Cable Terminations - control	31,500.0	ea	Contr	Contr	0.54	0.300	50.09	9,450	1.09	0	17,010	NO	0	513,627	10,253	530,637	0	$530,637	HDR|CB Estimated Quantity & Cost
413	Electrical	Cable Terminations - instrument	32,800.0	ea	Contr	Contr	0.54	0.300	50.09	9,840	1.09	0	17,712	NO	0	534,824	10,676	552,536	0	$552,536	HDR|CB Estimated Quantity & Cost
414	Electrical	Conduit - Lighting A/G	33,000.0	lf	Contr	Contr	2.83	0.25	50.09	8,250	1.09	0	93,390	YES	5,603	448,405	8,951	541,795	0	$541,795	HDR|CB Estimated Quantity & Cost
415	Electrical	Wire - Lighting 1/C No 12	80,000.0	lf	Contr	Contr	0.176	0.018	50.09	1,440	1.09	0	14,080	YES	845	78,267	1,562	92,347	0	$92,347	HDR|CB Estimated Quantity & Cost
416	Electrical	Lighting - Outdoor Fixtures, pole	30.0	ea	Contr	Contr	1,600.00	12.00	50.09	360	1.09	0	48,000	YES	2,880	19,567	391	67,567	0	$67,567	HDR|CB Estimated Quantity & Cost
417	Electrical	Lighting - Outdoor Fixtures, 150W	320.0	ea	Contr	Contr	490.00	4.00	50.09	1,280	1.09	0	156,800	NO	0	69,571	1,389	226,371	0	$226,371	HDR|CB Estimated Quantity & Cost
418	Electrical	Lighting - Fixtures, 250W	80.0	ea	Contr	Contr	850.00	3.00	50.09	240	1.09	0	68,000	NO	0	13,044	260	81,044	0	$81,044	HDR|CB Estimated Quantity & Cost
419	Electrical	Lighting - Fixtures, fluorescent	180.0	ea	Contr	Contr	85.00	1.60	50.09	288	1.09	0	15,300	YES	918	15,653	312	30,953	0	$30,953	HDR|CB Estimated Quantity & Cost
420	Electrical	Lighting - Receptacles and switches	200.0	ea	Contr	Contr	32.00	1.37	50.09	273	1.09	0	6,400	YES	384	14,864	297	21,264	0	$21,264	HDR|CB Estimated Quantity & Cost
421	Electrical	Welding Receptacles	24.0	ea	Contr	Contr	1,800.00	4.00	50.09	96	1.09	0	43,200	NO	0	5,218	104	48,418	0	$48,418	HDR|CB Estimated Quantity & Cost
422	Electrical	Lighting - Exit	66.0	ea	Contr	Contr	150.00	2.00	50.09	132	1.09	0	9,900	YES	594	7,174	143	17,074	0	$17,074	HDR|CB Estimated Quantity & Cost
423	Electrical	Lighting - Emergency	120.0	ea	Contr	Contr	127.00	2.00	50.09	240	1.09	0	15,240	YES	914	13,044	260	28,284	0	$28,284	HDR|CB Estimated Quantity & Cost
424	Electrical	Cathodic Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
425	Electrical	Lightning Protection System	1.0	lot	Contr	Contr	100,000.00	200	50.09	200	1.09	0	100,000	YES	6,000	10,870	217	110,870	0	$110,870	HDR|CB Estimated Quantity & Cost
426	Electrical	Freeze Protection System	1.0	lot	Contr	Contr	800,000.00	5000	50.09	5,000	1.09	0	800,000	YES	48,000	271,760	5,425	1,071,760	0	$1,071,760	HDR|CB Estimated Quantity & Cost
427	Electrical	Electrical Circuit Testing	6,183.3	ea	Contr	Contr		2	50.09	12,367	1.09	0	0	NO	0	672,148	13,418	672,148	0	$672,148	HDR|CB Estimated Quantity & Cost
428		**Total Cable**	**1,545,819.0**	**LF**																	HDR|CB Estimated Quantity & Cost
429																					
430		**Division #6.1 - Electrical/Control Commodities Sub-Total**								**180,099**		**0**	**9,213,019**		**72,139**	**9,788,760**	**195,408**	**19,001,779**	**0**	**19,001,779**	
431																					
432	**Division #6.2 - Switchyard**																				
433																					
434	IV Electrica	138kV Dead End Towers 6 Legged (3 total)	150,000.0	lb	Contr	Contr	2.50	0.01	60.25	2,180	1.09	0	375,000	NO	0	142,500	2,365	517,500		$517,500	
435	IV Electrica	Interonnection Cabling and Termination Allowance	1.0	lot	Contr	Contr	15,000.00	1,526.36	51.33	1,526	1.09	0	15,000	NO	0	85,000	1,656	100,000		$100,000	HDR|CB Estimated Quantity & Cost
436																					HDR|CB Estimated Quantity & Cost
437		**Division #6.2 - Switchyard**								**3,706**		**0**	**$390,000**		**0**	**$227,500**	**$4,021**	**$617,500**	**$0**	**$617,500**	
438																					
439	**Division #7.0 - Instrumentation & Control**																				
440																					
441	I & C	BOP Instrument Devices	1,200.0	ea	Contr	Contr	750.00	12	50.09	14,400	1.09	0	900,000	NO	0	782,670	15,624	1,682,670	0	$1,682,670	
442	I & C	Auxiliary Boiler CEMS	1.0	lot	Contr	Contr	163,200.00	200	50.09	200	1.09	0	163,200	NO	0	10,870	217	174,070	0	$174,070	HDR|CB Estimated Quantity & Cost
443	I & C	Continuous Emissions Monitoring Equipment (CEMS)	2.0	ea	Contr	Contr	700,000.00	2000	53.33	4,000	1.09	0	1,400,000	NO	0	231,460	4,340	1,631,460	0	$1,631,460	HDR|CB Estimated Quantity & Cost
444	I & C	Control Valves	220.0	ea	Contr	Contr	4,000.00	24	54.96	5,280	1.09	0	880,000	NO	0	314,871	5,729	1,194,871	0	$1,194,871	HDR|CB Estimated Quantity & Cost
445	I & C	DCS w/ Configuration, Interfaces, Field Support, Interface, Bulks	1.0	ea	Contr	Contr	1,700,000.00	1691	50.09	1,691	1.09	0	1,700,000	NO	0	91,909	1,835	1,791,909	0	$1,791,909	HDR|CB Estimated Quantity & Cost
446	I & C	Emergency Trip sub Panel	1.0	ea	Contr	Contr	30,000.00	21	50.09	21	1.09	0	30,000	NO	0	1,141	23	31,141	0	$31,141	HDR|CB Estimated Quantity & Cost
447	I & C	Flow Element - Nozzle (Supply)	6.0	ea	Contr	Contr	30,000.00	20	54.96	120	1.09	0	180,000	NO	0	7,156	130	187,156	0	$187,156	HDR|CB Estimated Quantity & Cost
448	I & C	Instrument Calibration and loop check	1,500.0	ea	Contr	Contr	0.00	3	50.09	4,500	1.09	0	0	NO	0	244,584	4,883	244,584	0	$244,584	HDR|CB Estimated Quantity & Cost
449	I & C	Instrument piping 2&3-valve manifolds	284.0	ea	Contr	Contr	400.00	5.22	54.96	1,481	1.09	0	113,600	NO	0	88,331	1,607	201,931	0	$201,931	HDR|CB Estimated Quantity & Cost
450	I & C	Instrument Racks & Enclosures	1.0	lot	Contr	Contr	350,000.00	1450	50.09	1,450	1.09	0	350,000	NO	0	78,811	1,573	428,811	0	$428,811	HDR|CB Estimated Quantity & Cost
451	I & C	Instrument Tubing - copper	6,000.0	lf	Contr	Contr	3.70	0.15	54.96	900	1.09	0	22,200	NO	0	53,671	977	75,871	0	$75,871	HDR|CB Estimated Quantity & Cost
452	I & C	Instrument Tubing - Stainless Steel	2,500.0	lf	Contr	Contr	6.25	0.20	54.96	500	1.09	0	15,625	NO	0	29,817	543	45,442	0	$45,442	HDR|CB Estimated Quantity & Cost
453	I & C	PLC Hardware, Bulks, Aux Controls, Configuration	1.0	ls	Contr	Contr	241,200.00	253	50.09	253	1.09	0	241,200	NO	0	13,751	275	254,951	0	$254,951	HDR|CB Estimated Quantity & Cost
454																					HDR|CB Estimated Quantity & Cost
455		**Division #7.0 - Control Sub-Total**								**34,796**		**0**	**5,995,825**		**0**	**1,949,043**	**37,754**	**7,944,868**	**0**	**$7,944,868**	
456																					
457		**Sub-Total Direct Costs**								**946,217**		**0**	**320,700,819**	**0**		**54,646,306**	**1,026,123**	**375,347,125**	**26,167,400**	**401,514,525**	
458		Sales Tax - State (Plant Production Equipment is Exempt)	6.00%												**393,268**				**393,268**	**393,268**	
459	Indirects																				Sales Tax Included for Non-Production Facilities

Estimate Details

2 x 1 GE 7F7 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
460		**TOTAL DIRECT COSTS**								**946,217**		**0**	**320,700,819**			**54,646,306**	**1,026,123**	**375,347,125**	**26,560,668**	**$401,907,793**	
461																					
462	**Division #8.0 - Construction and Indirect Services**																				
463																					
464	Const Indirec	Construction Equipment	1.0	ls	Contr	Contr	12,055,653			0	1.09					0	0	0	12,055,653	$12,055,653	
465	Const Indirec	Construction Field staff	1.0	ls	Contr	Contr	11,522,855			0	1.09					0	0	0	11,522,855	$11,522,855	See Construction Equipment worksheet
466	Const Indirec	Construction Field staff expenses	1.0	ls	Contr	Contr	1,870,168			0	1.09					0	0	0	1,870,168	$1,870,168	See EPC Field Staff Worksheet for details
467	Const Indirec	Construction Permits	1.0	ls	Contr	Contr				0	1.09		51,450			0	0	51,450	0	$51,450	See EPC Field Staff Worksheet for details
468	Const Indirec	Construction Testing	1.0	ls	Contr	Contr				0	1.09		117,000			0	0	117,000	0	$117,000	See Const Indirects and Serv Worksheet
469	Const Indirec	Consumable Materials & Safety Supplies	2.00	$/MH	Contr	Contr	2,052,247			0	1.09					0	0	0	2,052,247	$2,052,247	See Const Indirects and Serv Worksheet
470	Const Indirec	Field Office Expenses	1.0	ls	Contr	Contr				1,369	1.09		1,033,370			65,849	1,485	1,099,219	22,373	$1,121,592	$2.00/Direct hour
471	Const Indirec	Performance Testing	1.0	ls	Contr	Contr				0	1.09		304,400			0	0	304,400	0	$304,400	See Const Indirects and Serv Worksheet
472	Const Indirec	Preoperational Testing, Startup & Commissioning	2.0	ls	Contr	Contr				21,690	1.09		1,113,000			752,767	23,534	1,865,767	0	$1,865,767	See Const Indirects and Serv Worksheet
473	Const Indirec	Site Safety	1.0	ls	Contr	Contr				7,580	1.09		658,040			375,008	8,224	1,033,048	0	$1,033,048	See Const Indirects and Serv Worksheet
474	Const Indirec	Small Tools	2.00	$/MH	Contr	Contr	2,052,247			0	1.09					0	0	0	2,052,247	$2,052,247	See Const Indirects and Serv Worksheet
475	Const Indirec	Start-up Supervision	1.0	ls	Contr	Contr	1,296,911			0	1.09					0	0	0	1,296,911	$1,296,911	$2.00/Direct hour
476	Const Indirec	Support Craft, Site Services, Scaffolding	1.0	ls	Contr	Contr				41,753	1.09		459,400			2,008,704	45,302	2,468,104	775,014	$3,243,118	See EPC Field Staff Worksheet for details
477	Const Indirec	Temporary Facilities	1.0	ls	Contr	Contr				17,947	1.09		2,336,753			863,403	19,472	3,200,157	82,500	$3,282,657	See Const Indirects and Serv Worksheet
478	Const Indirec	Temporary Utilities	1.0	ls	Contr	Contr				29,032	1.09		747,600			1,396,697	31,500	2,144,297	0	$2,144,297	See Const Indirects and Serv Worksheet
479																					See Const Indirects and Serv Worksheet
480		**Division #8.0 - Construction Indirects and Services Sub-Total**								**119,371**		**0**	**6,821,013**			**5,462,428**	**129,518**	**12,283,441**	**31,729,967**	**$44,013,409**	
481																					
482		**SUB-TOTAL CONSTRUCTION COST**								**1,065,588**		**0**	**327,521,832**			**60,108,735**	**1,155,641**	**387,630,567**	**58,290,635**	**445,921,202**	
483		**Subcontract Labor Hours**																			
484		**Material Cost Excluding CT, HRSG and ST (escalation and EPC**											**95,721,832**								
485	**Division #9.0 - Project Indirects**																				
486																					
487	Project Indire	- Power Plant Design Engineering	1.0	ls	Contr	6.0%	26,755,272											0	26,755,272	$26,755,272	
488	Project Indire	- Project Management (Home Office)	0.0	ls	Contr	0.0%	0											0	0	$0	6.0% of the Total Construction Cost
489																					Included in Engineering
490																					
491		Sub-Total Project Indirects										**0**	**0**			**0**	**0**	**0**	**26,755,272**	**$26,755,272**	
492																					
493	EPC Indirect	EPC Contractor Insurance & Misc Costs (% of Total Const. Cost)																			
494																					
495	EPC Indirect	- Builders Risk Insurance	1.0	ls	Contr	0.50%	2,229,606												2,229,606	$2,229,606	
496	EPC Indirect	- Comprehensive General Liability (CGL) Insurance	1.0	ls	Contr	0.50%	2,229,606											0	2,229,606	$2,229,606	Allowance based on info from other projects
497	EPC Indirect	- Warranty Reserve	1.0	ls	Contr		500,000											0	500,000	$500,000	Allowance based on info from other projects
498																					Allowance based on info from other projects
499		Sub-Total EPC Contractor Indirects										**0**	**0**			**0**	**0**	**0**	**4,959,212**	**$4,959,212**	
500																					
501		**Total Project Indirects**										**0**	**0**			**0**	**0**	**0**	**31,714,484**	**31,714,484**	
502																					
503		Sub-Total										**0**	**327,521,832**			**60,108,735**	**1,155,641**	**387,630,567**	**90,005,120**	**$477,635,686**	
504							Equipment	Material	Labor	S/C											
505	Project Indire	Escalation - EPC Contractor Escalation Rates					2.4%	2.4%	4.0%	4.0%			7,113,373			9,442,316	0	16,555,689	7,864,820	24,420,509	
506																					Excludes CT, HRSG and ST
507		Sub-Total										**0**	**334,635,205**			**69,551,051**	**1,155,641**	**404,186,256**	**97,869,939**	**$502,056,195**	
508							Equip	Mat	Labor	S/C											
509	EPC Indirect	EPC Contractor Contingency	Varies	%	Contr		0%	5%	5%	5%		0	4,786,092			3,477,553		8,263,644	4,529,497	12,793,141	
510	EPC Indirect	EPC Contractor G&A and Fee	8.0%	%	Contr		1.0%	8.0%	8.0%	8.0%		0	26,770,816			5,564,084		32,334,900	7,829,595	40,164,496	Excludes CT, HRSG and ST
511																					
512		Sub-Total		ls								0	31,556,908			9,041,637	0	40,598,545	12,359,092	$52,957,637	
513																					
514		**TOTAL EPC PROJECT COST**								**1,065,588**		**0**	**366,192,113**			**78,592,687**	**1,155,641**	**444,784,801**	**110,229,031**	**$555,013,832**	
515																					
516	**OWNER INDIRECTS**																				
517	**Division #9.1 - Owner Indirects**																				
518																					
519		**Power Block 1 and Common**																			
520	Owner Indire	Project Development	1.0	ls	Owner														6,500,000	$6,500,000	
521	Owner Indire	Transmission Line Relocation	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
522	Owner Indire	Transmission Interconnection Facilities	1.0	ls	Owner														5,500,000	$5,500,000	Budget provided by LG&E
523	Owner Indire	Natural Gas Pipeline Interconnection	1.0	ls	Owner														14,250,000	$14,250,000	To be estimated by Transmision Operator
524	Owner Indire	Natural Gas Pipeline Fixed O&M (Startup Period)	1.0	ls	Owner														6,300,000	$6,300,000	Budget provided by LG&E
525	Owner Indire	Construction Power (Service Installation and Energy)	1.0	ls	Owner														750,000	$750,000	Budget provided by LG&E
526	Owner Indire	Owner Operations Personnel (Prior to COD)	1.0	ls	Owner														2,340,000	$2,340,000	Budget estimated by HDR|CB
527	Owner Indire	Owners Project Management	1.0	ls	Owner														5,300,000	$5,300,000	Budget estimated by HDR|CB 7 sal @ 12 mo, 26 hr @ 6 n
528	Owner Indire	Owners Engineer	1.0	ls	Owner														1,900,000	$1,900,000	Budget provided by LG&E
529	Owner Indire	Owners Legal Counsel	1.0	ls	Owner														1,300,000	$1,300,000	Budget provided by LG&E
530	Owner Indire	Operator Training	1.0	ls	Owner														225,000	$225,000	Budget provided by LG&E
531	Owner Indire	Owner Startup Engineering	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
532	Owner Indire	Permitting, License Fees, & Environmental Compliance	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
533	Owner Indire	Highway Improvements, Miscellaneous Mitigation	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
534	Owner Indire	Land	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
535	Owner Indire	Rolling Stock	1.0	ls	Owner														0	$0	Budget provided by LG&E
536	Owner Indire	Water Infrastructure / Supply to Site	0.0	ls	Owner														0	$0	Budget estimated by HDR|CB
537	Owner Indire	Startup Testing (Includes Fuel & Power Sales)																			N/A (On site intake/pre-treatment/discharge incl. in EPC)
538	Owner Indire	- Fuel - Natural Gas	1.0	ls	Owner														12,160,800	$12,160,800	
539	Owner Indire	- Fuel - Fuel Oil	0.0	ls	Owner														0	$0	HDR|CB [2,702,400 MMBTU @ $4.50/MMBTU per LG&E 2017 Forecas
540	Owner Indire	- Electric Transmission Firm Point to Point	1.0	ls	Owner														4,000,000	$4,000,000	Budget estimated by HDR|CB [Not Required]
541	Owner Indire	- Startup Power	1.0	ls	Owner														391,104	$391,104	Budget provided by LG&E
542	Owner Indire	- Test Power Sales	1.0	ls	Owner														(15,552,000)	($15,552,000)	Budget estimated by HDR|CB [10,864 MWhr @$36/MWH]
543	Owner Indire	- Variable O&M - Water, Chemicals, etc.	1.0	ls	Owner														1,200,000	$1,200,000	Budget estimated by HDR|CB [432,000 MWhr @$36/MWH
544	Owner Indire	Site Security	1.0	ls	Owner														50,000	$50,000	Budget estimated by HDR|CB
545	Owner Indire	Operating Spare Parts	1.0	ls	Owner														10,000,000	$10,000,000	Budget estimated by HDR|CB
546	Owner Indire	Permanent Plant Equipment & Furnishings																		$0	Budget estimated by HDR|CB
547	Owner Indire	- Office Furniture	1.0	ls	Owner														350,000	$350,000	

Estimate Details

2 x 1 GE 7F7 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
Line #	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
548	Owner Indire	- Kitchen Furniture	1.0	ls	Owner														130,000	$130,000	Budget estimated by HDR|CB
549	Owner Indire	- Laboratory Equipment & Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
550	Owner Indire	- Locker Room Furniture	1.0	ls	Owner														180,000	$180,000	Budget estimated by HDR|CB
551	Owner Indire	- Warehouse Shelves	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
552	Owner Indire	- Workshop Tools & Test Equipment	1.0	ls	Owner														1,800,000	$1,800,000	Budget estimated by HDR|CB
553	Owner Indire	IT and Telecommunication Infrastructure	1.0	ls	Owner														250,000	$250,000	Budget estimated by HDR|CB
554	Owner Indire	NERC - Cyber Security	1.0	ls	Owner														1,000,000	$1,000,000	Budget estimated by HDR|CB
555	Owner Indire	Escalation - Owners Furnished Equipment	0.0	%	Owner														0	$0	Budget estimated by HDR|CB
556	Owner Indire	Builders Risk Insurance	0.0	ls	Owner														0	$0	N/A
557	Owner Indire	Property Tax During Construction	1.0	ls	Owner														1,750,000	$1,750,000	Included with EPC Contractor Indirects
558	Owner Indire	Financing Fees	0.0	ls	Owner														0	$0	Budget provided by LG&E
559	Owner Indire	AFUDC	1.0	ls	Owner														6,000,000	$6,000,000	N/A
560		**Total Owner Indirects**																	**70,174,904**	**$70,174,904**	AFUDC Based on 78% KU Ownership
561																					
562																					
563		**Owner Contingency**	10.00%	%	Owner														**55,501,383**	**$55,501,383**	
564																					
565																					
566		**Total Owner Indirects**																	**125,676,287**	**$125,676,287**	
567																					
568		**TOTAL PROJECT COST**										**0**	**366,192,113**			**78,592,687**	**1,155,641**	**444,784,801**	**235,905,318**	**$680,690,119**	
569																					
																			$/kW	**$968**	

2 x 1 Siemens H Class 760 MW Combined Cycle Unit

BUDGET ESTIMATE

5 x 10 Work Week

February 22, 2013

Rev 1

CONFIDENTIAL

2 x 1 Siemens H Class 760 MW Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 761.891
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
Site Development	**$0**	**$1,787,885**	**$1,537,001**	**36,870**	**250,000**	**$3,574,886**	**0.6%**
Raw Water Intake/Discharge Facilities	**$0**	**$500,000**	**$578,649**	**10,850**	**0**	**$1,078,649**	**0.2%**
2/22/2013	**$0**	**$6,655,575**	**$5,114,512**	**132,176**	**11,900,000**	**$23,670,087**	**4.1%**
Architectural & Metals	**$0**	**$5,385,510**	**$2,426,063**	**46,805**	**5,766,400**	**$13,577,973**	**2.4%**
Rev 1	**$0**	**$18,404,339**	**$12,217,857**	**226,564**	**225,000**	**$30,847,196**	**5.4%**
HRSG Equipment	**$0**	**$61,000,000**	**$12,959,860**	**187,705**	**0**	**$73,959,860**	**12.9%**
Steam Turbine Island Equipment	**$0**	**$43,000,000**	**$1,330,893**	**24,955**	**0**	**$44,330,893**	**7.8%**
Combustion Turbine Equipment	**$0**	**$134,993,527**	**$4,397,735**	**82,460**	**0**	**$139,391,261**	**24.4%**
Mechanical Draft Cooling Tower	**$0**	**$0**	**$0**	**0**	**5,800,000**	**$5,800,000**	**1.0%**
BOP Mechanical Equipment	**$0**	**$20,380,700**	**$1,557,180**	**26,647**	**1,346,000**	**$23,283,880**	**4.1%**
Electrical Equipment	**$0**	**$18,609,330**	**$1,319,501**	**26,340**	**0**	**$19,928,831**	**3.5%**
Electrical Commodities	**$0**	**$9,213,019**	**$9,788,760**	**195,408**	**0**	**$19,001,779**	**3.3%**
High Voltage Switchyard	**$0**	**$390,000**	**$227,500**	**4,021**	**0**	**$617,500**	**0.1%**
Instrumentation & Controls	**$0**	**$5,995,825**	**$1,949,043**	**37,754**	**0**	**$7,944,868**	**1.4%**
Sub-Total Direct Costs:	**$0**	**$326,315,710**	**$55,404,554**	**1,038,555**	**$25,287,400**	**$407,007,664**	**71.2%**
State Sales Tax (Non-Production Material Only)					**392,527**	**$392,527**	**0.1%**
Total Direct Cost	**$0**	**$326,315,710**	**$55,404,554**	**1,038,555**	**$25,679,927**	**$407,400,191**	**71.3%**
Construction Indirects & Services							
- Construction Field Staff			**$0**	**0**	**$11,522,855**	**$11,522,855**	**2.0%**
- Construction Field Staff Expenses			**$0**	**0**	**$1,870,168**	**$1,870,168**	**0.3%**
- Construction Equipment			**$0**	**0**	**$12,055,653**	**$12,055,653**	**2.1%**
- Small Tools			**$0**	**0**	**$2,077,109**	**$2,077,109**	**0.4%**
- Consumable Materials & Safety Supplies			**$0**	**0**	**$2,077,109**	**$2,077,109**	**0.4%**
- Field Office Expense		**$1,033,370**	**$65,849**	**1,485**	**$22,373**	**$1,121,592**	**0.2%**
- Temporary Facilities		**$2,336,753**	**$863,403**	**19,472**	**$82,500**	**$3,282,657**	**0.6%**
- Temporary Utilities		**$747,600**	**$1,396,697**	**31,500**	**$0**	**$2,144,297**	**0.4%**
- Support Craft & Site Services		**$459,400**	**$2,008,704**	**45,302**	**$775,014**	**$3,243,118**	**0.6%**
- Site Safety		**$658,040**	**$375,008**	**8,224**	**$0**	**$1,033,048**	**0.2%**
- Construction Permits		**$51,450**	**$0**	**0**	**$0**	**$51,450**	**0.0%**
- Construction Testing		**$117,000**	**$0**	**0**	**$0**	**$117,000**	**0.0%**
- Performance Testing		**$304,400**	**$0**	**0**	**$0**	**$304,400**	**0.1%**
- Start-up Supervision		**$0**	**$0**	**0**	**$1,296,911**	**$1,296,911**	**0.2%**
- Preop Testing, Start-up		**$1,113,000**	**$752,767**	**23,534**	**$0**	**$1,865,767**	**0.3%**
Sub-Total Construction Indirects and Services		**$6,821,013**	**$5,462,428**	**129,518**	**$31,779,693**	**$44,063,134**	**7.7%**
Total Construction Cost	**$0**	**$333,136,723**	**$60,866,983**	**1,168,072**	**$57,459,620**	**$451,463,326**	**79.0%**
Estimated Subcontract Labor Hours				**199,637**			
Project Indirects							
- Project Engineering (Eng, PM, CM & Procurement)					**$27,087,800**	**$27,087,800**	**4.7%**
Sub-Total Project Indirects	**$0**	**$0**	**$0**	**0**	**$27,087,800**	**$27,087,800**	**4.7%**
EPC Contractor Insurance & Misc Costs							
- Builders Risk					**$2,257,317**	**$2,257,317**	**0.4%**

2 x 1 Siemens H Class 760 MW Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 761.891
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
- Comprehensive General Liability (CGL) Insurance					**$2,257,317**	**$2,257,317**	**0.4%**
- Warranty Reserve					**$500,000**	**$500,000**	**0.1%**
Sub-Total EPC Contractor Insur. & Misc. C	**$0**	**$0**	**$0**	**0**	**$5,014,633**	**$5,014,633**	**0.9%**
Total EPC Contractor Project Indirect Cost	**$0**	**$0**	**$0**	**0**	**$32,102,433**	**$32,102,433**	**5.6%**
- Escalation (Eqt, Materials & Labor)	**$0**	**$7,029,603**	**$9,553,797**		**$7,803,093**	**$24,386,493**	**4.3%**
Sub-Total	**0**	**340,166,327**	**70,420,779**	**1,367,710**	**97,365,146**	**507,952,252**	**88.9%**
- EPC Contractor Contingency	**$0**	**$4,707,160**	**$3,521,039**		**$4,548,257**	**$12,776,456**	**2.2%**
- EPC Contractor G&A and Profit	**$0**	**$34,016,633**	**$7,042,078**		**$9,736,515**	**$50,795,225**	**8.9%**
TOTAL EPC PROJECT COST	**$0**	**$378,890,119**	**$80,983,896**	**1,367,710**	**$111,649,918**	**$571,523,933**	**100.0%**
EPC Price per kW						**$750**	
Owner Indirect Costs							
- Total Owner Indirects						**$70,724,904**	
- Owner Contingency						**$57,152,393**	
TOTAL PROJECT COST						**$699,401,230**	
Total Project Cost per kW						**$918**	
Estimate Options (include 25 % markup for indirects)							
Fuel Oil System						**$11,250,000**	
Bypass Stack and Diverter Damper						**N/A**	
Gas Compression						**Not Required**	
SCR System to meet 12 ppm NOx						**Not Required**	
Optional SCR System						**Included in Base**	

Total Craft Labor Hours	**1,367,710**	**erformance Guarantees:**		**Executive-in-Charge:**	**WHD**
Ave. Craft Wage without Escalation	**$52.95**	**Liquidated Damages:**		**Project Manager:**	**JPS**
Field Labor Type	**TBD**	**Special Insurance:**		**Construction Manager:**	**SMP**
Labor Productivity Factor	**1.085**	**Performance Bond:**		**Lead Estimator:**	**CDF**

CONFIDENTIAL

2 x 1 Siemens H Class 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

														CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	E BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																						
1	**Division #1.0 - Sitework**																					
2		Sitework	Roads - Asphalt paving main site rds & Parking lots	8,500.0	sy	Sub	Contr	20.00		44.43		1.09	0	0	YES	5,100	0	0	0	170,000	$170,000	HDR|CB Estimated Quantity
3		Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Powerblock	1,740.0	sy	Contr	Contr	5.00	0.055	44.43	96	1.09	0	8,700	YES	522	4,613	104	13,313	0	$13,313	HDR|CB Estimated Quantity
4		Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Secondary A	6,945.0	sy	Contr	Contr	5.00	0.055	44.43	382	1.09	0	34,725	YES	2,084	18,412	414	53,137	0	$53,137	HDR|CB Estimated Quantity
5		Sitework	Roads - Haul/Construction Roads Treated Gravel	29,700.0	sy	Contr	Contr	8.00	0.1	44.43	2,970	1.09	0	237,600	YES	14,256	143,162	3,222	380,762	0	$380,762	HDR|CB Estimated Quantity
6		Sitework	Roads - Main Roads Crushed stone Base Course	8,500.0	sy	Contr	Contr	12.00	0.1	44.43	850	1.09	0	102,000	YES	6,120	40,972	922	142,972	0	$142,972	HDR|CB Estimated Quantity
7		Sitework	Roads - Drainage and culverts	90,000.0	sy	Contr	Contr	2.00	0.05	44.43	4,500	1.09	0	180,000	YES	10,800	216,912	4,883	396,912	0	$396,912	HDR|CB Estimated Quantity
8		Sitework	Soil Erosion Control Measures	2,160	lf	Contr	Contr	1	0.027	44.43	58	1.09	0	2,160	YES	130	2,811	58	4,971	0	4,971	HDR|CB Estimated Quantity
9	#	Sitework	Site - Topsoil stripping/stockpiling	10,125	cy	Contr	Contr		0.030	44.43	304	1.09	0	0	YES	0	14,642	304	14,642	0	$14,642	HDR|CB Estimated Quantity
10		Sitework	Site - Drainage - Pipe Culverts (Assume 12" dia)	3,000	lf	Contr	Contr	9.00	0.12	44.43	360	1.09	0	27,000	YES	1,620	17,353	360	44,353	0	$44,353	HDR|CB Estimated Quantity
11	Re	Sitework	Site - Drainage - Manholes	25	ea	Contr	Contr	1,500	16	44.43	400	1.09	0	37,500	YES	2,250	19,281	400	56,781	0	$56,781	HDR|CB Estimated Quantity
14		Sitework	Site - Fire Protection hydrants, valve boxes, ductile iron	30.0	ea	Contr	Contr	3,000.00	20	39.54	600	1.09	0	90,000	YES	5,400	25,739	651	115,739	0	$115,739	HDR|CB Estimated Quantity
15		Sitework	Site - Fire Protection U/G piping, DI	4,500.0	lf	Contr	Contr	41.00	0.5	39.54	2,250	1.09	0	184,500	YES	11,070	96,520	2,441	281,020	0	$281,020	HDR|CB Estimated Quantity
16		Sitework	Pipe Utility Trench Excavation	10,500	cy	Contr	Contr		0.2	39.54	2,100	1.09	0	0	YES	0	90,086	2,100	90,086	0	$90,086	HDR|CB Estimated Quantity
17		Sitework	Pipe Utility Trench Backfill (including bedding)	9,000	cy	Contr	Contr		0.2	39.54	1,800	1.09	0	0	YES	0	77,216	1,800	77,216	0	$77,216	HDR|CB Estimated Quantity
20		Sitework	Spoil Disposal	11,250	cy	Contr	Contr		0.1	44.43	1,125	1.09	0	0	YES	0	54,228	1,125	54,228	0	$54,228	HDR|CB Estimated Quantity
21		Sitework	Site - Sanitary sewer lift stations	1.0	ea	Contr	Contr	11,700.00	40	39.54	40	1.09	0	11,700	YES	702	1,716	43	13,416	0	$13,416	HDR|CB Estimated Quantity
22		Sitework	Site - Sanitary waste piping and manholes	2,500.0	lf	Contr	Contr	20.00	1	39.54	2,500	1.09	0	50,000	YES	3,000	107,245	2,713	157,245	0	$157,245	HDR|CB Estimated Quantity
23		Sitework	Site - Storm drain piping and culverts	22,500.0	lf	Contr	Contr	12.00	0.25	39.54	5,625	1.09	0	270,000	YES	16,200	241,301	6,103	511,301	0	$511,301	HDR|CB Estimated Quantity
24		Sitework	Site Finishing - Seed Site Earthwork	6.0	ac	Contr	Contr	10,000.00	0.54	39.54	3	1.09	0	60,000	YES	3,600	139	4	60,139	0	$60,139	HDR|CB Estimated Quantity
25		Sitework	Site Finishing - Grading around foundations	7,500.0	sy	Contr	Contr		0.02	39.54	150	1.09	0	0	YES	0	6,435	163	6,435	0	$6,435	HDR|CB Estimated Quantity
26		Sitework	Site Finishing - Stone Surfacing	7,500.0	sy	Contr	Contr	10.00	0.015	39.54	113	1.09	0	75,000	YES	4,500	4,826	122	79,826	0	$79,826	HDR|CB Estimated Quantity
27		Sitework	Site Improvements - landscaping at admin building	1.0	ls	Contr	Contr	30,000.00	360	39.54	360	1.09	0	30,000	YES	1,800	15,443	391	45,443	0	$45,443	HDR|CB Estimated Quantity
28		Sitework	Site Improvements - Main Gate Security Facilities	1.0	lot	Contr	Contr	150,000.00	3600	39.54	3,600	1.09	0	150,000	YES	9,000	154,433	3,906	304,433	0	$304,433	HDR|CB Estimated Quantity
29		Sitework	Site Improvements - Site Entrance Sign and Landscaping	1.0	ls	Contr	Contr	18,750.00	240	39.54	240	1.09	0	18,750	YES	1,125	10,296	260	29,046	0	$29,046	HDR|CB Estimated Quantity
30		Sitework	Site Improvements - Site Security Boundary Fencing	18,750.0	lf	Contr	Contr	11.00	0.2	39.54	3,750	1.09	0	206,250	YES	12,375	160,867	4,069	367,117	0	$367,117	HDR|CB Estimated Quantity
31		Sitework	Site Improvements - Fencing Active gates	6.0	ea	Contr	Contr	2,000.00	48	39.54	288	1.09	0	12,000	YES	720	12,355	312	24,355	0	$24,355	HDR|CB Estimated Quantity
32		Sitework	Site Surveying	1.0	lot	Sub	Contr	80,000.00		44.43	0	1.09	0	0	YES	2,400	0	0	0	80,000	$80,000	HDR|CB Estimated Quantity
33																						
34			**Division #1 - Sitework Sub-Total**								**34,463**		**0**	**1,787,885**		**114,773**	**1,537,001**	**36,870**	**3,324,886**	**250,000**	**3,574,886**	
35																						
36	**Division #1.3 - Raw Water Intake and Discharge Facilities**																					HDR Allowance for Interconnection and Updgrage of
37			Raw Water River Intake and Discharge Facilities	1.0	ea	Contr	Contr	500,000.00	10,000	53.33	10,000	1.09	0	500,000	NO	0	578,649	10,850	1,078,649	0	$1,078,649	Unit 1 and 2 Intake Structure
38																						
39			**Division #1.3 - Raw Water Intake Clarification and Discharge Facilities Sub-Total**								**10,000**		**0**	**500,000**		**0**	**578,649**	**10,850**	**1,078,649**	**0**	**$1,078,649**	
40																						
41																						
42	**Division #2.0 - Earthwork and Concrete**																					
43	**Division #2.1 - Earthwork**																					
44		Earthwork	Structural Backfill Power Block (using imported material)	220,000.0	cy	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,500,000	$5,500,000	HDR|CB Estimated Quantity
45		Earthwork	Retaining Wall (MSE)	40,000.0	sf	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	1,000,000	$1,000,000	HDR|CB Estimated Quantity
46		Earthwork	Structural Excavation Main Power Block - Earth/Rock	300,000.0	cy	Sub	Contr	18.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,400,000	$5,400,000	HDR|CB Estimated Quantity
47																						
48				560,000.0	cy						0		0	0		0	0	0	0	11,900,000	11,900,000	
49	**Division # 2.2 - Concrete Main Power Block Area**																					
50																						
51			Includes Forms, Rebar, Placement, Finishing, Embeds																			
52		Concrete	HRSG and Stack	7,500	cy	Contr	Contr	250	4.5	38.69	33,750	1.09	0	1,875,000	NO	0	1,416,954	36,619	3,291,954	0	$3,291,954	HDR|CB Estimated Quantity
53		Concrete	Gas Turbine Foundation	4,800	cy	Contr	Contr	300	4.5	38.69	21,600	1.09	0	1,440,000	NO	0	906,851	23,436	2,346,851	0	$2,346,851	HDR|CB Estimated Quantity
54		Concrete	Steam Turbine building	800	cy	Contr	Contr	250	4.5	38.69	3,600	1.09	0	200,000	NO	0	151,142	3,906	351,142	0	$351,142	HDR|CB Estimated Quantity
55		Concrete	Spread Footings & Piers Pipe/Tray Trestle/Racks	400.0	cy	Contr	Contr	250	4.5	38.69	1,800	1.09	0	100,000	NO	0	75,571	1,953	175,571	0	$175,571	HDR|CB Estimated Quantity
56		Concrete	Steam Turbine Bldg fill slab	300.0	cy	Contr	Contr	210.00	4.5	38.69	1,350	1.09	0	63,000	NO	0	56,678	1,465	119,678	0	$119,678	HDR|CB Estimated Quantity
57		Concrete	Steam Turbine Bldg Mat Foundation	1,200.0	cy	Contr	Contr	250	4.5	38.69	5,400	1.09	0	300,000	NO	0	226,713	5,859	526,713	0	$526,713	HDR|CB Estimated Quantity
58		Concrete	Steam Turbine Bldg Elevated Slab	500.0	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	NO	0	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
59		Concrete	Steam Turbine Bldg sumps foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
60		Concrete	Steam Turbine Pedestal FDN (Columns & Tabletop, Mat)	2,500.0	cy	Contr	Contr	350.00	8	38.69	20,000	1.09	0	875,000	NO	0	839,677	21,700	1,714,677	0	$1,714,677	HDR|CB Estimated Quantity
61		Concrete	Aux. Equipment Foundations	500	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	YES	7,500	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
62		Concrete	Equip Fdn - Generator Breaker	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
63		Concrete	Equip Fdn - CT PEEC	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
64		Concrete	Equip Fdn - Power Distribution Center	80	cy	Contr	Contr	250	4.5	38.69	360	1.09	0	20,000	YES	1,200	15,114	391	35,114	0	$35,114	HDR|CB Estimated Quantity
65		Concrete	Equip Fdn - CEMS	40	cy	Contr	Contr	250	4.5	38.69	180	1.09	0	10,000	YES	600	7,557	195	17,557	0	$17,557	HDR|CB Estimated Quantity
66		Concrete	Equip Fdn - Boiler Feed Pump	120	cy	Contr	Contr	250	4.5	38.69	540	1.09	0	30,000	YES	1,800	22,671	586	52,671	0	$52,671	HDR|CB Estimated Quantity
67		Concrete	Equip Fdn - Main Step-up Transformer Fdn/Walls	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
68		Concrete	Equip Fdn - Plant Aux Power Transformers Fnd/Walls	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
69		Concrete	Equip Fdn - Misc off Base Equip fnds	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
70		Concrete	Elec. Ductbank (Tubes, Conc., Forms, Rebar) 12 Tubes	500.0	lf	Contr	Contr	125	0.57	38.69	285	1.09	0	62,500	NO	0	11,965	309	74,465	0	$74,465	HDR|CB Estimated Quantity
71		Concrete	Elec. Ductbank to Cooling Tower (Tubes, Conc., Forms, Rebar) 6 T	750.0	lf	Contr	Contr	100	0.45	38.69	338	1.09	0	75,000	NO	0	14,170	366	89,170	0	$89,170	HDR|CB Estimated Quantity
72		Concrete	Equip Fdn - Pumps & misc equipment	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
73		Concrete	Electrical Building Foundation	130.0	cy	Contr	Contr	250	4.5	38.69	585	1.09	0	32,500	NO	0	24,561	635	57,061	0	$57,061	HDR|CB Estimated Quantity
74		Concrete	Cooling Tower Basin	2,500.0	cy	Contr	Contr	250	5.5	38.69	13,750	1.09	0	625,000	NO	0	577,278	14,919	1,202,278	0	$1,202,278	HDR|CB Estimated Quantity
75		Concrete	Administration Building foundation	1,100.0	cy	Contr	Contr	250	4.5	38.69	4,950	1.09	0	275,000	YES	16,500	207,820	5,371	482,820	0	$482,820	HDR|CB Estimated Quantity
76		Concrete	Auxilary Boiler Building floor slab & foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
77		Concrete	Demineralized Water Tank Foundations	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
78		Concrete	Service water storage tank foundations	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	YES	3,000	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
79		Concrete	Main Gate Guard House	3.0	cy	Contr	Contr	250	4.5	38.69	14	1.09	0	750	YES	45	567	15	1,317	0	$1,317	HDR|CB Estimated Quantity
80		Concrete	Water Treatment Buildings, enclosures and tank fdns	0.0	cy	Contr	Contr	250	4.5	38.69	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
81		Concrete	Grouting (equipment & steel)	30.0	cy	Contr	Contr	2,227.50	81	38.69	2,430	1.09	0	66,825	NO	0	102,021	2,637	168,846	0	$168,846	HDR|CB Estimated Quantity
82																						
83			Sub Total Concrete	**25,173**				AVG MH/CY	5.15		121,821			6,655,575		32,445	5,114,512	132,176	11,770,087	0	11,770,087	
84																						
85			**Division #2 - Earthwork & Concrete Sub-Total**								**121,821**		**0**	**6,655,575**		**32,445**	**5,114,512**	**132,176**	**11,770,087**	**11,900,000**	**23,670,087**	
86																						
87	**Division #3.0 - Architectural**													-								
88																						
89		rchitectura	Exterior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
90		rchitectura	Fire extinguishers	36.0	ea	Contr	Contr	500.00	3	53.33	108	1.09	0	18,000	YES	1,080	6,249	117	24,249	0	$24,249	HDR|CB Estimated Quantity
91		rchitectura	Fire hose cabinets	26.0	ea	Contr	Contr	1,200.00	20	53.33	520	1.09	0	31,200	YES	1,872	30,090	564	61,290	0	$61,290	HDR|CB Estimated Quantity
92		rchitectura	Fire hydrants w/monitor nozzles	10.0	ea	Contr	Contr	2,550.00	12	54.96	120	1.09	0	25,500	YES	1,530	7,156	130	32,656	0	$32,656	HDR|CB Estimated Quantity
93		rchitectura	Fire protection control room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
94		rchitectura	Fire Protection Elect Equip & Cable Spreading Room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
95		rchitectura	Fire Protection GSU and Aux Transformers	1.0	ls	Sub	Contr	200,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	200,000	$200,000	HDR|CB Estimated Quantity
96		rchitectura	Fire Protection Turbine Building	1.0	ls	Sub	Contr	600,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
97		rchitectura	Fire Detection/Alarm	1.0	lot	Contr	Contr	410,000.00	1000	50.09	1,000	1.09	0	410,000	NO	0	54,352	1,085	464,352	0	$464,352	HDR|CB Estimated Quantity
98		rchitectura	HVAC System Allowance	1.0	ls	Sub	Contr	750,000.00		54.96	0	1.09	0	0	YES	22,500	0	0	0	750,000	$750,000	HDR|CB Estimated Quantity
99		rchitectura	Interior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
100		rchitectura	Masonry Walls 8" CMU	20,000.0	sf	Contr	Contr	4.00	0.15	32.95	3,000	1.09	0	80,000	yes	4,800	107,267	3,255	187,267	0	$187,267	HDR|CB Estimated Quantity
101		rchitectura	Overhead Rolling Doors - steel	4.0	ea	Contr	Contr	5,000.00	40	38.68	160	1.09	0	20,000	yes	1,200	6,715	174	26,715	0	$26,715	HDR|CB Estimated Quantity
102		rchitectura	Painting - equipment and piping	1.0	lot	Contr	Contr	100,000.00	3600	36.36	3,600	1.09	0	100,000	yes	6,000	142,016	3,906	242,016	0	$242,016	HDR|CB Estimated Quantity
103		rchitectura	Painting - structural steel, grating, handrail touch-up	250,000.0	sf	Contr	Contr	0.30	0.010	36.36	2,500	1.09	0	75,000	yes	4,500	98,622	2,713	173,622	0	$173,622	HDR|CB Estimated Quantity
104		rchitectura	Painting - turbine room floor epoxy finish	40,000.0	sf	Contr	Contr	0.80	0.045	36.36	1,805	1.09	0	32,000	yes	1,920	71,197	1,958	103,197	0	$103,197	HDR|CB Estimated Quantity
105		rchitectura	Restrooms, showers, locker rooms	1.0	lot	Contr	Contr	125,000.00	1200	53.33	1,200	1.09	0	125,000	YES	7,500	69,438	1,302	194,438	0	$194,438	HDR|CB Estimated Quantity
106		rchitectura	Roof Drains	1,700.0	lf	Contr	Contr	32.50	2.0	54.96	3,400	1.09	0	55,250	yes	3,315	202,758	3,689	258,008	0	$258,008	HDR|CB Estimated Quantity
107		rchitectura	Structural Steel - Misc Building Steel	25.0	ton	Contr	Contr	3,200.00	30	60.25	750	1.09	0	80,000	yes	4,800	49,026	814	129,026	0	$129,026	HDR|CB Estimated Quantity
108		rchitectura	Structural Steel - Pipe Rack	600.0	ton	Contr	Contr	3,400.00	20	60.25	12,000	1.09	0	2,040,000	NO	0	784,409	13,020	2,824,409	0	$2,824,409	HDR|CB Estimated Quantity
109		rchitectura	Structural Steel - Misc Platforms	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	NO	0	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
110		rchitectura	Structural Steel - Turbine Building Framing	500.0	ton	Contr	Contr	2,850.00	15	60.25	7,500	1.09	0	1,425,000	NO	0	490,255	8,138	1,915,255	0	$1,915,255	HDR|CB Estimated Quantity

2 x 1 Siemens H Class 760 MW Combined Cycle Unit

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Conceptual

STATUS DATE: 22-Feb-13

E BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
Line #																					
111	rchitectura	Trench Floor Drain Cover	2,000.0	lf	Contr	Contr	60.45	0.4	54.96	800	1.09	0	120,900	yes	7,254	47,708	868	168,608	0	$168,608	HDR|CB Estimated Quantity
112	rchitectura	Turbine Building Built-up Roof	18,000.0	sf	Contr	Contr	0.75	0.035	35.31	630	1.09	0	13,500	NO	0	24,138	684	37,638	0	$37,638	HDR|CB Estimated Quantity
113	rchitectura	Turbine Building Metal Siding	52,900.0	sf	Contr	Contr	10.40	0.05	56.41	2,645	1.09	0	550,160	NO	0	161,876	2,870	712,036	0	$712,036	HDR|CB Estimated Quantity
114	rchitectura	Administration/Control/Maintenance Building	16,000.0	sf	Sub	Contr	140.00		38.68	0	1.09	0	0	YES	0	0	0	0	2,240,000	$2,240,000	HDR|CB Estimated Quantity
115	rchitectura	Cooling Tower, pre-engineered - Elect, Chem feed, I&C Bldg	3,000.0	sf	Sub	Contr	80.00		59.59	0	1.09	0	0	NO	0	0	0	0	240,000	$240,000	HDR|CB Estimated Quantity
116	rchitectura	Main Gate Guard House	80.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	YES	0	0	0	0	6,400	$6,400	HDR|CB Estimated Quantity
117	rchitectura	Auxilary Boiler Building	4,000.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	440,000	$440,000	HDR|CB Estimated Quantity
118	rchitectura	Water Treatment Building	0.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
119	rchitectura	Warehouse	8,000.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	NO	0	0	0	0	640,000	$640,000	HDR|CB Estimated Quantity
120	rchitectura	Boiler Feed Pump Buildings	2.0	ea	sub	Contr	300,000.00		38.68	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
121																					
122		**Division #3 - Architectural Sub-Total**								**43,138**	**1.05**	**0**	**5,385,510**		**75,471**	**2,426,063**	**46,805**	**7,811,573**	**5,766,400**	**$13,577,973**	
123																					
124	**Division #4.0 - Mechanical Piping**																				
125	**Division #4.1 - Mechanical Piping**																				
126																					
127	chanical Pip	Pipe - MS, HR, CR, BFW, LPS	**3,590.0**	lf																	
128	chanical Pip	- System - Cold Reheat (Carbon)	800.0	lf	Contr	Contr	2,990.00	7.2	54.96	5,790	1.09	0	2,392,000	NO	0	345,308	6,283	2,737,308	0	$2,737,308	HDR|CB Estimated Quantity
129	chanical Pip	- System - Feedwater (Carbon)	650.0	lf	Contr	Contr	910.00	5.6	54.96	3,666	1.09	0	591,500	NO	0	218,620	3,978	810,120	0	$810,120	HDR|CB Estimated Quantity
130	chanical Pip	- System - Hot Reheat (Alloy)	540.0	lf	Contr	Contr	3,645.00	14.4	54.96	7,766	1.09	0	1,968,300	NO	0	463,139	8,426	2,431,439	0	$2,431,439	HDR|CB Estimated Quantity
131	chanical Pip	- System - Main Steam (Alloy)	800.0	lf	Contr	Contr	4,000.00	14.4	54.96	11,506	1.09	0	3,200,000	NO	0	686,131	12,484	3,886,131	0	$3,886,131	HDR|CB Estimated Quantity
132	chanical Pip	- System - Low Pressure Steam Steam (Alloy)	800.0	lf	Contr	Contr	246.00	7.5	54.96	6,016	1.09	0	196,800	NO	0	358,762	6,527	555,562	0	$555,562	HDR|CB Estimated Quantity
133	chanical Pip	Pipe - Above Ground - Large Bore Average "	**29,610.0**	lf																	
134	chanical Pip	- System - Boilers, Vents and Drains	700.0	lf	Contr	Contr	300.00	4.14	54.96	2,895	1.09	0	210,000	NO	0	172,654	3,141	382,654	0	$382,654	HDR|CB Estimated Quantity
135	chanical Pip	- System - Aux steam drain returns	2,500.0	lf	Contr	Contr	30.00	1.22	54.96	3,055	1.09	0	75,000	NO	0	182,184	3,315	257,184	0	$257,184	HDR|CB Estimated Quantity
136	chanical Pip	- System - Building drains	1,350.0	lf	Contr	Contr	30.00	1.22	54.96	1,650	1.09	0	40,500	YES	2,430	98,379	1,790	138,879	0	$138,879	HDR|CB Estimated Quantity
137	chanical Pip	- System - Building fire protection	5,800.0	lf	Contr	Contr	18.00	1.50	54.96	8,723	1.09	0	104,400	YES	6,264	520,204	9,465	624,604	0	$624,604	HDR|CB Estimated Quantity
138	chanical Pip	- System - Building sump pumps	800.0	lf	Contr	Contr	47.00	1.55	54.96	1,241	1.09	0	37,600	YES	2,256	73,995	1,346	111,595	0	$111,595	HDR|CB Estimated Quantity
139	chanical Pip	- System - Circulating Water	1,000.0	lf	Contr	Contr	450.00	4.70	54.96	4,700	1.09	0	450,000	NO	0	280,282	5,100	730,282	0	$730,282	HDR|CB Estimated Quantity
140	chanical Pip	- System - Condensate	1,350.0	lf	Contr	Contr	190.00	2.35	54.96	3,173	1.09	0	256,500	NO	0	189,191	3,442	445,691	0	$445,691	HDR|CB Estimated Quantity
141	chanical Pip	- System - Condenser Air Extraction	300.0	lf	Contr	Contr	184.00	2.35	54.96	705	1.09	0	55,200	NO	0	42,042	765	97,242	0	$97,242	HDR|CB Estimated Quantity
142	chanical Pip	- System - Cooling water	600.0	lf	Contr	Contr	320.00	2.63	54.96	1,579	1.09	0	192,000	NO	0	94,175	1,713	286,175	0	$286,175	HDR|CB Estimated Quantity
143	chanical Pip	- System - Demineralized water	400.0	lf	Contr	Contr	27.00	0.39	54.96	154	1.09	0	10,800	NO	0	9,193	167	19,993	0	$19,993	HDR|CB Estimated Quantity
144	chanical Pip	- System - Fire Protection	300.0	lf	Contr	Contr	150.00	2.35	54.96	705	1.09	0	45,000	YES	2,700	42,042	765	87,042	0	$87,042	HDR|CB Estimated Quantity
145	chanical Pip	- System - Natural Gas High Pressure - SS	260.0	lf	Contr	Contr	52.40	0.85	54.96	220	1.09	0	13,624	YES	817	13,117	239	26,741	0	$26,741	HDR|CB Estimated Quantity
146	chanical Pip	- System - Potable water	1,000.0	lf	Contr	Contr	18.00	1.50	54.96	1,504	1.09	0	18,000	YES	1,080	89,690	1,632	107,690	0	$107,690	HDR|CB Estimated Quantity
147	chanical Pip	- System - Sanitary waste	3,000.0	lf	Contr	Contr	47.00	1.55	54.96	4,653	1.09	0	141,000	YES	8,460	277,480	5,049	418,480	0	$418,480	HDR|CB Estimated Quantity
148	chanical Pip	- System - Service Water	1,000.0	lf	Contr	Contr	184.00	1.97	54.96	1,974	1.09	0	184,000	YES	11,040	117,719	2,142	301,719	0	$301,719	HDR|CB Estimated Quantity
149	chanical Pip	- System - STG lube oil	200.0	lf	Contr	Contr	32.00	1.11	54.96	222	1.09	0	6,400	NO	0	13,239	241	19,639	0	$19,639	HDR|CB Estimated Quantity
150	chanical Pip	- System - STG oil purification	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
151	chanical Pip	- System - STG Seal Oil	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
152	chanical Pip	- System - STG Stator cooling	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
153	chanical Pip	- System - STG Steam Seal	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
154	chanical Pip	- System - Turbine drains	690.0	lf	Contr	Contr	47.00	1.55	54.96	1,070	1.09	0	32,430	NO	0	63,820	1,161	96,250	0	$96,250	HDR|CB Estimated Quantity
155	chanical Pip	- System - HRSG Blowdown	200.0	lf	Contr	Contr	18.00	1.50	54.96	301	1.09	0	3,600	NO	0	17,938	326	21,538	0	$21,538	HDR|CB Estimated Quantity
156	chanical Pip	- System - Cycle Makeup	360.0	lf	Contr	Contr	47.00	1.55	54.96	558	1.09	0	16,920	NO	0	33,298	606	50,218	0	$50,218	HDR|CB Estimated Quantity
157	chanical Pip	- System - Miscellaneous Systems Piping CS)	6,600.0	lf	Contr	Contr	47.00	1.55	54.96	10,237	1.09	0	310,200	YES	18,612	610,455	11,107	920,655	0	$920,655	HDR|CB Estimated Quantity
158	chanical Pip	Pipe - Above Ground - Small Bore	**26,055.0**	lf																	
159	chanical Pip	- System - Water Cycle Sample - Alloy	150.0	lf	Contr	Contr	13.00	0.85	54.96	127	1.09	0	1,950	NO	0	7,568	138	9,518	0	$9,518	HDR|CB Estimated Quantity
160	chanical Pip	- System - STG lube oil	300.0	lf	Contr	Contr	11.60	0.62	54.96	186	1.09	0	3,480	NO	0	11,092	202	14,572	0	$14,572	HDR|CB Estimated Quantity
161	chanical Pip	- System - CT Auxilarie	1,800.0	lf	Contr	Contr	18.00	1.13	54.96	2,030	1.09	0	32,400	NO	0	121,082	2,203	153,482	0	$153,482	HDR|CB Estimated Quantity
162	chanical Pip	- System - Instrument Air	3,100.0	lf	Contr	Contr	8.00	0.14	54.96	437	1.09	0	24,800	NO	0	26,066	474	50,866	0	$50,866	HDR|CB Estimated Quantity
163	chanical Pip	- System - Instrument Air supply	3,000.0	lf	Contr	Contr	35.00	0.28	54.96	846	1.09	0	105,000	NO	0	50,451	918	155,451	0	$155,451	HDR|CB Estimated Quantity
164	chanical Pip	- System - Service Air piping	1,300.0	lf	Contr	Contr	12.00	0.22	54.96	281	1.09	0	15,600	YES	936	16,761	305	32,361	0	$32,361	HDR|CB Estimated Quantity
165	chanical Pip	- System - Instrument Air	2,035.0	lf	Contr	Contr	11.50	0.52	54.96	1,052	1.09	0	23,403	YES	1,404	62,741	1,142	86,144	0	$86,144	HDR|CB Estimated Quantity
166	chanical Pip	- System - Service Water	900.0	lf	Contr	Contr	20.00	1.32	54.96	1,184	1.09	0	18,000	YES	1,080	70,631	1,285	88,631	0	$88,631	HDR|CB Estimated Quantity
167	chanical Pip	- System - Cycle Chemical Feed	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
168	chanical Pip	- System - Boiler Vents & Drains - Alloy	700.0	lf	Contr	Contr	20.00	1.32	54.96	921	1.09	0	14,000	YES	840	54,935	1,000	68,935	0	$68,935	HDR|CB Estimated Quantity
169	chanical Pip	- System - (HP) Main Steam - Alloy	600.0	lf	Contr	Contr	20.00	1.32	54.96	790	1.09	0	12,000	YES	720	47,087	857	59,087	0	$59,087	HDR|CB Estimated Quantity
170	chanical Pip	- System - (LP) Steam - Carbon	1,400.0	lf	Contr	Contr	18.00	1.13	54.96	1,579	1.09	0	25,200	YES	1,512	94,175	1,713	119,375	0	$119,375	HDR|CB Estimated Quantity
171	chanical Pip	- System - Hot Reheat Steam - Alloy	650.0	lf	Contr	Contr	20.00	1.32	54.96	855	1.09	0	13,000	YES	780	51,011	928	64,011	0	$64,011	HDR|CB Estimated Quantity
172	chanical Pip	- System - Cold Reheat Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
173	chanical Pip	- System - Cycle Makeup	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
174	chanical Pip	- System - Aux Steam - Carbon	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
175	chanical Pip	- System - STG Seals and Drains - Alloy	1,400.0	lf	Contr	Contr	20.00	1.32	54.96	1,842	1.09	0	28,000	YES	1,680	109,871	1,999	137,871	0	$137,871	HDR|CB Estimated Quantity
176	chanical Pip	- System - CT System - Carbon	250.0	lf	Contr	Contr	18.00	1.13	54.96	282	1.09	0	4,500	YES	270	16,817	306	21,317	0	$21,317	HDR|CB Estimated Quantity
177	chanical Pip	- System - Hydrogen - Carbon	0.0	lf	Contr	Contr	12.35	1.03	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
178	chanical Pip	- System - Carbon Dioxide - Carbon	0.0	lf	Contr	Contr	12.35	1.03	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
179	chanical Pip	- System - Miscellaneous	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
180	chanical Pip	- System - Condensate - Carbon	400.0	lf	Contr	Contr	18.00	1.13	54.96	451	1.09	0	7,200	YES	432	26,907	490	34,107	0	$34,107	HDR|CB Estimated Quantity
181	chanical Pip	- System - Closed Cycle Cooling Water - Carbon	900.0	lf	Contr	Contr	12.35	1.03	54.96	931	1.09	0	11,115	YES	667	55,496	1,010	66,611	0	$66,611	HDR|CB Estimated Quantity
182	chanical Pip	- System - Fuel Gas - Carbon	900.0	lf	Contr	Contr	18.00	1.13	54.96	1,015	1.09	0	16,200	YES	972	60,541	1,101	76,741	0	$76,741	HDR|CB Estimated Quantity
183	chanical Pip	- System - Condensed Air Extraction - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
184	chanical Pip	- System - CW Chemical Feed - Carbon	20.0	lf	Contr	Contr	18.00	1.13	54.96	23	1.09	0	360	YES	22	1,345	24	1,705	0	$1,705	HDR|CB Estimated Quantity
185	chanical Pip	- System - Nitrogen Gas System	200.0	lf	Contr	Contr	19.00	0.19	54.96	38	1.09	0	3,800	YES	228	2,242	41	6,042	0	$6,042	HDR|CB Estimated Quantity
186	chanical Pip	- System - Waste Water Coll & Treatment - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
187	chanical Pip	- System - Chemical Waste Treatment	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
188	chanical Pip	- System - Miscellaneous Systems Piping	4,400.0	lf	Contr	Contr	12.35	1.03	54.96	4,550	1.09	0	54,340	YES	3,260	271,313	4,936	325,653	0	$325,653	HDR|CB Estimated Quantity
189	chanical Pip	Pipe - Below Ground - Large Bore	**22,195.0**	lf																	
190	chanical Pip	- System - Hydrogen	0.0	lf	Contr	Contr	20.00	0.71	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
191	chanical Pip	- System - Fuel Gas	800.0	lf	Contr	Contr	170.00	1.97	54.96	1,579	1.09	0	136,000	NO	0	94,175	1,713	230,175	0	$230,175	HDR|CB Estimated Quantity
192	chanical Pip	- System - Main Circ. - HDPE	400.0	lf	Contr	Contr	15.00	1.13	54.96	451	1.09	0	6,000	NO	0	26,907	490	32,907	0	$32,907	HDR|CB Estimated Quantity
192	chanical Pip	- System - Miscellaneous Systems Piping - HDPE	7,840.0	lf	Contr	Contr	15.00	1.13	54.96	8,844	1.09	0	117,600	NO	0	527,379	9,595	644,979	0	$644,979	HDR|CB Estimated Quantity
193	chanical Pip	- System - Waste Water Treatment Piping - HDPE (Sch 17)	2,565.0	lf	Contr	Contr	6.00	0.66	54.96	1,688	1.09	0	15,390	NO	0	100,649	1,831	116,039	0	$116,039	HDR|CB Estimated Quantity
193	chanical Pip	- System - Sanitary Sewer	3,000.0	lf	Contr	Contr	15.00	1.13	54.96	3,384	1.09	0	45,000	NO	0	201,803	3,672	246,803	0	$246,803	HDR|CB Estimated Quantity
194	chanical Pip	- System - Natural Gas Low Pressure - CS	850.0	lf	Contr	Contr	30.00	1.22	54.96	1,039	1.09	0	25,500	NO	0	61,942	1,127	87,442	0	$87,442	HDR|CB Estimated Quantity
195	chanical Pip	- System - Natural Gas High Pressure - CS	500.0	lf	Contr	Contr	30.00	1.22	54.96	611	1.09	0	15,000	NO	0	36,437	663	51,437	0	$51,437	HDR|CB Estimated Quantity
196	chanical Pip	- System - Potable Water to site facilities	500.0	lf	Contr	Contr	47.00	1.55	54.96	776	1.09	0	23,500	NO	0	46,247	841	69,747	0	$69,747	HDR|CB Estimated Quantity
197	chanical Pip	- System - Cooling tower blowdown	1,160.0	lf	Contr	Contr	115.00	1.69	54.96	1,963	1.09	0	133,400	NO	0	117,046	2,130	250,446	0	$250,446	HDR|CB Estimated Quantity
198	chanical Pip	- System - Cooling tower makeup water Pipe	1,000.0	lf	Contr	Contr	115.00	1.69	39.54	1,692	1.09	0	115,000	NO	0	72,583	1,836	187,583	0	$187,583	HDR|CB Estimated Quantity
199	chanical Pip	Pipe - Below Ground - Small Bore	**790.0**	lf																	HDR|CB Estimated Quantity
200	chanical Pip	- System - Miscellaneous Systems Piping	790.0	lf	Contr	Contr	12.35	1.03	54.96	817	1.09	0	9,757	NO	0	48,713	886	58,470	0	$58,470	Based on 1-1/2" dia with 1 fitting per 20 ft.
201	chanical Pip	Circulating water 96" RCP	2,000.0	lf	Contr	Contr	636.00	7.52	54.96	15,040	1.09	0	1,272,000	NO	0	896,904	16,318	2,168,904	0	$2,168,904	HDR|CB Estimated Quantity
202	chanical Pip	Piping Non Destructive Examination	1.0	lot	Sub	Contr	75,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	75,000	$75,000	HDR|CB Estimated Quantity
203	chanical Pip	Steam Blows	1.0	lot	Sub	Contr	150,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	150,000	$150,000	HDR|CB Estimated Quantity
204	chanical Pip	Stress relieving LB Alloy	50.0	ea	Contr	Contr	1,500.00	80.00	54.96	4,000	1.09	0	75,000	NO	0	238,538	4,340	313,538	0	$313,538	HDR|CB Estimated Quantity
205																					
206		**Division #4.1 - Mechanical Piping Sub-Total**	**82,240.0**	**LF**						148,495		0	13,005,618		69,683	8,827,101	161,117	21,832,719	225,000	$22,057,719	
207																					
208	**Division #4.2 - Mechanical Valves**																				
209																					
210	hanical Va	Valves - Large Bore General Service	500.0	ea	Contr	Contr	636.00	16.92	54.96	8,460	1.09	0	318,000	NO	0	504,508	9,179	822,508	0	$822,508	HDR|CB Estimated Quantity
211	hanical Va	Valves - Large Bore HP 900# to 3800#	100.0	ea	Contr	Contr	6,750.00	56.4	54.96	5,640	1.09	0	675,000	NO	0	336,339	6,119	1,011,339	0	$1,011,339	HDR|CB Estimated Quantity
212	hanical Va	Valves - Large Bore LP Circ Water	4.0	ea	Contr	Contr	197,500.00	112.8	54.96	451	1.09	0	790,000	NO	0	26,907	490	816,907	0	$816,907	HDR|CB Estimated Quantity
213	hanical Va	Valves - Small Bore - I/A supply	100.0	ea	Contr	Contr	17.50	1.88	54.96	188	1.09	0	1,750	NO	0	11,211	204	12,961	0	$12,961	HDR|CB Estimated Quantity
214	hanical Va	Valves - Small Bore - Instrument piping	500.0	ea	Contr	Contr	270.00	1.88	54.96	940	1.09	0	135,000	NO	0	56,056	1,020	191,056	0	$191,056	HDR|CB Estimated Quantity
215	hanical Va	Valves - Small Bore Bronze	40.0	ea	Contr	Contr	480.00	2.82	54.96	113	1.09	0	19,200	NO	0	6,727	122	25,927	0	$25,927	HDR|CB Estimated Quantity

2 x 1 Siemens H Class 760 MW Combined Cycle Unit

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STATUS DATE: 22-Feb-13

E BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
Line #																					
216	hanical Va	Valves - Small Bore Class 800	250.0	ea	Contr	Contr	305.00	2.82	54.96	705	1.09	0	76,250	NO	0	42,042	765	118,292	0	$118,292	HDR|CB Estimated Quantity
217	hanical Va	Valves - Small Bore HP 1500# Alloy & CS	150.0	ea	Contr	Contr	670.00	15.04	54.96	2,256	1.09	0	100,500	NO	0	134,536	2,448	235,036	0	$235,036	HDR|CB Estimated Quantity
218	hanical Va	Valves - Small Bore HP 3800# Alloy	30.0	ea	Contr	Contr	3,050.00	22.56	54.96	677	1.09	0	91,500	NO	0	40,361	734	131,861	0	$131,861	HDR|CB Estimated Quantity
219	hanical Va	Valves - By Pass	1.0	ea	Contr	Contr	1,150,000.00	75.2	54.96	75	1.09	0	1,150,000	NO	0	4,485	82	1,154,485	0	$1,154,485	HDR|CB Estimated Quantity
220																					
221																					
222		**Division #4.2 - Mechanical Valves Sub-Total**	**1,675.0**	**ea**						19,505		$0	3,357,200		0	1,163,172	21,163	4,520,372	0	$4,520,372	
223																					
224	**Division #4.3 - Mechanical Insulation & Coatings**																				
225																					
226	Insulation	Insulation - BOP Equipment	16,000.0	sf	Contr	Contr	15.00	0.5	46.60	8,000	1.09	0	240,000	NO	0	404,462	8,680	644,462	0	$644,462	HDR|CB Estimated Quantity
227	Insulation	Insulation - Piping Freeze Protection	2,000.0	lf	Contr	Contr	3.50	0.2	46.60	400	1.09	0	7,000	NO	0	20,223	434	27,223	0	$27,223	HDR|CB Estimated Quantity
228	Insulation	Insulation - Piping Large Bore BOP	7,460.0	lf	Contr	Contr	15.00	0.5	46.60	3,730	1.09	0	111,900	NO	0	188,580	4,047	300,480	0	$300,480	HDR|CB Estimated Quantity
229	Insulation	Insulation - Piping Large Bore High Temp	3,590.0	lf	Contr	Contr	50.00	1.5	46.60	5,385	1.09	0	179,500	NO	0	272,253	5,843	451,753	0	$451,753	HDR|CB Estimated Quantity
230	Insulation	Insulation - Piping Small Bore	22,720.0	lf	Contr	Contr	8.00	0.23	46.60	5,226	1.09	0	181,760	NO	0	264,194	5,670	445,954	0	$445,954	HDR|CB Estimated Quantity
231																					
232																					
233		**Division #4.3 - Mechanical Insulation & Coatings Sub-Total**								22,741		0	720,160		0	1,149,713	24,674	1,869,873	0	$1,869,873	
234																					
235																					
236	**Division #4.4 - Mechanical Engineered Pipe Hangers (Including Supplemental Support Steel)**																				
237																					
238	hanical Pipe H	Hangers & Supports - (Large Bore Engineered)	200	ea	Contr	Contr	1,760.00	12.5	54.96	2,502	1.09	0	352,311	NO	0	149,218	2,715	501,529	0	$501,529	HDR|CB Estimated Quantity
239	hanical Pipe H	Hangers & Supports - (Large Bore Rigid)	1558	ea	Contr	Contr	192.50	7.1	54.96	11,065	1.09	0	299,996	NO	0	659,844	12,005	959,840	0	$959,840	HDR|CB Estimated Quantity
240	hanical Pipe H	Hangers & Supports - (Small Bore Rigid)	1861	ea	Contr	Contr	88.00	1.5	54.96	2,792	1.09	0	163,774	NO	0	166,476	3,029	330,251	0	$330,251	HDR|CB Estimated Quantity
241																					
242		**Division #4.4 - Mechanical Engineered Pipe Hangers Sub-Total**								16,359		0	816,081		0	975,538	17,749	1,791,619	0	$1,791,619	
243																					
244	**Division #4.5 - Mechanical Accessories**																				
245																					
246	nical Acces	Instr. Air Supply filter regulators	40.0	ea	Contr	Contr	132.00	2.4	54.96	96	1.09	0	5,280	NO	0	5,725	104	11,005	0	$11,005	HDR|CB Estimated Quantity
247	nical Acces	Expansion Joints - Circ Water	2.0	ea	Contr	Contr	75,000.00	210	54.96	420	1.09	0	150,000	NO	0	25,047	456	175,047	0	$175,047	HDR|CB Estimated Quantity
248	nical Acces	Miscellaneous Specialties	1.0	lot	Contr	Contr	75,000.00	600	54.96	600	1.09	0	75,000	NO	0	35,781	651	110,781	0	$110,781	HDR|CB Estimated Quantity
249	nical Acces	Miscellaneous Strainers, traps, Exp Joints	1.0	ls	Contr	Contr	125,000.00	120	54.96	120	1.09	0	125,000	NO	0	7,156	130	132,156	0	$132,156	HDR|CB Estimated Quantity
250	nical Acces	Miscellaneous Trolleys & Hoists	1.0	ls	Contr	Contr	150,000.00	480	54.96	480	1.09	0	150,000	NO	0	28,625	521	178,625	0	$178,625	HDR|CB Estimated Quantity
251																					
252		**Division #4.5 - Mechanical Accessories Sub-Total**								1,716		0	505,280		0	102,333	1,862	607,613	0	$607,613	
253																					
254		**Division #4 - Mechanical Piping**								**208,815**		**0**	**18,404,339**		**69,683**	**12,217,857**	**226,564**	**30,622,196**	**225,000**	**$30,847,196**	
255																					
256	**Division #5.0 - Mechanical Equipment**																				
257																					
258	**Division #5.1 - Boiler Equipment**																				
259																					
260	HRSG	Heat Recovery Steam Generator with Duct Burner/CO/Penthouse	2.0	ea	Contr	Contr	30,500,000.00		69.04	0	1.09	0	61,000,000	NO	0	0	0	61,000,000	0	$61,000,000	OEM Bidget Proposal
261	HRSG	Steam Generator Erection	2.0	ea	Contr	Contr		86,500	69.04	173,000	1.09	0	0	NO	0	12,959,860	187,705	12,959,860	0	$12,959,860	HDR|CB Estimated cost
262																					
263		**Division #5.1 - Boiler Equipment Sub-Total**								**173,000**		**0**	**61,000,000**		**0**	**12,959,860**	**187,705**	**73,959,860**	**0**	**$73,959,860**	
264																					
265	**Division #5.2 - Turbine Equipment**																				
266																					
267	STG	Steam Turbine Generator	1.0	ea	Contr	Contr	43,000,000.00		53.33	0	1.09	0	43,000,000	NO	0	0	0	43,000,000	0	$43,000,000	Recent Vender quote
268	STG	Steam Turbine Generator, Erection	1.0	ea	Contr	Contr		23,000	53.33	23,000	1.09	0	0	NO	0	1,330,893	24,955	1,330,893	0	$1,330,893	HDR|CB Estimated cost
269																					
270		**Division #5.2 - Turbine Equipment Sub-Total**								**23,000**		**0**	**43,000,000**		**0**	**1,330,893**	**24,955**	**44,330,893**	**0**	**44,330,893**	
271																					
272	**Division #5.3 - Not Used**																				
273																					
274	**Division #5.4 - Mechanical Draft Cooling Tower**																				
275																					
276	Cooling Tw	Cooling Tower - Mechanical Draft (F&E)	1.0	Is	Sub	Contr	5,800,000.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	5,800,000	$5,800,000	Recent Vender quote
277																					
278		**Division #5.4 - Mechanical Draft Cooling Tower Sub-Total**								**0**		**0**	**0**		**0**	**0**	**0**	**0**	**5,800,000**	**5,800,000**	
279																					
280	**Division #5.5 - Combustion Turbine Equipment**																				
281																					
282	CT	Combustion Turbine	2.0	ea	Contr	Contr	67,496,763.34		53.33	0	1.09	0	134,993,527	NO	0	0	0	134,993,527	0	$134,993,527	OEM Bidget Proposal
283	CT	Combustion Turbine, Installation	2.0	ea	Contr	Contr		38,000	53.33	76,000	1.09	0	0	NO	0	4,397,735	82,460	4,397,735	0	$4,397,735	HDR|CB Estimated cost
284																					
285																					
286		**Division #5.4 - Combustion Turbine Equipment Sub-Total**								**76,000**		**0**	**134,993,527**		**0**	**4,397,735**	**82,460**	**139,391,261**	**0**	**139,391,261**	
287																					
288	**Division #5.6 - BOP Mechanical Equipment**																				
289																					
290	Equipment	Blowdown Tank	4.0	ea	Contr	Contr	16,600.00	20	54.96	80	1.09	0	66,400	NO	0	4,771	87	71,171	0	$71,171	HDR|CB Estimated cost
291	Equipment	Closed Cooling Water Exchanger	2.0	ea	Contr	Contr	1,039,500.00	300	54.96	600	1.09	0	2,079,000	NO	0	35,781	651	2,114,781	0	$2,114,781	HDR|CB Estimated cost
292	Equipment	Closed Cooling Water Inhibitor Mixing Pot	1.0	ea	Contr	Contr	3,000.00	8	54.96	8	1.09	0	3,000	NO	0	477	9	3,477	0	$3,477	HDR|CB Estimated cost
293	Equipment	Closed Cooling Water (CCW) Heat Exchanger Strainer (Shell & Tube	2.0	ea	Contr	Contr	34,000.00	10	54.96	20	1.09	0	68,000	NO	0	1,193	22	69,193	0	$69,193	HDR|CB Estimated cost
294	Equipment	Instrument Air Receivers	2.0	ea	Contr	Contr	5,000.00	44	54.96	88	1.09	0	10,000	NO	0	5,248	95	15,248	0	$15,248	HDR|CB Estimated cost
295	Equipment	Main Condenser	1.0	ea	Contr	Contr	4,400,000.00	9000	65.52	9,000	1.09	0	4,400,000	NO	0	639,756	9,765	5,039,756	0	$5,039,756	Recent Vender quote
296	Equipment	Oil/Water Separator	1.0	ea	Contr	Contr	50,000.00	244	54.96	244	1.09	0	50,000	NO	0	14,551	265	64,551	0	$64,551	HDR|CB Estimated cost
297	Equipment	Plant Air Compressors	2.0	ea	Contr	Contr	140,000.00	100	54.96	200	1.09	0	280,000	NO	0	11,927	217	291,927	0	$291,927	HDR|CB Estimated cost
298	Equipment	Plant Air Dryers	2.0	ea	Contr	Contr	30,000.00	100	54.96	200	1.09	0	60,000	NO	0	11,927	217	71,927	0	$71,927	HDR|CB Estimated cost
299	Equipment	Plant Air Receivers	2.0	ea	Contr	Contr	5,000.00	20	54.96	40	1.09	0	10,000	NO	0	2,385	43	12,385	0	$12,385	HDR|CB Estimated cost
302	Equipment	Pumps - Circulating Water	2.0	ea	Contr	Contr	875,000.00	500	54.96	1,000	1.09	0	1,750,000	NO	0	59,635	1,085	1,809,635	0	$1,809,635	HDR|CB Estimated cost
303	Equipment	Pumps - Auxiliary Cooling Water	1.0	ea	Contr	Contr	120,000.00	96	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
304	Equipment	Pumps - Closed Cooling Water	2.0	ea	Contr	Contr	134,000.00	200	53.33	400	1.09	0	268,000	NO	0	23,146	434	291,146	0	$291,146	HDR|CB Estimated cost
306	Equipment	Pumps - Boiler Feed	2.0	ea	Contr	Contr	775,000.00	1200	53.33	2,400	1.09	0	1,550,000	NO	0	138,876	2,604	1,688,876	0	$1,688,876	HDR|CB Estimated cost
307	Equipment	Pumps - Condensate	2.0	ea	Contr	Contr	230,000.00	200	53.33	400	1.09	0	460,000	NO	0	23,146	434	483,146	0	$483,146	HDR|CB Estimated cost
308	Equipment	Pumps - Service Water	2.0	ea	Contr	Contr	160,000.00	210	53.33	420	1.09	0	320,000	NO	0	24,303	456	344,303	0	$344,303	HDR|CB Estimated cost
309	Equipment	Pumps - Fire Water (Electric and Diesel)	0.0	lt	Contr	Contr	500,000.00	310	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
310	Equipment	Pumps - Sump - Blowdown, Waste Water	2.0	ea	Contr	Contr	30,000.00	24	53.33	48	1.09	0	60,000	NO	0	2,778	52	62,778	0	$62,778	HDR|CB Estimated cost
311	Equipment	Pumps - Sump - Power Island Misc Building Sumps	6.0	ea	Contr	Contr	30,000.00	24	53.33	144	1.09	0	180,000	NO	0	8,333	156	188,333	0	$188,333	HDR|CB Estimated cost
314	Equipment	Pumps - Demin Water Transfer	2.0	ea	Contr	Contr	66,000.00	48	53.33	96	1.09	0	132,000	NO	0	5,555	104	137,555	0	$137,555	HDR|CB Estimated cost
318	Equipment	Pumps - Treated Water Transfer to Serv Water Tank	2.0	ea	Contr	Contr	40,000.00	80	53.33	160	1.09	0	80,000	NO	0	9,258	174	89,258	0	$89,258	HDR|CB Estimated cost
319	Equipment	Pumps - Waste Water	2.0	ea	Contr	Contr	80,000.00	125	53.33	250	1.09	0	160,000	NO	0	14,466	271	174,466	0	$174,466	HDR|CB Estimated cost
320	Equipment	Pumps - Evaporative Cooling Water	2.0	ea	Contr	Contr	37,000.00	80	53.33	160	1.09	0	74,000	NO	0	9,258	174	83,258	0	$83,258	HDR|CB Estimated cost
321	Equipment	Sample Analysis Panel (water)	2.0	ea	Contr	Contr	200,000.00	139	54.96	278	1.09	0	400,000	NO	0	16,578	302	416,578	0	$416,578	HDR|CB Estimated cost
322	Equipment	Tank - 200,000 gal treated water/service water - (F&E)	0.0	ea	Sub	Contr	540,000.00	0		0	1.09	0	0	yes	0	0	0	0	0	$0	Furnish and Erect price
323	Equipment	Tank - Demin Water Storage 200,000 gal. (F&E)	1.0	ea	Sub	Contr	600,000.00	0		0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	Furnish and Erect Price
324	Equipment	Tank - Turbine Drains	2.0	ea	Contr	Contr	75,000.00	200	53.33	400	1.09	0	150,000	NO	0	23,146	434	173,146	0	$173,146	HDR|CB Estimated cost
325	Equipment	Tank - Closed Cooling Water Dispersant 10,000 gal.	1.0	ea	Contr	Contr	36,500.00	100	54.96	100	1.09	0	36,500	NO	0	5,963	109	42,463	0	$42,463	HDR|CB Estimated cost
326	Equipment	Tank - Closed Cooling Water Accumulator	1.0	ea	Contr	Contr	20,600.00	44	54.96	44	1.09	0	20,600	NO	0	2,624	48	23,224	0	$23,224	HDR|CB Estimated cost
329	Equipment	Aqueous Ammonia System Unloading, Storage Tank, Forwarding Pu	1.0	ea	Contr	Contr	400,000.00	400	53.33	400	1.09	0	400,000	NO	0	23,146	434	423,146	0	$423,146	HDR|CB Estimated cost
331	Equipment	Auxiliary Boiler System	1.0	ea	Contr	Contr	1,600,000.00	400	53.33	400	1.09	0	1,600,000	NO	0	23,146	434	1,623,146	0	$1,623,146	HDR|CB Estimated cost
332	Equipment	Compressed Gas Storage System (CO2)	1.0	ea	Contr	Contr	40,000.00	475	54.96	475	1.09	0	40,000	NO	0	28,326	515	68,326	0	$68,326	HDR|CB Estimated cost

2 x 1 Siemens H Class 760 MW Combined Cycle Unit

Kentucky
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Conceptual

STATUS DATE: 22-Feb-13

E BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
333	Equipment	Compressed Gas Storage System (H2)	1.0	ea	Contr	Contr	40,000.00	198	54.96	198	1.09	0	40,000	NO	0	11,808	215	51,808	0	$51,808	HDR|CB Estimated cost
334	Equipment	Compressed Gas Storage System (N2)	2.0	ea	Contr	Contr	20,000.00	370	54.96	740	1.09	0	40,000	NO	0	44,130	803	84,130	0	$84,130	HDR|CB Estimated cost
335	Equipment	Demineralized Water Treatment System Dual 100% Trains	0.0	ea	Contr	Contr	1,197,000.00	4000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
336	Equipment	Condensate Polisher and Related	1.0	ea	Contr	Contr	1,000,000.00	3600	54.96	3,600	1.09	0	1,000,000	NO	0	214,684	3,906	1,214,684	0	$1,214,684	HDR|CB Estimated cost
337	Equipment	Fuel Gas Filter Separators	2.0	ea	Contr	Contr	210,000.00	200	54.96	400	1.09	0	420,000	NO	0	23,854	434	443,854	0	$443,854	Sub Budgetary Quote
338	Equipment	Fuel Gas Performance Heater	2.0	ea	Contr	Contr	761,600.00	300	54.96	600	1.09	0	1,523,200	NO	0	35,781	651	1,558,981	0	$1,558,981	Sub Budgetary Quote
339	Equipment	Fuel Gas Electric Startup Heater	2.0	ea	Contr	Contr	84,000.00	40	54.96	80	1.09	0	168,000	NO	0	4,771	87	172,771	0	$172,771	HDR|CB Estimated cost
340	Equipment	Fuel Gas Drain Tank	2.0	ea	Contr	Contr	2,000.00	15	54.96	30	1.09	0	4,000	NO	0	1,789	33	5,789	0	$5,789	HDR|CB Estimated cost
341	Equipment	Fuel Gas Dewpoint Heater	1.0	ea	Contr	Contr	476,000.00	80	54.96	80	1.09	0	476,000	NO	0	4,771	87	480,771	0	$480,771	HDR|CB Estimated cost
342	Equipment	Fuel Gas Scrubber	1.0	ea	Contr	Contr	392,000.00	60	54.96	60	1.09	0	392,000	NO	0	3,578	65	395,578	0	$395,578	HDR|CB Estimated cost
343	Equipment	Fuel Gas Compressor Package 2 x 100% w/ Building	0.0	ea	Contr	Contr	2,500,000.00	3000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
344	Equipment	Hydrogen Generator	0.0	ea	Contr	Contr	194,000.00	40	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
345	Equipment	Steam Silencers	1.0	ea	Contr	Contr	150,000.00	20	54.96	20	1.09	0	150,000	NO	0	1,193	22	151,193	0	$151,193	HDR|CB Estimated cost
346	Equipment	Condensate Water Strainer	1.0	ea	Contr	Contr	150,000.00	40	54.96	40	1.09	0	150,000	NO	0	2,385	43	152,385	0	$152,385	HDR|CB Estimated cost
347	Equipment	Cycle Chem Feed	1.0	ea	Contr	Contr	200,000.00	100	54.96	100	1.09	0	200,000	NO	0	5,963	109	205,963	0	$205,963	HDR|CB Estimated cost
348	Equipment	Cooling Tower Chemical Feed	1.0	ea	Contr	Contr	250,000.00	300	54.96	300	1.09	0	250,000	NO	0	17,890	326	267,890	0	$267,890	HDR|CB Estimated cost
349	Equipment	Condeser Vaccum Pump/Air Removal Equipment	1.0	ea	Contr	Contr	350,000.00	40	54.96	40	1.09	0	350,000	NO	0	2,385	43	352,385	0	$352,385	HDR|CB Estimated cost
350	Equipment	Turbine Room Bridge Crane - 60T	1.0	ea	Contr	Contr	390,000.00	120	53.33	120	1.09	0	390,000	NO	0	6,944	130	396,944	0	$396,944	HDR|CB Estimated cost
351	Equipment	Elevator for 2 HRSG	1.0	ea	sub	contr	746,000.00	0		0	1.09	0	0	NO	0	0	0	0	746,000	$746,000	HDR|CB Estimated cost
352																					
353		**Division #5.6 BOP Mechanical Equipment Sub-Total**								**24,559**		**0**	**20,380,700**		**0**	**1,557,180**	**26,647**	**21,937,880**	**1,346,000**	**23,283,880**	
354																					
355	**Division #6.0 - Electrical Equipment**																				
356																					
357	Electrical	Eqpt - 24kv Bus Isolated Phase, 8000A	600.0	lf	Contr	Contr	750.00	8	50.09	4,800	1.09	0	450,000	NO	0	260,890	5,208	710,890	0	$710,890	HDR|CB Estimated cost
358	Electrical	Eqpt - 24kv Bus Isolated Phase, 9000A	300.0	lf	Contr	Contr	900.00	8	50.09	2,400	1.09	0	270,000	NO	0	130,445	2,604	400,445	0	$400,445	HDR|CB Estimated cost
359	Electrical	Eqpt - Bus 6.9kV non-seg	200.0	lf	Contr	Contr	510.00	4	50.09	800	1.09	0	102,000	NO	0	43,482	868	145,482	0	$145,482	HDR|CB Estimated cost
360	Electrical	Eqpt - Bus Duct 480V, 2500A	480.0	lf	Contr	Contr	610.00	3.2	50.09	1,536	1.09	0	292,800	NO	0	83,485	1,667	376,285	0	$376,285	HDR|CB Estimated cost
361	Electrical	Eqpt - Generator Breaker, 8000A, 24kV	3.0	ea	Contr	Contr	450,000.00	300	50.09	900	1.09	0	1,350,000	NO	0	48,917	977	1,398,917	0	$1,398,917	HDR|CB Estimated cost
362	Electrical	Eqpt - LV Switchgear - 480V, 4000A EO Main Ckt Bkr	6.0	ea	Contr	Contr	35,000.00	56	50.09	336	1.09	0	210,000	NO	0	18,262	365	228,262	0	$228,262	HDR|CB Estimated cost
363	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Main Ckt Bkr.	2.0	ea	Contr	Contr	15,400.00	30	50.09	60	1.09	0	30,800	NO	0	3,261	65	34,061	0	$34,061	HDR|CB Estimated cost
364	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Tie Ckt Bkr.	3.0	ea	Contr	Contr	15,400.00	30	50.09	90	1.09	0	46,200	NO	0	4,892	98	51,092	0	$51,092	HDR|CB Estimated cost
365	Electrical	Eqpt - LV Switchgear - 480V, 1200A EO Tie Ckt Bkr.	1.0	ea	Contr	Contr	10,780.00	26	50.09	26	1.09	0	10,780	NO	0	1,413	28	12,193	0	$12,193	HDR|CB Estimated cost
366	Electrical	Eqpt - LV Switchgear - 480V, 800A MO Fdr Ckt Bkr.	16.0	ea	Contr	Contr	4,575.00	22	50.09	352	1.09	0	73,200	NO	0	19,132	382	92,332	0	$92,332	HDR|CB Estimated cost
367	Electrical	Eqpt - LV Switchgear - 480V, 800A Equipped Space	6.0	ea	Contr	Contr	1,090.00	13.2	50.09	79	1.09	0	6,540	NO	0	4,305	86	10,845	0	$10,845	HDR|CB Estimated cost
368	Electrical	Eqpt - Motor Control Centers - 480V	16.0	ea	Contr	Contr	46,000.00	132	50.09	2,112	1.09	0	736,000	NO	0	114,792	2,292	850,792	0	$850,792	HDR|CB Estimated cost
369	Electrical	Eqpt - MV Switchgear - 7kV, 3000A Main Ckt Bkr.	1.00	ea	Contr	Contr	79,640.00	76	50.09	76	1.09	0	79,640	NO	0	4,131	82	83,771	0	$83,771	HDR|CB Estimated cost
370	Electrical	Eqpt - MV Switchgear - 7kV, 2000A Fdr Ckt Bkr.	2.00	ea	Contr	Contr	42,870.00	72	50.09	144	1.09	0	85,740	NO	0	7,827	156	93,567	0	$93,567	HDR|CB Estimated cost
371	Electrical	Eqpt - MV Switchgear - 7kV, 1200A Fdr Ckt Bkr.	20.00	ea	Contr	Contr	36,360.00	48	50.09	960	1.09	0	727,200	NO	0	52,178	1,042	779,378	0	$779,378	HDR|CB Estimated cost
372	Electrical	Eqpt - Relay panels and Metering	3.0	ea	Contr	Contr	34,500.00	120.00	50.09	360	1.09	0	103,500	NO	0	19,567	391	123,067	0	$123,067	HDR|CB Estimated cost
373	Electrical	Eqpt - Station Batteries 125 Volt DC/Charger	1.0	lot	Contr	Contr	350,000.00	635	50.09	635	1.09	0	350,000	NO	0	34,514	689	384,514	0	$384,514	HDR|CB Estimated cost
374	Electrical	Eqpt - Transformer GSU - 310 MVA, 18kV-345kV	2.0	ea	Contr	Contr	3,200,000.00	950	50.09	1,900	1.09	0	6,400,000	NO	0	103,269	2,062	6,503,269	0	$6,503,269	HDR|CB Estimated cost
375	Electrical	Eqpt - Transformer GSU - 415 MVA, 18kV-345kV	1.0	ea	Contr	Contr	4,100,000.00	950	50.09	950	1.09	0	4,100,000	NO	0	51,634	1,031	4,151,634	0	$4,151,634	HDR|CB Estimated cost
376	Electrical	Eqpt - Transformer UAT 33 MVA, 18kV/6.9kV	2.0	ea	Contr	Contr	900,000.00	650	50.09	1,300	1.09	0	1,800,000	NO	0	70,658	1,411	1,870,658	0	$1,870,658	HDR|CB Estimated cost
377	Electrical	Eqpt - Emergency Diesel Gnerator packaged 750kW	1.0	ea	Contr	Contr	200,000.00	100	50.09	100	1.09	0	200,000	NO	0	5,435	109	205,435	0	$205,435	HDR|CB Estimated cost
378	Electrical	Eqpt - UPS (120VAC)	1.0	ea	Contr	Contr	300,000.00	528	50.09	528	1.09	0	300,000	NO	0	28,698	573	328,698	0	$328,698	HDR|CB Estimated cost
379	Electrical	Eqpt - Transformer Aux Power 2.5/3.3MVA, 7kV-480V	4.0	ea	Contr	Contr	104,500.00	210	50.09	840	1.09	0	418,000	NO	0	45,656	911	463,656	0	$463,656	HDR|CB Estimated cost
380	Electrical	Eqpt - Lighting Transformers	8.0	ea	Contr	Contr	916.27	9.09	50.09	73	1.09	0	7,330	YES	440	3,953	79	11,283	0	$11,283	HDR|CB Estimated cost
381	Electrical	Eqpt - Panelboards 480/120 & 480/277/120	8.0	ea	Contr	Contr	1,200.00	40.00	50.09	320	1.09	0	9,600	YES	576	17,393	347	26,993	0	$26,993	HDR|CB Estimated cost
382	Electrical	Eqpt - Plant Network System	1.0	ea	Contr	Contr	100,000.00	300	50.09	300	1.09	0	100,000	YES	6,000	16,306	326	116,306	0	$116,306	HDR|CB Estimated cost
383	Electrical	Eqpt - Plant Security System	1.0	lot	Contr	Contr	250,000.00	1800	50.09	1,800	1.09	0	250,000	YES	15,000	97,834	1,953	347,834	0	$347,834	HDR|CB Estimated cost
384	Electrical	Eqpt - Plant Telephone System	1.0	ea	Contr	Contr	100,000.00	500	50.09	500	1.09	0	100,000	YES	6,000	27,176	543	127,176	0	$127,176	HDR|CB Estimated cost
385																					
386		**Division #6.0 - Electrical Equipment Sub-Total**								**24,277**		**0**	**18,609,330**		**28,016**	**1,319,501**	**26,340**	**19,928,831**	**0**	**19,928,831**	
387																					
388	**Division #6.1 - Electrical/Control Commodities**																				
389																					
390	Electrical	Grounding - Buried Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
391	Electrical	Grounding - Above Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
392	Electrical	Grounding - Ground Rods Copper	96.0	ea	Contr	Contr	22.95	1.74	50.09	167	1.09	0	2,204	NO	0	9,079	181	11,283	0	$11,283	HDR|CB Estimated Quantity & Cost
393	Electrical	Grounding - Exothermic Connections	2,850.0	ea	Contr	Contr	9.75	1.14	50.09	3,249	1.09	0	27,788	NO	0	176,590	3,525	204,377	0	$204,377	HDR|CB Estimated Quantity & Cost
394	Electrical	Grounding - Servit Post	1,328.8	ea	Contr	Contr	30.00	1	50.09	1,107	1.09	0	39,864	NO	0	60,146	1,201	100,010	0	$100,010	HDR|CB Estimated Quantity & Cost
395	Electrical	Conduit A/G 5" RGS	1,000.0	lf	Contr	Contr	58.00	1.00	50.09	1,000	1.09	0	58,000	NO	0	54,352	1,085	112,352	0	$112,352	HDR|CB Estimated Quantity & Cost
396	Electrical	Conduit A/G 2" ave RGS	85,000.0	lf	Contr	Contr	8.50	0.30	50.09	25,500	1.09	0	722,500	NO	0	1,385,978	27,668	2,108,478	0	$2,108,478	HDR|CB Estimated Quantity & Cost
397	Electrical	Conduit U/G - 4 x 6 PVC 5"	8,000.0	lf	Contr	Contr	240.00	2.00	50.09	16,000	1.09	0	1,920,000	NO	0	869,633	17,360	2,789,633	0	$2,789,633	HDR|CB Estimated Quantity & Cost
398	Electrical	Conduit U/G - 8 x 8 PVC 5"	700.0	lf	Contr	Contr	530.00	5.00	50.09	3,500	1.09	0	371,000	NO	0	190,232	3,798	561,232	0	$561,232	HDR|CB Estimated Quantity & Cost
399	Electrical	Cable Tray, Raceway 24" Aluminum	5,200.0	lf	Contr	Contr	17.00	0.84	50.09	4,368	1.09	0	88,400	NO	0	237,410	4,739	325,810	0	$325,810	HDR|CB Estimated Quantity & Cost
400	Electrical	Cable Tray, Raceway 36" Aluminum	2,200.0	lf	Contr	Contr	20.00	1.05	50.09	2,310	1.09	0	44,000	NO	0	125,553	2,506	169,553	0	$169,553	HDR|CB Estimated Quantity & Cost
401	Electrical	Cable - Overhead Conductor to Substation	2,250.0	lf	Contr	Contr	8.50	0.50	50.09	1,125	1.09	0	19,125	NO	0	61,146	1,221	80,271	0	$80,271	HDR|CB Estimated Quantity & Cost
402	Electrical	Cable - Medium Voltage (7kV 1C Cable)	80,000.0	lf	Contr	Contr	14.60	0.127	50.09	10,160	1.09	0	1,168,000	NO	0	552,217	11,024	1,720,217	0	$1,720,217	HDR|CB Estimated Quantity & Cost
403	Electrical	Cable Terminations - 7kV	96.0	ea	Contr	Contr	195.00	12.00	50.09	1,152	1.09	0	18,720	NO	0	62,614	1,250	81,334	0	$81,334	HDR|CB Estimated Quantity & Cost
404	Electrical	Cable 600V Power 1/c No. 2/0 ave size	160,000.0	lf	Contr	Contr	3.55	0.041	50.09	6,560	1.09	0	568,000	NO	0	356,550	7,118	924,550	0	$924,550	HDR|CB Estimated Quantity & Cost
405	Electrical	Wire 600V Power 3/c # 10 ave. size	250,000.0	lf	Contr	Contr	0.27	0.0185	50.09	4,625	1.09	0	67,500	NO	0	251,378	5,018	318,878	0	$318,878	HDR|CB Estimated Quantity & Cost
406	Electrical	Cable - Fiber Optic	16,500.0	lf	Contr	Contr	6.00	0.025	50.09	413	1.09	0	99,000	NO	0	22,420	448	121,420	0	$121,420	HDR|CB Estimated Quantity & Cost
407	Electrical	Cable - Permanent Telephone Line	1.0	ls	Contr	Contr	10,000.00	240.000	50.09	240	1.09	0	10,000	NO	0	13,044	260	23,044	0	$23,044	HDR|CB Estimated Quantity & Cost
408	Electrical	Cable - Control	600,000.0	lf	Contr	Contr	1.10	0.040	50.09	24,000	1.09	0	660,000	NO	0	1,304,450	26,040	1,964,450	0	$1,964,450	HDR|CB Estimated Quantity & Cost
409	Electrical	Cable - Instrument 4pr tw/shld No. 18	400,000.0	lf	Contr	Contr	3.25	0.025	50.09	10,000	1.09	0	1,300,000	NO	0	543,521	10,850	1,843,521	0	$1,843,521	HDR|CB Estimated Quantity & Cost
410	Electrical	Cable - Thermocouple 2pr tw/shld No. 16	13,000.0	lf	Contr	Contr	0.33	0.030	50.09	390	1.09	0	4,290	NO	0	21,197	423	25,487	0	$25,487	HDR|CB Estimated Quantity & Cost
411	Electrical	Cable - Data Highway	24,068.0	lf	Contr	Contr	4.59	0.034	50.09	828	1.09	0	110,472	NO	0	45,000	898	155,472	0	$155,472	HDR|CB Estimated Quantity & Cost
412	Electrical	Cable Terminations - low voltage	30,500.0	ea	Contr	Contr	0.85	0.300	50.09	9,150	1.09	0	25,925	NO	0	497,321	9,928	523,246	0	$523,246	HDR|CB Estimated Quantity & Cost
413	Electrical	Cable Terminations - control	31,500.0	ea	Contr	Contr	0.54	0.300	50.09	9,450	1.09	0	17,010	NO	0	513,627	10,253	530,637	0	$530,637	HDR|CB Estimated Quantity & Cost
414	Electrical	Cable Terminations - instrument	32,800.0	ea	Contr	Contr	0.54	0.300	50.09	9,840	1.09	0	17,712	NO	0	534,824	10,676	552,536	0	$552,536	HDR|CB Estimated Quantity & Cost
415	Electrical	Conduit - Lighting A/G	33,000.0	lf	Contr	Contr	2.83	0.25	50.09	8,250	1.09	0	93,390	YES	5,603	448,405	8,951	541,795	0	$541,795	HDR|CB Estimated Quantity & Cost
416	Electrical	Wire - Lighting 1/C No 12	80,000.0	lf	Contr	Contr	0.176	0.018	50.09	1,440	1.09	0	14,080	YES	845	78,267	1,562	92,347	0	$92,347	HDR|CB Estimated Quantity & Cost
417	Electrical	Lighting - Outdoor Fixtures, pole	30.0	ea	Contr	Contr	1,600.00	12.00	50.09	360	1.09	0	48,000	YES	2,880	19,567	391	67,567	0	$67,567	HDR|CB Estimated Quantity & Cost
418	Electrical	Lighting - Outdoor Fixtures, 150W	320.0	ea	Contr	Contr	490.00	4.00	50.09	1,280	1.09	0	156,800	NO	0	69,571	1,389	226,371	0	$226,371	HDR|CB Estimated Quantity & Cost
419	Electrical	Lighting - Fixtures, 250W	80.0	ea	Contr	Contr	850.00	3.00	50.09	240	1.09	0	68,000	NO	0	13,044	260	81,044	0	$81,044	HDR|CB Estimated Quantity & Cost
420	Electrical	Lighting - Fixtures, fluorescent	180.0	ea	Contr	Contr	85.00	1.60	50.09	288	1.09	0	15,300	YES	918	15,653	312	30,953	0	$30,953	HDR|CB Estimated Quantity & Cost
421	Electrical	Lighting - Receptacles and switches	200.0	ea	Contr	Contr	32.00	1.37	50.09	273	1.09	0	6,400	YES	384	14,864	297	21,264	0	$21,264	HDR|CB Estimated Quantity & Cost
422	Electrical	Welding Receptacles	24.0	ea	Contr	Contr	1,800.00	4.00	50.09	96	1.09	0	43,200	NO	0	5,218	104	48,418	0	$48,418	HDR|CB Estimated Quantity & Cost
423	Electrical	Lighting - Exit	66.0	ea	Contr	Contr	150.00	2.00	50.09	132	1.09	0	9,900	YES	594	7,174	143	17,074	0	$17,074	HDR|CB Estimated Quantity & Cost
424	Electrical	Lighting - Emergency	120.0	ea	Contr	Contr	127.00	2.00	50.09	240	1.09	0	15,240	YES	914	13,044	260	28,284	0	$28,284	HDR|CB Estimated Quantity & Cost
425	Electrical	Cathodic Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
426	Electrical	Lightning Protection System	1.0	lot	Contr	Contr	100,000.00	200	50.09	200	1.09	0	100,000	YES	6,000	10,870	217	110,870	0	$110,870	HDR|CB Estimated Quantity & Cost
427	Electrical	Freeze Protection System	1.0	lot	Contr	Contr	800,000.00	5000	50.09	5,000	1.09	0	800,000	YES	48,000	271,760	5,425	1,071,760	0	$1,071,760	HDR|CB Estimated Quantity & Cost
428	Electrical	Electrical Circuit Testing	6,183.3	ea	Contr	Contr		2	50.09	12,367	1.09	0	0	NO	0	672,148	13,418	672,148	0	$672,148	HDR|CB Estimated Quantity & Cost
429		**Total Cable**	**1,545,819.0**	**LF**																	
430																					
431		**Division #6.1 - Electrical/Control Commodities Sub-Total**								**180,099**		**0**	**9,213,019**		**72,139**	**9,788,760**	**195,408**	**19,001,779**	**0**	**19,001,779**	
432																					
433	**Division #6.2 - Switchyard**																				
434																					

2 x 1 Siemens H Class 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

E BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
Line #																					
435	IV Electrica	138kV Dead End Towers 6 Legged (3 total)	150,000.0	lb	Contr	Contr	2.50	0.01	60.25	2,180	1.09	0	375,000	NO	0	142,500	2,365	517,500		$517,500	HDR|CB Estimated Quantity & Cost
436	IV Electrica	Interonnection Cabling and Termination Allowance	1.0	lot	Contr	Contr	15,000.00	1,526.36	51.33	1,526	1.09	0	15,000	NO	0	85,000	1,656	100,000		$100,000	HDR|CB Estimated Quantity & Cost
437																					
438		**Division #6.2 - Switchyard**								**3,706**		**0**	**$390,000**		**0**	**$227,500**	**$4,021**	**$617,500**	**$0**	**$617,500**	
439																					
440	**Division #7.0 - Instrumentation & Control**																				
441																					
442	I & C	BOP Instrument Devices	1,200.0	ea	Contr	Contr	750.00	12	50.09	14,400	1.09	0	900,000	NO	0	782,670	15,624	1,682,670	0	$1,682,670	HDR|CB Estimated Quantity & Cost
443	I & C	Auxiliary Boiler CEMS	1.0	lot	Contr	Contr	163,200.00	200	50.09	200	1.09	0	163,200	NO	0	10,870	217	174,070	0	$174,070	HDR|CB Estimated Quantity & Cost
444	I & C	Continuous Emissions Monitoring Equipment (CEMS)	2.0	ea	Contr	Contr	700,000.00	2000	53.33	4,000	1.09	0	1,400,000	NO	0	231,460	4,340	1,631,460	0	$1,631,460	HDR|CB Estimated Quantity & Cost
445	I & C	Control Valves	220.0	ea	Contr	Contr	4,000.00	24	54.96	5,280	1.09	0	880,000	NO	0	314,871	5,729	1,194,871	0	$1,194,871	HDR|CB Estimated Quantity & Cost
446	I & C	DCS w/ Configuration, Interfaces, Field Support, Interface, Bulks	1.0	ea	Contr	Contr	1,700,000.00	1691	50.09	1,691	1.09	0	1,700,000	NO	0	91,909	1,835	1,791,909	0	$1,791,909	HDR|CB Estimated Quantity & Cost
447	I & C	Emergency Trip sub Panel	1.0	ea	Contr	Contr	30,000.00	21	50.09	21	1.09	0	30,000	NO	0	1,141	23	31,141	0	$31,141	HDR|CB Estimated Quantity & Cost
448	I & C	Flow Element - Nozzle (Supply)	6.0	ea	Contr	Contr	30,000.00	20	54.96	120	1.09	0	180,000	NO	0	7,156	130	187,156	0	$187,156	HDR|CB Estimated Quantity & Cost
449	I & C	Instrument Calibration and loop check	1,500.0	ea	Contr	Contr	0.00	3	50.09	4,500	1.09	0	0	NO	0	244,584	4,883	244,584	0	$244,584	HDR|CB Estimated Quantity & Cost
450	I & C	Instrument piping 2&3-valve manifolds	284.0	ea	Contr	Contr	400.00	5.22	54.96	1,481	1.09	0	113,600	NO	0	88,331	1,607	201,931	0	$201,931	HDR|CB Estimated Quantity & Cost
451	I & C	Instrument Racks & Enclosures	1.0	lot	Contr	Contr	350,000.00	1450	50.09	1,450	1.09	0	350,000	NO	0	78,811	1,573	428,811	0	$428,811	HDR|CB Estimated Quantity & Cost
452	I & C	Instrument Tubing - copper	6,000.0	lf	Contr	Contr	3.70	0.15	54.96	900	1.09	0	22,200	NO	0	53,671	977	75,871	0	$75,871	HDR|CB Estimated Quantity & Cost
453	I & C	Instrument Tubing - Stainless Steel	2,500.0	lf	Contr	Contr	6.25	0.20	54.96	500	1.09	0	15,625	NO	0	29,817	543	45,442	0	$45,442	HDR|CB Estimated Quantity & Cost
454	I & C	PLC Hardware, Bulks, Aux Controls, Configuration	1.0	ls	Contr	Contr	241,200.00	253	50.09	253	1.09	0	241,200	NO	0	13,751	275	254,951	0	$254,951	HDR|CB Estimated Quantity & Cost
455																					
456		**Division #7.0 - Control Sub-Total**								**34,796**		**0**	**5,995,825**		**0**	**1,949,043**	**37,754**	**7,944,868**	**0**	**$7,944,868**	
457																					
458		**Sub-Total Direct Costs**								**957,675**		**0**	**326,315,710**	**0**		**55,404,554**	**1,038,555**	**381,720,264**	**25,287,400**	**407,007,664**	
459		Sales Tax - State (Plant Production Equipment is Exempt)	6.00%												**392,527**				**392,527**	**392,527**	Sales Tax Included for Non-Production Facilities
460	Indirects																				
461		**TOTAL DIRECT COSTS**								**957,675**		**0**	**326,315,710**			**55,404,554**	**1,038,555**	**381,720,264**	**25,679,927**	**$407,400,191**	
462																					
463	**Division #8.0 - Construction and Indirect Services**																				
464																					
465	Const Indirec	Construction Equipment	1.0	ls	Contr	Contr	12,055,653			0	1.09					0	0	0	12,055,653	$12,055,653	See Construction Equipment worksheet
466	Const Indirec	Construction Field staff	1.0	ls	Contr	Contr	11,522,855			0	1.09					0	0	0	11,522,855	$11,522,855	See EPC Field Staff Worksheet for details
467	Const Indirec	Construction Field staff expenses	1.0	ls	Contr	Contr	1,870,168			0	1.09					0	0	0	1,870,168	$1,870,168	See EPC Field Staff Worksheet for details
468	Const Indirec	Construction Permits	1.0	ls	Contr	Contr				0	1.09		51,450			0	0	51,450	0	$51,450	See Const Indirects and Serv Worksheet
469	Const Indirec	Construction Testing	1.0	ls	Contr	Contr				0	1.09		117,000			0	0	117,000	0	$117,000	See Const Indirects and Serv Worksheet
470	Const Indirec	Consumable Materials & Safety Supplies	2.00	$/MH	Contr	Contr	2,077,109			0	1.09					0	0	0	2,077,109	$2,077,109	$2.00/Direct hour
471	Const Indirec	Field Office Expenses	1.0	ls	Contr	Contr				1,369	1.09		1,033,370			65,849	1,485	1,099,219	22,373	$1,121,592	See Const Indirects and Serv Worksheet
472	Const Indirec	Performance Testing	1.0	ls	Contr	Contr				0	1.09		304,400			0	0	304,400	0	$304,400	See Const Indirects and Serv Worksheet
473	Const Indirec	Preoperational Testing, Startup & Commissioning	2.0	ls	Contr	Contr				21,690	1.09		1,113,000			752,767	23,534	1,865,767	0	$1,865,767	See Const Indirects and Serv Worksheet
474	Const Indirec	Site Safety	1.0	ls	Contr	Contr				7,580	1.09		658,040			375,008	8,224	1,033,048	0	$1,033,048	See Const Indirects and Serv Worksheet
475	Const Indirec	Small Tools	2.00	$/MH	Contr	Contr	2,077,109			0	1.09					0	0	0	2,077,109	$2,077,109	$2.00/Direct hour
476	Const Indirec	Start-up Supervision	1.0	ls	Contr	Contr	1,296,911			0	1.09					0	0	0	1,296,911	$1,296,911	See EPC Field Staff Worksheet for details
477	Const Indirec	Support Craft, Site Services, Scaffolding	1.0	ls	Contr	Contr				41,753	1.09		459,400			2,008,704	45,302	2,468,104	775,014	$3,243,118	See Const Indirects and Serv Worksheet
478	Const Indirec	Temporary Facilities	1.0	ls	Contr	Contr				17,947	1.09		2,336,753			863,403	19,472	3,200,157	82,500	$3,282,657	See Const Indirects and Serv Worksheet
479	Const Indirec	Temporary Utilities	1.0	ls	Contr	Contr				29,032	1.09		747,600			1,396,697	31,500	2,144,297	0	$2,144,297	See Const Indirects and Serv Worksheet
480																					
481		**Division #8.0 - Construction Indirects and Services Sub-Total**								**119,371**		**0**	**6,821,013**			**5,462,428**	**129,518**	**12,283,441**	**31,779,693**	**$44,063,134**	
482																					
483		**SUB-TOTAL CONSTRUCTION COST**								**1,077,046**		**0**	**333,136,723**			**60,866,983**	**1,168,072**	**394,003,706**	**57,459,620**	**451,463,326**	
484		**Subcontract Labor Hours**																			
485		**Material Cost Excluding CT, HRSG and ST (escalation and EP**											**94,143,197**								
486	**Division #9.0 - Project Indirects**																				
487																					
488	Project Indire	- Power Plant Design Engineering	1.0	ls	Contr	6.0%	27,087,800											0	27,087,800	$27,087,800	6.0% of the Total Construction Cost
489	Project Indire	- Project Management (Home Office)	0.0	ls	Contr	0.0%	0											0	0	$0	Included in Engineering
490																					
491																					
492		Sub-Total Project Indirects										**0**	**0**			**0**	**0**	**0**	**27,087,800**	**$27,087,800**	
493																					
494	EPC Indirect	EPC Contractor Insurance & Misc Costs (% of Total Const. Cost)																			
495																					
496	EPC Indirect	- Builders Risk Insurance	1.0	ls	Contr	0.50%	2,257,317												2,257,317	$2,257,317	Allowance based on info from other projects
497	EPC Indirect	- Comprehensive General Liability (CGL) Insurance	1.0	ls	Contr	0.50%	2,257,317											0	2,257,317	$2,257,317	Allowance based on info from other projects
498	EPC Indirect	- Warranty Reserve	1.0	ls	Contr		500,000											0	500,000	$500,000	Allowance based on info from other projects
499																					
500		Sub-Total EPC Contractor Indirects										**0**	**0**			**0**	**0**	**0**	**5,014,633**	**$5,014,633**	
501																					
502		**Total Project Indirects**										**0**	**0**			**0**	**0**	**0**	**32,102,433**	**32,102,433**	
503																					
504		Sub-Total										**0**	**333,136,723**			**60,866,983**	**1,168,072**	**394,003,706**	**89,562,053**	**$483,565,759**	
505							Equipment	Material	Labor	S/C											
506	Project Indire	Escalation - EPC Contractor Escalation Rates					2.4%	2.4%	4.0%	4.0%			7,029,603			9,553,797	0	16,583,400	7,803,093	24,386,493	Excludes CT, HRSG and ST
507																					
508		Sub-Total										**0**	**340,166,327**			**70,420,779**	**1,168,072**	**410,587,106**	**97,365,146**	**$507,952,252**	
509							Equip	Mat	Labor	S/C											
510	EPC Indirect	EPC Contractor Contingency	Varies	%	Contr		0%	5%	5%	5%		0	4,707,160			3,521,039		8,228,199	4,548,257	12,776,456	Excludes CT, HRSG and ST
511	EPC Indirect	EPC Contractor G&A and Fee	10.0%	%	Contr		0.0%	10.0%	10.0%	10.0%		0	34,016,633			7,042,078		41,058,711	9,736,515	50,795,225	
512																					
513		Sub-Total		ls								0	38,723,792			10,563,117	0	49,286,909	14,284,772	$63,571,681	
514																					
515		**TOTAL EPC PROJECT COST**								**1,077,046**		**0**	**378,890,119**			**80,983,896**	**1,168,072**	**459,874,015**	**111,649,918**	**$571,523,933**	
516																					
517	**OWNER INDIRECTS**																				
518	**Division #9.1 - Owner Indirects**																				
519																					
520		**Power Block 1 and Common**																			
521	Owner Indire	Project Development	1.0	ls	Owner														6,500,000	$6,500,000	Budget provided by LG&E
522	Owner Indire	Transmission Line Relocation	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
523	Owner Indire	Transmission Interconnection Facilities	1.0	ls	Owner														5,500,000	$5,500,000	To be estimated by Transmision Operator
524	Owner Indire	Natural Gas Pipeline Interconnection	1.0	ls	Owner														14,250,000	$14,250,000	Budget provided by LG&E
525	Owner Indire	Natural Gas Pipeline Fixed O&M (Startup Period)	1.0	ls	Owner														6,750,000	$6,750,000	Budget provided by LG&E
526	Owner Indire	Construction Power (Service Installation and Energy)	1.0	ls	Owner														750,000	$750,000	Budget estimated by HDR|CB
527	Owner Indire	Owner Operations Personnel (Prior to COD)	1.0	ls	Owner														2,340,000	$2,340,000	Budget estimated by HDR|CB 7 sal @ 12 mo, 26 hr @ 6
528	Owner Indire	Owners Project Management	1.0	ls	Owner														5,300,000	$5,300,000	Budget provided by LG&E
529	Owner Indire	Owners Engineer	1.0	ls	Owner														1,900,000	$1,900,000	Budget provided by LG&E
530	Owner Indire	Owners Legal Counsel	1.0	ls	Owner														1,300,000	$1,300,000	Budget provided by LG&E
531	Owner Indire	Operator Training	1.0	ls	Owner														225,000	$225,000	Budget estimated by HDR|CB
532	Owner Indire	Owner Startup Engineering	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
533	Owner Indire	Permitting, License Fees, & Environmental Compliance	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
534	Owner Indire	Highway Improvements, Miscellaneous Mitigation	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
535	Owner Indire	Land	1.0	ls	Owner														0	$0	Budget provided by LG&E
536	Owner Indire	Rolling Stock	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
537	Owner Indire	Water Infrastructure / Supply to Site	0.0	ls	Owner														0	$0	N/A (On site intake/pre-treatment/discharge incl. in EPC)
538	Owner Indire	Startup Testing (Includes Fuel & Power Sales)																			
539	Owner Indire	- Fuel - Natural Gas	1.0	ls	Owner														12,160,800	$12,160,800	HDR|CB [2,702,400 MMBTU @ $4.50/MMBTU per LG&E 2017 Foreca

2 x 1 Siemens H Class 760 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

E BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
540	Owner Indire	- Fuel - Fuel Oil	0.0	ls	Owner														0	$0	Budget estimated by HDR|CB [Not Required]
541	Owner Indire	- Electric Transmission Firm Point to Point	1.0	ls	Owner														4,000,000	$4,000,000	Budget provided by LG&E
542	Owner Indire	- Startup Power	1.0	ls	Owner														391,104	$391,104	Budget estimated by HDR|CB [10,864 MWhr @$36/MWH
543	Owner Indire	- Test Power Sales	1.0	ls	Owner														(15,552,000)	($15,552,000)	Budget estimated by HDR|CB [432,000 MWhr @$36/MW
544	Owner Indire	- Variable O&M - Water, Chemicals, etc.	1.0	ls	Owner														1,200,000	$1,200,000	Budget estimated by HDR|CB
545	Owner Indire	Site Security	1.0	ls	Owner														50,000	$50,000	Budget estimated by HDR|CB
546	Owner Indire	Operating Spare Parts	1.0	ls	Owner														10,000,000	$10,000,000	Budget estimated by HDR|CB
547	Owner Indire	Permanent Plant Equipment & Furnishings																		$0	
548	Owner Indire	- Office Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
549	Owner Indire	- Kitchen Furniture	1.0	ls	Owner														130,000	$130,000	Budget estimated by HDR|CB
550	Owner Indire	- Laboratory Equipment & Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
551	Owner Indire	- Locker Room Furniture	1.0	ls	Owner														180,000	$180,000	Budget estimated by HDR|CB
552	Owner Indire	- Warehouse Shelves	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
553	Owner Indire	- Workshop Tools & Test Equipment	1.0	ls	Owner														1,800,000	$1,800,000	Budget estimated by HDR|CB
554	Owner Indire	IT and Telecommunication Infrastructure	1.0	ls	Owner														250,000	$250,000	Budget estimated by HDR|CB
555	Owner Indire	NERC - Cyber Security	1.0	ls	Owner														1,000,000	$1,000,000	Budget estimated by HDR|CB
556	Owner Indire	Escalation - Owners Furnished Equipment	0.0	%	Owner														0	$0	N/A
557	Owner Indire	Builders Risk Insurance	0.0	ls	Owner														0	$0	Included with EPC Contractor Indirects
558	Owner Indire	Property Tax During Construction	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
559	Owner Indire	Financing Fees	0.0	ls	Owner														0	$0	N/A
560	Owner Indire	AFUDC	1.0	ls	Owner														6,100,000	$6,100,000	AFUDC Based on 78% KU Ownership
561		**Total Owner Indirects**																	**70,724,904**	**$70,724,904**	
562																					
563																					
564		**Owner Contingency**	10.00%	%	Owner														**57,152,393**	**$57,152,393**	
565																					
566																					
567		**Total Owner Indirects**																	**127,877,297**	**$127,877,297**	
568																					
569		**TOTAL PROJECT COST**											**0**	**378,890,119**			**80,983,896**	**1,168,072**	**459,874,015**	**239,527,215**	**$699,401,230**	

$/kW **$918**

2 x 1 Siemens H Class 700 MW Combined Cycle Unit

BUDGET ESTIMATE

5 x 10 Work Week

February 22, 2013

Rev 1

CONFIDENTIAL

2 x 1 Siemens H Class 700 MW Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 705.605
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
Site Development	$0	$1,787,885	$1,537,001	36,870	250,000	$3,574,886	0.6%
Raw Water Intake/Discharge Facilities	$0	$500,000	$578,649	10,850	0	$1,078,649	0.2%
Foundations & Concrete	$0	$6,655,575	$5,114,512	132,176	11,900,000	$23,670,087	4.2%
Architectural & Metals	$0	$5,385,510	$2,426,063	46,805	5,766,400	$13,577,973	2.4%
Piping, Valves, Support, Accessories	$0	$17,191,839	$12,217,857	226,564	225,000	$29,634,696	5.3%
HRSG Equipment	$0	$57,000,000	$12,585,298	182,280	0	$69,585,298	12.4%
Steam Turbine Island Equipment	$0	$40,968,521	$1,157,299	21,700	0	$42,125,819	7.5%
Combustion Turbine Equipment	$0	$134,993,527	$4,397,735	82,460	0	$139,391,261	24.9%
Mechanical Draft Cooling Tower	$0	$0	$0	0	5,390,000	$5,390,000	1.0%
BOP Mechanical Equipment	$0	$19,836,700	$1,557,180	26,647	1,346,000	$22,739,880	4.1%
Electrical Equipment	$0	$18,109,330	$1,319,501	26,340	0	$19,428,831	3.5%
Electrical Commodities	$0	$9,213,019	$9,788,760	195,408	0	$19,001,779	3.4%
High Voltage Switchyard	$0	$390,000	$227,500	4,021	0	$617,500	0.1%
Instrumentation & Controls	$0	$5,995,825	$1,949,043	37,754	0	$7,944,868	1.4%
Sub-Total Direct Costs:	$0	$318,027,731	$54,856,397	1,029,875	$24,877,400	$397,761,528	71.0%
State Sales Tax (Non-Production Material Only)					392,527	$392,527	0.1%
Total Direct Cost	$0	$318,027,731	$54,856,397	1,029,875	$25,269,927	$398,154,055	71.1%
Construction Indirects & Services							
- Construction Field Staff			$0	0	$11,522,855	$11,522,855	2.1%
- Construction Field Staff Expenses			$0	0	$1,870,168	$1,870,168	0.3%
- Construction Equipment			$0	0	$12,055,653	$12,055,653	2.2%
- Small Tools			$0	0	$2,059,749	$2,059,749	0.4%
- Consumable Materials & Safety Supplies			$0	0	$2,059,749	$2,059,749	0.4%
- Field Office Expense		$1,033,370	$65,849	1,485	$22,373	$1,121,592	0.2%
- Temporary Facilities		$2,336,753	$863,403	19,472	$82,500	$3,282,657	0.6%
- Temporary Utilities		$747,600	$1,396,697	31,500	$0	$2,144,297	0.4%
- Support Craft & Site Services		$459,400	$2,008,704	45,302	$775,014	$3,243,118	0.6%
- Site Safety		$658,040	$375,008	8,224	$0	$1,033,048	0.2%
- Construction Permits		$51,450	$0	0	$0	$51,450	0.0%
- Construction Testing		$117,000	$0	0	$0	$117,000	0.0%
- Performance Testing		$304,400	$0	0	$0	$304,400	0.1%
- Start-up Supervision		$0	$0	0	$1,296,911	$1,296,911	0.2%
- Preop Testing, Start-up		$1,113,000	$752,767	23,534	$0	$1,865,767	0.3%
Sub-Total Construction Indirects and Services		$6,821,013	$5,462,428	129,518	$31,744,973	$44,028,414	7.9%
Total Construction Cost	$0	$324,848,744	$60,318,825	1,159,392	$57,014,900	$442,182,469	78.9%
Estimated Subcontract Labor Hours				196,401			
Project Indirects							
- Project Engineering (Eng, PM, CM & Procurement)					$26,530,948	$26,530,948	4.7%
Sub-Total Project Indirects	$0	$0	$0	0	$26,530,948	$26,530,948	4.7%
EPC Contractor Insurance & Misc Costs							
- Builders Risk					$2,210,912	$2,210,912	0.4%
- Comprehensive General Liability (CGL) Insurance					$2,210,912	$2,210,912	0.4%

2 x 1 Siemens H Class 700 MW Combined Cycle Unit

LOCATION: Kentucky
PROJECT # 189895
PLANT TYPE: **NGCC**
CLIENT: LG&E/KU
ESTIMATE TYPE: Conceptual
LEAD ESTIMATOR:

STATUS DATE: 22-Feb-13

COST DATE BASIS: February 2013
NTP PERIOD:
CONSTRUCTION NTP - Mob:
COMMERCIAL OPERATION DATE: 1-Jun-2018
TECHNOLOGY: CT with HRSG & STG
NET MW RATING: 705.605
NO. OF UNITS: 1
FUEL TYPE: Nat Gas
BOILER: Fired
STEAM TURBINE: Condensing
COOLING TYPE: Mechanical Draft

	TOTAL COSTS						
DIVISION OF WORK	**Procurement Major Equipment**	**Contractor Material $**	**Contractor Labor $**	**Contractor Manhours**	**Subcontractor or Other $**	**Project Total $**	**%**
- Warranty Reserve					**$500,000**	**$500,000**	**0.1%**
Sub-Total EPC Contractor Insur. & Misc. Co	**$0**	**$0**	**$0**	**0**	**$4,921,825**	**$4,921,825**	**0.9%**
Total EPC Contractor Project Indirect Cost	**$0**	**$0**	**$0**	**0**	**$31,452,773**	**$31,452,773**	**5.6%**
- Escalation (Eqt, Materials & Labor)	**$0**	**$6,909,863**	**$9,473,204**		**$7,770,060**	**$24,153,127**	**4.3%**
Sub-Total	**0**	**331,758,607**	**69,792,030**	**1,355,793**	**96,237,733**	**497,788,370**	**88.9%**
- EPC Contractor Contingency	**$0**	**$4,594,335**	**$3,489,601**		**$4,512,387**	**$12,596,323**	**2.2%**
- EPC Contractor G&A and Profit	**$0**	**$33,175,861**	**$6,979,203**		**$9,623,773**	**$49,778,837**	**8.9%**
TOTAL EPC PROJECT COST	**$0**	**$369,528,802**	**$80,260,834**	**1,355,793**	**$110,373,893**	**$560,163,529**	**100.0%**
EPC Price per kW						**$794**	
Owner Indirect Costs							
- Total Owner Indirects						**$70,174,904**	
- Owner Contingency						**$56,016,353**	
TOTAL PROJECT COST						**$686,354,786**	
Total Project Cost per kW						**$973**	
Estimate Options (include 25 % markup for indirects)							
Fuel Oil System						**$11,250,000**	
Bypass Stack and Diverter Damper						**N/A**	
Gas Compression						**Not Required**	
SCR System to meet 12 ppm NOx						**Not Required**	
Optional SCR System						**Included in Base**	

Total Craft Labor Hours	**1,355,793**	**erformance Guarantees:**		**Executive-in-Charge:**	**WHD**
Ave. Craft Wage without Escalation	**$52.88**	**Liquidated Damages:**		**Project Manager:**	**JPS**
Field Labor Type	**TBD**	**Special Insurance:**		**Construction Manager:**	**SMP**
Labor Productivity Factor	**1.085**	**Performance Bond:**		**Lead Estimator:**	**CDF**

Estimate Details

2 x 1 Siemens H Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
1	**Division #1.0 - Sitework**																				
2	Sitework	Roads - Asphalt paving main site rds & Parking lots	8,500.0	sy	Sub	Contr	20.00		44.43		1.09	0	0	YES	5,100	0	0	0	170,000	$170,000	HDR|CB Estimated Quantity
3	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Powerblock A	1,740.0	sy	Contr	Contr	5.00	0.055	44.43	96	1.09	0	8,700	YES	522	4,613	104	13,313	0	$13,313	HDR|CB Estimated Quantity
4	Sitework	Roads - Secondary Site Rds/Bndry Rd Treated Gravel (Secondary Ar	6,945.0	sy	Contr	Contr	5.00	0.055	44.43	382	1.09	0	34,725	YES	2,084	18,412	414	53,137	0	$53,137	HDR|CB Estimated Quantity
5	Sitework	Roads - Haul/Construction Roads Treated Gravel	29,700.0	sy	Contr	Contr	8.00	0.1	44.43	2,970	1.09	0	237,600	YES	14,256	143,162	3,222	380,762	0	$380,762	HDR|CB Estimated Quantity
6	Sitework	Roads - Main Roads Crushed stone Base Course	8,500.0	sy	Contr	Contr	12.00	0.1	44.43	850	1.09	0	102,000	YES	6,120	40,972	922	142,972	0	$142,972	HDR|CB Estimated Quantity
7	Sitework	Roads - Drainage and culverts	90,000.0	sy	Contr	Contr	2.00	0.05	44.43	4,500	1.09	0	180,000	YES	10,800	216,912	4,883	396,912	0	$396,912	HDR|CB Estimated Quantity
8	Sitework	Soil Erosion Control Measures	2,160	lf	Contr	Contr	1	0.027	44.43	58	1.09	0	2,160	YES	130	2,811	58	4,971	0	4,971	HDR|CB Estimated Quantity
9	Sitework	Site - Topsoil stripping/stockpiling	10,125	cy	Contr	Contr		0.030	44.43	304	1.09	0	0	YES	0	14,642	304	14,642	0	$14,642	HDR|CB Estimated Quantity
10	Sitework	Site - Drainage - Pipe Culverts (Assume 12" dia)	3,000	lf	Contr	Contr	9.00	0.12	44.43	360	1.09	0	27,000	YES	1,620	17,353	360	44,353	0	$44,353	HDR|CB Estimated Quantity
11	Sitework	Site - Drainage - Manholes	25	ea	Contr	Contr	1,500	16	44.43	400	1.09	0	37,500	YES	2,250	19,281	400	56,781	0	$56,781	HDR|CB Estimated Quantity
14	Sitework	Site - Fire Protection hydrants, valve boxes, ductile iron	30.0	ea	Contr	Contr	3,000.00	20	39.54	600	1.09	0	90,000	YES	5,400	25,739	651	115,739	0	$115,739	HDR|CB Estimated Quantity
15	Sitework	Site - Fire Protection U/G piping, DI	4,500.0	lf	Contr	Contr	41.00	0.5	39.54	2,250	1.09	0	184,500	YES	11,070	96,520	2,441	281,020	0	$281,020	HDR|CB Estimated Quantity
16	Sitework	Pipe Utility Trench Excavation	10,500	cy	Contr	Contr		0.2	39.54	2,100	1.09	0	0	YES	0	90,086	2,100	90,086	0	$90,086	HDR|CB Estimated Quantity
17	Sitework	Pipe Utility Trench Backfill (including bedding)	9,000	cy	Contr	Contr		0.2	39.54	1,800	1.09	0	0	YES	0	77,216	1,800	77,216	0	$77,216	HDR|CB Estimated Quantity
20	Sitework	Spoil Disposal	11,250	cy	Contr	Contr		0.1	44.43	1,125	1.09	0	0	YES	0	54,228	1,125	54,228	0	$54,228	HDR|CB Estimated Quantity
21	Sitework	Site - Sanitary sewer lift stations	1.0	ea	Contr	Contr	11,700.00	40	39.54	40	1.09	0	11,700	YES	702	1,716	43	13,416	0	$13,416	HDR|CB Estimated Quantity
22	Sitework	Site - Sanitary waste piping and manholes	2,500.0	lf	Contr	Contr	20.00	1	39.54	2,500	1.09	0	50,000	YES	3,000	107,245	2,713	157,245	0	$157,245	HDR|CB Estimated Quantity
23	Sitework	Site - Storm drain piping and culverts	22,500.0	lf	Contr	Contr	12.00	0.25	39.54	5,625	1.09	0	270,000	YES	16,200	241,301	6,103	511,301	0	$511,301	HDR|CB Estimated Quantity
24	Sitework	Site Finishing - Seed Site Earthwork	6.0	ac	Contr	Contr	10,000.00	0.54	39.54	3	1.09	0	60,000	YES	3,600	139	4	60,139	0	$60,139	HDR|CB Estimated Quantity
25	Sitework	Site Finishing - Grading around foundations	7,500.0	sy	Contr	Contr		0.02	39.54	150	1.09	0	0	YES	0	6,435	163	6,435	0	$6,435	HDR|CB Estimated Quantity
26	Sitework	Site Finishing - Stone Surfacing	7,500.0	sy	Contr	Contr	10.00	0.015	39.54	113	1.09	0	75,000	YES	4,500	4,826	122	79,826	0	$79,826	HDR|CB Estimated Quantity
27	Sitework	Site Improvements - landscaping at admin building	1.0	ls	Contr	Contr	30,000.00	360	39.54	360	1.09	0	30,000	YES	1,800	15,443	391	45,443	0	$45,443	HDR|CB Estimated Quantity
28	Sitework	Site Improvements - Main Gate Security Facilities	1.0	lot	Contr	Contr	150,000.00	3600	39.54	3,600	1.09	0	150,000	YES	9,000	154,433	3,906	304,433	0	$304,433	HDR|CB Estimated Quantity
29	Sitework	Site Improvements - Site Entrance Sign and Landscaping	1.0	ls	Contr	Contr	18,750.00	240	39.54	240	1.09	0	18,750	YES	1,125	10,296	260	29,046	0	$29,046	HDR|CB Estimated Quantity
30	Sitework	Site Improvements - Site Security Boundary Fencing	18,750.0	lf	Contr	Contr	11.00	0.2	39.54	3,750	1.09	0	206,250	YES	12,375	160,867	4,069	367,117	0	$367,117	HDR|CB Estimated Quantity
31	Sitework	Site Improvements - Fencing Active gates	6.0	ea	Contr	Contr	2,000.00	48	39.54	288	1.09	0	12,000	YES	720	12,355	312	24,355	0	$24,355	HDR|CB Estimated Quantity
32	Sitework	Site Surveying	1.0	lot	Sub	Contr	80,000.00		44.43	0	1.09	0	0	YES	2,400	0	0	0	80,000	$80,000	HDR|CB Estimated Quantity
33																					
34		**Division #1 - Sitework Sub-Total**								**34,463**		**0**	**1,787,885**		**114,773**	**1,537,001**	**36,870**	**3,324,886**	**250,000**	**3,574,886**	
35																					
36	**Division #1.3 - Raw Water Intake and Discharge Facilities**																				HDR Allowance for Interconnection and Updgrage of
37		Raw Water River Intake and Discharge Facilities	1.0	ea	Contr	Contr	500,000.00	10,000	53.33	10,000	1.09	0	500,000	NO	0	578,649	10,850	1,078,649	0	$1,078,649	Unit 1 and 2 Intake Structure
38																					
39		**Division #1.3 - Raw Water Intake Clarification and Discharge Facilities Sub-Total**								**10,000**		**0**	**500,000**		**0**	**578,649**	**10,850**	**1,078,649**	**0**	**$1,078,649**	
40																					
41																					
42	**Division #2.0 - Earthwork and Concrete**																				
43	**Division #2.1 - Earthwork**																				
44	Earthwork	Structural Backfill Power Block (using imported material)	220,000.0	cy	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,500,000	$5,500,000	HDR|CB Estimated Quantity
45	Earthwork	Retaining Wall (MSE)	40,000.0	sf	Sub	Contr	25.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	1,000,000	$1,000,000	HDR|CB Estimated Quantity
46	Earthwork	Structural Excavation Main Power Block - Earth/Rock	300,000.0	cy	Sub	Contr	18.00	0	39.54	0	1.09	0	0	NO	0	0	0	0	5,400,000	$5,400,000	HDR|CB Estimated Quantity
47																					
48			560,000.0	cy						0		0	0		0	0	0	0	11,900,000	11,900,000	
49	**Division # 2.2 - Concrete Main Power Block Area**																				
50																					
51		Includes Forms, Rebar, Placement, Finishing, Embeds																			
52	Concrete	HRSG and Stack	7,500	cy	Contr	Contr	250	4.5	38.69	33,750	1.09	0	1,875,000	NO	0	1,416,954	36,619	3,291,954	0	$3,291,954	HDR|CB Estimated Quantity
53	Concrete	Gas Turbine Foundation	4,800	cy	Contr	Contr	300	4.5	38.69	21,600	1.09	0	1,440,000	NO	0	906,851	23,436	2,346,851	0	$2,346,851	HDR|CB Estimated Quantity
54	Concrete	Steam Turbine building	800	cy	Contr	Contr	250	4.5	38.69	3,600	1.09	0	200,000	NO	0	151,142	3,906	351,142	0	$351,142	HDR|CB Estimated Quantity
55	Concrete	Spread Footings & Piers Pipe/Tray Trestle/Racks	400.0	cy	Contr	Contr	250	4.5	38.69	1,800	1.09	0	100,000	NO	0	75,571	1,953	175,571	0	$175,571	HDR|CB Estimated Quantity
56	Concrete	Steam Turbine Bldg fill slab	300.0	cy	Contr	Contr	210.00	4.5	38.69	1,350	1.09	0	63,000	NO	0	56,678	1,465	119,678	0	$119,678	HDR|CB Estimated Quantity
57	Concrete	Steam Turbine Bldg Mat Foundation	1,200.0	cy	Contr	Contr	250	4.5	38.69	5,400	1.09	0	300,000	NO	0	226,713	5,859	526,713	0	$526,713	HDR|CB Estimated Quantity
58	Concrete	Steam Turbine Bldg Elevated Slab	500.0	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	NO	0	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
59	Concrete	Steam Turbine Bldg sumps foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
60	Concrete	Steam Turbine Pedestal FDN (Columns & Tabletop, Mat)	2,500.0	cy	Contr	Contr	350.00	8	38.69	20,000	1.09	0	875,000	NO	0	839,677	21,700	1,714,677	0	$1,714,677	HDR|CB Estimated Quantity
61	Concrete	Aux. Equipment Foundations	500	cy	Contr	Contr	250	4.5	38.69	2,250	1.09	0	125,000	YES	7,500	94,464	2,441	219,464	0	$219,464	HDR|CB Estimated Quantity
62	Concrete	Equip Fdn - Generator Breaker	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
63	Concrete	Equip Fdn - CT PEEC	60	cy	Contr	Contr	250	4.5	38.69	270	1.09	0	15,000	YES	900	11,336	293	26,336	0	$26,336	HDR|CB Estimated Quantity
64	Concrete	Equip Fdn - Power Distribution Center	80	cy	Contr	Contr	250	4.5	38.69	360	1.09	0	20,000	YES	1,200	15,114	391	35,114	0	$35,114	HDR|CB Estimated Quantity
65	Concrete	Equip Fdn - CEMS	40	cy	Contr	Contr	250	4.5	38.69	180	1.09	0	10,000	YES	600	7,557	195	17,557	0	$17,557	HDR|CB Estimated Quantity
66	Concrete	Equip Fdn - Boiler Feed Pump	120	cy	Contr	Contr	250	4.5	38.69	540	1.09	0	30,000	YES	1,800	22,671	586	52,671	0	$52,671	HDR|CB Estimated Quantity
67	Concrete	Equip Fdn - Main Step-up Transformer Fdn/Walls	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
68	Concrete	Equip Fdn - Plant Aux Power Transformers Fnd/Walls	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
69	Concrete	Equip Fdn - Misc off Base Equip fnds	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
70	Concrete	Elec. Ductbank (Tubes, Conc., Forms, Rebar) 12 Tubes	500.0	lf	Contr	Contr	125	0.57	38.69	285	1.09	0	62,500	NO	0	11,965	309	74,465	0	$74,465	HDR|CB Estimated Quantity
71	Concrete	Elec. Ductbank to Cooling Tower (Tubes, Conc., Forms, Rebar) 6 Tu	750.0	lf	Contr	Contr	100	0.45	38.69	338	1.09	0	75,000	NO	0	14,170	366	89,170	0	$89,170	HDR|CB Estimated Quantity
72	Concrete	Equip Fdn - Pumps & misc equipment	50.0	cy	Contr	Contr	250	4.5	38.69	225	1.09	0	12,500	NO	0	9,446	244	21,946	0	$21,946	HDR|CB Estimated Quantity
73	Concrete	Electrical Building Foundation	130.0	cy	Contr	Contr	250	4.5	38.69	585	1.09	0	32,500	NO	0	24,561	635	57,061	0	$57,061	HDR|CB Estimated Quantity
74	Concrete	Cooling Tower Basin	2,500.0	cy	Contr	Contr	250	5.5	38.69	13,750	1.09	0	625,000	NO	0	577,278	14,919	1,202,278	0	$1,202,278	HDR|CB Estimated Quantity
75	Concrete	Administration Building foundation	1,100.0	cy	Contr	Contr	250	4.5	38.69	4,950	1.09	0	275,000	YES	16,500	207,820	5,371	482,820	0	$482,820	HDR|CB Estimated Quantity
76	Concrete	Auxilary Boiler Building floor slab & foundation	350.0	cy	Contr	Contr	250	4.5	38.69	1,575	1.09	0	87,500	NO	0	66,125	1,709	153,625	0	$153,625	HDR|CB Estimated Quantity
77	Concrete	Demineralized Water Tank Foundations	100.0	cy	Contr	Contr	250	4.5	38.69	450	1.09	0	25,000	NO	0	18,893	488	43,893	0	$43,893	HDR|CB Estimated Quantity
78	Concrete	Service water storage tank foundations	200.0	cy	Contr	Contr	250	4.5	38.69	900	1.09	0	50,000	YES	3,000	37,785	977	87,785	0	$87,785	HDR|CB Estimated Quantity
79	Concrete	Main Gate Guard House	3.0	cy	Contr	Contr	250	4.5	38.69	14	1.09	0	750	YES	45	567	15	1,317	0	$1,317	HDR|CB Estimated Quantity
80	Concrete	Water Treatment Buildings, enclosures and tank fdns	0.0	cy	Contr	Contr	250	4.5	38.69	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
81	Concrete	Grouting (equipment & steel)	30.0	cy	Contr	Contr	2,227.50	81	38.69	2,430	1.09	0	66,825	NO	0	102,021	2,637	168,846	0	$168,846	HDR|CB Estimated Quantity
82																					
83		Sub Total Concrete	**25,173**				AVG MH/CY	5.15		121,821			6,655,575		32,445	5,114,512	132,176	11,770,087	0	11,770,087	
84																					
85		**Division #2 - Earthwork & Concrete Sub-Total**								**121,821**		**0**	**6,655,575**		**32,445**	**5,114,512**	**132,176**	**11,770,087**	**11,900,000**	**23,670,087**	
86																					
87	**Division #3.0 - Architectural**												-								
88																					
89	rchitectura	Exterior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
90	rchitectura	Fire extinguishers	36.0	ea	Contr	Contr	500.00	3	53.33	108	1.09	0	18,000	YES	1,080	6,249	117	24,249	0	$24,249	HDR|CB Estimated Quantity
91	rchitectura	Fire hose cabinets	26.0	ea	Contr	Contr	1,200.00	20	53.33	520	1.09	0	31,200	YES	1,872	30,090	564	61,290	0	$61,290	HDR|CB Estimated Quantity
92	rchitectura	Fire hydrants w/monitor nozzles	10.0	ea	Contr	Contr	2,550.00	12	54.96	120	1.09	0	25,500	YES	1,530	7,156	130	32,656	0	$32,656	HDR|CB Estimated Quantity
93	rchitectura	Fire protection control room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity
94	rchitectura	Fire Protection Elect Equip & Cable Spreading Room FM200	1.0	ls	Sub	Contr	25,000.00		53.33	0	1.09	0	0	NO	0	0	0	0	25,000	$25,000	HDR|CB Estimated Quantity

Estimate Details

2 x 1 Siemens H Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
95	rchitectura	Fire Protection GSU and Aux Transformers	1.0	ls	Sub	Contr	200,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	200,000	$200,000	HDR|CB Estimated Quantity
96	rchitectura	Fire Protection Turbine Building	1.0	ls	Sub	Contr	600,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
97	rchitectura	Fire Detection/Alarm	1.0	lot	Contr	Contr	410,000.00	1000	50.09	1,000	1.09	0	410,000	NO	0	54,352	1,085	464,352	0	$464,352	HDR|CB Estimated Quantity
98	rchitectura	HVAC System Allowance	1.0	ls	Sub	Contr	750,000.00		54.96	0	1.09	0	0	YES	22,500	0	0	0	750,000	$750,000	HDR|CB Estimated Quantity
99	rchitectura	Interior Doors - steel	50.0	ea	Contr	Contr	1,200.00	8	38.68	400	1.09	0	60,000	YES	3,600	16,786	434	76,786	0	$76,786	HDR|CB Estimated Quantity
100	rchitectura	Masonry Walls 8" CMU	20,000.0	sf	Contr	Contr	4.00	0.15	32.95	3,000	1.09	0	80,000	yes	4,800	107,267	3,255	187,267	0	$187,267	HDR|CB Estimated Quantity
101	rchitectura	Overhead Rolling Doors - steel	4.0	ea	Contr	Contr	5,000.00	40	38.68	160	1.09	0	20,000	yes	1,200	6,715	174	26,715	0	$26,715	HDR|CB Estimated Quantity
102	rchitectura	Painting - equipment and piping	1.0	lot	Contr	Contr	100,000.00	3600	36.36	3,600	1.09	0	100,000	yes	6,000	142,016	3,906	242,016	0	$242,016	HDR|CB Estimated Quantity
103	rchitectura	Painting - structural steel, grating, handrail touch-up	250,000.0	sf	Contr	Contr	0.30	0.010	36.36	2,500	1.09	0	75,000	yes	4,500	98,622	2,713	173,622	0	$173,622	HDR|CB Estimated Quantity
104	rchitectura	Painting - turbine room floor epoxy finish	40,000.0	sf	Contr	Contr	0.80	0.045	36.36	1,805	1.09	0	32,000	yes	1,920	71,197	1,958	103,197	0	$103,197	HDR|CB Estimated Quantity
105	rchitectura	Restrooms, showers, locker rooms	1.0	lot	Contr	Contr	125,000.00	1200	53.33	1,200	1.09	0	125,000	YES	7,500	69,438	1,302	194,438	0	$194,438	HDR|CB Estimated Quantity
106	rchitectura	Roof Drains	1,700.0	lf	Contr	Contr	32.50	2.0	54.96	3,400	1.09	0	55,250	yes	3,315	202,758	3,689	258,008	0	$258,008	HDR|CB Estimated Quantity
107	rchitectura	Structural Steel - Misc Building Steel	25.0	ton	Contr	Contr	3,200.00	30	60.25	750	1.09	0	80,000	yes	4,800	49,026	814	129,026	0	$129,026	HDR|CB Estimated Quantity
108	rchitectura	Structural Steel - Pipe Rack	600.0	ton	Contr	Contr	3,400.00	20	60.25	12,000	1.09	0	2,040,000	NO	0	784,409	13,020	2,824,409	0	$2,824,409	HDR|CB Estimated Quantity
109	rchitectura	Structural Steel - Misc Platforms	20.0	ton	Contr	Contr	3,200.00	30	60.25	600	1.09	0	64,000	NO	0	39,220	651	103,220	0	$103,220	HDR|CB Estimated Quantity
110	rchitectura	Structural Steel - Turbine Building Framing	500.0	ton	Contr	Contr	2,850.00	15	60.25	7,500	1.09	0	1,425,000	NO	0	490,255	8,138	1,915,255	0	$1,915,255	HDR|CB Estimated Quantity
111	rchitectura	Trench Floor Drain Cover	2,000.0	lf	Contr	Contr	60.45	0.4	54.96	800	1.09	0	120,900	yes	7,254	47,708	868	168,608	0	$168,608	HDR|CB Estimated Quantity
112	rchitectura	Turbine Building Built-up Roof	18,000.0	sf	Contr	Contr	0.75	0.035	35.31	630	1.09	0	13,500	NO	0	24,138	684	37,638	0	$37,638	HDR|CB Estimated Quantity
113	rchitectura	Turbine Building Metal Siding	52,900.0	sf	Contr	Contr	10.40	0.05	56.41	2,645	1.09	0	550,160	NO	0	161,876	2,870	712,036	0	$712,036	HDR|CB Estimated Quantity
114	rchitectura	Administration/Control/Maintenance Building	16,000.0	sf	Sub	Contr	140.00		38.68	0	1.09	0	0	YES	0	0	0	0	2,240,000	$2,240,000	HDR|CB Estimated Quantity
115	rchitectura	Cooling Tower, pre-engineered - Elect, Chem feed, I&C Bldg	3,000.0	sf	Sub	Contr	80.00		59.59	0	1.09	0	0	NO	0	0	0	0	240,000	$240,000	HDR|CB Estimated Quantity
116	rchitectura	Main Gate Guard House	80.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	YES	0	0	0	0	6,400	$6,400	HDR|CB Estimated Quantity
117	rchitectura	Auxilary Boiler Building	4,000.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	440,000	$440,000	HDR|CB Estimated Quantity
118	rchitectura	Water Treatment Building	0.0	sf	Sub	Contr	110.00		38.68	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
119	rchitectura	Warehouse	8,000.0	sf	Sub	Contr	80.00		38.68	0	1.09	0	0	NO	0	0	0	0	640,000	$640,000	HDR|CB Estimated Quantity
120	rchitectura	Boiler Feed Pump Buildings	2.0	ea	sub	Contr	300,000.00		38.68	0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	HDR|CB Estimated Quantity
121																					
122		**Division #3 - Architectural Sub-Total**								**43,138**	**1.05**	**0**	**5,385,510**		**75,471**	**2,426,063**	**46,805**	**7,811,573**	**5,766,400**	**$13,577,973**	
123																					
124	**Division #4.0 - Mechanical Piping**																				
125	**Division #4.1 - Mechanical Piping**																				
126																					
127	hanical Pip	Pipe - MS, HR, CR, BFW, LPS	**3,590.0**	lf																	
128	hanical Pip	- System - Cold Reheat (Carbon)	800.0	lf	Contr	Contr	2,600.00	7.2	54.96	5,790	1.09	0	2,080,000	NO	0	345,308	6,283	2,425,308	0	$2,425,308	HDR|CB Estimated Quantity
129	hanical Pip	- System - Feedwater (Carbon)	650.0	lf	Contr	Contr	790.00	5.6	54.96	3,666	1.09	0	513,500	NO	0	218,620	3,978	732,120	0	$732,120	HDR|CB Estimated Quantity
130	hanical Pip	- System - Hot Reheat (Alloy)	540.0	lf	Contr	Contr	3,170.00	14.4	54.96	7,766	1.09	0	1,711,800	NO	0	463,139	8,426	2,174,939	0	$2,174,939	HDR|CB Estimated Quantity
131	hanical Pip	- System - Main Steam (Alloy)	800.0	lf	Contr	Contr	3,480.00	14.4	54.96	11,506	1.09	0	2,784,000	NO	0	686,131	12,484	3,470,131	0	$3,470,131	HDR|CB Estimated Quantity
132	hanical Pip	- System - Low Pressure Steam Steam (Alloy)	800.0	lf	Contr	Contr	246.00	7.5	54.96	6,016	1.09	0	196,800	NO	0	358,762	6,527	555,562	0	$555,562	HDR|CB Estimated Quantity
133	hanical Pip	Pipe - Above Ground - Large Bore Average "	**29,610.0**	lf																	
134	hanical Pip	- System - Boilers, Vents and Drains	700.0	lf	Contr	Contr	300.00	4.14	54.96	2,895	1.09	0	210,000	NO	0	172,654	3,141	382,654	0	$382,654	HDR|CB Estimated Quantity
135	hanical Pip	- System - Aux steam drain returns	2,500.0	lf	Contr	Contr	30.00	1.22	54.96	3,055	1.09	0	75,000	NO	0	182,184	3,315	257,184	0	$257,184	HDR|CB Estimated Quantity
136	hanical Pip	- System - Building drains	1,350.0	lf	Contr	Contr	30.00	1.22	54.96	1,650	1.09	0	40,500	YES	2,430	98,379	1,790	138,879	0	$138,879	HDR|CB Estimated Quantity
137	hanical Pip	- System - Building fire protection	5,800.0	lf	Contr	Contr	18.00	1.50	54.96	8,723	1.09	0	104,400	YES	6,264	520,204	9,465	624,604	0	$624,604	HDR|CB Estimated Quantity
138	hanical Pip	- System - Building sump pumps	800.0	lf	Contr	Contr	47.00	1.55	54.96	1,241	1.09	0	37,600	YES	2,256	73,995	1,346	111,595	0	$111,595	HDR|CB Estimated Quantity
139	hanical Pip	- System - Circulating Water	1,000.0	lf	Contr	Contr	450.00	4.70	54.96	4,700	1.09	0	450,000	NO	0	280,282	5,100	730,282	0	$730,282	HDR|CB Estimated Quantity
140	hanical Pip	- System - Condensate	1,350.0	lf	Contr	Contr	190.00	2.35	54.96	3,173	1.09	0	256,500	NO	0	189,191	3,442	445,691	0	$445,691	HDR|CB Estimated Quantity
141	hanical Pip	- System - Condenser Air Extraction	300.0	lf	Contr	Contr	184.00	2.35	54.96	705	1.09	0	55,200	NO	0	42,042	765	97,242	0	$97,242	HDR|CB Estimated Quantity
142	hanical Pip	- System - Cooling water	600.0	lf	Contr	Contr	320.00	2.63	54.96	1,579	1.09	0	192,000	NO	0	94,175	1,713	286,175	0	$286,175	HDR|CB Estimated Quantity
143	hanical Pip	- System - Demineralized water	400.0	lf	Contr	Contr	27.00	0.39	54.96	154	1.09	0	10,800	NO	0	9,193	167	19,993	0	$19,993	HDR|CB Estimated Quantity
144	hanical Pip	- System - Fire Protection	300.0	lf	Contr	Contr	150.00	2.35	54.96	705	1.09	0	45,000	YES	2,700	42,042	765	87,042	0	$87,042	HDR|CB Estimated Quantity
145	hanical Pip	- System - Natural Gas High Pressure - SS	260.0	lf	Contr	Contr	52.40	0.85	54.96	220	1.09	0	13,624	YES	817	13,117	239	26,741	0	$26,741	HDR|CB Estimated Quantity
146	hanical Pip	- System - Potable water	1,000.0	lf	Contr	Contr	18.00	1.50	54.96	1,504	1.09	0	18,000	YES	1,080	89,690	1,632	107,690	0	$107,690	HDR|CB Estimated Quantity
147	hanical Pip	- System - Sanitary waste	3,000.0	lf	Contr	Contr	47.00	1.55	54.96	4,653	1.09	0	141,000	YES	8,460	277,480	5,049	418,480	0	$418,480	HDR|CB Estimated Quantity
148	hanical Pip	- System - Service Water	1,000.0	lf	Contr	Contr	184.00	1.97	54.96	1,974	1.09	0	184,000	YES	11,040	117,719	2,142	301,719	0	$301,719	HDR|CB Estimated Quantity
149	hanical Pip	- System - STG lube oil	200.0	lf	Contr	Contr	32.00	1.11	54.96	222	1.09	0	6,400	NO	0	13,239	241	19,639	0	$19,639	HDR|CB Estimated Quantity
150	hanical Pip	- System - STG oil purification	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
151	hanical Pip	- System - STG Seal Oil	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
152	hanical Pip	- System - STG Stator cooling	300.0	lf	Contr	Contr	32.00	1.11	54.96	333	1.09	0	9,600	NO	0	19,858	361	29,458	0	$29,458	HDR|CB Estimated Quantity
153	hanical Pip	- System - STG Steam Seal	300.0	lf	Contr	Contr	18.00	1.50	54.96	451	1.09	0	5,400	NO	0	26,907	490	32,307	0	$32,307	HDR|CB Estimated Quantity
154	hanical Pip	- System - Turbine drains	690.0	lf	Contr	Contr	47.00	1.55	54.96	1,070	1.09	0	32,430	NO	0	63,820	1,161	96,250	0	$96,250	HDR|CB Estimated Quantity
155	hanical Pip	- System - HRSG Blowdown	200.0	lf	Contr	Contr	18.00	1.50	54.96	301	1.09	0	3,600	NO	0	17,938	326	21,538	0	$21,538	HDR|CB Estimated Quantity
156	hanical Pip	- System - Cycle Makeup	360.0	lf	Contr	Contr	47.00	1.55	54.96	558	1.09	0	16,920	NO	0	33,298	606	50,218	0	$50,218	HDR|CB Estimated Quantity
157	hanical Pip	- System - Miscellaneous Systems Piping CS)	6,600.0	lf	Contr	Contr	47.00	1.55	54.96	10,237	1.09	0	310,200	YES	18,612	610,455	11,107	920,655	0	$920,655	HDR|CB Estimated Quantity
158	hanical Pip	Pipe - Above Ground - Small Bore	**26,055.0**	lf																	
159	hanical Pip	- System - Water Cycle Sample - Alloy	150.0	lf	Contr	Contr	13.00	0.85	54.96	127	1.09	0	1,950	NO	0	7,568	138	9,518	0	$9,518	HDR|CB Estimated Quantity
160	hanical Pip	- System - STG lube oil	300.0	lf	Contr	Contr	11.60	0.62	54.96	186	1.09	0	3,480	NO	0	11,092	202	14,572	0	$14,572	HDR|CB Estimated Quantity
161	hanical Pip	- System - CT Auxilarie	1,800.0	lf	Contr	Contr	18.00	1.13	54.96	2,030	1.09	0	32,400	NO	0	121,082	2,203	153,482	0	$153,482	HDR|CB Estimated Quantity
162	hanical Pip	- System - Instrument Air	3,100.0	lf	Contr	Contr	8.00	0.14	54.96	437	1.09	0	24,800	NO	0	26,066	474	50,866	0	$50,866	HDR|CB Estimated Quantity
163	hanical Pip	- System - Instrument Air supply	3,000.0	lf	Contr	Contr	35.00	0.28	54.96	846	1.09	0	105,000	NO	0	50,451	918	155,451	0	$155,451	HDR|CB Estimated Quantity
164	hanical Pip	- System - Service Air piping	1,300.0	lf	Contr	Contr	12.00	0.22	54.96	281	1.09	0	15,600	YES	936	16,761	305	32,361	0	$32,361	HDR|CB Estimated Quantity
165	hanical Pip	- System - Instrument Air	2,035.0	lf	Contr	Contr	11.50	0.52	54.96	1,052	1.09	0	23,403	YES	1,404	62,741	1,142	86,144	0	$86,144	HDR|CB Estimated Quantity
166	hanical Pip	- System - Service Water	900.0	lf	Contr	Contr	20.00	1.32	54.96	1,184	1.09	0	18,000	YES	1,080	70,631	1,285	88,631	0	$88,631	HDR|CB Estimated Quantity
167	hanical Pip	- System - Cycle Chemical Feed	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
168	hanical Pip	- System - Boiler Vents & Drains - Alloy	700.0	lf	Contr	Contr	20.00	1.32	54.96	921	1.09	0	14,000	YES	840	54,935	1,000	68,935	0	$68,935	HDR|CB Estimated Quantity
169	hanical Pip	- System - (HP) Main Steam - Alloy	600.0	lf	Contr	Contr	20.00	1.32	54.96	790	1.09	0	12,000	YES	720	47,087	857	59,087	0	$59,087	HDR|CB Estimated Quantity
170	hanical Pip	- System - (LP) Steam - Carbon	1,400.0	lf	Contr	Contr	18.00	1.13	54.96	1,579	1.09	0	25,200	YES	1,512	94,175	1,713	119,375	0	$119,375	HDR|CB Estimated Quantity
171	hanical Pip	- System - Hot Reheat Steam - Alloy	650.0	lf	Contr	Contr	20.00	1.32	54.96	855	1.09	0	13,000	YES	780	51,011	928	64,011	0	$64,011	HDR|CB Estimated Quantity
172	hanical Pip	- System - Cold Reheat Steam - Alloy	400.0	lf	Contr	Contr	20.00	1.32	54.96	526	1.09	0	8,000	YES	480	31,392	571	39,392	0	$39,392	HDR|CB Estimated Quantity
173	hanical Pip	- System - Cycle Makeup	200.0	lf	Contr	Contr	0.00	0.00	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
174	hanical Pip	- System - Aux Steam - Carbon	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
175	hanical Pip	- System - STG Seals and Drains - Alloy	1,400.0	lf	Contr	Contr	20.00	1.32	54.96	1,842	1.09	0	28,000	YES	1,680	109,871	1,999	137,871	0	$137,871	HDR|CB Estimated Quantity
176	hanical Pip	- System - CT System - Carbon	250.0	lf	Contr	Contr	18.00	1.13	54.96	282	1.09	0	4,500	YES	270	16,817	306	21,317	0	$21,317	HDR|CB Estimated Quantity
177	hanical Pip	- System - Hydrogen - Carbon	0.0	lf	Contr	Contr	12.35	1.03	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
178	hanical Pip	- System - Carbon Dioxide - Carbon	0.0	lf	Contr	Contr	12.35	1.03	54.96	0	1.09	0	0	YES	0	0	0	0	0	$0	HDR|CB Estimated Quantity
179	hanical Pip	- System - Miscellaneous	300.0	lf	Contr	Contr	12.35	1.03	54.96	310	1.09	0	3,705	YES	222	18,499	337	22,204	0	$22,204	HDR|CB Estimated Quantity
180	hanical Pip	- System - Condensate - Carbon	400.0	lf	Contr	Contr	18.00	1.13	54.96	451	1.09	0	7,200	YES	432	26,907	490	34,107	0	$34,107	HDR|CB Estimated Quantity
181	hanical Pip	- System - Closed Cycle Cooling Water - Carbon	900.0	lf	Contr	Contr	12.35	1.03	54.96	931	1.09	0	11,115	YES	667	55,496	1,010	66,611	0	$66,611	HDR|CB Estimated Quantity
182	hanical Pip	- System - Fuel Gas - Carbon	900.0	lf	Contr	Contr	18.00	1.13	54.96	1,015	1.09	0	16,200	YES	972	60,541	1,101	76,741	0	$76,741	HDR|CB Estimated Quantity
183	hanical Pip	- System - Condensed Air Extraction - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
184	hanical Pip	- System - CW Chemical Feed - Carbon	20.0	lf	Contr	Contr	18.00	1.13	54.96	23	1.09	0	360	YES	22	1,345	24	1,705	0	$1,705	HDR|CB Estimated Quantity
185	hanical Pip	- System - Nitrogen Gas System	200.0	lf	Contr	Contr	19.00	0.19	54.96	38	1.09	0	3,800	YES	228	2,242	41	6,042	0	$6,042	HDR|CB Estimated Quantity

2 x 1 Siemens H Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

														CONSTRUCTION PROJECT TOTALS CONTRACTOR								
	TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																						
186		chanical Pip	- System - Waste Water Coll & Treatment - Carbon	150.0	lf	Contr	Contr	12.35	1.03	54.96	155	1.09	0	1,853	YES	111	9,249	168	11,102	0	$11,102	HDR|CB Estimated Quantity
187		chanical Pip	- System - Chemical Waste Treatment	200.0	lf	Contr	Contr	12.35	1.03	54.96	207	1.09	0	2,470	YES	148	12,332	224	14,802	0	$14,802	HDR|CB Estimated Quantity
188		chanical Pip	- System - Miscellaneous Systems Piping	4,400.0	lf	Contr	Contr	12.35	1.03	54.96	4,550	1.09	0	54,340	YES	3,260	271,313	4,936	325,653	0	$325,653	HDR|CB Estimated Quantity
189		chanical Pip	Pipe - Below Ground - Large Bore	**22,195.0**	lf																	
190		chanical Pip	- System - Hydrogen	0.0	lf	Contr	Contr	20.00	0.71	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated Quantity
191		chanical Pip	- System - Fuel Gas	800.0	lf	Contr	Contr	170.00	1.97	54.96	1,579	1.09	0	136,000	NO	0	94,175	1,713	230,175	0	$230,175	HDR|CB Estimated Quantity
192		chanical Pip	- System - Main Circ. - HDPE	400.0	lf	Contr	Contr	15.00	1.13	54.96	451	1.09	0	6,000	NO	0	26,907	490	32,907	0	$32,907	HDR|CB Estimated Quantity
192		chanical Pip	- System - Miscellaneous Systems Piping - HDPE	7,840.0	lf	Contr	Contr	15.00	1.13	54.96	8,844	1.09	0	117,600	NO	0	527,379	9,595	644,979	0	$644,979	HDR|CB Estimated Quantity
193		chanical Pip	- System - Waste Water Treatment Piping - HDPE (Sch 17)	2,565.0	lf	Contr	Contr	6.00	0.66	54.96	1,688	1.09	0	15,390	NO	0	100,649	1,831	116,039	0	$116,039	HDR|CB Estimated Quantity
193		chanical Pip	- System - Sanitary Sewer	3,000.0	lf	Contr	Contr	15.00	1.13	54.96	3,384	1.09	0	45,000	NO	0	201,803	3,672	246,803	0	$246,803	HDR|CB Estimated Quantity
194		chanical Pip	- System - Natural Gas Low Pressure - CS	850.0	lf	Contr	Contr	30.00	1.22	54.96	1,039	1.09	0	25,500	NO	0	61,942	1,127	87,442	0	$87,442	HDR|CB Estimated Quantity
195		chanical Pip	- System - Natural Gas High Pressure - CS	500.0	lf	Contr	Contr	30.00	1.22	54.96	611	1.09	0	15,000	NO	0	36,437	663	51,437	0	$51,437	HDR|CB Estimated Quantity
196		chanical Pip	- System - Potable Water to site facilities	500.0	lf	Contr	Contr	47.00	1.55	54.96	776	1.09	0	23,500	NO	0	46,247	841	69,747	0	$69,747	HDR|CB Estimated Quantity
197		chanical Pip	- System - Cooling tower blowdown	1,160.0	lf	Contr	Contr	115.00	1.69	54.96	1,963	1.09	0	133,400	NO	0	117,046	2,130	250,446	0	$250,446	HDR|CB Estimated Quantity
198		chanical Pip	- System - Cooling tower makeup water Pipe	1,000.0	lf	Contr	Contr	115.00	1.69	39.54	1,692	1.09	0	115,000	NO	0	72,583	1,836	187,583	0	$187,583	HDR|CB Estimated Quantity
199		chanical Pip	Pipe - Below Ground - Small Bore	**790.0**	lf																	HDR|CB Estimated Quantity
200		chanical Pip	- System - Miscellaneous Systems Piping	790.0	lf	Contr	Contr	12.35	1.03	54.96	817	1.09	0	9,757	NO	0	48,713	886	58,470	0	$58,470	Based on 1-1/2" dia with 1 fitting per 20 ft.
201		chanical Pip	Circulating water 96" RCP	2,000.0	lf	Contr	Contr	636.00	7.52	54.96	15,040	1.09	0	1,272,000	NO	0	896,904	16,318	2,168,904	0	$2,168,904	HDR|CB Estimated Quantity
202		chanical Pip	Piping Non Destructive Examination	1.0	lot	Sub	Contr	75,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	75,000	$75,000	HDR|CB Estimated Quantity
203		chanical Pip	Steam Blows	1.0	lot	Sub	Contr	150,000.00		54.96	0	1.09	0	0	NO	0	0	0	0	150,000	$150,000	HDR|CB Estimated Quantity
204		chanical Pip	Stress relieving LB Alloy	50.0	ea	Contr	Contr	1,500.00	80.00	54.96	4,000	1.09	0	75,000	NO	0	238,538	4,340	313,538	0	$313,538	HDR|CB Estimated Quantity
205																						
206			**Division #4.1 - Mechanical Piping Sub-Total**	**82,240.0**	**LF**						148,495		0	11,943,118		69,683	8,827,101	161,117	20,770,219	225,000	$20,995,219	
207																						
208	**Division #4.2 - Mechanical Valves**																					
209																						
210		chanical Va	Valves - Large Bore General Service	500.0	ea	Contr	Contr	636.00	16.92	54.96	8,460	1.09	0	318,000	NO	0	504,508	9,179	822,508	0	$822,508	HDR|CB Estimated Quantity
211		chanical Va	Valves - Large Bore HP 900# to 3800#	100.0	ea	Contr	Contr	6,750.00	56.4	54.96	5,640	1.09	0	675,000	NO	0	336,339	6,119	1,011,339	0	$1,011,339	HDR|CB Estimated Quantity
212		chanical Va	Valves - Large Bore LP Circ Water	4.0	ea	Contr	Contr	197,500.00	112.8	54.96	451	1.09	0	790,000	NO	0	26,907	490	816,907	0	$816,907	HDR|CB Estimated Quantity
213		chanical Va	Valves - Small Bore - I/A supply	100.0	ea	Contr	Contr	17.50	1.88	54.96	188	1.09	0	1,750	NO	0	11,211	204	12,961	0	$12,961	HDR|CB Estimated Quantity
214		chanical Va	Valves - Small Bore - Instrument piping	500.0	ea	Contr	Contr	270.00	1.88	54.96	940	1.09	0	135,000	NO	0	56,056	1,020	191,056	0	$191,056	HDR|CB Estimated Quantity
215		chanical Va	Valves - Small Bore Bronze	40.0	ea	Contr	Contr	480.00	2.82	54.96	113	1.09	0	19,200	NO	0	6,727	122	25,927	0	$25,927	HDR|CB Estimated Quantity
216		chanical Va	Valves - Small Bore Class 800	250.0	ea	Contr	Contr	305.00	2.82	54.96	705	1.09	0	76,250	NO	0	42,042	765	118,292	0	$118,292	HDR|CB Estimated Quantity
217		chanical Va	Valves - Small Bore HP 1500# Alloy & CS	150.0	ea	Contr	Contr	670.00	15.04	54.96	2,256	1.09	0	100,500	NO	0	134,536	2,448	235,036	0	$235,036	HDR|CB Estimated Quantity
218		chanical Va	Valves - Small Bore HP 3800# Alloy	30.0	ea	Contr	Contr	3,050.00	22.56	54.96	677	1.09	0	91,500	NO	0	40,361	734	131,861	0	$131,861	HDR|CB Estimated Quantity
219		chanical Va	Valves - By Pass	1.0	ea	Contr	Contr	1,000,000.00	75.2	54.96	75	1.09	0	1,000,000	NO	0	4,485	82	1,004,485	0	$1,004,485	HDR|CB Estimated Quantity
220																						
221																						
222			**Division #4.2 - Mechanical Valves Sub-Total**	**1,675.0**	**ea**						19,505		$0	3,207,200		0	1,163,172	21,163	4,370,372	0	$4,370,372	
223																						
224	**Division #4.3 - Mechanical Insulation & Coatings**																					
225																						
226		Insulation	Insulation - BOP Equipment	16,000.0	sf	Contr	Contr	15.00	0.5	46.60	8,000	1.09	0	240,000	NO	0	404,462	8,680	644,462	0	$644,462	HDR|CB Estimated Quantity
227		Insulation	Insulation - Piping Freeze Protection	2,000.0	lf	Contr	Contr	3.50	0.2	46.60	400	1.09	0	7,000	NO	0	20,223	434	27,223	0	$27,223	HDR|CB Estimated Quantity
228		Insulation	Insulation - Piping Large Bore BOP	7,460.0	lf	Contr	Contr	15.00	0.5	46.60	3,730	1.09	0	111,900	NO	0	188,580	4,047	300,480	0	$300,480	HDR|CB Estimated Quantity
229		Insulation	Insulation - Piping Large Bore High Temp	3,590.0	lf	Contr	Contr	50.00	1.5	46.60	5,385	1.09	0	179,500	NO	0	272,253	5,843	451,753	0	$451,753	HDR|CB Estimated Quantity
230		Insulation	Insulation - Piping Small Bore	22,720.0	lf	Contr	Contr	8.00	0.23	46.60	5,226	1.09	0	181,760	NO	0	264,194	5,670	445,954	0	$445,954	HDR|CB Estimated Quantity
231																						
232																						
233			**Division #4.3 - Mechanical Insulation & Coatings Sub-Total**								22,741		0	720,160		0	1,149,713	24,674	1,869,873	0	$1,869,873	
234																						
235																						
236	**Division #4.4 - Mechanical Engineered Pipe Hangers (Including Supplemental Support Steel)**																					
237																						
238		hanical Pipe H	Hangers & Supports - (Large Bore Engineered)	200	ea	Contr	Contr	1,760.00	12.5	54.96	2,502	1.09	0	352,311	NO	0	149,218	2,715	501,529	0	$501,529	HDR|CB Estimated Quantity
239		hanical Pipe H	Hangers & Supports - (Large Bore Rigid)	1558	ea	Contr	Contr	192.50	7.1	54.96	11,065	1.09	0	299,996	NO	0	659,844	12,005	959,840	0	$959,840	HDR|CB Estimated Quantity
240		hanical Pipe H	Hangers & Supports - (Small Bore Rigid)	1861	ea	Contr	Contr	88.00	1.5	54.96	2,792	1.09	0	163,774	NO	0	166,476	3,029	330,251	0	$330,251	HDR|CB Estimated Quantity
241																						
242			**Division #4.4 - Mechanical Engineered Pipe Hangers Sub-Total**								16,359		0	816,081		0	975,538	17,749	1,791,619	0	$1,791,619	
243																						
244	**Division #4.5 - Mechanical Accessories**																					
245																						
246		nical Acces	Instr. Air Supply filter regulators	40.0	ea	Contr	Contr	132.00	2.4	54.96	96	1.09	0	5,280	NO	0	5,725	104	11,005	0	$11,005	HDR|CB Estimated Quantity
247		nical Acces	Expansion Joints - Circ Water	2.0	ea	Contr	Contr	75,000.00	210	54.96	420	1.09	0	150,000	NO	0	25,047	456	175,047	0	$175,047	HDR|CB Estimated Quantity
248		nical Acces	Miscellaneous Specialties	1.0	lot	Contr	Contr	75,000.00	600	54.96	600	1.09	0	75,000	NO	0	35,781	651	110,781	0	$110,781	HDR|CB Estimated Quantity
249		nical Acces	Miscellaneous Strainers, traps, Exp Joints	1.0	ls	Contr	Contr	125,000.00	120	54.96	120	1.09	0	125,000	NO	0	7,156	130	132,156	0	$132,156	HDR|CB Estimated Quantity
250		nical Acces	Miscellaneous Trolleys & Hoists	1.0	ls	Contr	Contr	150,000.00	480	54.96	480	1.09	0	150,000	NO	0	28,625	521	178,625	0	$178,625	HDR|CB Estimated Quantity
251																						
252			**Division #4.5 - Mechanical Accessories Sub-Total**								1,716		0	505,280		0	102,333	1,862	607,613	0	$607,613	
253																						
254			**Division #4 - Mechanical Piping**								**208,815**		**0**	**17,191,839**		**69,683**	**12,217,857**	**226,564**	**29,409,696**	**225,000**	**$29,634,696**	
255																						
256	**Division #5.0 - Mechanical Equipment**																					
257																						
258	**Division #5.1 - Boiler Equipment**																					
259																						
260		HRSG	Heat Recovery Steam Generator with CO/Penthouse	2.0	ea	Contr	Contr	28,500,000.00		69.04	0	1.09	0	57,000,000	NO	0	0	0	57,000,000	0	$57,000,000	OEM Bidget Proposal
261		HRSG	Steam Generator Erection	2.0	ea	Contr	Contr		84,000	69.04	168,000	1.09	0	0	NO	0	12,585,298	182,280	12,585,298	0	$12,585,298	HDR|CB Estimated cost
262																						
263			**Division #5.1 - Boiler Equipment Sub-Total**								**168,000**		**0**	**57,000,000**		**0**	**12,585,298**	**182,280**	**69,585,298**	**0**	**$69,585,298**	
264																						
265	**Division #5.2 - Turbine Equipment**																					
266																						
267		STG	Steam Turbine Generator	1.0	ea	Contr	Contr	40,968,520.68		53.33	0	1.09	0	40,968,521	NO	0	0	0	40,968,521	0	$40,968,521	Recent Vender quote
268		STG	Steam Turbine Generator, Erection	1.0	ea	Contr	Contr		20,000	53.33	20,000	1.09	0	0	NO	0	1,157,299	21,700	1,157,299	0	$1,157,299	HDR|CB Estimated cost
269																						
270			**Division #5.2 - Turbine Equipment Sub-Total**								**20,000**		**0**	**40,968,521**		**0**	**1,157,299**	**21,700**	**42,125,819**	**0**	**42,125,819**	
271																						
272	**Division #5.3 - Not Used**																					
273																						

Estimate Details

2 x 1 Siemens H Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	CONSTRUCTION PROJECT TOTALS CONTRACTOR						SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #													MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $			
274	**Division #5.4 - Mechanical Draft Cooling Tower**																				
275																					
276	Cooling Tw	Cooling Tower - Mechanical Draft (F&E)	1.0	Is	Sub	Contr	5,390,000.00	0	53.33	0	1.09	0	0	NO	0	0	0	0	5,390,000	$5,390,000	Recent Vender quote
277																					
278		**Division #5.4 - Mechanical Draft Cooling Tower Sub-Total**								**0**		**0**	**0**		**0**	**0**	**0**	**0**	**5,390,000**	**5,390,000**	
279																					
280	**Division #5.5 - Combustion Turbine Equipment**																				
281																					
282	CT	Combustion Turbine	2.0	ea	Contr	Contr	67,496,763.34		53.33	0	1.09	0	134,993,527	NO	0	0	0	134,993,527	0	$134,993,527	OEM Bidget Proposal
283	CT	Combustion Turbine, Installation	2.0	ea	Contr	Contr		38,000	53.33	76,000	1.09	0	0	NO	0	4,397,735	82,460	4,397,735	0	$4,397,735	HDR|CB Estimated cost
284																					
285																					
286		**Division #5.4 - Combustion Turbine Equipment Sub-Total**								**76,000**		**0**	**134,993,527**		**0**	**4,397,735**	**82,460**	**139,391,261**	**0**	**139,391,261**	
287																					
288	**Division #5.6 - BOP Mechanical Equipment**																				
289																					
290	Equipment	Blowdown Tank	4.0	ea	Contr	Contr	16,600.00	20	54.96	80	1.09	0	66,400	NO	0	4,771	87	71,171	0	$71,171	HDR|CB Estimated cost
291	Equipment	Closed Cooling Water Exchanger	2.0	ea	Contr	Contr	1,039,500.00	300	54.96	600	1.09	0	2,079,000	NO	0	35,781	651	2,114,781	0	$2,114,781	HDR|CB Estimated cost
292	Equipment	Closed Cooling Water Inhibitor Mixing Pot	1.0	ea	Contr	Contr	3,000.00	8	54.96	8	1.09	0	3,000	NO	0	477	9	3,477	0	$3,477	HDR|CB Estimated cost
293	Equipment	Closed Cooling Water (CCW) Heat Exchanger Strainer (Shell & Tube	2.0	ea	Contr	Contr	34,000.00	10	54.96	20	1.09	0	68,000	NO	0	1,193	22	69,193	0	$69,193	HDR|CB Estimated cost
294	Equipment	Instrument Air Receivers	2.0	ea	Contr	Contr	5,000.00	44	54.96	88	1.09	0	10,000	NO	0	5,248	95	15,248	0	$15,248	HDR|CB Estimated cost
295	Equipment	Main Condenser	1.0	ea	Contr	Contr	4,400,000.00	9000	65.52	9,000	1.09	0	4,400,000	NO	0	639,756	9,765	5,039,756	0	$5,039,756	Recent Vender quote
296	Equipment	Oil/Water Separator	1.0	ea	Contr	Contr	50,000.00	244	54.96	244	1.09	0	50,000	NO	0	14,551	265	64,551	0	$64,551	HDR|CB Estimated cost
297	Equipment	Plant Air Compressors	2.0	ea	Contr	Contr	140,000.00	100	54.96	200	1.09	0	280,000	NO	0	11,927	217	291,927	0	$291,927	HDR|CB Estimated cost
298	Equipment	Plant Air Dryers	2.0	ea	Contr	Contr	30,000.00	100	54.96	200	1.09	0	60,000	NO	0	11,927	217	71,927	0	$71,927	HDR|CB Estimated cost
299	Equipment	Plant Air Receivers	2.0	ea	Contr	Contr	5,000.00	20	54.96	40	1.09	0	10,000	NO	0	2,385	43	12,385	0	$12,385	HDR|CB Estimated cost
302	Equipment	Pumps - Circulating Water	2.0	ea	Contr	Contr	750,000.00	500	54.96	1,000	1.09	0	1,500,000	NO	0	59,635	1,085	1,559,635	0	$1,559,635	HDR|CB Estimated cost
303	Equipment	Pumps - Auxiliary Cooling Water	1.0	ea	Contr	Contr	120,000.00	96	53.33	96	1.09	0	120,000	NO	0	5,555	104	125,555	0	$125,555	HDR|CB Estimated cost
304	Equipment	Pumps - Closed Cooling Water	2.0	ea	Contr	Contr	134,000.00	200	53.33	400	1.09	0	268,000	NO	0	23,146	434	291,146	0	$291,146	HDR|CB Estimated cost
306	Equipment	Pumps - Boiler Feed	2.0	ea	Contr	Contr	663,000.00	1200	53.33	2,400	1.09	0	1,326,000	NO	0	138,876	2,604	1,464,876	0	$1,464,876	HDR|CB Estimated cost
307	Equipment	Pumps - Condensate	2.0	ea	Contr	Contr	195,000.00	200	53.33	400	1.09	0	390,000	NO	0	23,146	434	413,146	0	$413,146	HDR|CB Estimated cost
308	Equipment	Pumps - Service Water	2.0	ea	Contr	Contr	160,000.00	210	53.33	420	1.09	0	320,000	NO	0	24,303	456	344,303	0	$344,303	HDR|CB Estimated cost
309	Equipment	Pumps - Fire Water (Electric and Diesel)	0.0	lt	Contr	Contr	500,000.00	310	53.33	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
310	Equipment	Pumps - Sump - Blowdown, Waste Water	2.0	ea	Contr	Contr	30,000.00	24	53.33	48	1.09	0	60,000	NO	0	2,778	52	62,778	0	$62,778	HDR|CB Estimated cost
311	Equipment	Pumps - Sump - Power Island Misc Building Sumps	6.0	ea	Contr	Contr	30,000.00	24	53.33	144	1.09	0	180,000	NO	0	8,333	156	188,333	0	$188,333	HDR|CB Estimated cost
314	Equipment	Pumps - Demin Water Transfer	2.0	ea	Contr	Contr	66,000.00	48	53.33	96	1.09	0	132,000	NO	0	5,555	104	137,555	0	$137,555	HDR|CB Estimated cost
318	Equipment	Pumps - Treated Water Transfer to Serv Water Tank	2.0	ea	Contr	Contr	40,000.00	80	53.33	160	1.09	0	80,000	NO	0	9,258	174	89,258	0	$89,258	HDR|CB Estimated cost
319	Equipment	Pumps - Waste Water	2.0	ea	Contr	Contr	80,000.00	125	53.33	250	1.09	0	160,000	NO	0	14,466	271	174,466	0	$174,466	HDR|CB Estimated cost
320	Equipment	Pumps - Evaporative Cooling Water	2.0	ea	Contr	Contr	37,000.00	80	53.33	160	1.09	0	74,000	NO	0	9,258	174	83,258	0	$83,258	HDR|CB Estimated cost
321	Equipment	Sample Analysis Panel (water)	2.0	ea	Contr	Contr	200,000.00	139	54.96	278	1.09	0	400,000	NO	0	16,578	302	416,578	0	$416,578	HDR|CB Estimated cost
322	Equipment	Tank - 200,000 gal treated water/service water - (F&E)	0.0	ea	Sub	Contr	540,000.00	0		0	1.09	0	0	yes	0	0	0	0	0	$0	Furnish and Erect price
323	Equipment	Tank - Demin Water Storage 200,000 gal. (F&E)	1.0	ea	Sub	Contr	600,000.00	0		0	1.09	0	0	NO	0	0	0	0	600,000	$600,000	Furnish and Erect Price
324	Equipment	Tank - Turbine Drains	2.0	ea	Contr	Contr	75,000.00	200	53.33	400	1.09	0	150,000	NO	0	23,146	434	173,146	0	$173,146	HDR|CB Estimated cost
325	Equipment	Tank - Closed Cooling Water Dispersant 10,000 gal.	1.0	ea	Contr	Contr	36,500.00	100	54.96	100	1.09	0	36,500	NO	0	5,963	109	42,463	0	$42,463	HDR|CB Estimated cost
326	Equipment	Tank - Closed Cooling Water Accumulator	1.0	ea	Contr	Contr	20,600.00	44	54.96	44	1.09	0	20,600	NO	0	2,624	48	23,224	0	$23,224	HDR|CB Estimated cost
329	Equipment	Aqueous Ammonia System Unloading, Storage Tank, Forwarding Pu	1.0	ea	Contr	Contr	400,000.00	400	53.33	400	1.09	0	400,000	NO	0	23,146	434	423,146	0	$423,146	HDR|CB Estimated cost
331	Equipment	Auxiliary Boiler System	1.0	ea	Contr	Contr	1,600,000.00	400	53.33	400	1.09	0	1,600,000	NO	0	23,146	434	1,623,146	0	$1,623,146	HDR|CB Estimated cost
332	Equipment	Compressed Gas Storage System (CO2)	1.0	ea	Contr	Contr	40,000.00	475	54.96	475	1.09	0	40,000	NO	0	28,326	515	68,326	0	$68,326	HDR|CB Estimated cost
333	Equipment	Compressed Gas Storage System (H2)	1.0	ea	Contr	Contr	40,000.00	198	54.96	198	1.09	0	40,000	NO	0	11,808	215	51,808	0	$51,808	HDR|CB Estimated cost
334	Equipment	Compressed Gas Storage System (N2)	2.0	ea	Contr	Contr	20,000.00	370	54.96	740	1.09	0	40,000	NO	0	44,130	803	84,130	0	$84,130	HDR|CB Estimated cost
335	Equipment	Demineralized Water Treatment System Dual 100% Trains	0.0	ea	Contr	Contr	1,197,000.00	4000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
336	Equipment	Condensate Polisher and Related	1.0	ea	Contr	Contr	1,000,000.00	3600	54.96	3,600	1.09	0	1,000,000	NO	0	214,684	3,906	1,214,684	0	$1,214,684	HDR|CB Estimated cost
337	Equipment	Fuel Gas Filter Separators	2.0	ea	Contr	Contr	210,000.00	200	54.96	400	1.09	0	420,000	NO	0	23,854	434	443,854	0	$443,854	Sub Budgetary Quote
338	Equipment	Fuel Gas Performance Heater	2.0	ea	Contr	Contr	761,600.00	300	54.96	600	1.09	0	1,523,200	NO	0	35,781	651	1,558,981	0	$1,558,981	Sub Budgetary Quote
339	Equipment	Fuel Gas Electric Startup Heater	2.0	ea	Contr	Contr	84,000.00	40	54.96	80	1.09	0	168,000	NO	0	4,771	87	172,771	0	$172,771	HDR|CB Estimated cost
340	Equipment	Fuel Gas Drain Tank	2.0	ea	Contr	Contr	2,000.00	15	54.96	30	1.09	0	4,000	NO	0	1,789	33	5,789	0	$5,789	HDR|CB Estimated cost
341	Equipment	Fuel Gas Dewpoint Heater	1.0	ea	Contr	Contr	476,000.00	80	54.96	80	1.09	0	476,000	NO	0	4,771	87	480,771	0	$480,771	HDR|CB Estimated cost
342	Equipment	Fuel Gas Scrubber	1.0	ea	Contr	Contr	392,000.00	60	54.96	60	1.09	0	392,000	NO	0	3,578	65	395,578	0	$395,578	HDR|CB Estimated cost
343	Equipment	Fuel Gas Compressor Package 2 x 100% w/ Building	0.0	ea	Contr	Contr	2,500,000.00	3000	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
344	Equipment	Hydrogen Generator	0.0	ea	Contr	Contr	194,000.00	40	54.96	0	1.09	0	0	NO	0	0	0	0	0	$0	HDR|CB Estimated cost
345	Equipment	Steam Silencers	1.0	ea	Contr	Contr	150,000.00	20	54.96	20	1.09	0	150,000	NO	0	1,193	22	151,193	0	$151,193	HDR|CB Estimated cost
346	Equipment	Condensate Water Strainer	1.0	ea	Contr	Contr	150,000.00	40	54.96	40	1.09	0	150,000	NO	0	2,385	43	152,385	0	$152,385	HDR|CB Estimated cost
347	Equipment	Cycle Chem Feed	1.0	ea	Contr	Contr	200,000.00	100	54.96	100	1.09	0	200,000	NO	0	5,963	109	205,963	0	$205,963	HDR|CB Estimated cost
348	Equipment	Cooling Tower Chemical Feed	1.0	ea	Contr	Contr	250,000.00	300	54.96	300	1.09	0	250,000	NO	0	17,890	326	267,890	0	$267,890	HDR|CB Estimated cost
349	Equipment	Condeser Vaccum Pump/Air Removal Equipment	1.0	ea	Contr	Contr	350,000.00	40	54.96	40	1.09	0	350,000	NO	0	2,385	43	352,385	0	$352,385	HDR|CB Estimated cost
350	Equipment	Turbine Room Bridge Crane - 60T	1.0	ea	Contr	Contr	390,000.00	120	53.33	120	1.09	0	390,000	NO	0	6,944	130	396,944	0	$396,944	HDR|CB Estimated cost
351	Equipment	Elevator for 2 HRSG	1.0	ea	sub	contr	746,000.00	0		0	1.09	0	0	NO	0	0	0	0	746,000	$746,000	HDR|CB Estimated cost
352																					
353		**Division #5.6 BOP Mechanical Equipment Sub-Total**								**24,559**		**0**	**19,836,700**		**0**	**1,557,180**	**26,647**	**21,393,880**	**1,346,000**	**22,739,880**	
354																					
355	**Division #6.0 - Electrical Equipment**																				
356																					
357	Electrical	Eqpt - 24kv Bus Isolated Phase, 8000A	600.0	lf	Contr	Contr	750.00	8	50.09	4,800	1.09	0	450,000	NO	0	260,890	5,208	710,890	0	$710,890	HDR|CB Estimated cost
358	Electrical	Eqpt - 24kv Bus Isolated Phase, 9000A	300.0	lf	Contr	Contr	900.00	8	50.09	2,400	1.09	0	270,000	NO	0	130,445	2,604	400,445	0	$400,445	HDR|CB Estimated cost
359	Electrical	Eqpt - Bus 6.9kV non-seg	200.0	lf	Contr	Contr	510.00	4	50.09	800	1.09	0	102,000	NO	0	43,482	868	145,482	0	$145,482	HDR|CB Estimated cost
360	Electrical	Eqpt - Bus Duct 480V, 2500A	480.0	lf	Contr	Contr	610.00	3.2	50.09	1,536	1.09	0	292,800	NO	0	83,485	1,667	376,285	0	$376,285	HDR|CB Estimated cost
361	Electrical	Eqpt - Generator Breaker, 8000A, 24kV	3.0	ea	Contr	Contr	450,000.00	300	50.09	900	1.09	0	1,350,000	NO	0	48,917	977	1,398,917	0	$1,398,917	HDR|CB Estimated cost
362	Electrical	Eqpt - LV Switchgear - 480V, 4000A EO Main Ckt Bkr	6.0	ea	Contr	Contr	35,000.00	56	50.09	336	1.09	0	210,000	NO	0	18,262	365	228,262	0	$228,262	HDR|CB Estimated cost
363	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Main Ckt Bkr.	2.0	ea	Contr	Contr	15,400.00	30	50.09	60	1.09	0	30,800	NO	0	3,261	65	34,061	0	$34,061	HDR|CB Estimated cost
364	Electrical	Eqpt - LV Switchgear - 480V, 2000A EO Tie Ckt Bkr.	3.0	ea	Contr	Contr	15,400.00	30	50.09	90	1.09	0	46,200	NO	0	4,892	98	51,092	0	$51,092	HDR|CB Estimated cost
365	Electrical	Eqpt - LV Switchgear - 480V, 1200A EO Tie Ckt Bkr.	1.0	ea	Contr	Contr	10,780.00	26	50.09	26	1.09	0	10,780	NO	0	1,413	28	12,193	0	$12,193	HDR|CB Estimated cost
366	Electrical	Eqpt - LV Switchgear - 480V, 800A MO Fdr Ckt Bkr.	16.0	ea	Contr	Contr	4,575.00	22	50.09	352	1.09	0	73,200	NO	0	19,132	382	92,332	0	$92,332	HDR|CB Estimated cost
367	Electrical	Eqpt - LV Switchgear - 480V, 800A Equipped Space	6.0	ea	Contr	Contr	1,090.00	13.2	50.09	79	1.09	0	6,540	NO	0	4,305	86	10,845	0	$10,845	HDR|CB Estimated cost
368	Electrical	Eqpt - Motor Control Centers - 480V	16.0	ea	Contr	Contr	46,000.00	132	50.09	2,112	1.09	0	736,000	NO	0	114,792	2,292	850,792	0	$850,792	HDR|CB Estimated cost
369	Electrical	Eqpt - MV Switchgear - 7kV, 3000A Main Ckt Bkr.	1.00	ea	Contr	Contr	79,640.00	76	50.09	76	1.09	0	79,640	NO	0	4,131	82	83,771	0	$83,771	HDR|CB Estimated cost
370	Electrical	Eqpt - MV Switchgear - 7kV, 2000A Fdr Ckt Bkr.	2.00	ea	Contr	Contr	42,870.00	72	50.09	144	1.09	0	85,740	NO	0	7,827	156	93,567	0	$93,567	HDR|CB Estimated cost
371	Electrical	Eqpt - MV Switchgear - 7kV, 1200A Fdr Ckt Bkr.	20.00	ea	Contr	Contr	36,360.00	48	50.09	960	1.09	0	727,200	NO	0	52,178	1,042	779,378	0	$779,378	HDR|CB Estimated cost
372	Electrical	Eqpt - Relay panels and Metering	3.0	ea	Contr	Contr	34,500.00	120.00	50.09	360	1.09	0	103,500	NO	0	19,567	391	123,067	0	$123,067	HDR|CB Estimated cost
373	Electrical	Eqpt - Station Batteries 125 Volt DC/Charger	1.0	lot	Contr	Contr	350,000.00	635	50.09	635	1.09	0	350,000	NO	0	34,514	689	384,514	0	$384,514	HDR|CB Estimated cost

Estimate Details

2 x 1 Siemens H Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
TE BASIS	ISCIPLIN	DESCRIPTION	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	PROCUREMENT MAJOR EQUIP. TOTAL $	MATERIAL $	TAXABLE	SALES TAX $	LABOR $	MHRS	SUBTOTAL $	SUBCONT or OTHER $	PROJECT TOTAL $	BASIS NOTES
Line #																					
374	Electrical	Eqpt - Transformer GSU - 310 MVA, 18kV-345kV	2.0	ea	Contr	Contr	3,200,000.00	950	50.09	1,900	1.09	0	6,400,000	NO	0	103,269	2,062	6,503,269	0	$6,503,269	HDR|CB Estimated cost
375	Electrical	Eqpt - Transformer GSU - 415 MVA, 18kV-345kV	1.0	ea	Contr	Contr	3,600,000.00	950	50.09	950	1.09	0	3,600,000	NO	0	51,634	1,031	3,651,634	0	$3,651,634	HDR|CB Estimated cost
376	Electrical	Eqpt - Transformer UAT 33 MVA, 18kV/6.9kV	2.0	ea	Contr	Contr	900,000.00	650	50.09	1,300	1.09	0	1,800,000	NO	0	70,658	1,411	1,870,658	0	$1,870,658	HDR|CB Estimated cost
377	Electrical	Eqpt - Emergency Diesel Gnerator packaged 750kW	1.0	ea	Contr	Contr	200,000.00	100	50.09	100	1.09	0	200,000	NO	0	5,435	109	205,435	0	$205,435	HDR|CB Estimated cost
378	Electrical	Eqpt - UPS (120VAC)	1.0	ea	Contr	Contr	300,000.00	528	50.09	528	1.09	0	300,000	NO	0	28,698	573	328,698	0	$328,698	HDR|CB Estimated cost
379	Electrical	Eqpt - Transformer Aux Power 2.5/3.3MVA, 7kV-480V	4.0	ea	Contr	Contr	104,500.00	210	50.09	840	1.09	0	418,000	NO	0	45,656	911	463,656	0	$463,656	HDR|CB Estimated cost
380	Electrical	Eqpt - Lighting Transformers	8.0	ea	Contr	Contr	916.27	9.09	50.09	73	1.09	0	7,330	YES	440	3,953	79	11,283	0	$11,283	HDR|CB Estimated cost
381	Electrical	Eqpt - Panelboards 480/120 & 480/277/120	8.0	ea	Contr	Contr	1,200.00	40.00	50.09	320	1.09	0	9,600	YES	576	17,393	347	26,993	0	$26,993	HDR|CB Estimated cost
382	Electrical	Eqpt - Plant Network System	1.0	ea	Contr	Contr	100,000.00	300	50.09	300	1.09	0	100,000	YES	6,000	16,306	326	116,306	0	$116,306	HDR|CB Estimated cost
383	Electrical	Eqpt - Plant Security System	1.0	lot	Contr	Contr	250,000.00	1800	50.09	1,800	1.09	0	250,000	YES	15,000	97,834	1,953	347,834	0	$347,834	HDR|CB Estimated cost
384	Electrical	Eqpt - Plant Telephone System	1.0	ea	Contr	Contr	100,000.00	500	50.09	500	1.09	0	100,000	YES	6,000	27,176	543	127,176	0	$127,176	HDR|CB Estimated cost
385																					
386		**Division #6.0 - Electrical Equipment Sub-Total**								**24,277**		**0**	**18,109,330**		**28,016**	**1,319,501**	**26,340**	**19,428,831**	**0**	**19,428,831**	
387																					
388	**Division #6.1 - Electrical/Control Commodities**																				
389																					
390	Electrical	Grounding - Buried Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
391	Electrical	Grounding - Above Ground Conductor	40,000.0	lf	Contr	Contr	4.79	0.054	50.09	2,160	1.09	0	191,600	NO	0	117,400	2,344	309,000	0	$309,000	HDR|CB Estimated Quantity & Cost
392	Electrical	Grounding - Ground Rods Copper	96.0	ea	Contr	Contr	22.95	1.74	50.09	167	1.09	0	2,204	NO	0	9,079	181	11,283	0	$11,283	HDR|CB Estimated Quantity & Cost
393	Electrical	Grounding - Exothermic Connections	2,850.0	ea	Contr	Contr	9.75	1.14	50.09	3,249	1.09	0	27,788	NO	0	176,590	3,525	204,377	0	$204,377	HDR|CB Estimated Quantity & Cost
394	Electrical	Grounding - Servit Post	1,328.8	ea	Contr	Contr	30.00	1	50.09	1,107	1.09	0	39,864	NO	0	60,146	1,201	100,010	0	$100,010	HDR|CB Estimated Quantity & Cost
395	Electrical	Conduit A/G 5" RGS	1,000.0	lf	Contr	Contr	58.00	1.00	50.09	1,000	1.09	0	58,000	NO	0	54,352	1,085	112,352	0	$112,352	HDR|CB Estimated Quantity & Cost
396	Electrical	Conduit A/G 2" ave RGS	85,000.0	lf	Contr	Contr	8.50	0.30	50.09	25,500	1.09	0	722,500	NO	0	1,385,978	27,668	2,108,478	0	$2,108,478	HDR|CB Estimated Quantity & Cost
397	Electrical	Conduit U/G - 4 x 6 PVC 5"	8,000.0	lf	Contr	Contr	240.00	2.00	50.09	16,000	1.09	0	1,920,000	NO	0	869,633	17,360	2,789,633	0	$2,789,633	HDR|CB Estimated Quantity & Cost
398	Electrical	Conduit U/G - 8 x 8 PVC 5"	700.0	lf	Contr	Contr	530.00	5.00	50.09	3,500	1.09	0	371,000	NO	0	190,232	3,798	561,232	0	$561,232	HDR|CB Estimated Quantity & Cost
399	Electrical	Cable Tray, Raceway 24" Aluminum	5,200.0	lf	Contr	Contr	17.00	0.84	50.09	4,368	1.09	0	88,400	NO	0	237,410	4,739	325,810	0	$325,810	HDR|CB Estimated Quantity & Cost
400	Electrical	Cable Tray, Raceway 36" Aluminum	2,200.0	lf	Contr	Contr	20.00	1.05	50.09	2,310	1.09	0	44,000	NO	0	125,553	2,506	169,553	0	$169,553	HDR|CB Estimated Quantity & Cost
401	Electrical	Cable - Overhead Conductor to Substation	2,250.0	lf	Contr	Contr	8.50	0.50	50.09	1,125	1.09	0	19,125	NO	0	61,146	1,221	80,271	0	$80,271	HDR|CB Estimated Quantity & Cost
402	Electrical	Cable - Medium Voltage (7kV 1C Cable)	80,000.0	lf	Contr	Contr	14.60	0.127	50.09	10,160	1.09	0	1,168,000	NO	0	552,217	11,024	1,720,217	0	$1,720,217	HDR|CB Estimated Quantity & Cost
403	Electrical	Cable Terminations - 7kV	96.0	ea	Contr	Contr	195.00	12.00	50.09	1,152	1.09	0	18,720	NO	0	62,614	1,250	81,334	0	$81,334	HDR|CB Estimated Quantity & Cost
404	Electrical	Cable 600V Power 1/c No. 2/0 ave size	160,000.0	lf	Contr	Contr	3.55	0.041	50.09	6,560	1.09	0	568,000	NO	0	356,550	7,118	924,550	0	$924,550	HDR|CB Estimated Quantity & Cost
405	Electrical	Wire 600V Power 3/c # 10 ave. size	250,000.0	lf	Contr	Contr	0.27	0.0185	50.09	4,625	1.09	0	67,500	NO	0	251,378	5,018	318,878	0	$318,878	HDR|CB Estimated Quantity & Cost
406	Electrical	Cable - Fiber Optic	16,500.0	lf	Contr	Contr	6.00	0.025	50.09	413	1.09	0	99,000	NO	0	22,420	448	121,420	0	$121,420	HDR|CB Estimated Quantity & Cost
407	Electrical	Cable - Permanent Telephone Line	1.0	ls	Contr	Contr	10,000.00	240.000	50.09	240	1.09	0	10,000	NO	0	13,044	260	23,044	0	$23,044	HDR|CB Estimated Quantity & Cost
408	Electrical	Cable - Control	600,000.0	lf	Contr	Contr	1.10	0.040	50.09	24,000	1.09	0	660,000	NO	0	1,304,450	26,040	1,964,450	0	$1,964,450	HDR|CB Estimated Quantity & Cost
409	Electrical	Cable - Instrument 4pr tw/shld No. 18	400,000.0	lf	Contr	Contr	3.25	0.025	50.09	10,000	1.09	0	1,300,000	NO	0	543,521	10,850	1,843,521	0	$1,843,521	HDR|CB Estimated Quantity & Cost
410	Electrical	Cable - Thermocouple 2pr tw/shld No. 16	13,000.0	lf	Contr	Contr	0.33	0.030	50.09	390	1.09	0	4,290	NO	0	21,197	423	25,487	0	$25,487	HDR|CB Estimated Quantity & Cost
411	Electrical	Cable - Data Highway	24,068.0	lf	Contr	Contr	4.59	0.034	50.09	828	1.09	0	110,472	NO	0	45,000	898	155,472	0	$155,472	HDR|CB Estimated Quantity & Cost
412	Electrical	Cable Terminations - low voltage	30,500.0	ea	Contr	Contr	0.85	0.300	50.09	9,150	1.09	0	25,925	NO	0	497,321	9,928	523,246	0	$523,246	HDR|CB Estimated Quantity & Cost
413	Electrical	Cable Terminations - control	31,500.0	ea	Contr	Contr	0.54	0.300	50.09	9,450	1.09	0	17,010	NO	0	513,627	10,253	530,637	0	$530,637	HDR|CB Estimated Quantity & Cost
414	Electrical	Cable Terminations - instrument	32,800.0	ea	Contr	Contr	0.54	0.300	50.09	9,840	1.09	0	17,712	NO	0	534,824	10,676	552,536	0	$552,536	HDR|CB Estimated Quantity & Cost
415	Electrical	Conduit - Lighting A/G	33,000.0	lf	Contr	Contr	2.83	0.25	50.09	8,250	1.09	0	93,390	YES	5,603	448,405	8,951	541,795	0	$541,795	HDR|CB Estimated Quantity & Cost
416	Electrical	Wire - Lighting 1/C No 12	80,000.0	lf	Contr	Contr	0.176	0.018	50.09	1,440	1.09	0	14,080	YES	845	78,267	1,562	92,347	0	$92,347	HDR|CB Estimated Quantity & Cost
417	Electrical	Lighting - Outdoor Fixtures, pole	30.0	ea	Contr	Contr	1,600.00	12.00	50.09	360	1.09	0	48,000	YES	2,880	19,567	391	67,567	0	$67,567	HDR|CB Estimated Quantity & Cost
418	Electrical	Lighting - Outdoor Fixtures, 150W	320.0	ea	Contr	Contr	490.00	4.00	50.09	1,280	1.09	0	156,800	NO	0	69,571	1,389	226,371	0	$226,371	HDR|CB Estimated Quantity & Cost
419	Electrical	Lighting - Fixtures, 250W	80.0	ea	Contr	Contr	850.00	3.00	50.09	240	1.09	0	68,000	NO	0	13,044	260	81,044	0	$81,044	HDR|CB Estimated Quantity & Cost
420	Electrical	Lighting - Fixtures, fluorescent	180.0	ea	Contr	Contr	85.00	1.60	50.09	288	1.09	0	15,300	YES	918	15,653	312	30,953	0	$30,953	HDR|CB Estimated Quantity & Cost
421	Electrical	Lighting - Receptacles and switches	200.0	ea	Contr	Contr	32.00	1.37	50.09	273	1.09	0	6,400	YES	384	14,864	297	21,264	0	$21,264	HDR|CB Estimated Quantity & Cost
422	Electrical	Welding Receptacles	24.0	ea	Contr	Contr	1,800.00	4.00	50.09	96	1.09	0	43,200	NO	0	5,218	104	48,418	0	$48,418	HDR|CB Estimated Quantity & Cost
423	Electrical	Lighting - Exit	66.0	ea	Contr	Contr	150.00	2.00	50.09	132	1.09	0	9,900	YES	594	7,174	143	17,074	0	$17,074	HDR|CB Estimated Quantity & Cost
424	Electrical	Lighting - Emergency	120.0	ea	Contr	Contr	127.00	2.00	50.09	240	1.09	0	15,240	YES	914	13,044	260	28,284	0	$28,284	HDR|CB Estimated Quantity & Cost
425	Electrical	Cathodic Protection System	1.0	lot	Contr	Contr	100,000.00	480	50.09	480	1.09	0	100,000	YES	6,000	26,089	521	126,089	0	$126,089	HDR|CB Estimated Quantity & Cost
426	Electrical	Lightning Protection System	1.0	lot	Contr	Contr	100,000.00	200	50.09	200	1.09	0	100,000	YES	6,000	10,870	217	110,870	0	$110,870	HDR|CB Estimated Quantity & Cost
427	Electrical	Freeze Protection System	1.0	lot	Contr	Contr	800,000.00	5000	50.09	5,000	1.09	0	800,000	YES	48,000	271,760	5,425	1,071,760	0	$1,071,760	HDR|CB Estimated Quantity & Cost
428	Electrical	Electrical Circuit Testing	6,183.3	ea	Contr	Contr		2	50.09	12,367	1.09	0	0	NO	0	672,148	13,418	672,148	0	$672,148	HDR|CB Estimated Quantity & Cost
429		**Total Cable**	**1,545,819.0**	**LF**																	
430																					
431		**Division #6.1 - Electrical/Control Commodities Sub-Total**								**180,099**		**0**	**9,213,019**		**72,139**	**9,788,760**	**195,408**	**19,001,779**	**0**	**19,001,779**	
432																					
433	**Division #6.2 - Switchyard**																				
434																					
435	V Electrica	138kV Dead End Towers 6 Legged (3 total)	150,000.0	lb	Contr	Contr	2.50	0.01	60.25	2,180	1.09	0	375,000	NO	0	142,500	2,365	517,500		$517,500	HDR|CB Estimated Quantity & Cost
436	V Electrica	Interonnection Cabling and Termination Allowance	1.0	lot	Contr	Contr	15,000.00	1,526.36	51.33	1,526	1.09	0	15,000	NO	0	85,000	1,656	100,000		$100,000	HDR|CB Estimated Quantity & Cost
437																					
438		**Division #6.2 - Switchyard**								**3,706**		**0**	**$390,000**		**0**	**$227,500**	**$4,021**	**$617,500**	**$0**	**$617,500**	
439																					
440	**Division #7.0 - Instrumentation & Control**																				
441																					
442	I & C	BOP Instrument Devices	1,200.0	ea	Contr	Contr	750.00	12	50.09	14,400	1.09	0	900,000	NO	0	782,670	15,624	1,682,670	0	$1,682,670	HDR|CB Estimated Quantity & Cost
443	I & C	Auxiliary Boiler CEMS	1.0	lot	Contr	Contr	163,200.00	200	50.09	200	1.09	0	163,200	NO	0	10,870	217	174,070	0	$174,070	HDR|CB Estimated Quantity & Cost
444	I & C	Continuous Emissions Monitoring Equipment (CEMS)	2.0	ea	Contr	Contr	700,000.00	2000	53.33	4,000	1.09	0	1,400,000	NO	0	231,460	4,340	1,631,460	0	$1,631,460	HDR|CB Estimated Quantity & Cost
445	I & C	Control Valves	220.0	ea	Contr	Contr	4,000.00	24	54.96	5,280	1.09	0	880,000	NO	0	314,871	5,729	1,194,871	0	$1,194,871	HDR|CB Estimated Quantity & Cost
446	I & C	DCS w/ Configuration, Interfaces, Field Support, Interface, Bulks	1.0	ea	Contr	Contr	1,700,000.00	1691	50.09	1,691	1.09	0	1,700,000	NO	0	91,909	1,835	1,791,909	0	$1,791,909	HDR|CB Estimated Quantity & Cost
447	I & C	Emergency Trip sub Panel	1.0	ea	Contr	Contr	30,000.00	21	50.09	21	1.09	0	30,000	NO	0	1,141	23	31,141	0	$31,141	HDR|CB Estimated Quantity & Cost
448	I & C	Flow Element - Nozzle (Supply)	6.0	ea	Contr	Contr	30,000.00	20	54.96	120	1.09	0	180,000	NO	0	7,156	130	187,156	0	$187,156	HDR|CB Estimated Quantity & Cost
449	I & C	Instrument Calibration and loop check	1,500.0	ea	Contr	Contr	0.00	3	50.09	4,500	1.09	0	0	NO	0	244,584	4,883	244,584	0	$244,584	HDR|CB Estimated Quantity & Cost
450	I & C	Instrument piping 2&3-valve manifolds	284.0	ea	Contr	Contr	400.00	5.22	54.96	1,481	1.09	0	113,600	NO	0	88,331	1,607	201,931	0	$201,931	HDR|CB Estimated Quantity & Cost
451	I & C	Instrument Racks & Enclosures	1.0	lot	Contr	Contr	350,000.00	1450	50.09	1,450	1.09	0	350,000	NO	0	78,811	1,573	428,811	0	$428,811	HDR|CB Estimated Quantity & Cost
452	I & C	Instrument Tubing - copper	6,000.0	lf	Contr	Contr	3.70	0.15	54.96	900	1.09	0	22,200	NO	0	53,671	977	75,871	0	$75,871	HDR|CB Estimated Quantity & Cost
453	I & C	Instrument Tubing - Stainless Steel	2,500.0	lf	Contr	Contr	6.25	0.20	54.96	500	1.09	0	15,625	NO	0	29,817	543	45,442	0	$45,442	HDR|CB Estimated Quantity & Cost
454	I & C	PLC Hardware, Bulks, Aux Controls, Configuration	1.0	ls	Contr	Contr	241,200.00	253	50.09	253	1.09	0	241,200	NO	0	13,751	275	254,951	0	$254,951	HDR|CB Estimated Quantity & Cost
455																					
456		**Division #7.0 - Control Sub-Total**								**34,796**		**0**	**5,995,825**		**0**	**1,949,043**	**37,754**	**7,944,868**	**0**	**$7,944,868**	
457																					
458		**Sub-Total Direct Costs**								**949,675**		**0**	**318,027,731**	**0**		**54,856,397**	**1,029,875**	**372,884,128**	**24,877,400**	**397,761,528**	
459		Sales Tax - State (Plant Production Equipment is Exempt)	6.00%												**392,527**				**392,527**	**392,527**	Sales Tax Included for Non-Production Facilities

2 x 1 Siemens H Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
TE BASIS	**ISCIPLIN**	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
Line #																					
460	Indirects																				
461		**TOTAL DIRECT COSTS**								**949,675**		**0**	**318,027,731**			**54,856,397**	**1,029,875**	**372,884,128**	**25,269,927**	**$398,154,055**	
462																					
463	**Division #8.0 - Construction and Indirect Services**																				
464																					
465	Const Indirec	Construction Equipment	1.0	ls	Contr	Contr	12,055,653			0	1.09					0	0	0	12,055,653	$12,055,653	See Construction Equipment worksheet
466	Const Indirec	Construction Field staff	1.0	ls	Contr	Contr	11,522,855			0	1.09					0	0	0	11,522,855	$11,522,855	See EPC Field Staff Worksheet for details
467	Const Indirec	Construction Field staff expenses	1.0	ls	Contr	Contr	1,870,168			0	1.09					0	0	0	1,870,168	$1,870,168	See EPC Field Staff Worksheet for details
468	Const Indirec	Construction Permits	1.0	ls	Contr	Contr				0	1.09		51,450			0	0	51,450	0	$51,450	See Const Indirects and Serv Worksheet
469	Const Indirec	Construction Testing	1.0	ls	Contr	Contr				0	1.09		117,000			0	0	117,000	0	$117,000	See Const Indirects and Serv Worksheet
470	Const Indirec	Consumable Materials & Safety Supplies	2.00	$/MH	Contr	Contr	2,059,749			0	1.09					0	0	0	2,059,749	$2,059,749	$2.00/Direct hour
471	Const Indirec	Field Office Expenses	1.0	ls	Contr	Contr				1,369	1.09		1,033,370			65,849	1,485	1,099,219	22,373	$1,121,592	See Const Indirects and Serv Worksheet
472	Const Indirec	Performance Testing	1.0	ls	Contr	Contr				0	1.09		304,400			0	0	304,400	0	$304,400	See Const Indirects and Serv Worksheet
473	Const Indirec	Preoperational Testing, Startup & Commissioning	2.0	ls	Contr	Contr				21,690	1.09		1,113,000			752,767	23,534	1,865,767	0	$1,865,767	See Const Indirects and Serv Worksheet
474	Const Indirec	Site Safety	1.0	ls	Contr	Contr				7,580	1.09		658,040			375,008	8,224	1,033,048	0	$1,033,048	See Const Indirects and Serv Worksheet
475	Const Indirec	Small Tools	2.00	$/MH	Contr	Contr	2,059,749			0	1.09					0	0	0	2,059,749	$2,059,749	$2.00/Direct hour
476	Const Indirec	Start-up Supervision	1.0	ls	Contr	Contr	1,296,911			0	1.09					0	0	0	1,296,911	$1,296,911	See EPC Field Staff Worksheet for details
477	Const Indirec	Support Craft, Site Services, Scaffolding	1.0	ls	Contr	Contr				41,753	1.09		459,400			2,008,704	45,302	2,468,104	775,014	$3,243,118	See Const Indirects and Serv Worksheet
478	Const Indirec	Temporary Facilities	1.0	ls	Contr	Contr				17,947	1.09		2,336,753			863,403	19,472	3,200,157	82,500	$3,282,657	See Const Indirects and Serv Worksheet
479	Const Indirec	Temporary Utilities	1.0	ls	Contr	Contr				29,032	1.09		747,600			1,396,697	31,500	2,144,297	0	$2,144,297	See Const Indirects and Serv Worksheet
480																					
481		**Division #8.0 - Construction Indirects and Services Sub-Total**								**119,371**		**0**	**6,821,013**			**5,462,428**	**129,518**	**12,283,441**	**31,744,973**	**$44,028,414**	
482																					
483		**SUB-TOTAL CONSTRUCTION COST**								**1,069,046**		**0**	**324,848,744**			**60,318,825**	**1,159,392**	**385,167,569**	**57,014,900**	**442,182,469**	
484		**Subcontract Labor Hours**																			
485		**Material Cost Excluding CT, HRSG and ST (escalation and EPC**											**91,886,697**								
486	**Division #9.0 - Project Indirects**																				
487																					
488	Project Indire	- Power Plant Design Engineering	1.0	ls	Contr	6.0%	26,530,948											0	26,530,948	$26,530,948	6.0% of the Total Construction Cost
489	Project Indire	- Project Management (Home Office)	0.0	ls	Contr	0.0%	0											0	0	$0	Included in Engineering
490																					
491																					
492		Sub-Total Project Indirects										**0**	**0**			**0**	**0**	**0**	**26,530,948**	**$26,530,948**	
493																					
494	EPC Indirect	EPC Contractor Insurance & Misc Costs (% of Total Const. Cost)																			
495																					
496	EPC Indirect	- Builders Risk Insurance	1.0	ls	Contr	0.50%	2,210,912												2,210,912	$2,210,912	Allowance based on info from other projects
497	EPC Indirect	- Comprehensive General Liability (CGL) Insurance	1.0	ls	Contr	0.50%	2,210,912											0	2,210,912	$2,210,912	Allowance based on info from other projects
498	EPC Indirect	- Warranty Reserve	1.0	ls	Contr		500,000											0	500,000	$500,000	Allowance based on info from other projects
499																					
500		Sub-Total EPC Contractor Indirects										**0**	**0**			**0**	**0**	**0**	**4,921,825**	**$4,921,825**	
501																					
502		**Total Project Indirects**										**0**	**0**			**0**	**0**	**0**	**31,452,773**	**31,452,773**	
503																					
504		Sub-Total										**0**	**324,848,744**			**60,318,825**	**1,159,392**	**385,167,569**	**88,467,673**	**$473,635,242**	
505							Equipment	Material	Labor	S/C											
506	Project Indire	Escalation - EPC Contractor Escalation Rates					2.4%	2.4%	4.0%	4.0%			6,909,863			9,473,204	0	16,383,067	7,770,060	24,153,127	Excludes CT, HRSG and ST
507																					
508		Sub-Total										**0**	**331,758,607**			**69,792,030**	**1,159,392**	**401,550,637**	**96,237,733**	**$497,788,370**	
509							Equip	Mat	Labor	S/C											
510	EPC Indirect	EPC Contractor Contingency	Varies	%	Contr		0%	5%	5%	5%		0	4,594,335			3,489,601		8,083,936	4,512,387	12,596,323	Excludes CT, HRSG and ST
511	EPC Indirect	EPC Contractor G&A and Fee	10.0%	%	Contr		0.0%	10.0%	10.0%	10.0%		0	33,175,861			6,979,203		40,155,064	9,623,773	49,778,837	
512																					
513		Sub-Total		ls								0	37,770,196			10,468,804	0	48,239,000	14,136,160	$62,375,160	
514																					
515		**TOTAL EPC PROJECT COST**								**1,069,046**		**0**	**369,528,802**			**80,260,834**	**1,159,392**	**449,789,637**	**110,373,893**	**$560,163,529**	
516																					
517	**OWNER INDIRECTS**																				
518	**Division #9.1 - Owner Indirects**																				
519																					
520		**Power Block 1 and Common**																			
521	Owner Indire	Project Development	1.0	ls	Owner														6,500,000	$6,500,000	Budget provided by LG&E
522	Owner Indire	Transmission Line Relocation	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
523	Owner Indire	Transmission Interconnection Facilities	1.0	ls	Owner														5,500,000	$5,500,000	To be estimated by Transmision Operator
524	Owner Indire	Natural Gas Pipeline Interconnection	1.0	ls	Owner														14,250,000	$14,250,000	Budget provided by LG&E
525	Owner Indire	Natural Gas Pipeline Fixed O&M (Startup Period)	1.0	ls	Owner														6,300,000	$6,300,000	Budget provided by LG&E
526	Owner Indire	Construction Power (Service Installation and Energy)	1.0	ls	Owner														750,000	$750,000	Budget estimated by HDR|CB
527	Owner Indire	Owner Operations Personnel (Prior to COD)	1.0	ls	Owner														2,340,000	$2,340,000	Budget estimated by HDR|CB 7 sal @ 12 mo, 26 hr @ 6 n
528	Owner Indire	Owners Project Management	1.0	ls	Owner														5,300,000	$5,300,000	Budget provided by LG&E
529	Owner Indire	Owners Engineer	1.0	ls	Owner														1,900,000	$1,900,000	Budget provided by LG&E
530	Owner Indire	Owners Legal Counsel	1.0	ls	Owner														1,300,000	$1,300,000	Budget provided by LG&E
531	Owner Indire	Operator Training	1.0	ls	Owner														225,000	$225,000	Budget estimated by HDR|CB
532	Owner Indire	Owner Startup Engineering	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
533	Owner Indire	Permitting, License Fees, & Environmental Compliance	1.0	ls	Owner														0	$0	Budget provided by LG&E [in Project Management]
534	Owner Indire	Highway Improvements, Miscellaneous Mitigation	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
535	Owner Indire	Land	1.0	ls	Owner														0	$0	Budget provided by LG&E
536	Owner Indire	Rolling Stock	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
537	Owner Indire	Water Infrastructure / Supply to Site	0.0	ls	Owner														0	$0	N/A (On site intake/pre-treatment/discharge incl. in EPC)
538	Owner Indire	Startup Testing (Includes Fuel & Power Sales)																			
539	Owner Indire	- Fuel - Natural Gas	1.0	ls	Owner														12,160,800	$12,160,800	HDR|CB [2,702,400 MMBTU @ $4.50/MMBTU per LG&E 2017 Forecas
540	Owner Indire	- Fuel - Fuel Oil	0.0	ls	Owner														0	$0	Budget estimated by HDR|CB [Not Required]
541	Owner Indire	- Electric Transmission Firm Point to Point	1.0	ls	Owner														4,000,000	$4,000,000	Budget provided by LG&E
542	Owner Indire	- Startup Power	1.0	ls	Owner														391,104	$391,104	Budget estimated by HDR|CB [10,864 MWhr @$36/MWH]
543	Owner Indire	- Test Power Sales	1.0	ls	Owner														(15,552,000)	($15,552,000)	Budget estimated by HDR|CB [432,000 MWhr @$36/MWH
544	Owner Indire	- Variable O&M - Water, Chemicals, etc.	1.0	ls	Owner														1,200,000	$1,200,000	Budget estimated by HDR|CB
545	Owner Indire	Site Security	1.0	ls	Owner														50,000	$50,000	Budget estimated by HDR|CB
546	Owner Indire	Operating Spare Parts	1.0	ls	Owner														10,000,000	$10,000,000	Budget estimated by HDR|CB
547	Owner Indire	Permanent Plant Equipment & Furnishings																		$0	

Estimate Details

2 x 1 Siemens H Class 700 MW Combined Cycle Unit

Kentucky
NGCC
LG&E/KU
Conceptual

STATUS DATE: 22-Feb-13

													CONSTRUCTION PROJECT TOTALS CONTRACTOR								
TE BASIS	**ISCIPLIN**	**DESCRIPTION**	Qty	UM	D.O.R. Purch. Resp.	Const. Resp.	MATERIAL Purchase or Unit Cost	INSTALL. Labor MH/UM	Labor Wage Rate	Manhours w/o productivity	Prod. Factor	**PROCUREMENT MAJOR EQUIP. TOTAL $**	**MATERIAL $**	**TAXABLE**	**SALES TAX $**	**LABOR $**	**MHRS**	**SUBTOTAL $**	**SUBCONT or OTHER $**	**PROJECT TOTAL $**	**BASIS NOTES**
Line #																					
548	Owner Indire	- Office Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
549	Owner Indire	- Kitchen Furniture	1.0	ls	Owner														130,000	$130,000	Budget estimated by HDR|CB
550	Owner Indire	- Laboratory Equipment & Furniture	1.0	ls	Owner														350,000	$350,000	Budget estimated by HDR|CB
551	Owner Indire	- Locker Room Furniture	1.0	ls	Owner														180,000	$180,000	Budget estimated by HDR|CB
552	Owner Indire	- Warehouse Shelves	1.0	ls	Owner														0	$0	Budget estimated by HDR|CB
553	Owner Indire	- Workshop Tools & Test Equipment	1.0	ls	Owner														1,800,000	$1,800,000	Budget estimated by HDR|CB
554	Owner Indire	IT and Telecommunication Infrastructure	1.0	ls	Owner														250,000	$250,000	Budget estimated by HDR|CB
555	Owner Indire	NERC - Cyber Security	1.0	ls	Owner														1,000,000	$1,000,000	Budget estimated by HDR|CB
556	Owner Indire	Escalation - Owners Furnished Equipment	0.0	%	Owner														0	$0	N/A
557	Owner Indire	Builders Risk Insurance	0.0	ls	Owner														0	$0	Included with EPC Contractor Indirects
558	Owner Indire	Property Tax During Construction	1.0	ls	Owner														1,750,000	$1,750,000	Budget provided by LG&E
559	Owner Indire	Financing Fees	0.0	ls	Owner														0	$0	N/A
560	Owner Indire	AFUDC	1.0	ls	Owner														6,000,000	$6,000,000	AFUDC Based on 78% KU Ownership
561		**Total Owner Indirects**																	**70,174,904**	**$70,174,904**	
562																					
563																					
564		**Owner Contingency**	10.00%	%	Owner														**56,016,353**	**$56,016,353**	
565																					
566																					
567		**Total Owner Indirects**																	**126,191,257**	**$126,191,257**	
568																					
569		**TOTAL PROJECT COST**										**0**	**369,528,802**			**80,260,834**	**1,159,392**	**449,789,637**	**236,565,150**	**$686,354,786**	
																			$/kW	**$973**	

APPENDIX G

LIFE CYCLE COST ANALYSIS

- 1x1 GE F Class Project Life Cycle Cost Analysis
- 1x1 Siemens F Class Project Life Cycle Cost Analysis
- 1x1 MHI G Class Project Life Cycle Cost Analysis
- 1x1 Siemens H Class Project Life Cycle Cost Analysis
- 2x1 GE F Class Project Life Cycle Cost Analysis
- 2x1 Siemens F Class Project Life Cycle Cost Analysis
- 2x1 Siemens F Class 760 MW Project Life Cycle Cost Analysis
- 2x1 Siemens F Class 700 MW Project Life Cycle Cost Analysis
- 2x1 GE 7F7 Class 760 MW Project Life Cycle Cost Analysis
- 2x1 GE 7F7 Class 700 MW Project Life Cycle Cost Analysis
- 2x1 Siemens H Class 760 MW Project Life Cycle Cost Analysis
- 2x1 Siemens H Class 700 MW Project Life Cycle Cost Analysis

HDR		
LG&E - KU		
PROJECT:	189895	LG&E 2017 CC
DATE;	2/22/2013 8:49	
FILE:	1X1 F-CLASS CC	SHEET 1

PLANT DESIGN: 1X1 F (GE)

PLANT GROSS CAPACITY	314,308	KW
NET CONTRACT DEMAND	300,723	KW
HEAT RATE - GROSS HHV	6,496	BTU/KWH
HEAT RATE - NET HHV	6738	BTU/KWH

DEPRECIATION	NEW PLANT - UTILITY	20	YR MACRS
AMORTIZATION		30	YRS
DISCOUNT RATE		6.75%	

CAPITAL COST CATEGORIES:		($1,000)	
HARD COSTS:			
	EPC PLANT		$327,669
SOFT COSTS:			
	TOTAL OWNER INDIRECTS		$63,775
	OWNER CONTINGENCY		$32,767
	LTSA INITIATION		$12,682
	SUB-TOTAL	25.00%	$109,224
TOTAL PROJECT COST			$436,893

INSTALLED POWER PLANT COST ($/KW)	$1,453

FINANCE STRUCTURE:					
DEBT			AVG DCR	2.21	
	PERCENT		$199,529	46%	
	RATE			3.73%	
	TERM	20 YR		80	
	PAYMENT - QUARTER			$3,550	
EQUITY					
	PERCENT		$237,364	54%	
	POST-TAX RETURN		(TARGET)	9.27%	
	EQUITY PAYMENT			$22,004	GOAL SEEK IRR=7.77% UNLEVERED
			IRR	6.77%	
			NPV	$391	

PRO FORMA ANALYSIS:

YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
				0	1	2	3	4	5	6	7	8	9	10
ESCALATORS:														
	PARTS				2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.				0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:														
	FUEL													
	NATURAL GAS	($/MMBTU)		$11.70	$4.96	$5.31	$5.66	$6.06	$6.53	$6.91	$7.22	$7.59	$7.93	$8.32
	NATURAL GAS ANNUAL DEMAND CHARGE			($1,000)	$7,172	$7,172.28	$7,172.28	$7,172.28	$7,172.28	$7,172.28	$7,172.28	$7,172.28	$7,172.28	$7,172.28
0	PRICING OPTIONS	MARGINAL												
$29.01	POWER	CAPITAL RECOVERY		($/MWH)	$29.01	$29.01	$29.01	$29.01	$29.01	$29.01	$29.01	$29.01	$29.01	$29.01
		FIXED CAPACITY-DB		($/KW-MO)	$3.94	$3.94	$3.94	$3.94	$3.94	$3.94	$3.94	$3.94	$3.94	$3.94
		FIXED CAPACITY-EQ		($/KW-MO)	$6.10	$6.10	$6.10	$6.10	$6.10	$6.10	$6.10	$6.10	$6.10	$6.10
$13.70		OP COST		($/MWH)	$10.27	$10.57	$11.12	$11.19	$12.00	$11.75	$12.05	$12.66	$12.55	$13.50
$68.07	30 YR - LEVELIZED	FUEL COST POWER		($/MWH)	$38.88	$41.32	$43.91	$46.57	$49.84	$52.19	$54.40	$57.16	$58.92	$61.97
	$110.78	TOTAL COST		($/MWH)	$78.16	$80.90	$84.04	$86.78	$90.85	$92.96	$95.46	$98.84	$100.48	$104.49
	$42.71	TOLLED COST		($/MWH)	$39.28	$39.59	$40.13	$40.20	$41.02	$40.77	$41.06	$41.67	$41.56	$42.52
PRODUCTION DATA:				AVERAGE										
	ELECTRIC ENERGY	(MWH)		1,247,781	1277001	1271420	1235371	1263764	1204008	1268176	1264672	1228665	1271420	1202410
	TOTAL ELECTRIC	(MWH)		1,247,781	1277001	1271420	1235371	1263764	1204008	1268176	1264672	1228665	1271420	1202410
	FCP FUEL	(MMBTU)		8,407,380	8564651	8541887	8315674	8529266	8090620	8539956	8535397	8308424	8541887	8093803
	TOTAL	(MMBTU)		8,407,380	8564651	8541887	8315674	8529266	8090620	8539956	8535397	8308424	8541887	8093803
	AVG HEAT RATE	(BTU/KWH)			6707	6718	6731	6749	6720	6734	6749	6762	6718	6731
	AVG OUTPUT	(KW)			145776	145139	141024	144265	137444	144769	144369	140259	145139	137261
	CAPACITY FACTOR	(%)	FIRM	47.37%	48.48%	48.26%	46.90%	47.97%	45.70%	48.14%	48.01%	46.64%	48.26%	45.64%
	AMMONIA	(TON)			358	357	348	357	338	357	357	347	357	338
	MAKEUP WATER	(K-GALLONS)			13910	13849	13457	13766	13115	13814	13776	13383	13849	13098
	TOWER MAKEUP	(K-GALLONS)			251	250	243	248	236	249	248	241	250	236
	WASTE WATER	(K-GALLONS)			61738	61468	59725	61098	58209	61311	61142	59401	61468	58131
	NOx	(TON)			180	179	175	179	170	179	179	174	179	170
	SOx	(TON)			3	3	3	3	3	3	3	3	3	3

YEAR				2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				11	12	13	14	15	16	17	18	19	20
ESCALATORS:													
	PARTS			2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.			0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:													
	FUEL												
	NATURAL GAS	($/MMBTU)		$8.62	$8.99	$9.38	$9.80	$10.28	$10.68	$11.46	$12.23	$12.84	$13.48
	NATURAL GAS ANNUAL DEMAND CHARGE			$7,172.28	$7,172.28	$7,172.28	$7,172.28	$7,172.28	$7,172.28	$7,172.28	$7,172.28	$7,172.28	$7,172.28
0	PRICING OPTIONS	MARGINAL											
$29.01	POWER	CAPITAL RECOVERY		$29.01	$29.01	$29.01	$29.01	$29.01	$29.01	$29.01	$29.01	$29.01	$29.01
		FIXED CAPACITY-DB		$3.94	$3.94	$3.94	$3.94	$3.94	$3.94	$3.94	$3.94	$3.94	$3.94
		FIXED CAPACITY-EQ		$6.10	$6.10	$6.10	$6.10	$6.10	$6.10	$6.10	$6.10	$6.10	$6.10
$13.70		OP COST		$13.17	$13.50	$14.05	$14.10	$15.21	$14.88	$15.23	$16.10	$16.20	$17.51
$68.07	30 YR - LEVELIZED	FUEL COST POWER		$63.84	$66.47	$68.82	$71.65	$75.37	$77.91	$82.63	$88.12	$92.32	$97.15
	$110.78	TOTAL COST		$106.02	$108.98	$111.88	$114.76	$119.59	$121.80	$126.88	$133.23	$137.54	$143.67
	$42.71	TOLLED COST		$42.18	$42.52	$43.06	$43.11	$44.22	$43.89	$44.25	$45.11	$45.22	$46.52
PRODUCTION DATA:													
	ELECTRIC ENERGY	(MWH)		1266748	1263764	1239420	1268176	1197739	1260260	1271420	1237775	1266748	1196879
	TOTAL ELECTRIC	(MWH)		1266748	1263764	1239420	1268176	1197739	1260260	1271420	1237775	1266748	1196879
	FCP FUEL	(MMBTU)		8549411	8545763	8328579	8539956	8083663	8522069	8541887	8331856	8549411	8093480
	TOTAL	(MMBTU)		8549411	8545763	8328579	8539956	8083663	8522069	8541887	8331856	8549411	8093480
	AVG HEAT RATE	(BTU/KWH)		6749	6762	6720	6734	6749	6762	6718	6731	6749	6762
	AVG OUTPUT	(KW)		144606	144265	141486	144769	136728	143865	145139	141299	144606	136630
	CAPACITY FACTOR	(%)	FIRM	48.09%	47.97%	47.05%	48.14%	45.47%	47.84%	48.26%	46.99%	48.09%	45.43%
	AMMONIA	(TON)		357	357	348	357	338	356	357	348	357	338
	MAKEUP WATER	(K-GALLONS)		13798	13766	13501	13814	13047	13728	13849	13483	13798	13037
	TOWER MAKEUP	(K-GALLONS)		249	248	243	249	235	247	250	243	249	235
	WASTE WATER	(K-GALLONS)		61242	61098	59921	61311	57906	60928	61468	59841	61242	57864
	NOx	(TON)		180	179	175	179	170	179	179	175	180	170
	SOx	(TON)		3	3	3	3	3	3	3	3	3	3

HDR																							
LG&E - KU																							
PROJECT:	189895	LG&E 2017 CC																					
DATE;	2/22/2013 8:49																						
FILE:	1X1 F-CLASS CC	SHEET 2																					
REVENUE:		($1,000)																					
	CAPACITY FIXED			$10.03	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204
	ENERGY																						
		VARIABLE ENERGY			$13,110	$13,441	$13,733	$14,139	$14,451	$14,905	$15,235	$15,553	$15,955	$16,236	$16,682	$17,064	$17,410	$17,880	$18,218	$18,750	$19,366	$19,924	$20,522
		FUEL			$49,653	$52,530	$54,239	$58,860	$60,004	$66,183	$68,798	$70,233	$74,909	$74,513	$80,868	$83,999	$85,294	$90,864	$90,272	$98,188	$105,062	$109,071	$116,947
	TOTAL REVENUE			$1,759,873	$98,967	$102,175	$104,177	$109,203	$110,659	$117,293	$120,237	$121,991	$127,069	$126,953	$133,754	$137,267	$138,909	$144,948	$144,694	$153,142	$160,633	$165,199	$173,673
PRO FORMA ANALYSIS:																							
YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
EXPENSES:		($1,000)																					
	NATURAL GAS CONSUMPTION				$42,481	$45,357	$47,067	$51,687	$52,832	$59,011	$61,626	$63,061	$67,737	$67,340	$73,696	$76,826	$78,122	$83,692	$83,100	$91,016	$97,890	$101,899	$109,774
	NATURAL GAS ANNUAL DEMAND CHARGE				$7,172	$7,172	$7,172	$7,172	$7,172	$7,172	$7,172	$7,172	$7,172	$7,172	$7,172	$7,172	$7,172	$7,172	$7,172	$7,172	$7,172	$7,172	$7,172
	FUEI UNIT COST ($/MWH)				$38.88	$41.32	$43.91	$46.57	$49.84	$52.19	$54.40	$57.16	$58.92	$61.97	$63.84	$66.47	$68.82	$71.65	$75.37	$77.91	$82.63	$88.12	$92.32
	AMMONIA				$59	$59	$58	$59	$56	$59	$59	$58	$59	$56	$59	$59	$58	$59	$56	$59	$59	$58	$59
	CLARIFIED WATER				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	DEMIN WATER				$65	$65	$63	$64	$61	$65	$65	$63	$65	$61	$65	$64	$63	$65	$61	$64	$65	$63	$65
	CHEMICAL FEED				$15	$15	$15	$15	$15	$15	$15	$15	$15	$15	$15	$15	$15	$15	$15	$15	$15	$15	$15
	STARTUP FUEL				$2,516	$2,693	$2,871	$3,073	$3,312	$3,504	$3,662	$3,849	$4,022	$4,220	$4,372	$4,559	$4,757	$4,970	$5,214	$5,417	$5,812	$6,203	$6,512
	WASTEWATER TREATMENT				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	SPARE PARTS				$819	$839	$859	$880	$901	$922	$944	$967	$990	$1,014	$1,038	$1,063	$1,089	$1,115	$1,142	$1,169	$1,197	$1,226	$1,255
	VARIABLE MAINTENANCE PARTS AND LABOR				$1,851	$1,895	$1,902	$1,987	$1,950	$2,084	$2,134	$2,142	$2,238	$2,195	$2,346	$2,403	$2,412	$2,519	$2,472	$2,642	$2,705	$2,715	$2,837
	FIXED MAINTENANCE PARTS AND LABOR				$3,348	$3,428	$3,510	$3,594	$3,681	$3,769	$3,859	$3,952	$4,047	$4,144	$4,244	$4,345	$4,450	$4,556	$4,666	$4,778	$4,892	$5,010	$5,130
	FIXED O&M	7	24		$3,317	$3,346	$3,377	$3,407	$3,438	$3,468	$3,500	$3,531	$3,563	$3,595	$3,627	$3,660	$3,693	$3,726	$3,760	$3,794	$3,828	$3,862	$3,897
	MISC EXPENSES				$139	$140	$142	$143	$144	$146	$147	$148	$150	$151	$152	$154	$155	$156	$158	$159	$161	$162	$164
	INSURANCES				$347	$347	$347	$347	$347	$347	$347	$347	$347	$347	$347	$347	$347	$347	$347	$347	$347	$347	$347
	PROPERTY TAXES				$633	$612	$590	$568	$546	$524	$502	$481	$459	$437	$415	$393	$371	$350	$328	$306	$284	$262	$240
	LAND LEASE				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
				LEVELIZED																			
	Fixed ($/MWH)			$7.10	$6.10	$6.19	$6.45	$6.38	$6.77	$6.51	$6.61	$6.89	$6.74	$7.21	$6.94	$7.04	$7.27	$7.20	$7.73	$7.45	$7.48	$7.79	$7.72
	Variable ($/MWH)			$1.89	$1.45	$1.49	$1.54	$1.57	$1.62	$1.64	$1.69	$1.74	$1.76	$1.83	$1.85	$1.90	$1.95	$1.99	$2.06	$2.10	$2.13	$2.19	$2.24
	Consumables ($/MWH)			$4.72	$2.72	$2.89	$3.13	$3.24	$3.61	$3.60	$3.75	$4.03	$4.05	$4.46	$4.38	$4.56	$4.83	$4.91	$5.42	$5.34	$5.62	$6.11	$6.24
				NPV																			
	TOTAL OPERATING COST			$217,654	$13,110	$13,441	$13,733	$14,139	$14,451	$14,905	$15,235	$15,553	$15,955	$16,236	$16,682	$17,064	$17,410	$17,880	$18,218	$18,750	$19,366	$19,924	$20,522
	UNIT COST ($/MWH)			$13.70	$10.27	$10.57	$11.12	$11.19	$12.00	$11.75	$12.05	$12.66	$12.55	$13.50	$13.17	$13.50	$14.05	$14.10	$15.21	$14.88	$15.23	$16.10	$16.20

NET OPERATING INCOME				$460,776	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204	$36,204
	TAX DEPRECIATION			100%	$12,288	$23,654	$21,878	$20,240	$18,720	$17,317	$16,016	$14,817	$14,621	$14,617	$14,621	$14,617	$14,621	$14,617	$14,621	$14,617	$14,621	$14,617	$14,621
	TAX AMORTIZATION				$3,641	$3,641	$3,641	$3,641	$3,641	$3,641	$3,641	$3,641	$3,641	$3,641	$3,641	$3,641	$3,641	$3,641	$3,641	$3,641	$3,641	$3,641	$3,641
	BOOK DEPRECIATION				$14,563	$14,563	$14,563	$14,563	$14,563	$14,563	$14,563	$14,563	$14,563	$14,563	$14,563	$14,563	$14,563	$14,563	$14,563	$14,563	$14,563	$14,563	$14,563
	TOTAL CUMULATIVE DEP/AMORT				$14,563	$29,126	$43,689	$58,252	$72,816	$87,379	$101,942	$116,505	$131,068	$145,631	$160,194	$174,757	$189,321	$203,884	$218,447	$233,010	$247,573	$262,136	$276,699
	NET BOOK VALUE				$422,330	$407,767	$393,204	$378,641	$364,078	$349,515	$334,952	$320,389	$305,825	$291,262	$276,699	$262,136	$247,573	$233,010	$218,447	$203,884	$189,321	$174,757	$160,194
	TOTAL NON-CASH CHARGES				$15,928	$27,295	$25,519	$23,881	$22,361	$20,958	$19,657	$18,458	$18,261	$18,258	$18,261	$18,258	$18,261	$18,258	$18,261	$18,258	$18,261	$18,258	$18,261
	UNIT COST ($/MWH)		EXPENSE		$12.47	$21.47	$20.66	$18.90	$18.57	$16.53	$15.54	$15.02	$14.36	$15.18	$14.42	$14.45	$14.73	$14.40	$15.25	$14.49	$14.36	$14.75	$14.42
EARNINGS BEFORE INTEREST & TAXES (EBIT)					$20,276	$8,909	$10,685	$12,323	$13,844	$15,246	$16,547	$17,746	$17,943	$17,946	$17,943	$17,946	$17,943	$17,946	$17,943	$17,946	$17,943	$17,946	$17,943
DEBT SERVICE:														10 YR					15 YR				
	TOTAL PAYMENT				$14,200	$14,200	$14,200	$14,200	$14,200	$14,200	$14,200	$14,200	$14,200	$14,200	$14,200	$14,200	$14,200	$14,200	$14,200	$14,200	$14,200	$14,200	$14,200
	INTEREST PAYMENT				$7,347	$7,088	$6,819	$6,540	$6,250	$5,949	$5,637	$5,313	$4,977	$4,628	$4,266	$3,891	$3,501	$3,096	$2,676	$2,240	$1,787	$1,318	$831
	PRINCIPAL PAYMENTS				$6,853	$7,112	$7,381	$7,661	$7,950	$8,251	$8,563	$8,887	$9,223	$9,572	$9,934	$10,310	$10,700	$11,105	$11,525	$11,961	$12,413	$12,883	$13,370
TAX BASIS					$12,928	$1,821	$3,866	$5,783	$7,593	$9,297	$10,910	$12,433	$12,965	$13,318	$13,676	$14,055	$14,442	$14,850	$15,267	$15,706	$16,155	$16,628	$17,112
INCOME TAXES																							
	US		38.90%		$5,029	$708	$1,504	$2,250	$2,954	$3,616	$4,244	$4,836	$5,044	$5,181	$5,320	$5,468	$5,618	$5,777	$5,939	$6,110	$6,284	$6,468	$6,657
	GROSS RECIEPTS		0.00%		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CASH BASIS:																							
	NET OPERATING INCOME (NOI)				$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004
				NPV																			
	NET BEFORE TAX CASHFLOW			$307,368	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004	$22,004
				NPV																			
	LESS TAXES			($69,613)	($5,029)	($708)	($1,504)	($2,250)	($2,954)	($3,616)	($4,244)	($4,836)	($5,044)	($5,181)	($5,320)	($5,468)	($5,618)	($5,777)	($5,939)	($6,110)	($6,284)	($6,468)	($6,657)
	NET AFTER TAX CASH			($237,364)	$16,975	$21,295	$20,500	$19,754	$19,050	$18,387	$17,760	$17,167	$16,960	$16,823	$16,684	$16,536	$16,386	$16,227	$16,065	$15,894	$15,719	$15,535	$15,347
			NPV	$391																			
			IRR	6.77%																			
	DEBT SERVICE COVERAGE			AVERAGE																			
		AFTER TAX		2.21	2.20	2.50	2.44	2.39	2.34	2.29	2.25	2.21	2.19	2.18	2.17	2.16	2.15	2.14	2.13	2.12	2.11	2.09	2.08
		BEFORE TAX		2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55
	EQUITY RETURN:	100%																					
		PRE-TAX			9.27%	9.27%	9.27%	9.27%	9.27%	9.27%	9.27%	9.27%	9.27%	9.27%	9.27%	9.27%	9.27%	9.27%	9.27%	9.27%	9.27%	9.27%	9.27%
			AVG	ROIC	11.26%																		
		POST-TAX			7.15%	8.97%	8.64%	8.32%	8.03%	7.75%	7.48%	7.23%	7.15%	7.09%	7.03%	6.97%	6.90%	6.84%	6.77%	6.70%	6.62%	6.54%	6.47%
			AVG	ROIC	8.18%																		
HDR				ROA	4.03%	5.20%	4.98%	4.78%	4.60%	4.42%	4.26%	4.10%	4.05%	4.02%	3.99%	3.95%	3.91%	3.88%	3.84%	3.80%	3.75%	3.71%	3.67%
LG&E - KU				20 YR - AVG	4.13%																		
PROJECT:	189895	LG&E 2017 CC		40 YR - AVG	4.59%																		
DATE;	2/22/2013 8:49																						
FILE:	1X1 F-CLASS CC																						

HDR		
LG&E - KU		
PROJECT:	189895	LG&E 2017 CC
DATE:	2/22/2013 8:49	
FILE:	1X1 F-CLASS CC	SHEET 1

PLANT DESIGN:	1X1 F (Siemens)	
PLANT GROSS CAPACITY	351,648	KW
NET CONTRACT DEMAND	336,208	KW
HEAT RATE - GROSS HHV	6,527	BTU/KWH
HEAT RATE - NET HHV	6775	BTU/KWH

CAPITAL COST CATEGORIES:		($1,000)	
HARD COSTS:			
	EPC PLANT		$319,623
SOFT COSTS:			
	TOTAL OWNER INDIRECTS		$63,775
	OWNER CONTINGENCY		$31,962
	LTSA INITIATION		$1,729
	SUB-TOTAL	23.37%	$97,467
TOTAL PROJECT COST			$417,090

INSTALLED POWER PLANT COST ($/KW)	$1,241

FINANCE STRUCTURE:					
DEBT			AVG DCR	2.21	
	PERCENT		$190,485	46%	
	RATE			3.73%	
	TERM	20 YR		80	
	PAYMENT - QUARTER			$3,389	
EQUITY					
	PERCENT		$226,605	54%	
	POST-TAX RETURN		(TARGET)	9.25%	
	EQUITY PAYMENT			$20,961	GOAL SEEK IRR=7.77% UNLEVERED
			IRR	6.77%	
			NPV	$365	

DEPRECIATION	NEW PLANT - UTILITY	20	YR MACRS
AMORTIZATION		30	YRS
DISCOUNT RATE		6.75%	

PRO FORMA ANALYSIS:

YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ESCALATORS:																								
	PARTS				2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.				0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:																								
	FUEL																							
	NATURAL GAS	($/MMBTU)		$11.70	$4.96	$5.31	$5.66	$6.06	$6.53	$6.91	$7.22	$7.59	$7.93	$8.32	$8.62	$8.99	$9.38	$9.80	$10.28	$10.68	$11.46	$12.23	$12.84	$13.48
	NATURAL GAS ANNUAL DEMAND CHARGE			($1,000)	$8,062	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27	$8,062.27
0	PRICING OPTIONS	MARGINAL																						
$24.74	POWER	CAPITAL RECOVERY		($/MWH)	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74	$24.74
		FIXED CAPACITY-DB		($/KW-MO)	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36	$3.36
		FIXED CAPACITY-EQ		($/KW-MO)	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20	$5.20
$12.56		OP COST		($/MWH)	$9.29	$9.58	$10.11	$10.16	$10.98	$10.70	$10.98	$11.57	$11.45	$12.40	$12.03	$12.35	$12.89	$12.91	$14.02	$13.64	$13.99	$14.84	$14.91	$16.22
$68.44	30 YR - LEVELIZED	FUEL COST POWER		($/MWH)	$39.09	$41.54	$44.14	$46.83	$50.11	$52.47	$54.70	$57.47	$59.24	$62.31	$64.19	$66.83	$69.19	$72.04	$75.78	$78.34	$83.08	$88.60	$92.82	$97.68
	$105.74	TOTAL COST		($/MWH)	$73.13	$75.86	$79.00	$81.73	$85.83	$87.92	$90.41	$93.79	$95.43	$99.45	$100.96	$103.92	$106.82	$109.69	$114.54	$116.72	$121.82	$128.18	$132.48	$138.64
	$37.30	TOLLED COST		($/MWH)	$34.04	$34.32	$34.86	$34.90	$35.72	$35.44	$35.72	$36.32	$36.19	$37.15	$36.78	$37.09	$37.63	$37.65	$38.76	$38.39	$38.73	$39.59	$39.65	$40.96
PRODUCTION DATA:				AVERAGE																				
	ELECTRIC ENERGY	(MWH)		1,395,020	1427687	1421448	1381145	1412888	1346081	1417821	1413903	1373648	1421448	1344294	1416225	1412888	1385671	1417821	1339073	1408970	1421448	1383832	1416225	1338111
	TOTAL ELECTRIC	(MWH)		1,395,020	1427687	1421448	1381145	1412888	1346081	1417821	1413903	1373648	1421448	1344294	1416225	1412888	1385671	1417821	1339073	1408970	1421448	1383832	1416225	1338111
	FCP FUEL	(MMBTU)		9,450,626	9627413	9601824	9347541	9587637	9094561	9599653	9594528	9339391	9601824	9098138	9610281	9606181	9362048	9599653	9086740	9579547	9601824	9365731	9610281	9097776
	TOTAL	(MMBTU)		9,450,626	9627413	9601824	9347541	9587637	9094561	9599653	9594528	9339391	9601824	9098138	9610281	9606181	9362048	9599653	9086740	9579547	9601824	9365731	9610281	9097776
	AVG HEAT RATE	(BTU/KWH)			6743	6755	6768	6786	6756	6771	6786	6799	6755	6768	6786	6799	6756	6771	6786	6799	6755	6768	6786	6799
	AVG OUTPUT	(KW)			162978	162266	157665	161289	153662	161852	161404	156809	162266	153458	161669	161289	158182	161852	152862	160841	162266	157972	161669	152752
	CAPACITY FACTOR	(%)	FIRM	47.37%	48.48%	48.26%	46.90%	47.97%	45.70%	48.14%	48.01%	46.64%	48.26%	45.64%	48.09%	47.97%	47.05%	48.14%	45.47%	47.84%	48.26%	46.99%	48.09%	45.43%
	AMMONIA	(TON)			403	401	391	401	380	401	401	390	401	380	402	402	391	401	380	401	401	392	402	380
	MAKEUP WATER	(K-GALLONS)			15684	15615	15173	15521	14787	15576	15533	15090	15615	14768	15558	15521	15222	15576	14710	15478	15615	15202	15558	14700
	TOWER MAKEUP	(K-GALLONS)			251	250	243	248	236	249	248	241	250	236	249	248	243	249	235	247	250	243	249	235
	WASTE WATER	(K-GALLONS)			71198	70887	68877	70460	67129	70706	70511	68503	70887	67039	70627	70460	69103	70706	66779	70265	70887	69011	70627	66731
	NOx	(TON)			202	202	196	201	191	202	201	196	202	191	202	202	197	202	191	201	202	197	202	191
	SOx	(TON)			4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

HDR
LG&E - KU
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REVENUE: ($1,000)

CAPACITY FIXED		$8.56	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518
ENERGY																						
	VARIABLE ENERGY		$13,265	$13,616	$13,966	$14,357	$14,779	$15,171	$15,518	$15,899	$16,277	$16,674	$17,040	$17,443	$17,859	$18,303	$18,775	$19,222	$19,883	$20,540	$21,118	$21,706
	FUEL		$55,814	$59,048	$60,969	$66,163	$67,450	$74,396	$77,335	$78,948	$84,205	$83,759	$90,903	$94,422	$95,878	$102,139	$101,474	$110,372	$118,099	$122,605	$131,458	$130,700
TOTAL REVENUE		$1,877,989	$103,597	$107,181	$109,453	$115,038	$116,747	$124,084	$127,370	$129,365	$134,999	$134,950	$142,461	$146,383	$148,255	$154,960	$154,766	$164,111	$172,500	$177,662	$187,094	$186,924

PRO FORMA ANALYSIS:

YEAR			2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
EXPENSES:	($1,000)																						
NATURAL GAS CONSUMPTION				$47,752	$50,986	$52,907	$58,101	$59,387	$66,334	$69,272	$70,886	$76,142	$75,697	$82,841	$86,360	$87,816	$94,077	$93,412	$102,310	$110,037	$114,543	$123,396	$122,638
NATURAL GAS ANNUAL DEMAND CHARGE				$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062	$8,062
UNIT COST ($/MWH)				$39.09	$41.54	$44.14	$46.83	$50.11	$52.47	$54.70	$57.47	$59.24	$62.31	$64.19	$66.83	$69.19	$72.04	$75.78	$78.34	$83.08	$88.60	$92.82	$97.68
AMMONIA				$67	$67	$65	$66	$63	$67	$66	$65	$67	$63	$67	$67	$65	$67	$63	$66	$67	$65	$67	$63
CLARIFIED WATER				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DEMIN WATER				$73	$73	$71	$73	$69	$73	$73	$71	$73	$69	$73	$73	$71	$73	$69	$72	$73	$71	$73	$69
CHEMICAL FEED				$17	$17	$17	$17	$16	$17	$17	$17	$17	$16	$17	$17	$17	$17	$16	$17	$17	$17	$17	$16
STARTUP FUEL				$2,828	$3,027	$3,227	$3,455	$3,723	$3,939	$4,116	$4,327	$4,521	$4,743	$4,914	$5,125	$5,347	$5,587	$5,861	$6,089	$6,533	$6,972	$7,320	$7,685
WASTEWATER TREATMENT				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SPARE PARTS				$799	$818	$838	$858	$879	$900	$921	$943	$966	$989	$1,013	$1,037	$1,062	$1,088	$1,114	$1,140	$1,168	$1,196	$1,225	$1,254
VARIABLE MAINTENANCE PARTS AND LABOR				$3,719	$3,808	$3,900	$3,993	$4,089	$4,187	$4,288	$4,391	$4,496	$4,604	$4,715	$4,828	$4,944	$5,062	$5,184	$5,308	$5,436	$5,566	$5,700	$5,836
FIXED MAINTENANCE PARTS AND LABOR				$1,362	$1,395	$1,429	$1,463	$1,498	$1,534	$1,571	$1,608	$1,647	$1,687	$1,727	$1,768	$1,811	$1,854	$1,899	$1,944	$1,991	$2,039	$2,088	$2,138
FIXED O&M	7	24		$3,317	$3,346	$3,377	$3,407	$3,438	$3,468	$3,500	$3,531	$3,563	$3,595	$3,627	$3,660	$3,693	$3,726	$3,760	$3,794	$3,828	$3,862	$3,897	$3,932
MISC EXPENSES				$139	$140	$142	$143	$144	$146	$147	$148	$150	$151	$152	$154	$155	$156	$158	$159	$161	$162	$164	$165
INSURANCES				$339	$339	$339	$339	$339	$339	$339	$339	$339	$339	$339	$339	$339	$339	$339	$339	$339	$339	$339	$339
PROPERTY TAXES				$605	$584	$563	$542	$521	$501	$480	$459	$438	$417	$396	$375	$355	$334	$313	$292	$271	$250	$229	$209
LAND LEASE				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
			LEVELIZED																				
Fixed ($/MWH)			$4.50	$4.04	$4.08	$4.23	$4.17	$4.41	$4.22	$4.27	$4.43	$4.32	$4.60	$4.41	$4.46	$4.58	$4.52	$4.83	$4.63	$4.64	$4.81	$4.74	$5.07
Variable ($/MWH)			$3.43	$2.61	$2.68	$2.82	$2.83	$3.04	$2.95	$3.03	$3.20	$3.16	$3.42	$3.33	$3.42	$3.57	$3.57	$3.87	$3.77	$3.82	$4.02	$4.02	$4.36
Consumables ($/MWH)			$4.63	$2.65	$2.82	$3.05	$3.16	$3.53	$3.52	$3.67	$3.95	$3.97	$4.37	$4.30	$4.47	$4.74	$4.82	$5.32	$5.24	$5.53	$6.01	$6.14	$6.79
			NPV																				
TOTAL OPERATING COST			$223,039	$13,265	$13,616	$13,966	$14,357	$14,779	$15,171	$15,518	$15,899	$16,277	$16,674	$17,040	$17,443	$17,859	$18,303	$18,775	$19,222	$19,883	$20,540	$21,118	$21,706
UNIT COST ($/MWH)			$12.56	$9.29	$9.58	$10.11	$10.16	$10.98	$10.70	$10.98	$11.57	$11.45	$12.40	$12.03	$12.35	$12.89	$12.91	$14.02	$13.64	$13.99	$14.84	$14.91	$16.22

NET OPERATING INCOME				$439,312	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518	$34,518
	DEPRECIATION			100%	$11,986	$23,074	$21,341	$19,743	$18,260	$16,892	$15,623	$14,453	$14,262	$14,258	$14,262	$14,258	$14,262	$14,258	$14,262	$14,258	$14,262	$14,258	$14,262	$14,258
	AMORTIZATION				$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249	$3,249
	BOOK DEPRECIATION				$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903	$13,903
	TOTAL CUMULATIVE DEP/AMORT				$13,903	$27,806	$41,709	$55,612	$69,515	$83,418	$97,321	$111,224	$125,127	$139,030	$152,933	$166,836	$180,739	$194,642	$208,545	$222,448	$236,351	$250,254	$264,157	$278,060
	NET BOOK VALUE				$403,187	$389,284	$375,381	$361,478	$347,575	$333,672	$319,769	$305,866	$291,963	$278,060	$264,157	$250,254	$236,351	$222,448	$208,545	$194,642	$180,739	$166,836	$152,933	$139,030
	TOTAL NON-CASH CHARGES				$15,235	$26,322	$24,590	$22,992	$21,509	$20,141	$18,872	$17,702	$17,510	$17,507	$17,510	$17,507	$17,510	$17,507	$17,510	$17,507	$17,510	$17,507	$17,510	$17,507
	UNIT COST ($/MWH)		EXPENSE		$10.67	$18.52	$17.80	$16.27	$15.98	$14.21	$13.35	$12.89	$12.32	$13.02	$12.36	$12.39	$12.64	$12.35	$13.08	$12.43	$12.32	$12.65	$12.36	$13.08
EARNINGS BEFORE INTEREST & TAXES (EBIT)					$19,283	$8,195	$9,928	$11,526	$13,009	$14,377	$15,646	$16,815	$17,007	$17,010	$17,007	$17,010	$17,007	$17,010	$17,007	$17,010	$17,007	$17,010	$17,007	$17,010
DEBT SERVICE:														10 YR					15 YR					20 YR
	TOTAL PAYMENT				$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557	$13,557
	INTEREST PAYMENT				$7,014	$6,767	$6,510	$6,243	$5,967	$5,680	$5,382	$5,073	$4,752	$4,419	$4,073	$3,714	$3,342	$2,956	$2,555	$2,138	$1,706	$1,258	$793	$310
	PRINCIPAL PAYMENTS				$6,543	$6,790	$7,047	$7,313	$7,590	$7,877	$8,175	$8,484	$8,805	$9,138	$9,484	$9,843	$10,215	$10,601	$11,002	$11,418	$11,850	$12,299	$12,764	$13,247
TAX BASIS					$12,269	$1,428	$3,418	$5,282	$7,042	$8,697	$10,264	$11,743	$12,256	$12,592	$12,934	$13,296	$13,665	$14,055	$14,453	$14,872	$15,301	$15,752	$16,214	$16,700
INCOME TAXES																								
	US		38.90%		$4,773	$556	$1,329	$2,055	$2,739	$3,383	$3,993	$4,568	$4,767	$4,898	$5,031	$5,172	$5,316	$5,467	$5,622	$5,785	$5,952	$6,128	$6,307	$6,496
	GROSS RECIEPTS		0.00%		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CASH BASIS:																								
	NET OPERATING INCOME (NOI)				$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961
				NPV																				
	NET BEFORE TAX CASHFLOW			$292,858	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961	$20,961
				NPV																				
	LESS TAXES			($65,889)	($4,773)	($556)	($1,329)	($2,055)	($2,739)	($3,383)	($3,993)	($4,568)	($4,767)	($4,898)	($5,031)	($5,172)	($5,316)	($5,467)	($5,622)	($5,785)	($5,952)	($6,128)	($6,307)	($6,496)
	NET AFTER TAX CASH			($226,605)	$16,188	$20,405	$19,631	$18,906	$18,222	$17,578	$16,968	$16,393	$16,193	$16,063	$15,929	$15,789	$15,645	$15,494	$15,339	$15,176	$15,009	$14,833	$14,654	$14,465
			NPV	$365																				
			IRR	6.77%																				
	DEBT SERVICE COVERAGE			AVERAGE																				
		AFTER TAX		2.21	2.19	2.51	2.45	2.39	2.34	2.30	2.25	2.21	2.19	2.18	2.18	2.16	2.15	2.14	2.13	2.12	2.11	2.09	2.08	2.07
		BEFORE TAX		2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55
	EQUITY RETURN:	100%																						
		PRE-TAX			9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%
			AVG	ROIC	11.24%																			
		POST-TAX			7.14%	9.00%	8.66%	8.34%	8.04%	7.76%	7.49%	7.23%	7.15%	7.09%	7.03%	6.97%	6.90%	6.84%	6.77%	6.70%	6.62%	6.55%	6.47%	6.38%
			AVG	ROIC	8.17%																			
HDR				ROA	4.03%	5.22%	5.00%	4.80%	4.61%	4.43%	4.26%	4.10%	4.05%	4.02%	3.99%	3.95%	3.92%	3.88%	3.84%	3.80%	3.76%	3.71%	3.67%	3.62%
LG&E - KU				20 YR - AVG	4.13%																			
PROJECT:	189895	LG&E 2017 CC		40 YR - AVG	4.58%																			
DATE:	2/22/2013 8:49																							
FILE:	1X1 F-CLASS CC																							

HDR		
LG&E - KU		
PROJECT:	189895	LG&E 2017 CC
DATE:	2/22/2013 8:49	
FILE:	1X1 G-CLASS CC	SHEET 1

PLANT DESIGN:	1X1 G (MHI)	
PLANT GROSS CAPACITY	392,983	KW
NET CONTRACT DEMAND	374,921	KW
HEAT RATE - GROSS HHV	6,484	BTU/KWH
HEAT RATE - NET HHV	6744	BTU/KWH

CAPITAL COST CATEGORIES:		($1,000)	
HARD COSTS:			
	EPC PLANT		$353,870
SOFT COSTS:			
	TOTAL OWNER INDIRECTS		$64,082
	OWNER CONTINGENCY		$35,387
	LTSA INITIATION		$5,027
	SUB-TOTAL	22.80%	$104,496
TOTAL PROJECT COST			$458,366
INSTALLED POWER PLANT COST ($/KW)			$1,223

FINANCE STRUCTURE:				
DEBT			AVG DCR	2.21
	PERCENT		$209,336	46%
	RATE			3.73%
	TERM	20 YR		80
	PAYMENT - QUARTER			$3,725
EQUITY				
	PERCENT		$249,030	54%
	POST-TAX RETURN		(TARGET)	9.24%
	EQUITY PAYMENT			$23,010
			IRR	6.76%
			NPV	$340

GOAL SEEK IRR=7.77% UNLEVERED

DEPRECIATION	NEW PLANT - UTILITY	20	YR MACRS
AMORTIZATION		30	YRS
DISCOUNT RATE		6.75%	

PRO FORMA ANALYSIS:

YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ESCALATORS:																								
	PARTS				2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.				0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:																								
	FUEL																							
	NATURAL GAS	($/MMBTU)		$11.70	$4.96	$5.31	$5.66	$6.06	$6.53	$6.91	$7.22	$7.59	$7.93	$8.32	$8.62	$8.99	$9.38	$9.80	$10.28	$10.68	$11.46	$12.23	$12.84	$13.48
	NATURAL GAS ANNUAL DEMAND CHARGE			($1,000)	$8,950	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09	$8,950.09
0	PRICING OPTIONS	MARGINAL																						
$24.37	POWER	CAPITAL RECOVERY		($/MWH)	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37	$24.37
		FIXED CAPACITY-DB		($/KW-MO)	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31	$3.31
		FIXED CAPACITY-EQ		($/KW-MO)	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11	$5.11
$13.37		OP COST		($/MWH)	$9.87	$10.18	$10.75	$10.80	$11.67	$11.38	$11.68	$12.32	$12.19	$13.21	$12.82	$13.16	$13.74	$13.77	$14.96	$14.56	$14.92	$15.83	$15.90	$17.30
$68.13	30 YR - LEVELIZED	FUEL COST POWER		($/MWH)	$38.92	$41.35	$43.95	$46.62	$49.88	$52.24	$54.45	$57.21	$58.97	$62.03	$63.90	$66.53	$68.88	$71.71	$75.44	$77.98	$82.71	$88.20	$92.40	$97.24
	$105.87	TOTAL COST		($/MWH)	$73.16	$75.90	$79.06	$81.79	$85.93	$87.98	$90.50	$93.90	$95.53	$99.60	$101.09	$104.06	$106.99	$109.85	$114.76	$116.91	$122.00	$128.40	$132.67	$138.90
	$37.74	TOLLED COST		($/MWH)	$34.24	$34.55	$35.12	$35.17	$36.04	$35.75	$36.05	$36.69	$36.56	$37.58	$37.19	$37.53	$38.11	$38.14	$39.33	$38.93	$39.29	$40.20	$40.27	$41.67
PRODUCTION DATA:				AVERAGE																				
	ELECTRIC ENERGY	(MWH)		1,555,649	1592078	1585121	1540177	1575575	1501075	1581076	1576707	1531817	1585121	1499083	1579296	1575575	1545225	1581076	1493260	1571206	1585121	1543174	1579296	1492188
	TOTAL ELECTRIC	(MWH)		1,555,649	1592078	1585121	1540177	1575575	1501075	1581076	1576707	1531817	1585121	1499083	1579296	1575575	1545225	1581076	1493260	1571206	1585121	1543174	1579296	1492188
	FCP FUEL	(MMBTU)		10,491,334	10687589	10659181	10376897	10643432	10096058	10656772	10651083	10367850	10659181	10100030	10668570	10664019	10393001	10656772	10087376	10634451	10659181	10397090	10668570	10099628
	TOTAL	(MMBTU)		10,491,334	10687589	10659181	10376897	10643432	10096058	10656772	10651083	10367850	10659181	10100030	10668570	10664019	10393001	10656772	10087376	10634451	10659181	10397090	10668570	10099628
	AVG HEAT RATE	(BTU/KWH)			6713	6725	6737	6755	6726	6740	6755	6768	6725	6737	6755	6768	6726	6740	6755	6768	6725	6737	6755	6768
	AVG OUTPUT	(KW)			181744	180950	175819	179860	171356	180488	179989	174865	180950	171128	180285	179860	176395	180488	170464	179361	180950	176161	180285	170341
	CAPACITY FACTOR	(%)	FIRM	47.37%	48.48%	48.26%	46.90%	47.97%	45.70%	48.14%	48.01%	46.64%	48.26%	45.64%	48.09%	47.97%	47.05%	48.14%	45.47%	47.84%	48.26%	46.99%	48.09%	45.43%
	AMMONIA	(TON)			447	446	434	445	422	446	445	433	446	422	446	446	435	446	422	445	446	435	446	422
	MAKEUP WATER	(K-GALLONS)			15964	15895	15444	15799	15052	15854	15810	15360	15895	15032	15836	15799	15495	15854	14974	15755	15895	15474	15836	14963
	TOWER MAKEUP	(K-GALLONS)			251	250	243	248	236	249	248	241	250	236	249	248	243	249	235	247	250	243	249	235
	WASTE WATER	(K-GALLONS)			75335	75006	72879	74554	71029	74815	74608	72484	75006	70935	74730	74554	73118	74815	70659	74348	75006	73021	74730	70608
	NOx	(TON)			289	288	280	287	273	288	288	280	288	273	288	288	281	288	272	287	288	281	288	273
	SOx	(TON)			4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

HDR																								
LG&E - KU																								
PROJECT:	189895	LG&E 2017 CC																						
DATE:	2/22/2013 8:49																							
FILE:	1X1 G-CLASS CC	SHEET 2																						
REVENUE:		($1,000)																						
	CAPACITY FIXED			$8.43	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909
	ENERGY																							
		VARIABLE ENERGY			$15,718	$16,138	$16,558	$17,023	$17,525	$17,992	$18,412	$18,870	$19,325	$19,803	$20,248	$20,734	$21,235	$21,769	$22,334	$22,873	$23,651	$24,425	$25,113	$25,814
		FUEL			$61,961	$65,550	$67,683	$73,449	$74,877	$82,588	$85,851	$87,642	$93,477	$92,982	$100,913	$104,820	$106,436	$113,386	$112,648	$122,526	$131,104	$136,106	$145,935	$145,093
	TOTAL REVENUE			$2,096,861	$115,588	$119,597	$122,150	$128,381	$130,311	$138,490	$142,172	$144,421	$150,711	$150,694	$159,070	$163,462	$165,580	$173,064	$172,891	$183,308	$192,665	$198,440	$208,956	$208,816
PRO FORMA ANALYSIS:																								
YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
EXPENSES:		($1,000)																						
	NATURAL GAS CONSUMPTION				$53,010	$56,600	$58,733	$64,499	$65,927	$73,638	$76,901	$78,692	$84,527	$84,032	$91,963	$95,870	$97,486	$104,436	$103,698	$113,576	$122,154	$127,156	$136,984	$136,143
	NATURAL GAS ANNUAL DEMAND CHARGE				$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950	$8,950
	UNIT COST ($/MWH)				$38.92	$41.35	$43.95	$46.62	$49.88	$52.24	$54.45	$57.21	$58.97	$62.03	$63.90	$66.53	$68.88	$71.71	$75.44	$77.98	$82.71	$88.20	$92.40	$97.24
	AMMONIA				$74	$74	$72	$74	$70	$74	$74	$72	$74	$70	$74	$74	$72	$74	$70	$74	$74	$72	$74	$70
	CLARIFIED WATER				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	DEMIN WATER				$75	$74	$72	$74	$70	$74	$74	$72	$74	$70	$74	$74	$73	$74	$70	$74	$74	$72	$74	$70
	CHEMICAL FEED				$17	$17	$17	$17	$17	$17	$17	$17	$17	$17	$17	$17	$17	$17	$17	$17	$17	$17	$17	$17
	STARTUP FUEL				$3,139	$3,361	$3,582	$3,835	$4,133	$4,373	$4,569	$4,804	$5,019	$5,266	$5,455	$5,690	$5,936	$6,202	$6,506	$6,759	$7,253	$7,740	$8,126	$8,531
	WASTEWATER TREATMENT				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	SPARE PARTS				$885	$906	$928	$950	$973	$996	$1,020	$1,044	$1,070	$1,095	$1,121	$1,148	$1,176	$1,204	$1,233	$1,263	$1,293	$1,324	$1,356	$1,388
	VARIABLE MAINTENANCE PARTS AND LABOR				$5,211	$5,336	$5,464	$5,595	$5,730	$5,867	$6,008	$6,152	$6,300	$6,451	$6,606	$6,764	$6,927	$7,093	$7,263	$7,437	$7,616	$7,799	$7,986	$8,178
	FIXED MAINTENANCE PARTS AND LABOR				$1,822	$1,865	$1,910	$1,956	$2,003	$2,051	$2,100	$2,151	$2,202	$2,255	$2,309	$2,365	$2,421	$2,479	$2,539	$2,600	$2,662	$2,726	$2,792	$2,859
	FIXED O&M	7	24		$3,317	$3,346	$3,377	$3,407	$3,438	$3,468	$3,500	$3,531	$3,563	$3,595	$3,627	$3,660	$3,693	$3,726	$3,760	$3,794	$3,828	$3,862	$3,897	$3,932
	MISC EXPENSES				$139	$140	$142	$143	$144	$146	$147	$148	$150	$151	$152	$154	$155	$156	$158	$159	$161	$162	$164	$165
	INSURANCES				$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375
	PROPERTY TAXES				$665	$642	$619	$596	$573	$550	$527	$504	$481	$458	$435	$413	$390	$367	$344	$321	$298	$275	$252	$229
	LAND LEASE				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
				LEVELIZED																				
	Fixed ($/MWH)			$4.46	$3.97	$4.02	$4.17	$4.11	$4.35	$4.17	$4.22	$4.38	$4.27	$4.56	$4.37	$4.42	$4.55	$4.49	$4.81	$4.61	$4.62	$4.80	$4.74	$5.07
	Variable ($/MWH)			$4.31	$3.27	$3.37	$3.55	$3.55	$3.82	$3.71	$3.81	$4.02	$3.97	$4.30	$4.18	$4.29	$4.48	$4.49	$4.86	$4.73	$4.80	$5.05	$5.06	$5.48
	Consumables ($/MWH)			$4.60	$2.63	$2.80	$3.03	$3.14	$3.51	$3.50	$3.65	$3.92	$3.95	$4.35	$4.27	$4.45	$4.71	$4.79	$5.29	$5.21	$5.50	$5.98	$6.11	$6.75
				NPV																				
	TOTAL OPERATING COST			$264,886	$15,718	$16,138	$16,558	$17,023	$17,525	$17,992	$18,412	$18,870	$19,325	$19,803	$20,248	$20,734	$21,235	$21,769	$22,334	$22,873	$23,651	$24,425	$25,113	$25,814
	UNIT COST ($/MWH)			$13.37	$9.87	$10.18	$10.75	$10.80	$11.67	$11.38	$11.68	$12.32	$12.19	$13.21	$12.82	$13.16	$13.74	$13.77	$14.96	$14.56	$14.92	$15.83	$15.90	$17.30

NET OPERATING INCOME				$482,471	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909	$37,909
	DEPRECIATION			100%	$13,270	$25,546	$23,628	$21,859	$20,217	$18,702	$17,297	$16,002	$15,790	$15,786	$15,790	$15,786	$15,790	$15,786	$15,790	$15,786	$15,790	$15,786	$15,790	$15,786
	AMORTIZATION				$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483	$3,483
	BOOK DEPRECIATION				$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279	$15,279
	TOTAL CUMULATIVE DEP/AMORT				$15,279	$30,558	$45,837	$61,115	$76,394	$91,673	$106,952	$122,231	$137,510	$152,789	$168,068	$183,346	$198,625	$213,904	$229,183	$244,462	$259,741	$275,020	$290,298	$305,577
	NET BOOK VALUE				$443,087	$427,808	$412,529	$397,251	$381,972	$366,693	$351,414	$336,135	$320,856	$305,577	$290,298	$275,020	$259,741	$244,462	$229,183	$213,904	$198,625	$183,346	$168,068	$152,789
	TOTAL NON-CASH CHARGES				$16,753	$29,029	$27,111	$25,342	$23,700	$22,185	$20,780	$19,485	$19,273	$19,269	$19,273	$19,269	$19,273	$19,269	$19,273	$19,269	$19,273	$19,269	$19,273	$19,269
	UNIT COST ($/MWH)		EXPENSE		$10.52	$18.31	$17.60	$16.08	$15.79	$14.03	$13.18	$12.72	$12.16	$12.85	$12.20	$12.23	$12.47	$12.19	$12.91	$12.26	$12.16	$12.49	$12.20	$12.91
EARNINGS BEFORE INTEREST & TAXES (EBIT)					$21,155	$8,880	$10,798	$12,567	$14,209	$15,724	$17,128	$18,424	$18,636	$18,639	$18,636	$18,639	$18,636	$18,639	$18,636	$18,639	$18,636	$18,639	$18,636	$18,639
DEBT SERVICE:														10 YR					15 YR					20 YR
	TOTAL PAYMENT				$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898	$14,898
	INTEREST PAYMENT				$7,708	$7,436	$7,154	$6,861	$6,557	$6,242	$5,914	$5,575	$5,222	$4,856	$4,476	$4,082	$3,673	$3,248	$2,807	$2,350	$1,875	$1,383	$872	$341
	PRINCIPAL PAYMENTS				$7,190	$7,462	$7,744	$8,037	$8,341	$8,657	$8,984	$9,324	$9,677	$10,043	$10,422	$10,817	$11,226	$11,650	$12,091	$12,548	$13,023	$13,516	$14,027	$14,557
TAX BASIS					$13,447	$1,443	$3,643	$5,706	$7,652	$9,482	$11,214	$12,849	$13,414	$13,784	$14,160	$14,558	$14,963	$15,391	$15,829	$16,289	$16,761	$17,257	$17,764	$18,299
INCOME TAXES																								
	US		38.90%		$5,231	$561	$1,417	$2,220	$2,977	$3,688	$4,362	$4,998	$5,218	$5,362	$5,508	$5,663	$5,821	$5,987	$6,157	$6,337	$6,520	$6,713	$6,910	$7,118
	GROSS RECIEPTS		0.00%		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CASH BASIS:																								
	NET OPERATING INCOME (NOI)				$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010
				NPV																				
	NET BEFORE TAX CASHFLOW			$321,523	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010	$23,010
				NPV																				
	LESS TAXES			($72,154)	($5,231)	($561)	($1,417)	($2,220)	($2,977)	($3,688)	($4,362)	($4,998)	($5,218)	($5,362)	($5,508)	($5,663)	($5,821)	($5,987)	($6,157)	($6,337)	($6,520)	($6,713)	($6,910)	($7,118)
	NET AFTER TAX CASH			($249,030)	$17,779	$22,449	$21,593	$20,791	$20,034	$19,322	$18,648	$18,012	$17,792	$17,649	$17,502	$17,347	$17,190	$17,023	$16,853	$16,674	$16,491	$16,298	$16,100	$15,892
			NPV	$340																				
			IRR	6.76%																				
	DEBT SERVICE COVERAGE			AVERAGE																				
		AFTER TAX		2.21	2.19	2.51	2.45	2.40	2.34	2.30	2.25	2.21	2.19	2.18	2.17	2.16	2.15	2.14	2.13	2.12	2.11	2.09	2.08	2.07
		BEFORE TAX		2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
	EQUITY RETURN:	100%																						
		PRE-TAX			9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%	9.24%
			AVG	ROIC	11.23%																			
		POST-TAX			7.14%	9.01%	8.67%	8.35%	8.04%	7.76%	7.49%	7.23%	7.14%	7.09%	7.03%	6.97%	6.90%	6.84%	6.77%	6.70%	6.62%	6.54%	6.47%	6.38%
			AVG	ROIC	8.16%																			
HDR				ROA	4.03%	5.23%	5.01%	4.80%	4.61%	4.43%	4.26%	4.10%	4.05%	4.02%	3.99%	3.95%	3.91%	3.88%	3.84%	3.80%	3.76%	3.71%	3.67%	3.62%
LG&E - KU				20 YR - AVG	4.13%																			
PROJECT:	189895	LG&E 2017 CC		40 YR - AVG	4.58%																			
DATE:	2/22/2013 8:49																							
FILE:	1X1 G-CLASS CC																							

HDR		
LG&E - KU		
PROJECT:	189895	LG&E 2017 CC
DATE:	2/22/2013 8:49	
FILE:	1X1 H-CLASS CC	SHEET 1

PLANT DESIGN:	1 x 1 H (Siemens)		
PLANT GROSS CAPACITY	NEW & CLEAN	399,616	KW
NET CONTRACT DEMAND		381,366	KW
HEAT RATE - GROSS HHV		6,295	BTU/KWH
HEAT RATE - NET HHV		6546	BTU/KWH

DEPRECIATION	NEW PLANT - UTILITY	20	YR MACRS
AMORTIZATION		30	YRS
DISCOUNT RATE		6.75%	

CAPITAL COST CATEGORIES:		($1,000)	
HARD COSTS:			
	EPC PLANT		$359,340
SOFT COSTS:			
	TOTAL OWNER INDIRECTS		$56,082
	OWNER CONTINGENCY		$35,934
	LTSA INITIATION		$1,729
	SUB-TOTAL	20.69%	$93,745
TOTAL PROJECT COST			$453,085

INSTALLED POWER PLANT COST ($/KW)	$1,188

FINANCE STRUCTURE:					
DEBT			AVG DCR	2.21	
	PERCENT		$206,924	46%	
	RATE			3.73%	
	TERM	20 YR		80	
	PAYMENT - QUARTER			$3,682	
EQUITY					
	PERCENT		$246,161	54%	
	POST-TAX RETURN		(TARGET)	9.22%	
	EQUITY PAYMENT			$22,696	GOAL SEEK IRR=7.77% UNLEVERED
			IRR	6.77%	
			NPV	$436	

PRO FORMA ANALYSIS:

YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ESCALATORS:																								
	PARTS				2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.				0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:																								
	FUEL																							
	NATURAL GAS	($/MMBTU)		$11.70	$4.96	$5.31	$5.66	$6.06	$6.53	$6.91	$7.22	$7.59	$7.93	$8.32	$8.62	$8.99	$9.38	$9.80	$10.28	$10.68	$11.46	$12.23	$12.84	$13.48
	NATURAL GAS ANNUAL DEMAND CHARGE			($1,000)	$8,836	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20	$8,836.20
0	PRICING OPTIONS	MARGINAL																						
$23.65	POWER	CAPITAL RECOVERY		($/MWH)	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65	$23.65
		FIXED CAPACITY-DB		($/KW-MO)	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22	$3.22
		FIXED CAPACITY-EQ		($/KW-MO)	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96	$4.96
$13.26		OP COST		($/MWH)	$9.80	$10.11	$10.67	$10.72	$11.59	$11.29	$11.59	$12.22	$12.10	$13.10	$12.72	$13.05	$13.63	$13.66	$14.83	$14.44	$14.79	$15.69	$15.76	$17.14
$66.13	30 YR - LEVELIZED	FUEL COST POWER		($/MWH)	$37.77	$40.14	$42.65	$45.25	$48.42	$50.70	$52.85	$55.53	$57.24	$60.20	$62.02	$64.57	$66.86	$69.61	$73.22	$75.69	$80.28	$85.61	$89.69	$94.38
	$103.04	TOTAL COST		($/MWH)	$71.23	$73.89	$76.97	$79.62	$83.65	$85.64	$88.08	$91.40	$92.98	$96.96	$98.39	$101.27	$104.13	$106.91	$111.70	$113.77	$118.72	$124.94	$129.09	$135.17
	$36.91	TOLLED COST		($/MWH)	$33.45	$33.76	$34.32	$34.37	$35.24	$34.94	$35.24	$35.87	$35.74	$36.75	$36.37	$36.70	$37.28	$37.30	$38.48	$38.08	$38.44	$39.34	$39.41	$40.79
PRODUCTION DATA:				AVERAGE																				
	ELECTRIC ENERGY	(MWH)		1,582,393	1619448	1612371	1566655	1602661	1526881	1608257	1603813	1558151	1612371	1524855	1606446	1602661	1571789	1608257	1518932	1598217	1612371	1569703	1606446	1517841
	TOTAL ELECTRIC	(MWH)		1,582,393	1619448	1612371	1566655	1602661	1526881	1608257	1603813	1558151	1612371	1524855	1606446	1602661	1571789	1608257	1518932	1598217	1612371	1569703	1606446	1517841
	FCP FUEL	(MMBTU)		10,357,832	10551589	10523543	10244851	10507994	9967586	10521164	10515548	10235918	10523543	9971507	10532813	10528319	10260750	10521164	9959014	10499128	10523543	10264786	10532813	9971110
	TOTAL	(MMBTU)		10,357,832	10551589	10523543	10244851	10507994	9967586	10521164	10515548	10235918	10523543	9971507	10532813	10528319	10260750	10521164	9959014	10499128	10523543	10264786	10532813	9971110
	AVG HEAT RATE	(BTU/KWH)			6516	6527	6539	6557	6528	6542	6557	6569	6527	6539	6557	6569	6528	6542	6557	6569	6527	6539	6557	6569
	AVG OUTPUT	(KW)			184868	184061	178842	182952	174301	183591	183084	177871	184061	174070	183384	182952	179428	183591	173394	182445	184061	179190	183384	173269
	CAPACITY FACTOR	(%)	FIRM	47.37%	48.48%	48.26%	46.90%	47.97%	45.70%	48.14%	48.01%	46.64%	48.26%	45.64%	48.09%	47.97%	47.05%	48.14%	45.47%	47.84%	48.26%	46.99%	48.09%	45.43%
	AMMONIA	(TON)			441	440	428	439	417	440	440	428	440	417	440	440	429	440	416	439	440	429	440	417
	MAKEUP WATER	(K-GALLONS)			17611	17534	17037	17428	16604	17489	17441	16944	17534	16582	17470	17428	17093	17489	16518	17380	17534	17070	17470	16506
	TOWER MAKEUP	(K-GALLONS)			251	250	243	248	236	249	248	241	250	236	249	248	243	249	235	247	250	243	249	235
	WASTE WATER	(K-GALLONS)			77887	77546	75348	77079	73435	77348	77135	74939	77546	73337	77261	77079	75595	77348	73052	76866	77546	75494	77261	73000
	NOx	(TON)			285	284	277	284	269	284	284	276	284	269	284	284	277	284	269	283	284	277	284	269
	SOx	(TON)			4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

HDR																								
LG&E - KU																								
PROJECT:	189895	LG&E 2017 CC																						
DATE:	2/22/2013 8:49																							
FILE:	1X1 H-CLASS CC	SHEET 2																						
REVENUE:		($1,000)																						
	CAPACITY FIXED			$8.18	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423
	ENERGY																							
		VARIABLE ENERGY			15876.7775	16297.967	16719.9111	17187.0623	17690.3443	18160.3543	18582.7677	19043.73164	19501.6374	19982.0248	20430.5303	20919.551	21423.6035	21960.8417	22528.4518	23071.0508	23849.9842	24624.3039	25314.4799	26017.0521
		FUEL			$61,172	$64,716	$66,822	$72,515	$73,925	$81,537	$84,758	$86,527	$92,288	$91,799	$99,629	$103,486	$105,082	$111,944	$111,215	$120,967	$129,436	$134,375	$144,078	$143,247
	TOTAL REVENUE			$2,075,812	$114,472	$118,437	$120,965	$127,125	$129,038	$137,121	$140,764	$142,993	$149,212	$149,204	$157,482	$161,828	$163,928	$171,327	$171,166	$181,461	$190,709	$196,422	$206,815	$206,687
PRO FORMA ANALYSIS:																								
YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
EXPENSES:		($1,000)																						
	NATURAL GAS CONSUMPTION				$52,336	$55,880	$57,986	$63,678	$65,088	$72,701	$75,922	$77,691	$83,452	$82,963	$90,793	$94,650	$96,246	$103,107	$102,379	$112,131	$120,600	$125,538	$135,241	$134,411
	NATURAL GAS ANNUAL DEMAND CHARGE				$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836	$8,836
	UNIT COST ($/MWH)				$37.77	$40.14	$42.65	$45.25	$48.42	$50.70	$52.85	$55.53	$57.24	$60.20	$62.02	$64.57	$66.86	$69.61	$73.22	$75.69	$80.28	$85.61	$89.69	$94.38
	AMMONIA				$73	$73	$71	$73	$69	$73	$73	$71	$73	$69	$73	$73	$71	$73	$69	$73	$73	$71	$73	$69
	CLARIFIED WATER				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	DEMIN WATER				$82	$82	$80	$82	$78	$82	$82	$79	$82	$78	$82	$82	$80	$82	$77	$81	$82	$80	$82	$77
	CHEMICAL FEED				$19	$19	$19	$19	$18	$19	$19	$19	$19	$18	$19	$19	$19	$19	$18	$19	$19	$19	$19	$18
	STARTUP FUEL				$3,099	$3,318	$3,536	$3,786	$4,080	$4,318	$4,511	$4,742	$4,955	$5,199	$5,386	$5,617	$5,861	$6,123	$6,423	$6,673	$7,160	$7,642	$8,023	$8,423
	WASTEWATER TREATMENT				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	SPARE PARTS				$898	$920	$942	$965	$988	$1,011	$1,036	$1,061	$1,086	$1,112	$1,139	$1,166	$1,194	$1,223	$1,252	$1,282	$1,313	$1,344	$1,377	$1,410
	VARIABLE MAINTENANCE PARTS AND LABOR				$5,621	$5,756	$5,894	$6,036	$6,180	$6,329	$6,481	$6,636	$6,795	$6,959	$7,126	$7,297	$7,472	$7,651	$7,835	$8,023	$8,215	$8,412	$8,614	$8,821
	FIXED MAINTENANCE PARTS AND LABOR				$1,589	$1,627	$1,667	$1,707	$1,748	$1,789	$1,832	$1,876	$1,921	$1,968	$2,015	$2,063	$2,113	$2,163	$2,215	$2,268	$2,323	$2,379	$2,436	$2,494
	FIXED O&M	7	24		$3,317	$3,346	$3,377	$3,407	$3,438	$3,468	$3,500	$3,531	$3,563	$3,595	$3,627	$3,660	$3,693	$3,726	$3,760	$3,794	$3,828	$3,862	$3,897	$3,932
	MISC EXPENSES				$139	$140	$142	$143	$144	$146	$147	$148	$150	$151	$152	$154	$155	$156	$158	$159	$161	$162	$164	$165
	INSURANCES				$381	$381	$381	$381	$381	$381	$381	$381	$381	$381	$381	$381	$381	$381	$381	$381	$381	$381	$381	$381
	PROPERTY TAXES				$657	$634	$612	$589	$566	$544	$521	$498	$476	$453	$430	$408	$385	$362	$340	$317	$295	$272	$249	$227
	LAND LEASE				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
				LEVELIZED																				
	Fixed ($/MWH)			$4.20	3.756224652	3.8016078	3.94304533	3.88503725	4.11076618	3.93480294	3.97863869	4.129982988	4.02551846	4.29385373	4.11204697	4.15902024	4.27963468	4.22156744	4.51210141	4.32941306	4.33318762	4.49492392	4.4360945	4.74272142
	Variable ($/MWH)			$4.57	3.470982876	3.5698866	3.76223671	3.76597705	4.04775438	3.93517359	4.04078242	4.259020359	4.21457818	4.56342227	4.43560458	4.55278689	4.75362236	4.75733295	5.15799184	5.01976013	5.09511238	5.35921503	5.3623169	5.81155707
	Consumables ($/MWH)			$4.49	2.576612897	2.7365798	2.96708331	3.07306379	3.42741553	3.42197349	3.56719567	3.833005407	3.85490846	4.24694048	4.17019013	4.34120302	4.59681769	4.67615955	5.16168158	5.08631608	5.36356981	5.83309598	5.95964982	6.58655497
				NPV																				
	TOTAL OPERATING COST			$267,194	$15,877	$16,298	$16,720	$17,187	$17,690	$18,160	$18,583	$19,044	$19,502	$19,982	$20,431	$20,920	$21,424	$21,961	$22,528	$23,071	$23,850	$24,624	$25,314	$26,017
	UNIT COST ($/MWH)			$13.26	$9.80	$10.11	$10.67	$10.72	$11.59	$11.29	$11.59	$12.22	$12.10	$13.10	$12.72	$13.05	$13.63	$13.66	$14.83	$14.44	$14.79	$15.69	$15.76	$17.14

NET OPERATING INCOME				$476,286	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423	$37,423
	DEPRECIATION			100%	$13,475	$25,941	$23,993	$22,196	$20,529	$18,991	$17,565	$16,249	$16,034	$16,030	$16,034	$16,030	$16,034	$16,030	$16,034	$16,030	$16,034	$16,030	$16,034	$16,030
	AMORTIZATION				$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125	$3,125
	BOOK DEPRECIATION				$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103	$15,103
	TOTAL CUMULATIVE DEP/AMORT				$15,103	$30,206	$45,309	$60,411	$75,514	$90,617	$105,720	$120,823	$135,926	$151,028	$166,131	$181,234	$196,337	$211,440	$226,543	$241,645	$256,748	$271,851	$286,954	$302,057
	NET BOOK VALUE				$437,982	$422,879	$407,777	$392,674	$377,571	$362,468	$347,365	$332,262	$317,160	$302,057	$286,954	$271,851	$256,748	$241,645	$226,543	$211,440	$196,337	$181,234	$166,131	$151,028
	TOTAL NON-CASH CHARGES				$16,600	$29,066	$27,118	$25,321	$23,654	$22,116	$20,689	$19,374	$19,159	$19,155	$19,159	$19,155	$19,159	$19,155	$19,159	$19,155	$19,159	$19,155	$19,159	$19,155
	UNIT COST ($/MWH)		EXPENSE		$10.25	$18.03	$17.31	$15.80	$15.49	$13.75	$12.90	$12.43	$11.88	$12.56	$11.93	$11.95	$12.19	$11.91	$12.61	$11.99	$11.88	$12.20	$11.93	$12.62
EARNINGS BEFORE INTEREST & TAXES (EBIT)					$20,823	$8,357	$10,305	$12,102	$13,769	$15,307	$16,733	$18,049	$18,264	$18,268	$18,264	$18,268	$18,264	$18,268	$18,264	$18,268	$18,264	$18,268	$18,264	$18,268
DEBT SERVICE:														10 YR					15 YR					20 YR
	TOTAL PAYMENT				$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727	$14,727
	INTEREST PAYMENT				$7,620	$7,351	$7,072	$6,782	$6,482	$6,170	$5,846	$5,510	$5,162	$4,800	$4,424	$4,035	$3,630	$3,211	$2,775	$2,323	$1,854	$1,367	$861	$337
	PRINCIPAL PAYMENTS				$7,107	$7,376	$7,655	$7,945	$8,245	$8,557	$8,881	$9,216	$9,565	$9,927	$10,302	$10,692	$11,096	$11,516	$11,952	$12,404	$12,873	$13,360	$13,865	$14,390
TAX BASIS					$13,203	$1,006	$3,233	$5,319	$7,287	$9,137	$10,887	$12,538	$13,103	$13,468	$13,840	$14,233	$14,634	$15,057	$15,489	$15,945	$16,410	$16,901	$17,403	$17,931
INCOME TAXES																								
	US		38.90%		$5,136	$392	$1,258	$2,069	$2,835	$3,554	$4,235	$4,877	$5,097	$5,239	$5,384	$5,537	$5,693	$5,857	$6,025	$6,203	$6,384	$6,574	$6,770	$6,975
	GROSS RECIEPTS		0.00%		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CASH BASIS:																								
	NET OPERATING INCOME (NOI)				$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696
				NPV																				
	NET BEFORE TAX CASHFLOW			$317,193	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696	$22,696
				NPV																				
	LESS TAXES			($70,596)	($5,136)	($392)	($1,258)	($2,069)	($2,835)	($3,554)	($4,235)	($4,877)	($5,097)	($5,239)	($5,384)	($5,537)	($5,693)	($5,857)	($6,025)	($6,203)	($6,384)	($6,574)	($6,770)	($6,975)
	NET AFTER TAX CASH			($246,161)	$17,560	$22,305	$21,438	$20,627	$19,861	$19,142	$18,461	$17,819	$17,599	$17,457	$17,312	$17,159	$17,003	$16,839	$16,671	$16,493	$16,312	$16,122	$15,926	$15,721
			NPV	$436																				
			IRR	6.77%																				
	DEBT SERVICE COVERAGE			AVERAGE																				
		AFTER TAX		2.21	2.192390602	2.51	2.46	2.40	2.35	2.30	2.25	2.21	2.20	2.19	2.18	2.17	2.15	2.14	2.13	2.12	2.11	2.09	2.08	2.07
		BEFORE TAX		2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
	EQUITY RETURN:	100%																						
		PRE-TAX			9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%
			AVG	ROIC	11.21%																			
		POST-TAX			7.13%	9.06%	8.71%	8.38%	8.07%	7.78%	7.50%	7.24%	7.15%	7.09%	7.03%	6.97%	6.91%	6.84%	6.77%	6.70%	6.63%	6.55%	6.47%	6.39%
			AVG	ROIC	8.15%																			
HDR				ROA	4.02%	5.26%	5.03%	4.82%	4.63%	4.44%	4.27%	4.11%	4.06%	4.02%	3.99%	3.95%	3.92%	3.88%	3.84%	3.80%	3.76%	3.72%	3.67%	3.62%
LG&E - KU				20 YR - AVG	4.14%																			
PROJECT:	189895	LG&E 2017 CC		40 YR - AVG	4.57%																			
DATE:	2/22/2013 8:49																							
FILE:	1X1 H-CLASS CC																							

HDR		
LG&E - KU		
PROJECT:	189895	LG&E 2017 CC
DATE:	2/22/2013 8:49	
FILE:	2X1 F-CLASS CC	SHEET 1

PLANT DESIGN:	2x1 F (GE)		
PLANT GROSS CAPACITY	NEW & CLEAN	629,371	KW
NET CONTRACT DEMAND		602,168	KW
HEAT RATE - GROSS HHV		6,489	BTU/KWH
HEAT RATE - NET HHV		6730	BTU/KWH

DEPRECIATION	NEW PLANT - UTILITY	20	YR MACRS
AMORTIZATION		30	YRS
DISCOUNT RATE		6.75%	

CAPITAL COST CATEGORIES:			($1,000)
HARD COSTS:			
	EPC PLANT		$493,871
SOFT COSTS:			
	TOTAL OWNER INDIRECTS		$69,225
	OWNER CONTINGENCY		$49,387
	LTSA INITIATION		$12,682
	SUB-TOTAL	21.00%	$131,294
TOTAL PROJECT COST			$625,165
INSTALLED POWER PLANT COST ($/KW)			$1,038

FINANCE STRUCTURE:				
DEBT		AVG DCR	2.21	
	PERCENT	$285,513	46%	
	RATE		3.73%	
	TERM	20 YR	80	
	PAYMENT - QUARTER		$5,080	
EQUITY				
	PERCENT	$339,652	54%	
	POST-TAX RETURN	(TARGET)	9.22%	
	EQUITY PAYMENT		$31,316	GOAL SEEK IRR=7.77% UNLEVERED
		IRR	6.76%	
		NPV	$503	

PRO FORMA ANALYSIS:

YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ESCALATORS:																								
	PARTS				2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.				0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:																								
	FUEL																							
	NATURAL GAS	($/MMBTU)		$11.70	$4.96	$5.31	$5.66	$6.06	$6.53	$6.91	$7.22	$7.59	$7.93	$8.32	$8.62	$8.99	$9.38	$9.80	$10.28	$10.68	$11.46	$12.23	$12.84	$13.48
	NATURAL GAS ANNUAL DEMAND CHARGE			($1,000)	$14,345	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56	$14,344.56
0	PRICING OPTIONS	MARGINAL																						
$20.67	POWER	CAPITAL RECOVERY		($/MWH)	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67	$20.67
		FIXED CAPACITY-DB		($/KW-MO)	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81	$2.81
		FIXED CAPACITY-EQ		($/KW-MO)	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33	$4.33
$10.33		OP COST		($/MWH)	$7.42	$7.67	$8.10	$8.19	$8.83	$8.68	$8.92	$9.41	$9.35	$10.09	$9.87	$10.15	$10.58	$10.66	$11.53	$11.31	$11.64	$12.36	$12.48	$13.54
$67.99	30 YR - LEVELIZED	FUEL COST POWER		($/MWH)	$38.84	$41.27	$43.85	$46.52	$49.78	$52.13	$54.33	$57.09	$58.85	$61.90	$63.76	$66.39	$68.74	$71.56	$75.28	$77.82	$82.53	$88.01	$92.21	$97.03
	$98.98	TOTAL COST		($/MWH)	$66.92	$69.60	$72.62	$75.37	$79.27	$81.47	$83.92	$87.17	$88.87	$92.66	$94.30	$97.20	$99.99	$102.88	$107.48	$109.79	$114.84	$121.04	$125.36	$131.23
	$30.99	TOLLED COST		($/MWH)	$28.08	$28.34	$28.76	$28.86	$29.49	$29.35	$29.59	$30.07	$30.02	$30.76	$30.53	$30.81	$31.25	$31.32	$32.20	$31.97	$32.31	$33.03	$33.15	$34.20
PRODUCTION DATA:				AVERAGE																				
	ELECTRIC ENERGY	(MWH)		2,498,560	2557069	2545895	2473710	2530563	2410908	2539398	2532382	2460282	2545895	2407708	2536540	2530563	2481817	2539398	2398356	2523546	2545895	2478523	2536540	2396633
	TOTAL ELECTRIC	(MWH)		2,498,560	2557069	2545895	2473710	2530563	2410908	2539398	2532382	2460282	2545895	2407708	2536540	2530563	2481817	2539398	2398356	2523546	2545895	2478523	2536540	2396633
	FCP FUEL	(MMBTU)		16,814,759	17129303	17083773	16631348	17058531	16181240	17079911	17070793	16616847	17083773	16187605	17098821	17091526	16657159	17079911	16167325	17044138	17083773	16663711	17098821	16186961
	TOTAL	(MMBTU)		16,814,759	17129303	17083773	16631348	17058531	16181240	17079911	17070793	16616847	17083773	16187605	17098821	17091526	16657159	17079911	16167325	17044138	17083773	16663711	17098821	16186961
	AVG HEAT RATE	(BTU/KWH)			6699	6710	6723	6741	6712	6726	6741	6754	6710	6723	6741	6754	6712	6726	6741	6754	6710	6723	6741	6754
	AVG OUTPUT	(KW)			291903	290627	282387	288877	275218	289886	289085	280854	290627	274853	289559	288877	283312	289886	273785	288076	290627	282936	289559	273588
	CAPACITY FACTOR	(%)	FIRM	47.37%	48.48%	48.26%	46.90%	47.97%	45.70%	48.14%	48.01%	46.64%	48.26%	45.64%	48.09%	47.97%	47.05%	48.14%	45.47%	47.84%	48.26%	46.99%	48.09%	45.43%
	AMMONIA	(TON)			716	714	695	713	677	714	714	695	714	677	715	715	696	714	676	713	714	697	715	677
	MAKEUP WATER	(K-GALLONS)			27786	27664	26880	27498	26197	27594	27517	26734	27664	26163	27563	27498	26968	27594	26061	27421	27664	26932	27563	26042
	TOWER MAKEUP	(K-GALLONS)			251	250	243	248	236	249	248	241	250	236	249	248	243	249	235	247	250	243	249	235
	WASTE WATER	(K-GALLONS)			122917	122380	118910	121643	115891	122067	121730	118264	122380	115737	121930	121643	119300	122067	115288	121305	122380	119141	121930	115205
	NOx	(TON)			360	359	349	358	340	359	358	349	359	340	359	359	350	359	340	358	359	350	359	340
	SOx	(TON)			7	7	7	7	6	7	7	7	7	6	7	7	7	7	6	7	7	7	7	6

HDR
LG&E - KU
PROJECT: 189895 LG&E 2017 CC
DATE: 2/22/2013 8:49
FILE: 2X1 F-CLASS CC SHEET 2

REVENUE:		($1,000)											
CAPACITY FIXED			$7.15	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636
ENERGY													
VARIABLE ENERGY				18963.27855	19527.65	20032.308	20724.036	21284.419	22045.733	22597.911	23144.066	23813.25	24305.056
FUEL				$99,306	$105,059	$108,478	$117,719	$120,008	$132,367	$137,596	$140,466	$149,819	$149,025
TOTAL REVENUE			$3,148,581	$169,905	$176,223	$180,146	$190,079	$192,928	$206,048	$211,829	$215,246	$225,268	$224,966
PRO FORMA ANALYSIS:													
YEAR			2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
			0	1	2	3	4	5	6	7	8	9	10
EXPENSES:		($1,000)											
NATURAL GAS CONSUMPTION				$84,961	$90,715	$94,133	$103,375	$105,663	$118,022	$123,251	$126,122	$135,474	$134,681
NATURAL GAS ANNUAL DEMAND CHARGE				$14,345	$14,345	$14,345	$14,345	$14,345	$14,345	$14,345	$14,345	$14,345	$14,345
UNIT COST ($/MWH)				$38.84	$41.27	$43.85	$46.52	$49.78	$52.13	$54.33	$57.09	$58.85	$61.90
AMMONIA				$119	$118	$115	$118	$112	$118	$118	$115	$118	$112
CLARIFIED WATER				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DEMIN WATER				$130	$130	$126	$129	$123	$129	$129	$125	$130	$123
CHEMICAL FEED				$31	$31	$30	$31	$29	$31	$31	$30	$31	$29
STARTUP FUEL				$5,031	$5,386	$5,741	$6,147	$6,624	$7,009	$7,323	$7,699	$8,044	$8,439
WASTEWATER TREATMENT				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SPARE PARTS				$1,235	$1,264	$1,295	$1,326	$1,358	$1,390	$1,423	$1,458	$1,493	$1,528
VARIABLE MAINTENANCE PARTS AND LABOR				$2,992	$3,064	$3,079	$3,213	$3,161	$3,369	$3,450	$3,467	$3,618	$3,559
FIXED MAINTENANCE PARTS AND LABOR				$4,540	$4,648	$4,760	$4,874	$4,991	$5,111	$5,234	$5,359	$5,488	$5,620
FIXED O&M	7	24		$3,317	$3,346	$3,377	$3,407	$3,438	$3,468	$3,500	$3,531	$3,563	$3,595
MISC EXPENSES				$139	$140	$142	$143	$144	$146	$147	$148	$150	$151
INSURANCES				$524	$524	$524	$524	$524	$524	$524	$524	$524	$524
PROPERTY TAXES				$906	$875	$844	$813	$781	$750	$719	$688	$656	$625
LAND LEASE				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
			LEVELIZED										
Fixed ($/MWH)			$4.30	3.685986156	3.7448969	3.8993264	3.8570269	4.0972629	3.9375047	3.997354	4.1661882	4.0773402	4.3669515
Variable ($/MWH)			$1.52	1.170250473	1.2035961	1.2448624	1.2697085	1.3111411	1.3267535	1.3623598	1.4092399	1.4209555	1.4781753
Consumables ($/MWH)			$4.50	2.559784752	$2.72	$2.95	$3.06	$3.42	$3.42	$3.56	$3.83	$3.86	$4.25
			NPV										
TOTAL OPERATING COST			$328,515	$18,963	$19,528	$20,032	$20,724	$21,284	$22,046	$22,598	$23,144	$23,813	$24,305
UNIT COST ($/MWH)			$10.33	$7.42	$7.67	$8.10	$8.19	$8.83	$8.68	$8.92	$9.41	$9.35	$10.09

REVENUE:										
CAPACITY FIXED	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636
ENERGY										
VARIABLE ENERGY	25032.192	25676.609	26268.152	27057.805	27655.889	28536.677	29633.876	30636.658	31665.25	32442.733
FUEL	$161,736	$167,997	$170,589	$181,728	$180,545	$196,376	$210,125	$218,142	$233,893	$232,545
TOTAL REVENUE	$238,404	$245,310	$248,493	$260,421	$259,836	$276,549	$291,394	$300,414	$317,195	$316,623
PRO FORMA ANALYSIS:										
YEAR	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
	11	12	13	14	15	16	17	18	19	20
EXPENSES:										
NATURAL GAS CONSUMPTION	$147,392	$153,653	$156,244	$167,383	$166,200	$182,031	$195,780	$203,797	$219,549	$218,200
NATURAL GAS ANNUAL DEMAND CHARGE	$14,345	$14,345	$14,345	$14,345	$14,345	$14,345	$14,345	$14,345	$14,345	$14,345
UNIT COST ($/MWH)	$63.76	$66.39	$68.74	$71.56	$75.28	$77.82	$82.53	$88.01	$92.21	$97.03
AMMONIA	$118	$118	$115	$118	$112	$118	$118	$115	$118	$112
CLARIFIED WATER	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DEMIN WATER	$129	$129	$126	$129	$122	$128	$130	$126	$129	$122
CHEMICAL FEED	$31	$31	$30	$31	$29	$31	$31	$30	$31	$29
STARTUP FUEL	$8,743	$9,119	$9,514	$9,940	$10,427	$10,833	$11,624	$12,405	$13,024	$13,673
WASTEWATER TREATMENT	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SPARE PARTS	$1,565	$1,603	$1,641	$1,681	$1,721	$1,762	$1,804	$1,848	$1,892	$1,938
VARIABLE MAINTENANCE PARTS AND LABOR	$3,793	$3,884	$3,904	$4,073	$4,007	$4,271	$4,373	$4,395	$4,586	$4,512
FIXED MAINTENANCE PARTS AND LABOR	$5,755	$5,893	$6,034	$6,179	$6,327	$6,479	$6,635	$6,794	$6,957	$7,124
FIXED O&M	$3,627	$3,660	$3,693	$3,726	$3,760	$3,794	$3,828	$3,862	$3,897	$3,932
MISC EXPENSES	$152	$154	$155	$156	$158	$159	$161	$162	$164	$165
INSURANCES	$524	$524	$524	$524	$524	$524	$524	$524	$524	$524
PROPERTY TAXES	$594	$563	$531	$500	$469	$438	$406	$375	$344	$313
LAND LEASE	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fixed ($/MWH)	4.199293	4.2648781	4.4068647	4.3652954	4.6853772	4.5147003	4.5378429	4.727306	4.6854183	5.0308073
Variable ($/MWH)	1.4954751	1.5349834	1.5728956	1.6039466	1.6707671	1.6924246	1.7178298	1.7732763	1.8079184	1.8824688
Consumables ($/MWH)	$4.17	$4.35	$4.60	$4.69	$5.18	$5.10	$5.38	$5.86	$5.99	$6.62
TOTAL OPERATING COST	$25,032	$25,677	$26,268	$27,058	$27,656	$28,537	$29,634	$30,637	$31,665	$32,443
UNIT COST ($/MWH)	$9.87	$10.15	$10.58	$10.66	$11.53	$11.31	$11.64	$12.36	$12.48	$13.54

NET OPERATING INCOME				$657,178	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636	$51,636
	DEPRECIATION			100%	$18,520	$35,653	$32,976	$30,506	$28,215	$26,101	$24,140	$22,333	$22,037	$22,032	$22,037	$22,032	$22,037	$22,032	$22,037	$22,032	$22,037	$22,032	$22,037	$22,032
	AMORTIZATION				$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376	$4,376
	BOOK DEPRECIATION				$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839	$20,839
	TOTAL CUMULATIVE DEP/AMORT				$20,839	$41,678	$62,517	$83,355	$104,194	$125,033	$145,872	$166,711	$187,550	$208,388	$229,227	$250,066	$270,905	$291,744	$312,583	$333,422	$354,260	$375,099	$395,938	$416,777
	NET BOOK VALUE				$604,327	$583,488	$562,649	$541,810	$520,971	$500,132	$479,293	$458,455	$437,616	$416,777	$395,938	$375,099	$354,260	$333,422	$312,583	$291,744	$270,905	$250,066	$229,227	$208,388
	TOTAL NON-CASH CHARGES				$22,897	$40,029	$37,352	$34,883	$32,591	$30,478	$28,517	$26,709	$26,413	$26,408	$26,413	$26,408	$26,413	$26,408	$26,413	$26,408	$26,413	$26,408	$26,413	$26,408
	UNIT COST ($/MWH)		EXPENSE		$8.95	$15.72	$15.10	$13.78	$13.52	$12.00	$11.26	$10.86	$10.37	$10.97	$10.41	$10.44	$10.64	$10.40	$11.01	$10.46	$10.37	$10.65	$10.41	$11.02
EARNINGS BEFORE INTEREST & TAXES (EBIT)					$28,739	$11,607	$14,284	$16,753	$19,045	$21,158	$23,119	$24,927	$25,223	$25,228	$25,223	$25,228	$25,223	$25,228	$25,223	$25,228	$25,223	$25,228	$25,223	$25,228
DEBT SERVICE:														10 YR					15 YR					20 YR
	TOTAL PAYMENT				$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320	$20,320
	INTEREST PAYMENT				$10,514	$10,143	$9,758	$9,358	$8,943	$8,513	$8,067	$7,603	$7,122	$6,623	$6,105	$5,567	$5,009	$4,430	$3,829	$3,205	$2,558	$1,886	$1,189	$465
	PRINCIPAL PAYMENTS				$9,806	$10,177	$10,562	$10,962	$11,376	$11,807	$12,253	$12,717	$13,198	$13,697	$14,215	$14,753	$15,311	$15,890	$16,491	$17,115	$17,762	$18,434	$19,131	$19,855
TAX BASIS					$18,226	$1,464	$4,526	$7,395	$10,101	$12,645	$15,052	$17,323	$18,101	$18,605	$19,118	$19,661	$20,214	$20,798	$21,394	$22,023	$22,665	$23,342	$24,034	$24,763
INCOME TAXES																								
	US		38.90%		$7,090	$570	$1,761	$2,877	$3,929	$4,919	$5,855	$6,739	$7,041	$7,237	$7,437	$7,648	$7,863	$8,090	$8,322	$8,567	$8,817	$9,080	$9,349	$9,633
	GROSS RECIEPTS		0.00%		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CASH BASIS:																								
	NET OPERATING INCOME (NOI)				$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316
				NPV																				
	NET BEFORE TAX CASHFLOW			$437,661	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316	$31,316
				NPV																				
	LESS TAXES			($97,506)	($7,090)	($570)	($1,761)	($2,877)	($3,929)	($4,919)	($5,855)	($6,739)	($7,041)	($7,237)	($7,437)	($7,648)	($7,863)	($8,090)	($8,322)	($8,567)	($8,817)	($9,080)	($9,349)	($9,633)
	NET AFTER TAX CASH			($339,652)	$24,226	$30,746	$29,555	$28,439	$27,387	$26,397	$25,461	$24,577	$24,275	$24,079	$23,879	$23,668	$23,453	$23,226	$22,994	$22,749	$22,499	$22,236	$21,967	$21,683
			NPV	$503																				
			IRR	6.76%																				
	DEBT SERVICE COVERAGE			AVERAGE																				
		AFTER TAX		2.21	2.19	2.51	2.45	2.40	2.35	2.30	2.25	2.21	2.19	2.18	2.18	2.16	2.15	2.14	2.13	2.12	2.11	2.09	2.08	2.07
		BEFORE TAX		2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
	EQUITY RETURN:	100%																						
		PRE-TAX			9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%	9.22%
			AVG	ROIC	11.21%																			
		POST-TAX			7.13%	9.05%	8.70%	8.37%	8.06%	7.77%	7.50%	7.24%	7.15%	7.09%	7.03%	6.97%	6.90%	6.84%	6.77%	6.70%	6.62%	6.55%	6.47%	6.38%
			AVG	ROIC	8.15%																			
HDR				ROA	4.02%	5.25%	5.03%	4.82%	4.62%	4.44%	4.27%	4.11%	4.05%	4.02%	3.99%	3.95%	3.92%	3.88%	3.84%	3.80%	3.76%	3.71%	3.67%	3.62%
LG&E - KU				20 YR - AVG	4.14%																			
PROJECT:	189895	LG&E 2017 CC		40 YR - AVG	4.57%																			
DATE:	2/22/2013 8:49																							
FILE:	2X1 F-CLASS CC																							

HDR		
LG&E - KU		
PROJECT:	189895	LG&E 2017 CC
DATE:	2/22/2013 8:49	
FILE:	2X1 F-CLASS CC	SHEET 1

PLANT DESIGN:	2x1 F (Siemens)			
PLANT GROSS CAPACITY	NEW & CLEAN		704,691	KW
NET CONTRACT DEMAND			673,750	KW
HEAT RATE - GROSS HHV			6,514	BTU/KWH
HEAT RATE - NET HHV			6761	BTU/KWH

CAPITAL COST CATEGORIES:		($1,000)	
HARD COSTS:			
	EPC PLANT		$497,201
SOFT COSTS:			
	TOTAL OWNER INDIRECTS		$69,225
	OWNER CONTINGENCY		$49,720
	LTSA INITIATION		$3,459
	SUB-TOTAL	19.76%	$122,404
TOTAL PROJECT COST			$619,605
INSTALLED POWER PLANT COST ($/KW)			$920

FINANCE STRUCTURE:				
DEBT			AVG DCR	2.21
	PERCENT		$282,973	46%
	RATE			3.73%
	TERM	20 YR		80
	PAYMENT - QUARTER			$5,035
EQUITY				
	PERCENT		$336,631	54%
	POST-TAX RETURN		(TARGET)	9.20%
	EQUITY PAYMENT			$30,970
			IRR	6.76%
			NPV	$365

GOAL SEEK IRR=7.77% UNLEVERED

DEPRECIATION	NEW PLANT - UTILITY	20	YR MACRS
AMORTIZATION		30	YRS
DISCOUNT RATE		6.75%	

PRO FORMA ANALYSIS:

YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ESCALATORS:																								
	PARTS				2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.				0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:																								
	FUEL																							
	NATURAL GAS	($/MMBTU)		$11.70	$4.96	$5.31	$5.66	$6.06	$6.53	$6.91	$7.22	$7.59	$7.93	$8.32	$8.62	$8.99	$9.38	$9.80	$10.28	$10.68	$11.46	$12.23	$12.84	$13.48
	NATURAL GAS ANNUAL DEMAND CHARGE			($1,000)	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125
0	PRICING OPTIONS	MARGINAL																						
$18.28	POWER	CAPITAL RECOVERY	($/MWH)		$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28	$18.28
		FIXED CAPACITY-DB	($/KW-MO)		$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49	$2.49
		FIXED CAPACITY-EQ	($/KW-MO)		$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83	$3.83
$10.89		OP COST	($/MWH)		$7.78	$8.05	$8.53	$8.60	$9.33	$9.13	$9.39	$9.93	$9.85	$10.69	$10.40	$10.69	$11.19	$11.24	$12.24	$11.93	$12.28	$13.07	$13.17	$14.36
$68.31	30 YR - LEVELIZED	FUEL COST POWER	($/MWH)		$39.02	$41.46	$44.06	$46.74	$50.01	$52.37	$54.59	$57.36	$59.12	$62.18	$64.06	$66.70	$69.06	$71.90	$75.63	$78.18	$82.92	$88.42	$92.64	$97.48
	$97.48	TOTAL COST	($/MWH)		$65.08	$67.79	$70.87	$73.62	$77.62	$79.78	$82.26	$85.57	$87.25	$91.16	$92.74	$95.67	$98.53	$101.42	$106.15	$108.40	$113.48	$119.78	$124.09	$130.13
	$29.17	TOLLED COST	($/MWH)		$26.07	$26.34	$26.81	$26.89	$27.62	$27.41	$27.67	$28.21	$28.13	$28.98	$28.68	$28.98	$29.47	$29.52	$30.52	$30.22	$30.56	$31.36	$31.45	$32.64
PRODUCTION DATA:				AVERAGE																				
	ELECTRIC ENERGY	(MWH)		2,795,573	2861037	2848535	2767768	2831380	2697501	2841266	2833415	2752745	2848535	2693921	2838067	2831380	2776839	2841266	2683457	2823530	2848535	2773154	2838067	2681530
	TOTAL ELECTRIC	(MWH)		2,795,573	2861037	2848535	2767768	2831380	2697501	2841266	2833415	2752745	2848535	2693921	2838067	2831380	2776839	2841266	2683457	2823530	2848535	2773154	2838067	2681530
	FCP FUEL	(MMBTU)		18,901,253	19254827	19203647	18695082	19175273	18189121	19199307	19189057	18678782	19203647	18196277	19220563	19212363	18724096	19199307	18173480	19159094	19203647	18731461	19220563	18195552
	TOTAL	(MMBTU)		18,901,253	19254827	19203647	18695082	19175273	18189121	19199307	19189057	18678782	19203647	18196277	19220563	19212363	18724096	19199307	18173480	19159094	19203647	18731461	19220563	18195552
	AVG HEAT RATE	(BTU/KWH)			6730	6742	6755	6772	6743	6757	6772	6786	6742	6755	6772	6786	6743	6757	6772	6786	6742	6755	6772	6786
	AVG OUTPUT	(KW)			326602	325175	315955	323217	307934	324345	323449	314240	325175	307525	323980	323217	316991	324345	306331	322321	325175	316570	323980	306111
	CAPACITY FACTOR	(%)	FIRM	47.37%	48.48%	48.26%	46.90%	47.97%	45.70%	48.14%	48.01%	46.64%	48.26%	45.64%	48.09%	47.97%	47.05%	48.14%	45.47%	47.84%	48.26%	46.99%	48.09%	45.43%
	AMMONIA	(TON)			805	803	782	802	761	803	802	781	803	761	804	803	783	803	760	801	803	783	804	761
	MAKEUP WATER	(K-GALLONS)			32818	32674	31748	32477	30942	32591	32501	31575	32674	30901	32554	32477	31852	32591	30781	32387	32674	31810	32554	30759
	TOWER MAKEUP	(K-GALLONS)			251	250	243	248	236	249	248	241	250	236	249	248	243	249	235	247	250	243	249	235
	WASTE WATER	(K-GALLONS)			140068	139456	135502	138616	132062	139100	138716	134766	139456	131887	138944	138616	135946	139100	131374	138232	139456	135766	138944	131280
	NOx	(TON)			404	403	393	403	382	403	403	392	403	382	404	403	393	403	382	402	403	393	404	382
	SOx	(TON)			8	8	7	8	7	8	8	7	8	7	8	8	7	8	7	8	8	7	8	7

HDR																								
LG&E - KU																								
PROJECT:	189895	LG&E 2017 CC																						
DATE:	2/22/2013 8:49																							
FILE:	2X1 F-CLASS CC	SHEET 2																						
REVENUE:		($1,000)																						
	CAPACITY FIXED			$6.32	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109
	ENERGY																							
		VARIABLE ENERGY			22267.9679	22939.909	23610.9434	24362.4484	25177.3085	25929.5295	26592.2909	27322.8564	28045.5861	28806.4419	29506.9417	30278.4903	31074.6628	31928.7859	32835.1603	33693.407	34979.7594	36254.5096	37372.7954	38510.19
		FUEL			$111,628	$118,096	$121,939	$132,327	$134,899	$148,792	$154,670	$157,896	$168,409	$167,518	$181,806	$188,844	$191,757	$204,278	$202,948	$220,744	$236,198	$245,210	$262,917	$261,401
	TOTAL REVENUE			$3,469,431	$185,006	$192,145	$196,659	$207,798	$211,186	$225,831	$232,371	$236,329	$247,564	$247,433	$262,422	$270,231	$273,940	$287,316	$286,892	$305,546	$322,287	$332,574	$351,399	$351,020
PRO FORMA ANALYSIS:																								
YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
EXPENSES:		($1,000)																						
	NATURAL GAS CONSUMPTION				$95,504	$101,971	$105,814	$116,202	$118,775	$132,667	$138,545	$141,772	$152,285	$151,393	$165,681	$172,719	$175,632	$188,153	$186,823	$204,619	$220,074	$229,086	$246,792	$245,276
	NATURAL GAS ANNUAL DEMAND CHARGE				$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125	$16,125
	UNIT COST ($/MWH)				$39.02	$41.46	$44.06	$46.74	$50.01	$52.37	$54.59	$57.36	$59.12	$62.18	$64.06	$66.70	$69.06	$71.90	$75.63	$78.18	$82.92	$88.42	$92.64	$97.48
	AMMONIA				$133	$133	$130	$133	$126	$133	$133	$129	$133	$126	$133	$133	$130	$133	$126	$133	$133	$130	$133	$126
	CLARIFIED WATER				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	DEMIN WATER				$154	$153	$149	$152	$145	$153	$152	$148	$153	$145	$152	$152	$149	$153	$144	$152	$153	$149	$152	$144
	CHEMICAL FEED				$36	$36	$36	$36	$34	$36	$36	$36	$36	$34	$36	$36	$36	$36	$34	$36	$36	$36	$36	$34
	STARTUP FUEL				$5,655	$6,054	$6,453	$6,910	$7,445	$7,879	$8,232	$8,654	$9,042	$9,486	$9,828	$10,250	$10,695	$11,174	$11,721	$12,177	$13,067	$13,945	$14,640	$15,370
	WASTEWATER TREATMENT				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	SPARE PARTS				$1,243	$1,273	$1,303	$1,335	$1,367	$1,399	$1,433	$1,467	$1,503	$1,539	$1,576	$1,614	$1,652	$1,692	$1,732	$1,774	$1,817	$1,860	$1,905	$1,951
	VARIABLE MAINTENANCE PARTS AND LABOR				$7,439	$7,618	$7,801	$7,988	$8,180	$8,376	$8,577	$8,783	$8,994	$9,209	$9,430	$9,657	$9,889	$10,126	$10,369	$10,618	$10,873	$11,133	$11,401	$11,674
	FIXED MAINTENANCE PARTS AND LABOR				$2,725	$2,791	$2,858	$2,926	$2,996	$3,068	$3,142	$3,217	$3,295	$3,374	$3,455	$3,538	$3,622	$3,709	$3,798	$3,890	$3,983	$4,078	$4,176	$4,277
	FIXED O&M	7	24		$3,317	$3,346	$3,377	$3,407	$3,438	$3,468	$3,500	$3,531	$3,563	$3,595	$3,627	$3,660	$3,693	$3,726	$3,760	$3,794	$3,828	$3,862	$3,897	$3,932
	MISC EXPENSES				$139	$140	$142	$143	$144	$146	$147	$148	$150	$151	$152	$154	$155	$156	$158	$159	$161	$162	$164	$165
	INSURANCES				$527	$527	$527	$527	$527	$527	$527	$527	$527	$527	$527	$527	$527	$527	$527	$527	$527	$527	$527	$527
	PROPERTY TAXES				$898	$867	$836	$805	$775	$744	$713	$682	$651	$620	$589	$558	$527	$496	$465	$434	$403	$372	$341	$310
	LAND LEASE				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
				LEVELIZED																				
	Fixed ($/MWH)			$3.01	2.658632695	2.6933053	2.79624175	2.75788339	2.9211528	2.79909868	2.83338953	2.94448496	2.87332541	3.06848952	2.94213255	2.9794369	3.06973522	3.03201206	3.24497057	3.1177926	3.12480822	3.24598939	3.20808166	3.434812
	Variable ($/MWH)			$3.42	$2.60	2.674302	2.81839686	2.82119886	3.03228614	2.94794872	3.02706325	3.19055141	3.15725853	3.4185874	3.32283559	3.41062014	3.56107161	3.56385132	3.86399611	3.76044287	3.81689135	4.01473804	4.01706174	4.3536
	Consumables ($/MWH)			$4.46	2.524337198	$2.69	$2.92	$3.03	$3.38	$3.38	$3.52	$3.79	$3.82	$4.21	$4.13	$4.30	$4.56	$4.64	$5.13	$5.05	$5.34	$5.81	$5.94	$6.57
				NPV																				
	TOTAL OPERATING COST			$387,681	$22,268	$22,940	$23,611	$24,362	$25,177	$25,930	$26,592	$27,323	$28,046	$28,806	$29,507	$30,278	$31,075	$31,929	$32,835	$33,693	$34,980	$36,255	$37,373	$38,510
	UNIT COST ($/MWH)			$10.89	$7.78	$8.05	$8.53	$8.60	$9.33	$9.13	$9.39	$9.93	$9.85	$10.69	$10.40	$10.69	$11.19	$11.24	$12.24	$11.93	$12.28	$13.07	$13.17	$14.36

NET OPERATING INCOME				$650,475	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109	$51,109
	DEPRECIATION			100%	$18,645	$35,893	$33,198	$30,712	$28,405	$26,277	$24,303	$22,483	$22,185	$22,180	$22,185	$22,180	$22,185	$22,180	$22,185	$22,180	$22,185	$22,180	$22,185	$22,180
	AMORTIZATION				$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080	$4,080
	BOOK DEPRECIATION				$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653	$20,653
	TOTAL CUMULATIVE DEP/AMORT				$20,653	$41,307	$61,960	$82,614	$103,267	$123,921	$144,574	$165,228	$185,881	$206,535	$227,188	$247,842	$268,495	$289,149	$309,802	$330,456	$351,109	$371,763	$392,416	$413,070
	NET BOOK VALUE				$598,951	$578,298	$557,644	$536,991	$516,337	$495,684	$475,030	$454,377	$433,723	$413,070	$392,416	$371,763	$351,109	$330,456	$309,802	$289,149	$268,495	$247,842	$227,188	$206,535
	TOTAL NON-CASH CHARGES				$22,725	$39,973	$37,278	$34,792	$32,485	$30,357	$28,383	$26,564	$26,265	$26,260	$26,265	$26,260	$26,265	$26,260	$26,265	$26,260	$26,265	$26,260	$26,265	$26,260
	UNIT COST ($/MWH)		EXPENSE		$7.94	$14.03	$13.47	$12.29	$12.04	$10.68	$10.02	$9.65	$9.22	$9.75	$9.25	$9.27	$9.46	$9.24	$9.79	$9.30	$9.22	$9.47	$9.25	$9.79
EARNINGS BEFORE INTEREST & TAXES (EBIT)					$28,384	$11,136	$13,831	$16,317	$18,624	$20,752	$22,726	$24,546	$24,844	$24,849	$24,844	$24,849	$24,844	$24,849	$24,844	$24,849	$24,844	$24,849	$24,844	$24,849
DEBT SERVICE:														10 YR					15 YR					20 YR
	TOTAL PAYMENT				$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139	$20,139
	INTEREST PAYMENT				$10,420	$10,052	$9,671	$9,275	$8,864	$8,437	$7,995	$7,535	$7,059	$6,564	$6,050	$5,518	$4,965	$4,391	$3,795	$3,177	$2,535	$1,869	$1,178	$461
	PRINCIPAL PAYMENTS				$9,719	$10,087	$10,468	$10,864	$11,275	$11,702	$12,144	$12,604	$13,080	$13,575	$14,089	$14,622	$15,175	$15,749	$16,344	$16,963	$17,604	$18,270	$18,961	$19,678
TAX BASIS					$17,964	$1,084	$4,160	$7,042	$9,760	$12,315	$14,731	$17,010	$17,785	$18,285	$18,794	$19,331	$19,879	$20,458	$21,049	$21,672	$22,309	$22,980	$23,666	$24,388
INCOME TAXES																								
	US		38.90%		$6,988	$422	$1,618	$2,739	$3,797	$4,790	$5,730	$6,617	$6,918	$7,113	$7,311	$7,520	$7,733	$7,958	$8,188	$8,431	$8,678	$8,939	$9,206	$9,487
	GROSS RECIEPTS		0.00%		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CASH BASIS:																								
	NET OPERATING INCOME (NOI)				$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970
				NPV																				
	NET BEFORE TAX CASHFLOW			$432,911	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970	$30,970
				NPV																				
	LESS TAXES			($95,915)	($6,988)	($422)	($1,618)	($2,739)	($3,797)	($4,790)	($5,730)	($6,617)	($6,918)	($7,113)	($7,311)	($7,520)	($7,733)	($7,958)	($8,188)	($8,431)	($8,678)	($8,939)	($9,206)	($9,487)
	NET AFTER TAX CASH			($336,631)	$23,982	$30,548	$29,352	$28,231	$27,173	$26,180	$25,240	$24,353	$24,052	$23,857	$23,659	$23,450	$23,237	$23,012	$22,782	$22,540	$22,292	$22,031	$21,764	$21,483
			NPV	$365																				
			IRR	6.76%																				
	DEBT SERVICE COVERAGE			AVERAGE																				
		AFTER TAX		2.21	2.19	2.52	2.46	2.40	2.35	2.30	2.25	2.21	2.19	2.18	2.17	2.16	2.15	2.14	2.13	2.12	2.11	2.09	2.08	2.07
		BEFORE TAX		2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
	EQUITY RETURN:	100%																						
		PRE-TAX			9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%	9.20%
			AVG	ROIC	11.19%																			
		POST-TAX			7.12%	9.07%	8.72%	8.39%	8.07%	7.78%	7.50%	7.23%	7.14%	7.09%	7.03%	6.97%	6.90%	6.84%	6.77%	6.70%	6.62%	6.54%	6.47%	6.38%
			AVG	ROIC	8.14%																			
HDR				ROA	4.02%	5.27%	5.04%	4.83%	4.63%	4.44%	4.27%	4.11%	4.05%	4.02%	3.99%	3.95%	3.92%	3.88%	3.84%	3.80%	3.76%	3.71%	3.67%	3.62%
LG&E - KU				20 YR - AVG	4.14%																			
PROJECT:	189895	LG&E 2017 CC		40 YR - AVG	4.56%																			
DATE:	2/22/2013 8:49																							
FILE:	2X1 F-CLASS CC																							

HDR		
LG&E - KU		
PROJECT:	189895	
DATE;	2/25/2013 14:36	
FILE:		SHEET 1

PLANT DESIGN:	2x1 F5EE - 760		
PLANT GROSS CAPACITY		838,845	KW
NET CONTRACT DEMAND		797,746	KW
HEAT RATE - GROSS HHV		6,815	BTU/KWH
HEAT RATE - NET HHV		7112	BTU/KWH

DEPRECIATION	NEW PLANT - UTILITY	20	YR MACRS
AMORTIZATION		30	YRS
DISCOUNT RATE		6.75%	

CAPITAL COST CATEGORIES:		($1,000)	
HARD COSTS:			
	EPC PLANT		$516,668
SOFT COSTS:			
	TOTAL OWNER INDIRECTS		$70,125
	OWNER CONTINGENCY		$51,667
	LTSA INITIATION		$3,459
	SUB-TOTAL	19.51%	$125,250
TOTAL PROJECT COST			$641,918

INSTALLED POWER PLANT COST ($/KW)	$804.66

FINANCE STRUCTURE:					
DEBT			AVG DCR	2.21	
	PERCENT		$293,164	46%	
	RATE			3.73%	
	TERM	20 YR		80	
	PAYMENT - QUARTER			$5,216	
EQUITY					
	PERCENT		$348,754	54%	
	POST-TAX RETURN		(TARGET)	9.18%	
	EQUITY PAYMENT			$32,016	GOAL SEEK IRR=7.77% UNLEVERED
			IRR	6.75%	
			NPV	($85)	

PRO FORMA ANALYSIS:

YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ESCALATORS:																								
	PARTS				2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.				0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:																								
	FUEL																							
	NATURAL GAS	($/MMBTU)		$11.70	$4.96	$5.31	$5.66	$6.06	$6.53	$6.91	$7.22	$7.59	$7.93	$8.32	$8.62	$8.99	$9.38	$9.80	$10.28	$10.68	$11.46	$12.23	$12.84	$13.48
	NATURAL GAS ANNUAL DEMAND CHARGE			($1,000)	$20,082	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19	$20,082.19
0	PRICING OPTIONS	MARGINAL																						
$18.57	POWER	CAPITAL RECOVERY		($/MWH)	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57	$18.57
		FIXED CAPACITY-DB		($/KW-MO)	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18	$2.18
		FIXED CAPACITY-EQ		($/KW-MO)	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34	$3.34
$11.39		OP COST		($/MWH)	$8.06	$8.35	$8.85	$8.94	$9.71	$9.50	$9.78	$10.35	$10.27	$11.16	$10.86	$11.18	$11.70	$11.76	$12.82	$12.51	$12.89	$13.74	$13.85	$15.11
$70.25	30 YR - LEVELIZED	FUEL COST POWER		($/MWH)	$40.63	$43.10	$45.76	$48.44	$51.81	$54.13	$56.38	$59.21	$60.95	$64.11	$65.95	$68.61	$71.02	$73.87	$77.71	$80.22	$85.00	$90.60	$94.83	$99.79
	$100.22	TOTAL COST		($/MWH)	$67.25	$70.02	$73.18	$75.95	$80.09	$82.20	$84.72	$88.13	$89.79	$93.85	$95.38	$98.36	$101.30	$104.20	$109.09	$111.30	$116.46	$122.90	$127.25	$133.48
	$29.96	TOLLED COST		($/MWH)	$26.63	$26.92	$27.42	$27.51	$28.28	$28.07	$28.35	$28.92	$28.84	$29.73	$29.43	$29.75	$30.27	$30.33	$31.39	$31.08	$31.46	$32.31	$32.42	$33.68
PRODUCTION DATA:				AVERAGE																				
	ELECTRIC ENERGY	(MWH)		2,847,598	2914280	2901545	2819276	2884071	2747701	2894141	2886145	2803973	2901545	2744055	2890883	2884071	2828516	2894141	2733396	2876075	2901545	2824762	2890883	2731432
	TOTAL ELECTRIC	(MWH)		2,847,598	2914280	2901545	2819276	2884071	2747701	2894141	2886145	2803973	2901545	2744055	2890883	2884071	2828516	2894141	2733396	2876075	2901545	2824762	2890883	2731432
	FCP FUEL	(MMBTU)		19,457,954	19821942	19769256	19245711	19740046	18724849	19764787	19754235	19228931	19769256	18732215	19786669	19778228	19275579	19764787	18708747	19723390	19769256	19283162	19786669	18731469
	TOTAL	(MMBTU)		19,457,954	19821942	19769256	19245711	19740046	18724849	19764787	19754235	19228931	19769256	18732215	19786669	19778228	19275579	19764787	18708747	19723390	19769256	19283162	19786669	18731469
	AVG HEAT RATE	(BTU/KWH)			6802	6813	6826	6845	6815	6829	6845	6858	6813	6826	6845	6858	6815	6829	6845	6858	6813	6826	6845	6858
	AVG OUTPUT	(KW)			332680	331227	321835	329232	313664	330381	329469	320088	331227	313248	330009	329232	322890	330381	312031	328319	331227	322461	330009	311807
	CAPACITY FACTOR	(%)	FIRM	40.75%	41.70%	41.52%	40.34%	41.27%	39.32%	41.41%	41.30%	40.12%	41.52%	39.27%	41.37%	41.27%	40.48%	41.41%	39.11%	41.16%	41.52%	40.42%	41.37%	39.09%
	AMMONIA	(TON)			829	827	805	825	783	826	826	804	827	783	827	827	806	826	782	825	827	806	827	783
	MAKEUP WATER	(K-GALLONS)			41460	41279	40109	41030	39090	41174	41060	39891	41279	39039	41127	41030	40240	41174	38887	40917	41279	40187	41127	38859
	TOWER MAKEUP	(K-GALLONS)			216	215	209	213	203	214	214	207	215	203	214	213	209	214	202	213	215	209	214	202
	WASTE WATER	(K-GALLONS)			174645	173882	168951	172834	164662	173438	172959	168034	173882	164444	173243	172834	169505	173438	163805	172355	173882	169280	173243	163687
	NOx	(TON)			416	415	404	415	393	415	415	404	415	393	416	415	405	415	393	414	415	405	416	393
	SOx	(TON)			8	8	8	8	7	8	8	8	8	7	8	8	8	8	7	8	8	8	8	7

HDR
LG&E - KU
PROJECT: 189895 0
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REVENUE: ($1,000)

CAPACITY FIXED			$5.52	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880
ENERGY																							
	VARIABLE ENERGY			$23,482	$24,218	$24,952	$25,778	$26,675	$27,500	$28,221	$29,018	$29,806	$30,636	$31,397	$32,238	$33,105	$34,039	$35,030	$35,967	$37,393	$38,803	$40,034	$41,285
	FUEL			$118,399	$125,057	$129,013	$139,707	$142,355	$156,657	$162,708	$166,030	$176,852	$175,934	$190,643	$197,888	$200,887	$213,777	$212,408	$230,728	$246,638	$255,915	$274,143	$272,582
TOTAL REVENUE			$3,633,366	$194,762	$202,155	$206,845	$218,365	$221,910	$237,037	$243,808	$247,928	$259,539	$259,450	$274,920	$283,006	$286,873	$300,696	$300,319	$319,575	$336,910	$347,599	$367,057	$366,747

PRO FORMA ANALYSIS:

YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
EXPENSES:		($1,000)																						
	NATURAL GAS CONSUMPTION				$98,317	$104,975	$108,931	$119,625	$122,273	$136,575	$142,626	$145,948	$156,770	$155,852	$170,561	$177,806	$180,805	$193,695	$192,326	$210,646	$226,556	$235,833	$254,061	$252,500
	NATURAL GAS ANNUAL DEMAND CHARGE				$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082	$20,082
	FUEI UNIT COST ($/MWH)				$40.63	$43.10	$45.76	$48.44	$51.81	$54.13	$56.38	$59.21	$60.95	$64.11	$65.95	$68.61	$71.02	$73.87	$77.71	$80.22	$85.00	$90.60	$94.83	$99.79
	AMMONIA				$137	$137	$133	$137	$130	$137	$137	$133	$137	$130	$137	$137	$134	$137	$130	$137	$137	$134	$137	$130
	CLARIFIED WATER				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	DEMIN WATER				$194	$193	$188	$192	$183	$193	$192	$187	$193	$183	$193	$192	$188	$193	$182	$192	$193	$188	$193	$182
	CHEMICAL FEED				$50	$50	$49	$50	$48	$50	$50	$49	$50	$48	$50	$50	$49	$50	$48	$50	$50	$49	$50	$48
	STARTUP FUEL				$6,488	$6,946	$7,404	$7,927	$8,542	$9,039	$9,445	$9,929	$10,373	$10,883	$11,276	$11,760	$12,270	$12,819	$13,447	$13,971	$14,991	$15,998	$16,796	$17,633
	WASTEWATER TREATMENT				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	SPARE PARTS				$1,292	$1,323	$1,354	$1,387	$1,420	$1,454	$1,489	$1,525	$1,562	$1,599	$1,637	$1,677	$1,717	$1,758	$1,800	$1,844	$1,888	$1,933	$1,979	$2,027
	VARIABLE MAINTENANCE PARTS AND LABOR				$7,601	$7,784	$7,971	$8,162	$8,358	$8,558	$8,764	$8,974	$9,189	$9,410	$9,636	$9,867	$10,104	$10,346	$10,595	$10,849	$11,109	$11,376	$11,649	$11,929
	FIXED MAINTENANCE PARTS AND LABOR				$2,785	$2,852	$2,920	$2,990	$3,062	$3,136	$3,211	$3,288	$3,367	$3,448	$3,531	$3,615	$3,702	$3,791	$3,882	$3,975	$4,070	$4,168	$4,268	$4,371
	FIXED O&M	7	24		$3,317	$3,346	$3,377	$3,407	$3,438	$3,468	$3,500	$3,531	$3,563	$3,595	$3,627	$3,660	$3,693	$3,726	$3,760	$3,794	$3,828	$3,862	$3,897	$3,932
	MISC EXPENSES				$139	$140	$142	$143	$144	$146	$147	$148	$150	$151	$152	$154	$155	$156	$158	$159	$161	$162	$164	$165
	INSURANCES				$548	$548	$548	$548	$548	$548	$548	$548	$548	$548	$548	$548	$548	$548	$548	$548	$548	$548	$548	$548
	PROPERTY TAXES				$931	$899	$867	$834	$802	$770	$738	$706	$674	$642	$610	$578	$546	$514	$481	$449	$417	$385	$353	$321
	LAND LEASE				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
				LEVELIZED																				
	Fixed ($/MWH)			$2.99	$2.65	$2.68	$2.79	$2.75	$2.91	$2.79	$2.82	$2.93	$2.86	$3.06	$2.93	$2.97	$3.06	$3.02	$3.23	$3.10	$3.11	$3.23	$3.19	$3.42
	Variable ($/MWH)			$3.44	$2.61	$2.68	$2.83	$2.83	$3.04	$2.96	$3.04	$3.20	$3.17	$3.43	$3.33	$3.42	$3.57	$3.57	$3.88	$3.77	$3.83	$4.03	$4.03	$4.37
	Consumables ($/MWH)			$4.97	$2.80	$2.98	$3.24	$3.36	$3.76	$3.76	$3.92	$4.22	$4.24	$4.68	$4.60	$4.79	$5.08	$5.17	$5.71	$5.63	$5.95	$6.48	$6.63	$7.33
				NPV																				
	TOTAL OPERATING COST			$413,145	$23,482	$24,218	$24,952	$25,778	$26,675	$27,500	$28,221	$29,018	$29,806	$30,636	$31,397	$32,238	$33,105	$34,039	$35,030	$35,967	$37,393	$38,803	$40,034	$41,285
	UNIT COST ($/MWH)			$11.39	$8.06	$8.35	$8.85	$8.94	$9.71	$9.50	$9.78	$10.35	$10.27	$11.16	$10.86	$11.18	$11.70	$11.76	$12.82	$12.51	$12.89	$13.74	$13.85	$15.11

NET OPERATING INCOME				$673,013	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880	$52,880
	TAX DEPRECIATION			100%	$19,375	$37,298	$34,498	$31,915	$29,517	$27,306	$25,255	$23,364	$23,054	$23,049	$23,054	$23,049	$23,054	$23,049	$23,054	$23,049	$23,054	$23,049	$23,054	$23,049
	TAX AMORTIZATION				$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175	$4,175
	BOOK DEPRECIATION				$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397	$21,397
	TOTAL CUMULATIVE DEP/AMORT				$21,397	$42,795	$64,192	$85,589	$106,986	$128,384	$149,781	$171,178	$192,575	$213,973	$235,370	$256,767	$278,165	$299,562	$320,959	$342,356	$363,754	$385,151	$406,548	$427,946
	NET BOOK VALUE				$620,521	$599,124	$577,726	$556,329	$534,932	$513,535	$492,137	$470,740	$449,343	$427,946	$406,548	$385,151	$363,754	$342,356	$320,959	$299,562	$278,165	$256,767	$235,370	$213,973
	TOTAL NON-CASH CHARGES				$23,550	$41,473	$38,673	$36,090	$33,692	$31,481	$29,430	$27,539	$27,229	$27,224	$27,229	$27,224	$27,229	$27,224	$27,229	$27,224	$27,229	$27,224	$27,229	$27,224
	UNIT COST ($/MWH)		EXPENSE		$8.08	$14.29	$13.72	$12.51	$12.26	$10.88	$10.20	$9.82	$9.38	$9.92	$9.42	$9.44	$9.63	$9.41	$9.96	$9.47	$9.38	$9.64	$9.42	$9.97
EARNINGS BEFORE INTEREST & TAXES (EBIT)					$29,330	$11,407	$14,207	$16,791	$19,188	$21,399	$23,450	$25,341	$25,651	$25,657	$25,651	$25,657	$25,651	$25,657	$25,651	$25,657	$25,651	$25,657	$25,651	$25,657
DEBT SERVICE:														10 YR					15 YR					20 YR
	TOTAL PAYMENT				$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864	$20,864
	INTEREST PAYMENT				$10,795	$10,414	$10,019	$9,609	$9,183	$8,741	$8,283	$7,807	$7,313	$6,800	$6,268	$5,716	$5,143	$4,549	$3,932	$3,291	$2,626	$1,936	$1,221	$477
	PRINCIPAL PAYMENTS				$10,069	$10,450	$10,845	$11,256	$11,681	$12,123	$12,582	$13,058	$13,552	$14,064	$14,596	$15,148	$15,721	$16,316	$16,933	$17,573	$18,238	$18,928	$19,644	$20,387
TAX BASIS					$18,535	$992	$4,188	$7,182	$10,005	$12,658	$15,168	$17,535	$18,338	$18,856	$19,383	$19,940	$20,508	$21,108	$21,720	$22,365	$23,025	$23,720	$24,431	$25,179
INCOME TAXES																								
	US		38.90%		$7,210	$386	$1,629	$2,794	$3,892	$4,924	$5,900	$6,821	$7,134	$7,335	$7,540	$7,757	$7,978	$8,211	$8,449	$8,700	$8,957	$9,227	$9,504	$9,795
	GROSS RECIEPTS		0.00%		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CASH BASIS:																								
	NET OPERATING INCOME (NOI)				$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016
				NPV																				
	NET BEFORE TAX CASHFLOW			$447,614	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016	$32,016
				NPV																				
	LESS TAXES			($98,945)	($7,210)	($386)	($1,629)	($2,794)	($3,892)	($4,924)	($5,900)	($6,821)	($7,134)	($7,335)	($7,540)	($7,757)	($7,978)	($8,211)	($8,449)	($8,700)	($8,957)	($9,227)	($9,504)	($9,795)
	NET AFTER TAX CASH			($348,754)	$24,806	$31,630	$30,386	$29,222	$28,124	$27,092	$26,115	$25,195	$24,882	$24,681	$24,476	$24,259	$24,038	$23,805	$23,567	$23,315	$23,059	$22,789	$22,512	$22,221
			NPV	($85)																				
			IRR	6.75%																				
	DEBT SERVICE COVERAGE			AVERAGE																				
		AFTER TAX		2.21	2.19	2.52	2.46	2.40	2.35	2.30	2.25	2.21	2.19	2.18	2.17	2.16	2.15	2.14	2.13	2.12	2.11	2.09	2.08	2.07
		BEFORE TAX		2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	EQUITY RETURN:	100%																						
		PRE-TAX			9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%	9.18%
			AVG	ROIC	11.17%																			
		POST-TAX			7.11%	9.07%	8.71%	8.38%	8.06%	7.77%	7.49%	7.22%	7.13%	7.08%	7.02%	6.96%	6.89%	6.83%	6.76%	6.69%	6.61%	6.53%	6.45%	6.37%
			AVG	ROIC	8.12%																			
HDR				ROA	4.01%	5.27%	5.04%	4.82%	4.62%	4.44%	4.26%	4.10%	4.05%	4.02%	3.98%	3.95%	3.91%	3.87%	3.83%	3.79%	3.75%	3.71%	3.66%	3.61%
LG&E - KU				20 YR - AVG	4.14%																			
PROJECT:	189895	0		40 YR - AVG	4.56%																			
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LG&E - KU			
PROJECT:	189895		
DATE:	2/25/2013 14:36		
FILE:		SHEET 1	

PLANT DESIGN:	2x1 F5EE - 700		
PLANT GROSS CAPACITY		775,826	KW
NET CONTRACT DEMAND		739,029	KW
HEAT RATE - GROSS HHV		6,673	BTU/KWH
HEAT RATE - NET HHV		6951	BTU/KWH

CAPITAL COST CATEGORIES:		($1,000)	
HARD COSTS:			
	EPC PLANT		$502,740
SOFT COSTS:			
	TOTAL OWNER INDIRECTS		$69,575
	OWNER CONTINGENCY		$50,274
	LTSA INITIATION		$3,459
	SUB-TOTAL	19.70%	$123,308
TOTAL PROJECT COST			$626,048
INSTALLED POWER PLANT COST ($/KW)			$847

FINANCE STRUCTURE:					
DEBT			AVG DCR	2.21	
	PERCENT		$285,916	46%	
	RATE			3.73%	
	TERM	20 YR		80	
	PAYMENT - QUARTER			$5,087	
EQUITY					
	PERCENT		$340,132	54%	
	POST-TAX RETURN		(TARGET)	9.19%	
	EQUITY PAYMENT			$31,258	GOAL SEEK IRR=7.77% UNLEVERED
			IRR	6.75%	
			NPV	$123	

	DEPRECIATION	NEW PLANT - UTILITY	20	YR MACRS
	AMORTIZATION		30	YRS
	DISCOUNT RATE		6.75%	

PRO FORMA ANALYSIS:

YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ESCALATORS:																								
	PARTS				2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.				0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:																								
	FUEL																							
	NATURAL GAS	($/MMBTU)		$11.70	$4.96	$5.31	$5.66	$6.06	$6.53	$6.91	$7.22	$7.59	$7.93	$8.32	$8.62	$8.99	$9.38	$9.80	$10.28	$10.68	$11.46	$12.23	$12.84	$13.48
	NATURAL GAS ANNUAL DEMAND CHARGE			($1,000)	$18,184	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08	$18,184.08
0	PRICING OPTIONS	MARGINAL																						
$18.27	POWER	CAPITAL RECOVERY		($/MWH)	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27	$18.27
		FIXED CAPACITY-DB		($/KW-MO)	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29	$2.29
		FIXED CAPACITY-EQ		($/KW-MO)	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52	$3.52
$11.33		OP COST		($/MWH)	$8.01	$8.30	$8.80	$8.89	$9.66	$9.45	$9.72	$10.29	$10.22	$11.10	$10.80	$11.12	$11.64	$11.70	$12.75	$12.44	$12.82	$13.66	$13.77	$15.03
$69.30	30 YR - LEVELIZED	FUEL COST POWER		($/MWH)	$39.84	$42.30	$44.93	$47.61	$50.93	$53.27	$55.50	$58.30	$60.05	$63.17	$65.02	$67.67	$70.05	$72.90	$76.68	$79.21	$83.97	$89.52	$93.74	$98.65
	$98.90	TOTAL COST		($/MWH)	$66.13	$68.88	$72.01	$74.77	$78.86	$80.99	$83.50	$86.87	$88.54	$92.55	$94.09	$97.06	$99.97	$102.87	$107.70	$109.93	$115.06	$121.46	$125.79	$131.95
	$29.61	TOLLED COST		($/MWH)	$26.29	$26.58	$27.08	$27.16	$27.93	$27.72	$28.00	$28.57	$28.49	$29.38	$29.08	$29.39	$29.91	$29.97	$31.02	$30.71	$31.09	$31.93	$32.04	$33.30
PRODUCTION DATA:				AVERAGE																				
	ELECTRIC ENERGY	(MWH)		2,823,996	2890125	2877495	2795908	2860166	2724926	2870153	2862222	2780732	2877495	2721310	2866922	2860166	2805071	2870153	2710740	2852236	2877495	2801349	2866922	2708793
	TOTAL ELECTRIC	(MWH)		2,823,996	2890125	2877495	2795908	2860166	2724926	2870153	2862222	2780732	2877495	2721310	2866922	2860166	2805071	2870153	2710740	2852236	2877495	2801349	2866922	2708793
	FCP FUEL	(MMBTU)		19,190,957	19549951	19497987	18981627	19469178	18467911	19493580	19483173	18965077	19497987	18475176	19515162	19506836	19011085	19493580	18452030	19452751	19497987	19018564	19515162	18474441
	TOTAL	(MMBTU)		19,190,957	19549951	19497987	18981627	19469178	18467911	19493580	19483173	18965077	19497987	18475176	19515162	19506836	19011085	19493580	18452030	19452751	19497987	19018564	19515162	18474441
	AVG HEAT RATE	(BTU/KWH)			6764	6776	6789	6807	6777	6792	6807	6820	6776	6789	6807	6820	6777	6792	6807	6820	6776	6789	6807	6820
	AVG OUTPUT	(KW)			329923	328481	319168	326503	311065	327643	326738	317435	328481	310652	327274	326503	320214	327643	309445	325598	328481	319789	327274	309223
	CAPACITY FACTOR	(%)	FIRM	43.62%	44.64%	44.45%	43.19%	44.18%	42.09%	44.33%	44.21%	42.95%	44.45%	42.04%	44.28%	44.18%	43.33%	44.33%	41.87%	44.06%	44.45%	43.27%	44.28%	41.84%
	AMMONIA	(TON)			817	815	794	814	772	815	815	793	815	772	816	816	795	815	771	813	815	795	816	772
	MAKEUP WATER	(K-GALLONS)			37257	37094	36043	36871	35128	37000	36898	35847	37094	35081	36958	36871	36161	37000	34945	36769	37094	36113	36958	34920
	TOWER MAKEUP	(K-GALLONS)			231	230	223	228	218	229	229	222	230	217	229	228	224	229	217	228	230	224	229	216
	WASTE WATER	(K-GALLONS)			158970	158275	153787	157322	149883	157871	157435	152953	158275	149684	157694	157322	154291	157871	149103	156886	158275	154087	157694	148996
	NOx	(TON)			411	409	399	409	388	409	409	398	409	388	410	410	399	409	387	409	409	399	410	388
	SOx	(TON)			8	8	8	8	7	8	8	8	8	7	8	8	8	8	7	8	8	8	8	7

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LG&E - KU
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REVENUE:		($1,000)																						
	CAPACITY FIXED			$5.82	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607
	ENERGY																							
		VARIABLE ENERGY			$23,164	$23,889	$24,613	$25,427	$26,312	$27,124	$27,835	$28,622	$29,398	$30,218	$30,967	$31,796	$32,652	$33,572	$34,550	$35,472	$36,876	$38,267	$39,479	$40,712
		FUEL			$115,152	$121,718	$125,620	$136,167	$138,780	$152,885	$158,853	$162,129	$172,803	$171,898	$186,405	$193,551	$196,508	$209,221	$207,871	$225,939	$241,631	$250,781	$268,759	$267,220
	TOTAL REVENUE			$3,555,873	$189,922	$197,214	$201,840	$213,201	$216,698	$231,615	$238,294	$242,357	$253,808	$253,722	$268,978	$276,953	$280,767	$294,400	$294,028	$313,018	$330,114	$340,655	$359,844	$359,539
PRO FORMA ANALYSIS:																								
YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
EXPENSES:		($1,000)																						
	NATURAL GAS CONSUMPTION				$96,968	$103,534	$107,436	$117,983	$120,595	$134,701	$140,669	$143,945	$154,619	$153,713	$168,221	$175,366	$178,324	$191,037	$189,687	$207,755	$223,447	$232,597	$250,575	$249,035
	NATURAL GAS ANNUAL DEMAND CHARGE				$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184	$18,184
	UNIT COST ($/MWH)				$39.84	$42.30	$44.93	$47.61	$50.93	$53.27	$55.50	$58.30	$60.05	$63.17	$65.02	$67.67	$70.05	$72.90	$76.68	$79.21	$83.97	$89.52	$93.74	$98.65
	AMMONIA				$135	$135	$132	$135	$128	$135	$135	$131	$135	$128	$135	$135	$132	$135	$128	$135	$135	$132	$135	$128
	CLARIFIED WATER				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	DEMIN WATER				$174	$174	$169	$173	$165	$173	$173	$168	$174	$164	$173	$173	$169	$173	$164	$172	$174	$169	$173	$164
	CHEMICAL FEED				$43	$43	$42	$43	$41	$43	$43	$42	$43	$41	$43	$43	$42	$43	$41	$43	$43	$42	$43	$41
	STARTUP FUEL				$6,378	$6,828	$7,278	$7,792	$8,396	$8,885	$9,284	$9,759	$10,197	$10,698	$11,084	$11,560	$12,061	$12,601	$13,218	$13,733	$14,736	$15,726	$16,510	$17,333
	WASTEWATER TREATMENT				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	SPARE PARTS				$1,257	$1,287	$1,318	$1,350	$1,382	$1,415	$1,449	$1,484	$1,519	$1,556	$1,593	$1,631	$1,671	$1,711	$1,752	$1,794	$1,837	$1,881	$1,926	$1,972
	VARIABLE MAINTENANCE PARTS AND LABOR				$7,523	$7,704	$7,889	$8,078	$8,272	$8,470	$8,674	$8,882	$9,095	$9,313	$9,537	$9,766	$10,000	$10,240	$10,486	$10,738	$10,995	$11,259	$11,529	$11,806
	FIXED MAINTENANCE PARTS AND LABOR				$2,756	$2,823	$2,890	$2,960	$3,031	$3,103	$3,178	$3,254	$3,332	$3,412	$3,494	$3,578	$3,664	$3,752	$3,842	$3,934	$4,028	$4,125	$4,224	$4,326
	FIXED O&M	7	24		$3,317	$3,346	$3,377	$3,407	$3,438	$3,468	$3,500	$3,531	$3,563	$3,595	$3,627	$3,660	$3,693	$3,726	$3,760	$3,794	$3,828	$3,862	$3,897	$3,932
	MISC EXPENSES				$139	$140	$142	$143	$144	$146	$147	$148	$150	$151	$152	$154	$155	$156	$158	$159	$161	$162	$164	$165
	INSURANCES				$533	$533	$533	$533	$533	$533	$533	$533	$533	$533	$533	$533	$533	$533	$533	$533	$533	$533	$533	$533
	PROPERTY TAXES				$908	$876	$845	$814	$783	$751	$720	$689	$657	$626	$595	$563	$532	$501	$470	$438	$407	$376	$344	$313
	LAND LEASE				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
				LEVELIZED																				
	Fixed ($/MWH)			$2.99	$2.65	$2.68	$2.79	$2.75	$2.91	$2.79	$2.82	$2.93	$2.86	$3.06	$2.93	$2.97	$3.06	$3.02	$3.23	$3.11	$3.11	$3.23	$3.20	$3.42
	Variable ($/MWH)			$3.43	$2.60	$2.68	$2.82	$2.82	$3.04	$2.95	$3.03	$3.19	$3.16	$3.42	$3.33	$3.41	$3.57	$3.57	$3.87	$3.76	$3.82	$4.02	$4.02	$4.36
	Consumables ($/MWH)			$4.91	$2.76	$2.94	$3.20	$3.32	$3.71	$3.71	$3.87	$4.17	$4.19	$4.63	$4.54	$4.73	$5.02	$5.11	$5.65	$5.57	$5.88	$6.41	$6.55	$7.25
				NPV																				
	TOTAL OPERATING COST			$407,460	$23,164	$23,889	$24,613	$25,427	$26,312	$27,124	$27,835	$28,622	$29,398	$30,218	$30,967	$31,796	$32,652	$33,572	$34,550	$35,472	$36,876	$38,267	$39,479	$40,712
	UNIT COST ($/MWH)			$11.33	$8.01	$8.30	$8.80	$8.89	$9.66	$9.45	$9.72	$10.29	$10.22	$11.10	$10.80	$11.12	$11.64	$11.70	$12.75	$12.44	$12.82	$13.66	$13.77	$15.03

NET OPERATING INCOME				$656,807	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607	$51,607
	DEPRECIATION			100%	$18,853	$36,293	$33,568	$31,054	$28,722	$26,570	$24,574	$22,734	$22,432	$22,427	$22,432	$22,427	$22,432	$22,427	$22,432	$22,427	$22,432	$22,427	$22,432	$22,427
	AMORTIZATION				$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110	$4,110
	BOOK DEPRECIATION				$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868	$20,868
	TOTAL CUMULATIVE DEP/AMORT				$20,868	$41,737	$62,605	$83,473	$104,341	$125,210	$146,078	$166,946	$187,814	$208,683	$229,551	$250,419	$271,287	$292,156	$313,024	$333,892	$354,760	$375,629	$396,497	$417,365
	NET BOOK VALUE				$605,179	$584,311	$563,443	$542,575	$521,706	$500,838	$479,970	$459,102	$438,233	$417,365	$396,497	$375,629	$354,760	$333,892	$313,024	$292,156	$271,287	$250,419	$229,551	$208,683
	TOTAL NON-CASH CHARGES				$22,963	$40,403	$37,678	$35,165	$32,832	$30,680	$28,684	$26,844	$26,543	$26,537	$26,543	$26,537	$26,543	$26,537	$26,543	$26,537	$26,543	$26,537	$26,543	$26,537
	UNIT COST ($/MWH)		EXPENSE		$7.95	$14.04	$13.48	$12.29	$12.05	$10.69	$10.02	$9.65	$9.22	$9.75	$9.26	$9.28	$9.46	$9.25	$9.79	$9.30	$9.22	$9.47	$9.26	$9.80
EARNINGS BEFORE INTEREST & TAXES (EBIT)					$28,644	$11,204	$13,929	$16,442	$18,775	$20,927	$22,923	$24,763	$25,064	$25,069	$25,064	$25,069	$25,064	$25,069	$25,064	$25,069	$25,064	$25,069	$25,064	$25,069
DEBT SERVICE:														10 YR					15 YR					20 YR
	TOTAL PAYMENT				$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349	$20,349
	INTEREST PAYMENT				$10,528	$10,157	$9,771	$9,371	$8,956	$8,525	$8,078	$7,614	$7,132	$6,632	$6,113	$5,575	$5,016	$4,436	$3,834	$3,210	$2,561	$1,889	$1,190	$466
	PRINCIPAL PAYMENTS				$9,820	$10,192	$10,577	$10,977	$11,392	$11,823	$12,271	$12,735	$13,216	$13,716	$14,235	$14,774	$15,332	$15,912	$16,514	$17,139	$17,787	$18,460	$19,158	$19,883
TAX BASIS					$18,115	$1,047	$4,157	$7,071	$9,819	$12,401	$14,845	$17,149	$17,932	$18,437	$18,951	$19,494	$20,048	$20,633	$21,230	$21,860	$22,503	$23,181	$23,874	$24,604
INCOME TAXES																								
	US		38.90%		$7,047	$407	$1,617	$2,751	$3,820	$4,824	$5,775	$6,671	$6,976	$7,172	$7,372	$7,583	$7,799	$8,026	$8,258	$8,503	$8,754	$9,017	$9,287	$9,571
	GROSS RECIEPTS		0.00%		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CASH BASIS:																								
	NET OPERATING INCOME (NOI)				$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258
				NPV																				
	NET BEFORE TAX CASHFLOW			$436,980	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258	$31,258
				NPV																				
	LESS TAXES			($96,725)	($7,047)	($407)	($1,617)	($2,751)	($3,820)	($4,824)	($5,775)	($6,671)	($6,976)	($7,172)	($7,372)	($7,583)	($7,799)	($8,026)	($8,258)	($8,503)	($8,754)	($9,017)	($9,287)	($9,571)
	NET AFTER TAX CASH			($340,132)	$24,211	$30,851	$29,641	$28,508	$27,439	$26,434	$25,484	$24,587	$24,283	$24,086	$23,886	$23,675	$23,459	$23,232	$23,000	$22,755	$22,505	$22,241	$21,971	$21,687
			NPV	$123																				
			IRR	6.75%																				
	DEBT SERVICE COVERAGE			AVERAGE																				
		AFTER TAX		2.21	2.19	2.52	2.46	2.40	2.35	2.30	2.25	2.21	2.19	2.18	2.17	2.16	2.15	2.14	2.13	2.12	2.11	2.09	2.08	2.07
		BEFORE TAX		2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
	EQUITY RETURN:	100%																						
		PRE-TAX			9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%
			AVG	ROIC	11.18%																			
		POST-TAX			7.12%	9.07%	8.71%	8.38%	8.07%	7.77%	7.49%	7.23%	7.14%	7.08%	7.02%	6.96%	6.90%	6.83%	6.76%	6.69%	6.62%	6.54%	6.46%	6.38%
			AVG	ROIC	8.13%																			
HDR				ROA	4.01%	5.27%	5.04%	4.82%	4.63%	4.44%	4.27%	4.10%	4.05%	4.02%	3.98%	3.95%	3.91%	3.88%	3.84%	3.80%	3.75%	3.71%	3.66%	3.62%
LG&E - KU				20 YR - AVG	4.14%																			
PROJECT:	189895	0		40 YR - AVG	4.56%																			
DATE:	2/25/2013 14:36																							
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HDR		
LG&E - KU		
PROJECT:	189895	
DATE:	2/22/2013 9:50	
FILE:		SHEET 1

PLANT DESIGN:	2x1 7F7 - 760		
PLANT GROSS CAPACITY		840,788	KW
NET CONTRACT DEMAND		800,170	KW
HEAT RATE - GROSS HHV		6,644	BTU/KWH
HEAT RATE - NET HHV		6928	BTU/KWH

DEPRECIATION	NEW PLANT - UTILITY	20	YR MACRS
AMORTIZATION		30	YRS
DISCOUNT RATE		6.75%	

CAPITAL COST CATEGORIES:		($1,000)	
HARD COSTS:			
	EPC PLANT		$565,815
SOFT COSTS:			
	TOTAL OWNER INDIRECTS		$70,725
	OWNER CONTINGENCY		$56,581
	LTSA INITIATION		$15,853
	SUB-TOTAL	20.19%	$143,159
TOTAL PROJECT COST			$708,974
INSTALLED POWER PLANT COST ($/KW)			$886

FINANCE STRUCTURE:					
DEBT			AVG DCR	2.21	
	PERCENT		$323,788	46%	
	RATE			3.73%	
	TERM	20 YR		80	
	PAYMENT - QUARTER			$5,761	
EQUITY					
	PERCENT		$385,185	54%	
	POST-TAX RETURN		(TARGET)	9.19%	
	EQUITY PAYMENT			$35,399	GOAL SEEK IRR=7.77% UNLEVERED
			IRR	6.75%	
			NPV	($38)	

PRO FORMA ANALYSIS:

YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
				0	1	2	3	4	5	6	7	8	9	10
ESCALATORS:														
	PARTS				2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.				0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:														
	FUEL													
	NATURAL GAS	($/MMBTU)		$11.70	$4.96	$5.31	$5.66	$6.06	$6.53	$6.91	$7.22	$7.59	$7.93	$8.32
	NATURAL GAS ANNUAL DEMAND CHARGE			($1,000)	$19,621	#########	$19,621.27	$19,621.27	$19,621.27	$19,621.27	$19,621.27	$19,621.27	$19,621.27	$19,621.27
0	PRICING OPTIONS	MARGINAL												
$20.25	POWER	CAPITAL RECOVERY		($/MWH)	$20.25	$20.25	$20.25	$20.25	$20.25	$20.25	$20.25	$20.25	$20.25	$20.25
		FIXED CAPACITY-DB		($/KW-MO)	$2.40	$2.40	$2.40	$2.40	$2.40	$2.40	$2.40	$2.40	$2.40	$2.40
		FIXED CAPACITY-EQ		($/KW-MO)	$3.69	$3.69	$3.69	$3.69	$3.69	$3.69	$3.69	$3.69	$3.69	$3.69
$10.93		OP COST		($/MWH)	$7.68	$7.97	$8.43	$8.54	$9.23	$9.10	$9.37	$9.89	$9.85	$10.64
$68.09	30 YR - LEVELIZED	FUEL COST POWER		($/MWH)	$39.36	$41.76	$44.34	$46.94	$50.20	$52.45	$54.63	$57.38	$59.07	$62.13
	$99.27	TOTAL COST		($/MWH)	$67.30	$69.98	$73.02	$75.73	$79.68	$81.80	$84.25	$87.52	$89.17	$93.03
	$31.18	TOLLED COST		($/MWH)	$27.94	$28.22	$28.68	$28.80	$29.48	$29.35	$29.62	$30.14	$30.10	$30.89
PRODUCTION DATA:				AVERAGE										
	ELECTRIC ENERGY	(MWH)		2,885,698	2953273	2940367	2856997	2922659	2784464	2932864	2924760	2841489	2940367	2780769
	TOTAL ELECTRIC	(MWH)		2,885,698	2953273	2940367	2856997	2922659	2784464	2932864	2924760	2841489	2940367	2780769
	FCP FUEL	(MMBTU)		19,121,292	19478982	19427207	18912721	19398503	18400871	19422816	19412447	18896232	19427207	18408109
	TOTAL	(MMBTU)		19,121,292	19478982	19427207	18912721	19398503	18400871	19422816	19412447	18896232	19427207	18408109
	AVG HEAT RATE	(BTU/KWH)			6596	6607	6620	6637	6608	6622	6637	6650	6607	6620
	AVG OUTPUT	(KW)			337132	335658	326141	333637	317861	334802	333877	324371	335658	317439
	CAPACITY FACTOR	(%)	FIRM	41.17%	42.13%	41.95%	40.76%	41.70%	39.72%	41.84%	41.73%	40.54%	41.95%	39.67%
	AMMONIA	(TON)			814	812	791	811	769	812	812	790	812	770
	MAKEUP WATER	(K-GALLONS)			39202	39031	37924	38796	36961	38931	38823	37718	39031	36912
	TOWER MAKEUP	(K-GALLONS)			218	217	211	216	205	216	216	210	217	205
	WASTE WATER	(K-GALLONS)			173218	172461	167571	171423	163317	172021	171546	166662	172461	163100
	NOx	(TON)			526	525	511	524	497	524	524	510	525	497
	SOx	(TON)			8	8	8	8	7	8	8	8	8	7

YEAR				2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				11	12	13	14	15	16	17	18	19	20
ESCALATORS:													
	PARTS			2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.			0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:													
	FUEL												
	NATURAL GAS	($/MMBTU)		$8.62	$8.99	$9.38	$9.80	$10.28	$10.68	$11.46	$12.23	$12.84	$13.48
	NATURAL GAS ANNUAL DEMAND CHARGE			$19,621.27	$19,621.27	$19,621.27	$19,621.27	$19,621.27	$19,621.27	$19,621.27	$19,621.27	$19,621.27	$19,621.27
0	PRICING OPTIONS	MARGINAL											
$20.25	POWER	CAPITAL RECOVERY		$20.25	$20.25	$20.25	$20.25	$20.25	$20.25	$20.25	$20.25	$20.25	$20.25
		FIXED CAPACITY-DB		$2.40	$2.40	$2.40	$2.40	$2.40	$2.40	$2.40	$2.40	$2.40	$2.40
		FIXED CAPACITY-EQ		$3.69	$3.69	$3.69	$3.69	$3.69	$3.69	$3.69	$3.69	$3.69	$3.69
$10.93		OP COST		$10.42	$10.72	$11.20	$11.29	$12.24	$12.02	$12.40	$13.20	$13.35	$14.50
$68.09	30 YR - LEVELIZED	FUEL COST POWER		$63.91	$66.50	$68.83	$71.59	$75.31	$77.76	$82.39	$87.81	$91.92	$96.73
	$99.27	TOTAL COST		$94.58	$97.47	$100.29	$103.13	$107.80	$110.02	$115.04	$121.27	$125.52	$131.48
	$31.18	TOLLED COST		$30.67	$30.98	$31.45	$31.54	$32.49	$32.27	$32.65	$33.45	$33.60	$34.75
PRODUCTION DATA:													
	ELECTRIC ENERGY	(MWH)		2929562	2922659	2866360	2932864	2769968	2914556	2940367	2862557	2929562	2767978
	TOTAL ELECTRIC	(MWH)		2929562	2922659	2866360	2932864	2769968	2914556	2940367	2862557	2929562	2767978
	FCP FUEL	(MMBTU)		19444320	19436024	18942073	19422816	18385047	19382135	19427207	18949524	19444320	18407376
	TOTAL	(MMBTU)		19444320	19436024	18942073	19422816	18385047	19382135	19427207	18949524	19444320	18407376
	AVG HEAT RATE	(BTU/KWH)		6637	6650	6608	6622	6637	6650	6607	6620	6637	6650
	AVG OUTPUT	(KW)		334425	333637	327210	334802	316206	332712	335658	326776	334425	315979
	CAPACITY FACTOR	(%)	FIRM	41.79%	41.70%	40.89%	41.84%	39.52%	41.58%	41.95%	40.84%	41.79%	39.49%
	AMMONIA	(TON)		813	813	792	812	769	810	812	792	813	770
	MAKEUP WATER	(K-GALLONS)		38887	38796	38048	38931	36769	38688	39031	37998	38887	36742
	TOWER MAKEUP	(K-GALLONS)		216	216	211	216	204	215	217	211	216	204
	WASTE WATER	(K-GALLONS)		171828	171423	168121	172021	162467	170947	172461	167897	171828	162350
	NOx	(TON)		525	525	511	524	496	523	525	512	525	497
	SOx	(TON)		8	8	8	8	7	8	8	8	8	7

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REVENUE:		($1,000)																						
	CAPACITY FIXED			$6.09	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443
	ENERGY																							
		VARIABLE ENERGY			$22,695	$23,424	$24,078	$24,971	$25,707	$26,685	$27,392	$28,097	$28,953	$29,592	$30,515	$31,342	$32,104	$33,118	$33,897	$35,022	$36,461	$37,780	$39,112	$40,132
		FUEL			$116,237	$122,780	$126,667	$137,176	$139,779	$153,833	$159,779	$163,044	$173,679	$172,777	$187,231	$194,351	$197,298	$209,965	$208,620	$226,622	$242,257	$251,374	$269,286	$267,753
	TOTAL REVENUE			$3,647,061	$197,375	$204,646	$209,187	$220,590	$223,929	$238,961	$245,614	$249,584	$261,075	$260,811	$276,189	$284,136	$287,845	$301,525	$300,960	$320,087	$337,161	$347,597	$366,841	$366,328
PRO FORMA ANALYSIS:																								
YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
EXPENSES:		($1,000)																						
	NATURAL GAS CONSUMPTION				$96,616	$103,158	$107,046	$117,555	$120,158	$134,212	$140,158	$143,422	$154,058	$153,155	$167,610	$174,730	$177,677	$190,344	$188,998	$207,001	$222,636	$231,753	$249,665	$248,131
	NATURAL GAS ANNUAL DEMAND CHARGE				$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621	$19,621
	UNIT COST ($/MWH)				$39.36	$41.76	$44.34	$46.94	$50.20	$52.45	$54.63	$57.38	$59.07	$62.13	$63.91	$66.50	$68.83	$71.59	$75.31	$77.76	$82.39	$87.81	$91.92	$96.73
	AMMONIA				$135	$135	$131	$134	$127	$135	$134	$131	$135	$128	$135	$135	$131	$135	$127	$134	$135	$131	$135	$128
	CLARIFIED WATER				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	DEMIN WATER				$184	$183	$178	$182	$173	$182	$182	$177	$183	$173	$182	$182	$178	$182	$172	$181	$183	$178	$182	$172
	CHEMICAL FEED				$47	$47	$46	$47	$45	$47	$47	$46	$47	$45	$47	$47	$46	$47	$45	$47	$47	$46	$47	$45
	STARTUP FUEL				$6,882	$7,367	$7,853	$8,408	$9,060	$9,587	$10,017	$10,531	$11,002	$11,544	$11,960	$12,473	$13,014	$13,597	$14,263	$14,818	$15,900	$16,969	$17,815	$18,703
	WASTEWATER TREATMENT				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	SPARE PARTS				$1,415	$1,448	$1,483	$1,519	$1,555	$1,593	$1,631	$1,670	$1,710	$1,751	$1,793	$1,836	$1,880	$1,925	$1,972	$2,019	$2,067	$2,117	$2,168	$2,220
	VARIABLE MAINTENANCE PARTS AND LABOR				$3,759	$3,849	$3,869	$4,036	$3,972	$4,233	$4,334	$4,356	$4,545	$4,472	$4,765	$4,880	$4,904	$5,117	$5,035	$5,365	$5,494	$5,522	$5,761	$5,669
	FIXED MAINTENANCE PARTS AND LABOR				$5,190	$5,315	$5,443	$5,573	$5,707	$5,844	$5,984	$6,128	$6,275	$6,425	$6,580	$6,737	$6,899	$7,065	$7,234	$7,408	$7,586	$7,768	$7,954	$8,145
	FIXED O&M	7	24		$3,317	$3,346	$3,377	$3,407	$3,438	$3,468	$3,500	$3,531	$3,563	$3,595	$3,627	$3,660	$3,693	$3,726	$3,760	$3,794	$3,828	$3,862	$3,897	$3,932
	MISC EXPENSES				$139	$140	$142	$143	$144	$146	$147	$148	$150	$151	$152	$154	$155	$156	$158	$159	$161	$162	$164	$165
	INSURANCES				$600	$600	$600	$600	$600	$600	$600	$600	$600	$600	$600	$600	$600	$600	$600	$600	$600	$600	$600	$600
	PROPERTY TAXES				$1,028	$993	$957	$922	$886	$851	$815	$780	$744	$709	$674	$638	$603	$567	$532	$496	$461	$425	$390	$354
	LAND LEASE				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
				LEVELIZED																				
	Fixed ($/MWH)			$4.07	$3.48	$3.53	$3.68	$3.64	$3.87	$3.72	$3.78	$3.94	$3.85	$4.13	$3.97	$4.03	$4.17	$4.13	$4.43	$4.27	$4.30	$4.48	$4.44	$4.77
	Variable ($/MWH)			$1.66	$1.27	$1.31	$1.35	$1.38	$1.43	$1.44	$1.48	$1.53	$1.55	$1.61	$1.63	$1.67	$1.71	$1.74	$1.82	$1.84	$1.87	$1.93	$1.97	$2.05
	Consumables ($/MWH)			$5.20	$2.93	$3.12	$3.39	$3.52	$3.94	$3.94	$4.11	$4.42	$4.45	$4.91	$4.82	$5.02	$5.32	$5.42	$5.99	$5.90	$6.23	$6.79	$6.95	$7.68
				NPV																				
	TOTAL OPERATING COST			$401,561	$22,695	$23,424	$24,078	$24,971	$25,707	$26,685	$27,392	$28,097	$28,953	$29,592	$30,515	$31,342	$32,104	$33,118	$33,897	$35,022	$36,461	$37,780	$39,112	$40,132
	UNIT COST ($/MWH)			$10.93	$7.68	$7.97	$8.43	$8.54	$9.23	$9.10	$9.37	$9.89	$9.85	$10.64	$10.42	$10.72	$11.20	$11.29	$12.24	$12.02	$12.40	$13.20	$13.35	$14.50

NET OPERATING INCOME				$743,807	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443	$58,443
	DEPRECIATION			100%	$21,218	$40,846	$37,779	$34,950	$32,325	$29,903	$27,657	$25,586	$25,247	$25,241	$25,247	$25,241	$25,247	$25,241	$25,247	$25,241	$25,247	$25,241	$25,247	$25,241
	AMORTIZATION				$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772	$4,772
	BOOK DEPRECIATION				$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632	$23,632
	TOTAL CUMULATIVE DEP/AMORT				$23,632	$47,265	$70,897	$94,530	$118,162	$141,795	$165,427	$189,060	$212,692	$236,325	$259,957	$283,590	$307,222	$330,854	$354,487	$378,119	$401,752	$425,384	$449,017	$472,649
	NET BOOK VALUE				$685,341	$661,709	$638,076	$614,444	$590,811	$567,179	$543,547	$519,914	$496,282	$472,649	$449,017	$425,384	$401,752	$378,119	$354,487	$330,854	$307,222	$283,590	$259,957	$236,325
	TOTAL NON-CASH CHARGES				$25,990	$45,618	$42,551	$39,722	$37,097	$34,675	$32,429	$30,358	$30,019	$30,013	$30,019	$30,013	$30,019	$30,013	$30,019	$30,013	$30,019	$30,013	$30,019	$30,013
	UNIT COST ($/MWH)		EXPENSE		$8.80	$15.51	$14.89	$13.59	$13.32	$11.82	$11.09	$10.68	$10.21	$10.79	$10.25	$10.27	$10.47	$10.23	$10.84	$10.30	$10.21	$10.48	$10.25	$10.84
EARNINGS BEFORE INTEREST & TAXES (EBIT)					$32,453	$12,824	$15,891	$18,720	$21,346	$23,767	$26,014	$28,084	$28,424	$28,430	$28,424	$28,430	$28,424	$28,430	$28,424	$28,430	$28,424	$28,430	$28,424	$28,430
DEBT SERVICE:														10 YR					15 YR					20 YR
	TOTAL PAYMENT				$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044	$23,044
	INTEREST PAYMENT				$11,923	$11,502	$11,066	$10,613	$10,142	$9,654	$9,148	$8,622	$8,077	$7,511	$6,923	$6,313	$5,681	$5,024	$4,342	$3,635	$2,901	$2,139	$1,348	$527
	PRINCIPAL PAYMENTS				$11,121	$11,542	$11,978	$12,431	$12,902	$13,390	$13,896	$14,422	$14,967	$15,533	$16,121	$16,731	$17,363	$18,020	$18,702	$19,409	$20,143	$20,905	$21,696	$22,517
TAX BASIS					$20,530	$1,322	$4,825	$8,108	$11,203	$14,113	$16,866	$19,462	$20,347	$20,919	$21,501	$22,116	$22,743	$23,406	$24,082	$24,795	$25,523	$26,291	$27,076	$27,902
INCOME TAXES																								
	US		38.90%		$7,986	$514	$1,877	$3,154	$4,358	$5,490	$6,561	$7,571	$7,915	$8,137	$8,364	$8,603	$8,847	$9,105	$9,368	$9,645	$9,929	$10,227	$10,533	$10,854
	GROSS RECIEPTS		0.00%		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CASH BASIS:																								
	NET OPERATING INCOME (NOI)				$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399
				NPV																				
	NET BEFORE TAX CASHFLOW			$494,862	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399	$35,399
				NPV																				
	LESS TAXES			($109,715)	($7,986)	($514)	($1,877)	($3,154)	($4,358)	($5,490)	($6,561)	($7,571)	($7,915)	($8,137)	($8,364)	($8,603)	($8,847)	($9,105)	($9,368)	($9,645)	($9,929)	($10,227)	($10,533)	($10,854)
	NET AFTER TAX CASH			($385,185)	$27,413	$34,884	$33,521	$32,245	$31,041	$29,909	$28,838	$27,828	$27,484	$27,261	$27,035	$26,795	$26,551	$26,294	$26,031	$25,753	$25,470	$25,171	$24,866	$24,545
			NPV	($38)																				
			IRR	6.75%																				
	DEBT SERVICE COVERAGE			AVERAGE																				
		AFTER TAX		2.21	2.19	2.51	2.45	2.40	2.35	2.30	2.25	2.21	2.19	2.18	2.17	2.16	2.15	2.14	2.13	2.12	2.11	2.09	2.08	2.07
		BEFORE TAX		2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
	EQUITY RETURN:	100%																						
		PRE-TAX			9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%
			AVG	ROIC	11.18%																			
		POST-TAX			7.12%	9.06%	8.70%	8.37%	8.06%	7.76%	7.49%	7.22%	7.14%	7.08%	7.02%	6.96%	6.89%	6.83%	6.76%	6.69%	6.61%	6.53%	6.46%	6.37%
			AVG	ROIC	8.13%																			
HDR				ROA	4.01%	5.26%	5.03%	4.82%	4.62%	4.44%	4.26%	4.10%	4.05%	4.02%	3.98%	3.95%	3.91%	3.87%	3.83%	3.79%	3.75%	3.71%	3.66%	3.62%
LG&E - KU				20 YR - AVG	4.13%																			
PROJECT:	189895	0		40 YR - AVG	4.56%																			
DATE:	2/22/2013 9:50																							
FILE:	0																							

HDR		
LG&E - KU		
PROJECT:	189895	
DATE:	2/22/2013 9:50	
FILE:		SHEET 1

PLANT DESIGN:	2x1 7F7 - 700		
PLANT GROSS CAPACITY	NEW & CLEAN	777,686	KW
NET CONTRACT DEMAND		741,333	KW
HEAT RATE - GROSS HHV		6,403	BTU/KWH
HEAT RATE - NET HHV		6665	BTU/KWH

DEPRECIATION	NEW PLANT - UTILITY	20	YR MACRS
AMORTIZATION		30	YRS
DISCOUNT RATE		6.75%	

CAPITAL COST CATEGORIES:		($1,000)	
HARD COSTS:			
	EPC PLANT		$555,014
SOFT COSTS:			
	TOTAL OWNER INDIRECTS		$70,175
	OWNER CONTINGENCY		$55,501
	LTSA INITIATION		$15,853
	SUB-TOTAL	20.32%	$141,529
TOTAL PROJECT COST			$696,543

INSTALLED POWER PLANT COST ($/KW)	$940

FINANCE STRUCTURE:					
DEBT			AVG DCR	2.21	
	PERCENT		$318,111	46%	
	RATE			3.73%	
	TERM	20 YR		80	
	PAYMENT - QUARTER			$5,660	
EQUITY					
	PERCENT		$378,432	54%	
	POST-TAX RETURN		(TARGET)	9.19%	
	EQUITY PAYMENT			$34,778	GOAL SEEK IRR=7.77% UNLEVERED
			IRR	6.75%	
			NPV	($82)	

PRO FORMA ANALYSIS:

YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ESCALATORS:																								
	PARTS				2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.				0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:																								
	FUEL																							
	NATURAL GAS	($/MMBTU)		$11.70	$4.96	$5.31	$5.66	$6.06	$6.53	$6.91	$7.22	$7.59	$7.93	$8.32	$8.62	$8.99	$9.38	$9.80	$10.28	$10.68	$11.46	$12.23	$12.84	$13.48
	NATURAL GAS ANNUAL DEMAND CHARGE			($1,000)	$17,490	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99	$17,489.99
0	PRICING OPTIONS	MARGINAL																						
$19.93	POWER	CAPITAL RECOVERY		($/MWH)	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93	$19.93
		FIXED CAPACITY-DB		($/KW-MO)	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54	$2.54
		FIXED CAPACITY-EQ		($/KW-MO)	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91	$3.91
$10.38		OP COST		($/MWH)	$7.38	$7.64	$8.07	$8.17	$8.82	$8.69	$8.93	$9.43	$9.38	$10.13	$9.91	$10.20	$10.64	$10.72	$11.61	$11.40	$11.75	$12.49	$12.62	$13.69
$66.50	30 YR - LEVELIZED	FUEL COST POWER		($/MWH)	$38.19	$40.55	$43.07	$45.65	$48.84	$51.09	$53.24	$55.93	$57.62	$60.60	$62.39	$64.94	$67.23	$69.96	$73.60	$76.04	$80.61	$85.94	$90.01	$94.72
	$96.82	TOTAL COST		($/MWH)	$65.50	$68.12	$71.08	$73.76	$77.59	$79.71	$82.10	$85.29	$86.93	$90.66	$92.23	$95.07	$97.80	$100.62	$105.14	$107.37	$112.29	$118.36	$122.56	$128.34
	$30.31	TOLLED COST		($/MWH)	$27.31	$27.57	$28.00	$28.11	$28.75	$28.62	$28.87	$29.36	$29.31	$30.06	$29.84	$30.13	$30.57	$30.66	$31.54	$31.33	$31.68	$32.42	$32.55	$33.62
PRODUCTION DATA:				AVERAGE																				
	ELECTRIC ENERGY	(MWH)		2,880,851	2948312	2935428	2852198	2917750	2779787	2927937	2919847	2836716	2935428	2776098	2924641	2917750	2861546	2927937	2765315	2909660	2935428	2857748	2924641	2763329
	TOTAL ELECTRIC	(MWH)		2,880,851	2948312	2935428	2852198	2917750	2779787	2927937	2919847	2836716	2935428	2776098	2924641	2917750	2861546	2927937	2765315	2909660	2935428	2857748	2924641	2763329
	FCP FUEL	(MMBTU)		18,821,497	19173579	19122616	18616197	19094361	18112371	19118294	19108087	18599965	19122616	18119496	19139460	19131294	18645088	19118294	18096796	19078250	19122616	18652422	19139460	18118775
	TOTAL	(MMBTU)		18,821,497	19173579	19122616	18616197	19094361	18112371	19118294	19108087	18599965	19122616	18119496	19139460	19131294	18645088	19118294	18096796	19078250	19122616	18652422	19139460	18118775
	AVG HEAT RATE	(BTU/KWH)			6503	6514	6527	6544	6516	6530	6544	6557	6514	6527	6544	6557	6516	6530	6544	6557	6514	6527	6544	6557
	AVG OUTPUT	(KW)			336565	335095	325593	333076	317327	334239	333316	323826	335095	316906	333863	333076	326660	334239	315675	332153	335095	326227	333863	315448
	CAPACITY FACTOR	(%)	FIRM	44.36%	45.40%	45.20%	43.92%	44.93%	42.80%	45.09%	44.96%	43.68%	45.20%	42.75%	45.04%	44.93%	44.06%	45.09%	42.58%	44.80%	45.20%	44.01%	45.04%	42.55%
	AMMONIA	(TON)			802	800	778	798	757	799	799	778	800	758	800	800	780	799	757	798	800	780	800	758
	MAKEUP WATER	(K-GALLONS)			34156	34007	33043	33802	32204	33920	33826	32863	34007	32161	33882	33802	33151	33920	32036	33708	34007	33107	33882	32013
	TOWER MAKEUP	(K-GALLONS)			235	234	227	232	221	233	233	226	234	221	233	232	228	233	220	232	234	228	233	220
	WASTE WATER	(K-GALLONS)			151896	151232	146944	150322	143214	150846	150430	146147	151232	143024	150677	150322	147426	150846	142468	149905	151232	147230	150677	142366
	NOx	(TON)			518	516	503	516	489	516	516	502	516	489	517	517	503	516	489	515	516	504	517	489
	SOx	(TON)			8	8	7	8	7	8	8	7	8	7	8	8	7	8	7	8	8	7	8	7

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REVENUE:		($1,000)																						
	CAPACITY FIXED			$6.45	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418
	ENERGY																							
		VARIABLE ENERGY			21749.43277	22423.015	23021.8889	23851.6271	24515.8285	25431.6465	26088.6356	26736.14428	27536.8312	28115.1113	28987.8947	29755.4579	30456.1185	31401.9903	32107.2841	33165.9384	34483.4465	35683.0685	36918.3554	37839.5115
		FUEL			$112,591	$119,031	$122,858	$133,202	$135,764	$149,597	$155,450	$158,664	$169,132	$168,244	$182,472	$189,480	$192,381	$204,849	$203,525	$221,246	$236,635	$245,609	$263,241	$261,731
	TOTAL REVENUE			$3,550,908	$191,758	$198,872	$203,297	$214,471	$217,697	$232,447	$238,957	$242,818	$254,087	$253,777	$268,878	$276,654	$280,255	$293,669	$293,050	$311,829	$328,536	$338,710	$357,577	$356,988
PRO FORMA ANALYSIS:																								
YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
EXPENSES:		($1,000)																						
	NATURAL GAS CONSUMPTION				$95,101	$101,541	$105,368	$115,712	$118,274	$132,107	$137,960	$141,174	$151,642	$150,754	$164,982	$171,990	$174,891	$187,359	$186,035	$203,756	$219,145	$228,119	$245,751	$244,241
	NATURAL GAS ANNUAL DEMAND CHARGE				$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490	$17,490
	UNIT COST ($/MWH)				$38.19	$40.55	$43.07	$45.65	$48.84	$51.09	$53.24	$55.93	$57.62	$60.60	$62.39	$64.94	$67.23	$69.96	$73.60	$76.04	$80.61	$85.94	$90.01	$94.72
	AMMONIA				$133	$132	$129	$132	$125	$132	$132	$129	$132	$126	$133	$133	$129	$132	$125	$132	$132	$129	$133	$126
	CLARIFIED WATER				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	DEMIN WATER				$160	$159	$155	$158	$151	$159	$158	$154	$159	$151	$159	$158	$155	$159	$150	$158	$159	$155	$159	$150
	CHEMICAL FEED				$39	$39	$38	$39	$37	$39	$39	$38	$39	$37	$39	$39	$38	$39	$37	$39	$39	$38	$39	$37
	STARTUP FUEL				$6,134	$6,567	$7,000	$7,495	$8,076	$8,546	$8,929	$9,387	$9,807	$10,290	$10,661	$11,118	$11,601	$12,120	$12,714	$13,208	$14,173	$15,125	$15,880	$16,671
	WASTEWATER TREATMENT				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	SPARE PARTS				$1,388	$1,421	$1,455	$1,490	$1,526	$1,562	$1,600	$1,638	$1,677	$1,718	$1,759	$1,801	$1,844	$1,889	$1,934	$1,980	$2,028	$2,077	$2,126	$2,177
	VARIABLE MAINTENANCE PARTS AND LABOR				$3,681	$3,770	$3,787	$3,953	$3,886	$4,145	$4,244	$4,264	$4,450	$4,375	$4,667	$4,779	$4,801	$5,011	$4,926	$5,254	$5,380	$5,405	$5,642	$5,547
	FIXED MAINTENANCE PARTS AND LABOR				$5,160	$5,284	$5,411	$5,541	$5,674	$5,810	$5,950	$6,092	$6,239	$6,388	$6,542	$6,699	$6,859	$7,024	$7,193	$7,365	$7,542	$7,723	$7,908	$8,098
	FIXED O&M	7	24		$3,317	$3,346	$3,377	$3,407	$3,438	$3,468	$3,500	$3,531	$3,563	$3,595	$3,627	$3,660	$3,693	$3,726	$3,760	$3,794	$3,828	$3,862	$3,897	$3,932
	MISC EXPENSES				$139	$140	$142	$143	$144	$146	$147	$148	$150	$151	$152	$154	$155	$156	$158	$159	$161	$162	$164	$165
	INSURANCES				$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588
	PROPERTY TAXES				$1,010	$975	$940	$906	$871	$836	$801	$766	$731	$697	$662	$627	$592	$557	$522	$488	$453	$418	$383	$348
	LAND LEASE				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
				LEVELIZED																				
	Fixed ($/MWH)			$4.05	3.464512844	3.5206411	3.66663329	3.62768113	3.85452913	3.70511835	3.76235269	3.922238441	3.83956962	4.11335953	3.95648325	4.01935813	4.15430863	4.11626742	4.41933886	4.25957523	4.28265614	4.4627805	4.42455773	4.75215302
	Variable ($/MWH)			$1.63	1.248600619	1.2841788	1.32780288	1.35471751	1.39800416	1.4155818	1.45357197	1.503132291	1.51609072	1.57610436	1.59559952	1.63775298	1.67769174	1.71133338	1.78145544	1.8057351	1.83284122	1.89142303	1.92896146	2.00718231
	Consumables ($/MWH)			$4.70	$2.66	2.8339351	3.07719416	3.19226547	3.56678478	3.56515728	3.71900626	3.999662758	4.02519699	4.43809929	4.3595234	4.54097192	4.81123967	4.89735208	5.40991988	5.33325023	5.63183439	6.13222457	6.26968794	6.93411713
				NPV																				
	TOTAL OPERATING COST			$380,883	$21,749	$22,423	$23,022	$23,852	$24,516	$25,432	$26,089	$26,736	$27,537	$28,115	$28,988	$29,755	$30,456	$31,402	$32,107	$33,166	$34,483	$35,683	$36,918	$37,840
	UNIT COST ($/MWH)			$10.38	$7.38	$7.64	$8.07	$8.17	$8.82	$8.69	$8.93	$9.43	$9.38	$10.13	$9.91	$10.20	$10.64	$10.72	$11.61	$11.40	$11.75	$12.49	$12.62	$13.69

NET OPERATING INCOME				$730,765	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418	$57,418
	DEPRECIATION			100%	$20,813	$40,066	$37,058	$34,283	$31,708	$29,332	$27,129	$25,098	$24,765	$24,759	$24,765	$24,759	$24,765	$24,759	$24,765	$24,759	$24,765	$24,759	$24,765	$24,759
	AMORTIZATION				$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718	$4,718
	BOOK DEPRECIATION				$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218	$23,218
	TOTAL CUMULATIVE DEP/AMORT				$23,218	$46,436	$69,654	$92,872	$116,090	$139,309	$162,527	$185,745	$208,963	$232,181	$255,399	$278,617	$301,835	$325,053	$348,271	$371,489	$394,708	$417,926	$441,144	$464,362
	NET BOOK VALUE				$673,325	$650,107	$626,889	$603,670	$580,452	$557,234	$534,016	$510,798	$487,580	$464,362	$441,144	$417,926	$394,708	$371,489	$348,271	$325,053	$301,835	$278,617	$255,399	$232,181
	TOTAL NON-CASH CHARGES				$25,531	$44,784	$41,776	$39,001	$36,426	$34,050	$31,847	$29,815	$29,482	$29,477	$29,482	$29,477	$29,482	$29,477	$29,482	$29,477	$29,482	$29,477	$29,482	$29,477
	UNIT COST ($/MWH)		EXPENSE		$8.66	$15.26	$14.65	$13.37	$13.10	$11.63	$10.91	$10.51	$10.04	$10.62	$10.08	$10.10	$10.30	$10.07	$10.66	$10.13	$10.04	$10.31	$10.08	$10.67
EARNINGS BEFORE INTEREST & TAXES (EBIT)					$31,887	$12,634	$15,642	$18,417	$20,992	$23,368	$25,571	$27,602	$27,935	$27,941	$27,935	$27,941	$27,935	$27,941	$27,935	$27,941	$27,935	$27,941	$27,935	$27,941
DEBT SERVICE:														10 YR					15 YR					20 YR
	TOTAL PAYMENT				$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640	$22,640
	INTEREST PAYMENT				$11,714	$11,301	$10,872	$10,427	$9,965	$9,485	$8,988	$8,471	$7,935	$7,379	$6,802	$6,203	$5,581	$4,936	$4,266	$3,571	$2,850	$2,101	$1,324	$518
	PRINCIPAL PAYMENTS				$10,926	$11,339	$11,768	$12,213	$12,675	$13,155	$13,652	$14,169	$14,705	$15,261	$15,838	$16,437	$17,059	$17,704	$18,374	$19,069	$19,790	$20,539	$21,316	$22,122
TAX BASIS					$20,173	$1,333	$4,770	$7,990	$11,028	$13,883	$16,584	$19,131	$20,000	$20,562	$21,134	$21,738	$22,354	$23,005	$23,669	$24,370	$25,086	$25,840	$26,611	$27,423
INCOME TAXES																								
	US		38.90%		$7,847	$519	$1,856	$3,108	$4,290	$5,400	$6,451	$7,442	$7,780	$7,999	$8,221	$8,456	$8,696	$8,949	$9,207	$9,480	$9,758	$10,052	$10,352	$10,668
	GROSS RECIEPTS		0.00%		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CASH BASIS:																								
	NET OPERATING INCOME (NOI)				$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778
				NPV																				
	NET BEFORE TAX CASHFLOW			$486,186	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778	$34,778
				NPV																				
	LESS TAXES			($107,836)	($7,847)	($519)	($1,856)	($3,108)	($4,290)	($5,400)	($6,451)	($7,442)	($7,780)	($7,999)	($8,221)	($8,456)	($8,696)	($8,949)	($9,207)	($9,480)	($9,758)	($10,052)	($10,352)	($10,668)
	NET AFTER TAX CASH			($378,432)	$26,930	$34,259	$32,922	$31,670	$30,488	$29,378	$28,327	$27,336	$26,998	$26,779	$26,557	$26,322	$26,082	$25,829	$25,570	$25,298	$25,020	$24,726	$24,426	$24,110
			NPV	($82)																				
			IRR	6.75%																				
	DEBT SERVICE COVERAGE			AVERAGE																				
		AFTER TAX		2.21	2.189512038	2.51	2.45	2.40	2.35	2.30	2.25	2.21	2.19	2.18	2.17	2.16	2.15	2.14	2.13	2.12	2.11	2.09	2.08	2.06
		BEFORE TAX		2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
	EQUITY RETURN:	100%																						
		PRE-TAX			9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%	9.19%
			AVG	ROIC	11.18%																			
		POST-TAX			7.12%	9.05%	8.70%	8.37%	8.06%	7.76%	7.49%	7.22%	7.13%	7.08%	7.02%	6.96%	6.89%	6.83%	6.76%	6.68%	6.61%	6.53%	6.45%	6.37%
			AVG	ROIC	8.13%																			
HDR				ROA	4.01%	5.26%	5.03%	4.82%	4.62%	4.43%	4.26%	4.10%	4.05%	4.01%	3.98%	3.95%	3.91%	3.87%	3.83%	3.79%	3.75%	3.71%	3.66%	3.61%
LG&E - KU				20 YR - AVG	4.13%																			
PROJECT:	189895	0		40 YR - AVG	4.56%																			
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FILE:	0																							

HDR		
LG&E - KU		
PROJECT:	189895	
DATE:	2/22/2013 9:50	
FILE:		SHEET 1

PLANT DESIGN:	2x1 H - 760		
PLANT GROSS CAPACITY	NEW & CLEAN	857,282	KW
NET CONTRACT DEMAND		813,770	KW
HEAT RATE - GROSS HHV		6,372	BTU/KWH
HEAT RATE - NET HHV		6661	BTU/KWH

CAPITAL COST CATEGORIES:		($1,000)	
HARD COSTS:			
	EPC PLANT		$571,524
SOFT COSTS:			
	TOTAL OWNER INDIRECTS		$70,725
	OWNER CONTINGENCY		$57,152
	LTSA INITIATION		$3,459
	SUB-TOTAL	18.69%	$131,336
TOTAL PROJECT COST			$702,860
INSTALLED POWER PLANT COST ($/KW)			$864

FINANCE STRUCTURE:					
DEBT			AVG DCR	2.21	
	PERCENT		$320,996	46%	
	RATE			3.73%	
	TERM	20 YR		80	
	PAYMENT - QUARTER			$5,711	
EQUITY					
	PERCENT		$381,864	54%	
	POST-TAX RETURN		(TARGET)	9.17%	
	EQUITY PAYMENT			$35,017	GOAL SEEK IRR=7.77% UNLEVERED
			IRR	6.75%	
			NPV	($97)	

	DEPRECIATION	NEW PLANT - UTILITY	20 YR MACRS
	AMORTIZATION		30 YRS
	DISCOUNT RATE		6.75%

PRO FORMA ANALYSIS:

YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ESCALATORS:																								
	PARTS				2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.				0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:																								
	FUEL																							
	NATURAL GAS	($/MMBTU)		$11.70	$4.96	$5.31	$5.66	$6.06	$6.53	$6.91	$7.22	$7.59	$7.93	$8.32	$8.62	$8.99	$9.38	$9.80	$10.28	$10.68	$11.46	$12.23	$12.84	$13.48
	NATURAL GAS ANNUAL DEMAND CHARGE			($1,000)	$19,187	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00	$19,187.00
0	PRICING OPTIONS	MARGINAL																						
$18.07	POWER	CAPITAL RECOVERY		($/MWH)	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07	$18.07
		FIXED CAPACITY-DB		($/KW-MO)	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34
		FIXED CAPACITY-EQ		($/KW-MO)	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59
$12.03		OP COST		($/MWH)	$8.59	$8.89	$9.42	$9.50	$10.30	$10.07	$10.36	$10.96	$10.88	$11.81	$11.49	$11.82	$12.37	$12.43	$13.53	$13.20	$13.58	$14.45	$14.55	$15.87
$66.45	30 YR - LEVELIZED	FUEL COST POWER		($/MWH)	$38.13	$40.49	$43.01	$45.59	$48.78	$51.04	$53.18	$55.88	$57.56	$60.55	$62.34	$64.89	$67.18	$69.92	$73.55	$75.99	$80.57	$85.90	$89.97	$94.68
	$96.55	TOTAL COST		($/MWH)	$64.79	$67.45	$70.50	$73.16	$77.15	$79.18	$81.62	$84.91	$86.51	$90.43	$91.90	$94.78	$97.62	$100.41	$105.15	$107.26	$112.22	$118.42	$122.59	$128.61
	$30.10	TOLLED COST		($/MWH)	$26.66	$26.96	$27.49	$27.57	$28.37	$28.14	$28.43	$29.03	$28.95	$29.88	$29.56	$29.89	$30.44	$30.50	$31.60	$31.27	$31.65	$32.52	$32.62	$33.94
PRODUCTION DATA:				AVERAGE																				
	ELECTRIC ENERGY	(MWH)		3,201,887	3276866	3262546	3170042	3242899	3089561	3254221	3245230	3152834	3262546	3085461	3250558	3242899	3180431	3254221	3073477	3233907	3262546	3176210	3250558	3071269
	TOTAL ELECTRIC	(MWH)		3,201,887	3276866	3262546	3170042	3242899	3089561	3254221	3245230	3152834	3262546	3085461	3250558	3242899	3180431	3254221	3073477	3233907	3262546	3176210	3250558	3071269
	FCP FUEL	(MMBTU)		20,928,715	21320215	21263546	20700429	21232128	20140196	21258740	21247391	20682381	21263546	20148119	21282276	21273196	20732555	21258740	20122877	21214213	21263546	20740710	21282276	20147317
	TOTAL	(MMBTU)		20,928,715	21320215	21263546	20700429	21232128	20140196	21258740	21247391	20682381	21263546	20148119	21282276	21273196	20732555	21258740	20122877	21214213	21263546	20740710	21282276	20147317
	AVG HEAT RATE	(BTU/KWH)			6506	6517	6530	6547	6519	6533	6547	6560	6517	6530	6547	6560	6519	6533	6547	6560	6517	6530	6547	6560
	AVG OUTPUT	(KW)			374071	372437	361877	370194	352690	371486	370460	359913	372437	352222	371068	370194	363063	371486	350853	369167	372437	362581	371068	350601
	CAPACITY FACTOR	(%)	FIRM	44.92%	45.97%	45.77%	44.47%	45.49%	43.34%	45.65%	45.52%	44.23%	45.77%	43.28%	45.60%	45.49%	44.61%	45.65%	43.11%	45.37%	45.77%	44.56%	45.60%	43.08%
	AMMONIA	(TON)			891	889	866	888	842	889	888	865	889	842	890	889	867	889	841	887	889	867	890	842
	MAKEUP WATER	(K-GALLONS)			40490	40313	39170	40070	38176	40210	40099	38957	40313	38125	40165	40070	39298	40210	37977	39959	40313	39246	40165	37950
	TOWER MAKEUP	(K-GALLONS)			238	237	230	235	224	236	235	229	237	224	236	235	231	236	223	235	237	230	236	223
	WASTE WATER	(K-GALLONS)			171121	170373	165543	169347	161340	169939	169469	164644	170373	161126	169747	169347	166085	169939	160500	168878	170373	165865	169747	160385
	NOx	(TON)			448	447	435	446	423	446	446	434	447	423	447	447	435	446	423	445	447	436	447	423
	SOx	(TON)			9	9	8	8	8	9	8	8	9	8	9	9	8	9	8	8	9	8	9	8

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REVENUE:		($1,000)																					
CAPACITY FIXED			$5.93	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862
ENERGY																							
	VARIABLE ENERGY			28144.0952	28996.505	29849.196	30798.876	31825.523	32778.799	33627.183	34557.793	35480.535	36450.317	37349.657	38335.293	39352.011	40439.247	41590.579	42686.234	44293.299	45888.454	47299.261	48734.964
	FUEL			$124,935	$132,096	$136,351	$147,854	$150,702	$166,085	$172,593	$176,166	$187,807	$186,819	$202,640	$210,433	$213,658	$227,523	$226,050	$245,755	$262,867	$272,846	$292,451	$290,773
TOTAL REVENUE			$3,935,846	$210,942	$218,955	$224,063	$236,515	$240,390	$256,726	$264,083	$268,586	$281,150	$281,132	$297,852	$306,631	$310,873	$325,824	$325,503	$346,303	$365,023	$376,597	$397,613	$397,370
PRO FORMA ANALYSIS:																							
YEAR			2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
EXPENSES:		($1,000)																					
NATURAL GAS CONSUMPTION				$105,748	$112,909	$117,164	$128,667	$131,515	$146,898	$153,406	$156,979	$168,620	$167,632	$183,453	$191,246	$194,471	$208,336	$206,863	$226,568	$243,680	$253,659	$273,264	$271,586
NATURAL GAS ANNUAL DEMAND CHARGE				$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187	$19,187
UNIT COST ($/MWH)				$38.13	$40.49	$43.01	$45.59	$48.78	$51.04	$53.18	$55.88	$57.56	$60.55	$62.34	$64.89	$67.18	$69.92	$73.55	$75.99	$80.57	$85.90	$89.97	$94.68
AMMONIA				$148	$147	$143	$147	$140	$147	$147	$143	$147	$140	$147	$147	$144	$147	$139	$147	$147	$144	$147	$140
CLARIFIED WATER				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DEMIN WATER				$190	$189	$183	$188	$179	$188	$188	$182	$189	$179	$188	$188	$184	$188	$178	$187	$189	$184	$188	$178
CHEMICAL FEED				$46	$46	$45	$46	$43	$46	$46	$45	$46	$43	$46	$46	$45	$46	$43	$46	$46	$45	$46	$43
STARTUP FUEL				$6,729	$7,204	$7,679	$8,222	$8,860	$9,375	$9,796	$10,298	$10,759	$11,288	$11,695	$12,197	$12,726	$13,296	$13,947	$14,490	$15,548	$16,593	$17,421	$18,289
WASTEWATER TREATMENT				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SPARE PARTS				$1,429	$1,463	$1,498	$1,534	$1,571	$1,609	$1,647	$1,687	$1,727	$1,769	$1,811	$1,855	$1,899	$1,945	$1,991	$2,039	$2,088	$2,138	$2,190	$2,242
VARIABLE MAINTENANCE PARTS AND LABOR				$11,319	$11,591	$11,869	$12,154	$12,446	$12,744	$13,050	$13,363	$13,684	$14,012	$14,349	$14,693	$15,046	$15,407	$15,777	$16,155	$16,543	$16,940	$17,347	$17,763
FIXED MAINTENANCE PARTS AND LABOR				$3,203	$3,279	$3,358	$3,439	$3,521	$3,606	$3,692	$3,781	$3,872	$3,965	$4,060	$4,157	$4,257	$4,359	$4,464	$4,571	$4,681	$4,793	$4,908	$5,026
FIXED O&M	7	24		$3,317	$3,346	$3,377	$3,407	$3,438	$3,468	$3,500	$3,531	$3,563	$3,595	$3,627	$3,660	$3,693	$3,726	$3,760	$3,794	$3,828	$3,862	$3,897	$3,932
MISC EXPENSES				$139	$140	$142	$143	$144	$146	$147	$148	$150	$151	$152	$154	$155	$156	$158	$159	$161	$162	$164	$165
INSURANCES				$606	$606	$606	$606	$606	$606	$606	$606	$606	$606	$606	$606	$606	$606	$606	$606	$606	$606	$606	$606
PROPERTY TAXES				$1,019	$984	$949	$914	$879	$843	$808	$773	$738	$703	$668	$633	$597	$562	$527	$492	$457	$422	$387	$351
LAND LEASE				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
			LEVELIZED																				
Fixed ($/MWH)			$2.87	2.527821628	2.5612368	2.659618	2.6236457	2.7795379	2.6639733	2.6972146	2.8036277	2.7365399	2.9231541	2.803519	2.8398389	2.92673	2.8916042	3.0956278	2.97522	2.98286	3.0995449	3.0643702	3.2820655
Variable ($/MWH)			$4.55	3.454261618	3.5526889	3.7441123	3.7478347	4.0282546	3.9162161	4.0213162	4.2385028	4.1942747	4.5414382	4.4142363	4.5308541	4.7307221	4.7344148	5.1331435	4.9955777	5.070567	5.3333973	5.3364843	5.7835602
Consumables ($/MWH)			$4.61	2.606639861	$2.77	$3.01	$3.13	$3.49	$3.49	$3.64	$3.92	$3.94	$4.35	$4.27	$4.45	$4.72	$4.80	$5.30	$5.23	$5.52	$6.01	$6.15	$6.80
			NPV																				
TOTAL OPERATING COST			$490,394	$28,144	$28,997	$29,849	$30,799	$31,826	$32,779	$33,627	$34,558	$35,481	$36,450	$37,350	$38,335	$39,352	$40,439	$41,591	$42,686	$44,293	$45,888	$47,299	$48,735
UNIT COST ($/MWH)			$12.03	$8.59	$8.89	$9.42	$9.50	$10.30	$10.07	$10.36	$10.96	$10.88	$11.81	$11.49	$11.82	$12.37	$12.43	$13.53	$13.20	$13.58	$14.45	$14.55	$15.87

NET OPERATING INCOME				$736,421	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862	$57,862
	DEPRECIATION			100%	$21,432	$41,258	$38,161	$35,303	$32,651	$30,205	$27,936	$25,844	$25,501	$25,496	$25,501	$25,496	$25,501	$25,496	$25,501	$25,496	$25,501	$25,496	$25,501	$25,496
	AMORTIZATION				$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378	$4,378
	BOOK DEPRECIATION				$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429	$23,429
	TOTAL CUMULATIVE DEP/AMORT				$23,429	$46,857	$70,286	$93,715	$117,143	$140,572	$164,001	$187,429	$210,858	$234,287	$257,715	$281,144	$304,573	$328,001	$351,430	$374,859	$398,287	$421,716	$445,145	$468,573
	NET BOOK VALUE				$679,431	$656,003	$632,574	$609,145	$585,717	$562,288	$538,859	$515,431	$492,002	$468,573	$445,145	$421,716	$398,287	$374,859	$351,430	$328,001	$304,573	$281,144	$257,715	$234,287
	TOTAL NON-CASH CHARGES				$25,810	$45,636	$42,539	$39,681	$37,029	$34,583	$32,314	$30,222	$29,879	$29,874	$29,879	$29,874	$29,879	$29,874	$29,879	$29,874	$29,879	$29,874	$29,879	$29,874
	UNIT COST ($/MWH)		EXPENSE		$7.88	$13.99	$13.42	$12.24	$11.99	$10.63	$9.96	$9.59	$9.16	$9.68	$9.19	$9.21	$9.39	$9.18	$9.72	$9.24	$9.16	$9.41	$9.19	$9.73
EARNINGS BEFORE INTEREST & TAXES (EBIT)					$32,052	$12,226	$15,324	$18,181	$20,833	$23,279	$25,548	$27,640	$27,983	$27,989	$27,983	$27,989	$27,983	$27,989	$27,983	$27,989	$27,983	$27,989	$27,983	$27,989
DEBT SERVICE:														10 YR					15 YR					20 YR
	TOTAL PAYMENT				$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845	$22,845
	INTEREST PAYMENT				$11,820	$11,403	$10,970	$10,521	$10,055	$9,571	$9,069	$8,548	$8,007	$7,446	$6,863	$6,259	$5,632	$4,981	$4,305	$3,603	$2,876	$2,120	$1,336	$523
	PRINCIPAL PAYMENTS				$11,025	$11,442	$11,875	$12,324	$12,790	$13,274	$13,776	$14,297	$14,838	$15,399	$15,982	$16,586	$17,214	$17,865	$18,540	$19,242	$19,970	$20,725	$21,509	$22,322
TAX BASIS					$20,232	$823	$4,353	$7,660	$10,778	$13,708	$16,479	$19,092	$19,976	$20,543	$21,119	$21,730	$22,351	$23,008	$23,678	$24,385	$25,107	$25,868	$26,647	$27,466
INCOME TAXES																								
	US		38.90%		$7,870	$320	$1,693	$2,980	$4,193	$5,332	$6,410	$7,427	$7,771	$7,991	$8,215	$8,453	$8,695	$8,950	$9,211	$9,486	$9,767	$10,063	$10,366	$10,684
	GROSS RECIEPTS		0.00%		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CASH BASIS:																								
	NET OPERATING INCOME (NOI)				$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017
				NPV																				
	NET BEFORE TAX CASHFLOW			$489,623	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017	$35,017
				NPV																				
	LESS TAXES			($107,856)	($7,870)	($320)	($1,693)	($2,980)	($4,193)	($5,332)	($6,410)	($7,427)	($7,771)	($7,991)	($8,215)	($8,453)	($8,695)	($8,950)	($9,211)	($9,486)	($9,767)	($10,063)	($10,366)	($10,684)
	NET AFTER TAX CASH			($381,864)	$27,147	$34,697	$33,323	$32,037	$30,824	$29,684	$28,607	$27,590	$27,246	$27,026	$26,801	$26,564	$26,322	$26,067	$25,806	$25,531	$25,250	$24,954	$24,651	$24,333
			NPV	($97)																				
			IRR	6.75%																				
	DEBT SERVICE COVERAGE			AVERAGE																				
		AFTER TAX		2.21	2.19	2.52	2.46	2.40	2.35	2.30	2.25	2.21	2.19	2.18	2.17	2.16	2.15	2.14	2.13	2.12	2.11	2.09	2.08	2.07
		BEFORE TAX		2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	EQUITY RETURN:	100%																						
		PRE-TAX			9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%	9.17%
			AVG	ROIC	11.16%																			
		POST-TAX			7.11%	9.09%	8.73%	8.39%	8.07%	7.77%	7.49%	7.23%	7.14%	7.08%	7.02%	6.96%	6.89%	6.83%	6.76%	6.69%	6.61%	6.53%	6.46%	6.37%
			AVG	ROIC	8.12%																			
HDR				ROA	4.01%	5.28%	5.05%	4.83%	4.63%	4.44%	4.27%	4.10%	4.05%	4.02%	3.98%	3.95%	3.91%	3.87%	3.83%	3.79%	3.75%	3.71%	3.66%	3.62%
LG&E - KU				20 YR - AVG	4.14%																			
PROJECT:	189895	0		40 YR - AVG	4.55%																			
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FILE:	0																							

HDR		
LG&E - KU		
PROJECT:	189895	
DATE:	2/22/2013 9:50	
FILE:		SHEET 1

PLANT DESIGN:	2x1 H - 700		
PLANT GROSS CAPACITY	NEW & CLEAN	801,706	KW
NET CONTRACT DEMAND		762,270	KW
HEAT RATE - GROSS HHV		6,275	BTU/KWH
HEAT RATE - NET HHV		6550	BTU/KWH

DEPRECIATION	NEW PLANT - UTILITY	20	YR MACRS
AMORTIZATION		30	YRS
DISCOUNT RATE		6.75%	

CAPITAL COST CATEGORIES:		($1,000)	
HARD COSTS:			
	EPC PLANT		$560,164
SOFT COSTS:			
	TOTAL OWNER INDIRECTS		$70,175
	OWNER CONTINGENCY		$56,016
	LTSA INITIATION		$3,459
	SUB-TOTAL	18.79%	$129,650
TOTAL PROJECT COST			$689,814
INSTALLED POWER PLANT COST ($/KW)			$905

FINANCE STRUCTURE:					
DEBT			AVG DCR	2.21	
	PERCENT		$315,038	46%	
	RATE			3.73%	
	TERM	20 YR		80	
	PAYMENT - QUARTER			$5,605	
EQUITY					
	PERCENT		$374,776	54%	
	POST-TAX RETURN		(TARGET)	9.18%	
	EQUITY PAYMENT			$34,386	GOAL SEEK IRR=7.77% UNLEVERED
			IRR	6.75%	
			NPV	$13	

PRO FORMA ANALYSIS:

YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ESCALATORS:																									
	PARTS				2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
	CONSUMABLE ESC.				0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
UNIT COST DATA:																									
	FUEL																								
	NATURAL GAS	($/MMBTU)		$11.70	$4.96	$5.31	$5.66	$6.06	$6.53	$6.91	$7.22	$7.59	$7.93	$8.32	$8.62	$8.99	$9.38	$9.80	$10.28	$10.68	$11.46	$12.23	$12.84	$13.48
	NATURAL GAS ANNUAL DEMAND CHARGE			($1,000)	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672
0	PRICING OPTIONS	MARGINAL																							
$17.96	POWER	CAPITAL RECOVERY		($/MWH)	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96	$17.96
		FIXED CAPACITY-DB		($/KW-MO)	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45	$2.45
		FIXED CAPACITY-EQ		($/KW-MO)	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76	$3.76
$11.79		OP COST		($/MWH)	$8.47	$8.76	$9.27	$9.35	$10.13	$9.90	$10.18	$10.76	$10.68	$11.59	$11.27	$11.59	$12.13	$12.18	$13.26	$12.93	$13.28	$14.13	$14.22	$15.50
$66.17	30 YR - LEVELIZED	FUEL COST POWER		($/MWH)	$37.80	$40.16	$42.68	$45.27	$48.44	$50.73	$52.88	$55.57	$57.27	$60.24	$62.06	$64.61	$66.90	$69.65	$73.26	$75.73	$80.33	$85.66	$89.74	$94.43
	$95.92	TOTAL COST		($/MWH)	$64.23	$66.88	$69.91	$72.58	$76.54	$78.59	$81.02	$84.29	$85.91	$89.79	$91.29	$94.16	$96.99	$99.79	$104.48	$106.62	$111.57	$117.74	$121.92	$127.89
	$29.75	TOLLED COST		($/MWH)	$26.43	$26.72	$27.23	$27.31	$28.09	$27.86	$28.14	$28.73	$28.64	$29.55	$29.23	$29.55	$30.09	$30.14	$31.22	$30.89	$31.25	$32.09	$32.18	$33.46
PRODUCTION DATA:				AVERAGE																					
	ELECTRIC ENERGY	(MWH)		3,162,867	3236932	3222787	3131409	3203379	3051910	3214563	3205681	3114412	3222787	3047860	3210945	3203379	3141672	3214563	3036021	3194497	3222787	3137503	3210945	3033840
	TOTAL ELECTRIC	(MWH)		3,162,867	3236932	3222787	3131409	3203379	3051910	3214563	3205681	3114412	3222787	3047860	3210945	3203379	3141672	3214563	3036021	3194497	3222787	3137503	3210945	3033840
	FCP FUEL	(MMBTU)		20,715,663	21103178	21047086	20489701	21015988	19935171	21042329	21031095	20471837	21047086	19943014	21065625	21056638	20521500	21042329	19918029	20998255	21047086	20529573	21065625	19942220
	TOTAL	(MMBTU)		20,715,663	21103178	21047086	20489701	21015988	19935171	21042329	21031095	20471837	21047086	19943014	21065625	21056638	20521500	21042329	19918029	20998255	21047086	20529573	21065625	19942220
	AVG HEAT RATE	(BTU/KWH)			6519	6531	6543	6561	6532	6546	6561	6573	6531	6543	6561	6573	6532	6546	6561	6573	6531	6543	6561	6573
	AVG OUTPUT	(KW)			369513	367898	357467	365682	348392	366959	365945	355526	367898	347929	366546	365682	358638	366959	346578	364669	367898	358162	366546	346329
	CAPACITY FACTOR	(%)	FIRM	47.37%	48.48%	48.26%	46.90%	47.97%	45.70%	48.14%	48.01%	46.64%	48.26%	45.64%	48.09%	47.97%	47.05%	48.14%	45.47%	47.84%	48.26%	46.99%	48.09%	45.43%
	AMMONIA	(TON)			882	880	857	879	834	880	879	856	880	834	881	880	858	880	833	878	880	858	881	834
	MAKEUP WATER	(K-GALLONS)			34488	34337	33364	34131	32517	34250	34155	33183	34337	32474	34211	34131	33473	34250	32347	34036	34337	33429	34211	32324
	TOWER MAKEUP	(K-GALLONS)			251	250	243	248	236	249	248	241	250	236	249	248	243	249	235	247	250	243	249	235
	WASTE WATER	(K-GALLONS)			153971	153298	148952	152375	145170	152907	152485	148143	153298	144978	152735	152375	149440	152907	144415	151953	153298	149242	152735	144311
	NOx	(TON)			443	442	430	441	419	442	442	430	442	419	442	442	431	442	418	441	442	431	442	419
	SOx	(TON)			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

HDR																								
LG&E - KU																								
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FILE:	0	SHEET 2																						
REVENUE:		($1,000)																						
	CAPACITY FIXED			$6.21	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807
	ENERGY																							
		VARIABLE ENERGY			27412.13933	28224.665	29038.2974	29941.6004	30916.9538	31824.7883	32637.1237	33526.122	34408.1749	35335.0071	36197.0281	37139.7274	38111.973	39149.7906	40248.0826	41295.2571	42814.6513	44324.3198	45664.8214	47029.79
		FUEL			$122,344	$129,432	$133,644	$145,029	$147,849	$163,075	$169,517	$173,054	$184,576	$183,598	$199,258	$206,972	$210,164	$223,887	$222,430	$241,934	$258,872	$268,749	$288,155	$286,494
	TOTAL REVENUE			$3,862,489	$206,563	$214,464	$219,489	$231,778	$235,573	$251,707	$258,961	$263,387	$275,791	$275,740	$292,262	$300,918	$305,083	$319,844	$319,485	$340,036	$358,494	$369,880	$390,627	$390,330
PRO FORMA ANALYSIS:																								
YEAR				2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
EXPENSES:		($1,000)																						
	NATURAL GAS CONSUMPTION				$104,672	$111,760	$115,972	$127,357	$130,177	$145,402	$151,845	$155,381	$166,903	$165,926	$181,586	$189,299	$192,492	$206,215	$204,757	$224,261	$241,200	$251,077	$270,483	$268,821
	NATURAL GAS ANNUAL DEMAND CHARGE				$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672	$17,672
	UNIT COST ($/MWH)				$37.80	$40.16	$42.68	$45.27	$48.44	$50.73	$52.88	$55.57	$57.27	$60.24	$62.06	$64.61	$66.90	$69.65	$73.26	$75.73	$80.33	$85.66	$89.74	$94.43
	AMMONIA				$146	$146	$142	$146	$138	$146	$146	$142	$146	$138	$146	$146	$142	$146	$138	$145	$146	$142	$146	$138
	CLARIFIED WATER				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	DEMIN WATER				$162	$161	$156	$160	$152	$160	$160	$155	$161	$152	$160	$160	$157	$160	$151	$159	$161	$157	$160	$151
	CHEMICAL FEED				$38	$38	$37	$38	$36	$38	$38	$37	$38	$36	$38	$38	$37	$38	$36	$38	$38	$37	$38	$36
	STARTUP FUEL				$6,198	$6,636	$7,073	$7,573	$8,160	$8,635	$9,022	$9,485	$9,910	$10,397	$10,772	$11,234	$11,722	$12,247	$12,846	$13,346	$14,321	$15,283	$16,045	$16,845
	WASTEWATER TREATMENT				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	SPARE PARTS				$1,400	$1,434	$1,468	$1,504	$1,540	$1,577	$1,615	$1,653	$1,693	$1,734	$1,775	$1,818	$1,861	$1,906	$1,952	$1,999	$2,047	$2,096	$2,146	$2,198
	VARIABLE MAINTENANCE PARTS AND LABOR				$11,243	$11,513	$11,789	$12,072	$12,362	$12,659	$12,962	$13,274	$13,592	$13,918	$14,252	$14,594	$14,945	$15,303	$15,671	$16,047	$16,432	$16,826	$17,230	$17,644
	FIXED MAINTENANCE PARTS AND LABOR				$3,175	$3,251	$3,329	$3,409	$3,490	$3,574	$3,660	$3,748	$3,838	$3,930	$4,024	$4,121	$4,220	$4,321	$4,425	$4,531	$4,640	$4,751	$4,865	$4,982
	FIXED O&M	7	24		$3,317	$3,346	$3,377	$3,407	$3,438	$3,468	$3,500	$3,531	$3,563	$3,595	$3,627	$3,660	$3,693	$3,726	$3,760	$3,794	$3,828	$3,862	$3,897	$3,932
	MISC EXPENSES				$139	$140	$142	$143	$144	$146	$147	$148	$150	$151	$152	$154	$155	$156	$158	$159	$161	$162	$164	$165
	INSURANCES				$594	$594	$594	$594	$594	$594	$594	$594	$594	$594	$594	$594	$594	$594	$594	$594	$594	$594	$594	$594
	PROPERTY TAXES				$1,000	$966	$931	$897	$862	$828	$793	$759	$724	$690	$655	$621	$586	$552	$517	$483	$448	$414	$379	$345
	LAND LEASE				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
				LEVELIZED																				
	Fixed ($/MWH)			$2.88	2.540792747	2.5745341	2.67358359	2.63757455	2.79445219	2.67841533	2.71198322	2.81912748	2.75181013	2.93961288	2.81944156	2.85610314	2.94362754	2.90842899	3.11377479	2.99278684	3.00059394	3.11809506	3.0828266	3.301954
	Variable ($/MWH)			$4.57	$3.47	3.5723703	3.76485424	3.76859719	4.05057056	3.93791144	4.04359375	4.26198353	4.21751043	4.56659722	4.43869061	4.55595445	4.75692964	4.76064282	5.16158046	5.02325258	5.09865726	5.36294365	5.36604768	5.8156
	Consumables ($/MWH)			$4.33	2.454365126	$2.61	$2.83	$2.94	$3.29	$3.28	$3.43	$3.68	$3.71	$4.09	$4.01	$4.18	$4.43	$4.51	$4.98	$4.91	$5.19	$5.65	$5.77	$6.38
				NPV																				
	TOTAL OPERATING COST			$474,836	$27,412	$28,225	$29,038	$29,942	$30,917	$31,825	$32,637	$33,526	$34,408	$35,335	$36,197	$37,140	$38,112	$39,150	$40,248	$41,295	$42,815	$44,324	$45,665	$47,030
	UNIT COST ($/MWH)			$11.79	$8.47	$8.76	$9.27	$9.35	$10.13	$9.90	$10.18	$10.76	$10.68	$11.59	$11.27	$11.59	$12.13	$12.18	$13.26	$12.93	$13.28	$14.13	$14.22	$15.50

NET OPERATING INCOME				$722,990	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807	$56,807
	DEPRECIATION			100%	$21,006	$40,438	$37,402	$34,601	$32,002	$29,605	$27,381	$25,331	$24,994	$24,989	$24,994	$24,989	$24,994	$24,989	$24,994	$24,989	$24,994	$24,989	$24,994	$24,989
	AMORTIZATION				$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322	$4,322
	BOOK DEPRECIATION				$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994	$22,994
	TOTAL CUMULATIVE DEP/AMORT				$22,994	$45,988	$68,981	$91,975	$114,969	$137,963	$160,956	$183,950	$206,944	$229,938	$252,932	$275,925	$298,919	$321,913	$344,907	$367,901	$390,894	$413,888	$436,882	$459,876
	NET BOOK VALUE				$666,820	$643,826	$620,832	$597,838	$574,845	$551,851	$528,857	$505,863	$482,869	$459,876	$436,882	$413,888	$390,894	$367,901	$344,907	$321,913	$298,919	$275,925	$252,932	$229,938
	TOTAL NON-CASH CHARGES				$25,328	$44,760	$41,724	$38,923	$36,324	$33,926	$31,702	$29,652	$29,316	$29,311	$29,316	$29,311	$29,316	$29,311	$29,316	$29,311	$29,316	$29,311	$29,316	$29,311
	UNIT COST ($/MWH)		EXPENSE		$7.82	$13.89	$13.32	$12.15	$11.90	$10.55	$9.89	$9.52	$9.10	$9.62	$9.13	$9.15	$9.33	$9.12	$9.66	$9.18	$9.10	$9.34	$9.13	$9.66
EARNINGS BEFORE INTEREST & TAXES (EBIT)					$31,479	$12,047	$15,083	$17,884	$20,483	$22,881	$25,104	$27,155	$27,491	$27,496	$27,491	$27,496	$27,491	$27,496	$27,491	$27,496	$27,491	$27,496	$27,491	$27,496
DEBT SERVICE:														10 YR					15 YR					20 YR
	TOTAL PAYMENT				$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421	$22,421
	INTEREST PAYMENT				$11,601	$11,191	$10,767	$10,326	$9,868	$9,394	$8,901	$8,389	$7,859	$7,308	$6,736	$6,143	$5,527	$4,888	$4,225	$3,537	$2,822	$2,081	$1,312	$513
	PRINCIPAL PAYMENTS				$10,820	$11,230	$11,655	$12,095	$12,553	$13,028	$13,520	$14,032	$14,563	$15,113	$15,685	$16,278	$16,894	$17,533	$18,196	$18,885	$19,599	$20,340	$21,110	$21,908
TAX BASIS					$19,878	$856	$4,316	$7,558	$10,615	$13,487	$16,204	$18,765	$19,632	$20,189	$20,755	$21,354	$21,964	$22,608	$23,266	$23,960	$24,668	$25,415	$26,179	$26,983
INCOME TAXES																								
	US		38.90%		$7,733	$333	$1,679	$2,940	$4,129	$5,246	$6,303	$7,300	$7,637	$7,853	$8,074	$8,307	$8,544	$8,795	$9,050	$9,320	$9,596	$9,887	$10,184	$10,496
	GROSS RECIEPTS		0.00%		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CASH BASIS:																								
	NET OPERATING INCOME (NOI)				$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386
				NPV																				
	NET BEFORE TAX CASHFLOW			$480,773	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386	$34,386
				NPV																				
	LESS TAXES			($105,985)	($7,733)	($333)	($1,679)	($2,940)	($4,129)	($5,246)	($6,303)	($7,300)	($7,637)	($7,853)	($8,074)	($8,307)	($8,544)	($8,795)	($9,050)	($9,320)	($9,596)	($9,887)	($10,184)	($10,496)
	NET AFTER TAX CASH			($374,776)	$26,653	$34,053	$32,707	$31,446	$30,257	$29,139	$28,082	$27,086	$26,749	$26,532	$26,312	$26,079	$25,842	$25,591	$25,335	$25,065	$24,790	$24,499	$24,202	$23,889
			NPV	$13																				
			IRR	6.75%																				
	DEBT SERVICE COVERAGE			AVERAGE																				
		AFTER TAX		2.21	2.19	2.52	2.46	2.40	2.35	2.30	2.25	2.21	2.19	2.18	2.17	2.16	2.15	2.14	2.13	2.12	2.11	2.09	2.08	2.07
		BEFORE TAX		2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	EQUITY RETURN:	100%																						
		PRE-TAX			9.18%	9.18%	9.17%	9.17%	9.17%	9.17%	9.18%	9.18%	9.18%	9.17%	9.17%	9.17%	9.18%	9.18%	9.18%	9.17%	9.18%	9.18%	9.18%	9.18%
			AVG	ROIC	11.17%																			
		POST-TAX			7.11%	9.09%	8.73%	8.39%	8.07%	7.78%	7.49%	7.23%	7.14%	7.08%	7.02%	6.96%	6.90%	6.83%	6.76%	6.69%	6.61%	6.54%	6.46%	6.37%
			AVG	ROIC	8.12%																			
HDR				ROA	4.01%	5.28%	5.05%	4.83%	4.63%	4.44%	4.27%	4.10%	4.05%	4.02%	3.98%	3.95%	3.91%	3.87%	3.84%	3.79%	3.75%	3.71%	3.66%	3.62%
LG&E - KU				20 YR - AVG	4.14%																			
PROJECT:	189895	0		40 YR - AVG	4.56%																			
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APPENDIX H

NGCC DESIGN BASIS DOCUMENT

NGCC Design Basis Document

New Generation Options
Feasibility Study
EW Brown Station

February 22, 2013
HDR|C&B Project No. 189895
Revision 1
Final Issue

COMBINED CYCLE DESIGN BASIS DOCUMENT
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1 INTRODUCTION AND SUMMARY

This Design Basis Document has been developed for establishing design criteria for the major equipment procurement and potential specification development of a NGCC Facility proposed at EW Brown Station, using natural gas-fired combined cycle technology and implementing either a 2 x 1 or 1 x 1 power block arrangement. The potential NGCC Facility will either utilize H class, G class (1 x 1 only) or F class combined cycle technology. The document is intended to provide a plant cycle, equipment, and arrangement concept which will be utilized to develop the EPC Technical Specifications upon final plant size/technology and site selection.

This Design Basis Document has been organized into sections which define the overall plant design basis, including the cycle design, sizing criteria for major cycle equipment, levels of redundancy and plant arrangement concepts. The definition of the overall plant design basis is then followed by sections devoted to each of the major engineering disciplines of Mechanical, Electrical, Instrumentation & Controls and Civil/Structural. The individual discipline sections present the design standards and material/components selection criteria for various features of the plant.

1.1 COORDINATION WITH EQUIPMENT AND EPC TECHNICAL SPECIFICATIONS

This Design Basis Document is intended to be used by the project team in the preparation of the EPC Technical Specifications updated for the specific plant size and site selected for the project. It is the intent of this document to serve as the standard for the project based design criteria, sizing and scoping of the project. From the guidance provided in this document, appropriate sections of the EPC specifications can be supplied with details on equipment and system sizing and features.

The project capital cost estimates and schedule are based on a fully wrapped EPC Contract executed under a lump sum turnkey contract.

2 DESIGN BASIS

This Section defines the combined cycle plant configuration, the design of the thermal cycle selected for the plant, the sizing and margining of equipment, the philosophy of plant redundancy, site and plant arrangement criteria, emissions limitations, and site specific design criteria which will be applied to the plant.

2.1 OVERALL PLANT CONFIGURATION

The power block will be either a 1 x 1 or 2 x 1 configuration with one or two combustion turbine generators (CTGs), each CTG exhausting to a horizontal heat recovery steam generators (HRSGs), each equipped with supplementary duct firing, and one steam turbine generator (STG). The gross output of the power block at annual average ambient conditions will be maintained with duct firing to achieve the same gross output on a hot day. The plant will be operated as a cycling plant with up to 300 starts per year. The plant will be designed for a 30 year life.

Fuel gas performance heating and inlet air evaporative cooling for the combustion turbine also will be provided for increased plant efficiency. HRSG duct firing will be employed for generation of excess steam to enhance output of the steam turbine generator as needed. Combustion turbine inlet air evaporative cooling will be employed for enhanced combustion turbine performance when ambient conditions are appropriate.

The HRSGs will be triple pressure, triple drum units with selective catalytic reduction (SCR) for CTG producing greater than 12 ppm NOx and a CO catalyst. Plant cooling will be provided using a wet type mechanical draft cooling tower. The STG will be a reheat, fully condensing type with down-flow or axial exhaust. The condenser will be provided with two 100 percent vacuum pumps to provide the vacuum source. In addition, the condenser will be the only means for dearating the condensate/feedwater in the steam cycle.

Two 100 percent condensate pumps will be provided for condensate extraction from the condenser hotwell, two 60 percent circulating water pumps will be provided for cooling water supply to the condenser, and one 100 percent HRSG boiler feed pumps (BFP) will be provided for each HRSG with a warehouse spare rotating element.

The plant will be designed as an outdoor plant with the steam turbine located indoors. Each CTG will be located outdoors within enclosures provided by the CTG manufacturer.

Each CTG and the STG will have a dedicated main generator step-up transformer with a nominal output voltage of 345 kV. In addition two auxiliary transformers fed from a tap on the isolated phase bus are provided. Each auxiliary transformer will have sufficient capacity to operate the entire NGCC facility.

A demineralized water system will provide the water quality required by the HRSGs. The demineralized water system will contain water storage tanks and forwarding pumps. The demineralized water treatment system will be designed to meet environmental discharge regulations.

The natural gas fuel supply at the terminal point will be delivered by the gas pipeline supplier at pressure sufficient to meet manufacturer's gas pressure requirements. Natural gas filters, scrubbers and pressure reducing stations will be provided as required to meet the pressure and cleanliness requirements of the CTG manufacturer. Pressure reduction to meet the natural gas pressure requirements of the HRSG duct burners will be provided with the HRSGs.

2.2 THERMAL CYCLE DESIGN

The cycle design illustrates the flow and thermodynamic properties of the working fluid throughout the cycle and is documented through a series of heat balances that have been and will be generated for the project. The principal components defined by the cycle design are the HRSG(s), including duct firing requirements, the CTG(s), the STG, the heat rejection system and the associated pumps and piping networks.

The STG vendor will size the turbine exhaust annulus area (last stage blade length and material) to minimize exhaust losses based on relevant experience.

2.3 MAJOR EQUIPMENT RATINGS AND DESIGN MARGINS

This discussion provides a summary of the steam generator and turbine generator design margins/sizing criteria such that the power block can maintain its net electrical output on a high temperature day (1 percent incidence) over a 30 year life. A tabularized summary of equipment margins is included in Table 2-1 at the end of this section.

To maintain the minimum net output of the facility over the long term, the following conditions are imposed:

- An auxiliary load target of 2.0 to 2.56 percent of the gross plant output (final number to be determined during detailed plant design).
- The net plant heat rate is based on optimizing the design of the plant to provide the optimum heat rate to achieve net plant output at average ambient conditions.

An ASME PTC 46 overall plant performance test will be conducted to demonstrate compliance with this minimum net plant output and the base net plant heat rate guarantees. In addition, an ASME PTC 6 steam turbine test will be conducted to demonstrate guaranteed steam turbine generator performance. These performance tests are required to be performed while the plant is in compliance with permitted emissions.

2.3.1 Major Equipment Design Margins

Major equipment design margins are included in the table below.

Table 2-1 Major Equipment Design Margins

Equipment	Design Margins
Cooling Tower	Circulating Water Range: 20°F Cooling Tower Approach to Wet-bulb: 11°F
Condenser	Condenser Terminal Temperature Difference: 7°F

Table 2-1 Major Equipment Design Margins	
Equipment	**Design Margins**
Condensate Pumps	Flow: 10%, Head: 10%
Feedwater Pumps	Flow: 10%, Head: 10&
Circulating Water Pumps	Flow: 5%, Head: 5%

2.3.2 Major Equipment Redundancy

It is anticipated that the NGCC facility will be operated as a cycling plant at maximum continuous rating. Cyclic operation with overnight or longer shutdown is anticipated. The design and redundancy of major auxiliary equipment will prevent complete loss of any main equipment item in event of the failure of the auxiliary equipment.

Major auxiliary equipment redundancy for the NGCC facility is intended to be specified as listed below:

Table 2-2 Major Auxiliary Equipment Redundancy (Per Unit)	
Equipment	**Specification**
Condenser	1 x 100%
Condensate Pumps	2 x 100%
Boiler Feed Pumps	1 x 100% (per HRSG)
Condenser Vacuum Pumps	2 x 100%
Circulating Water Pumps	2 x 60%
Cooling Tower	1 x 100% (with one spare cell)
Closed Cooling Water Pumps	2 x 100%
Auxiliary Cooling Water Pump	1 x 100%

2.4 FUEL SPECIFICATIONS

2.4.1 Natural Gas

For development purposes, the natural gas to be supplied to EW Brown NGCC Facility is assumed to have the following characteristics. These gas properties will be amended to the actual values Texas Eastern tariff during detailed design:

Higher Heating Value	22,701 Btu/lb
Lower Heating Value	20,452 Btu/lb
Rate of Heat Values	1.110

2.5 SITE AND PLANT ARRANGEMENT

2.5.1 Site Arrangement

The site for the plant must be arranged around some key considerations important to plant operation and maintenance as follows.

- Site location selected based on lowest development costs for property, common facilities interconnection, excavation/fill and transmission line relocation.
- The NGCC site layout takes into consideration retirement of E. W. Brown Unit 1 and Unit 2.
- The cooling tower has been located such that a future drifting plume does not impact the O&M function of the existing plant, NGCC facility, or switchyard.
- Provisions for rail delivery and heavy haul access to the construction laydown area have been considered for ease of equipment delivery storage.
- Road access to major pieces of equipment and the parking lot has been provided including a main paved drive to the turbine building for trailer access when removing turbine parts.
- Ample parking space for facility staff and visitors.
- Ample space for construction laydown and parking areas.
- Space and equipment arrangement provisions for future expansion of NGCC facility have been considered.

2.5.2 Plant Arrangement

Several key factors govern a well arranged power block minimizing building volume while at the same time allowing for equipment access and removal. Key requirements are as follows:

- As much as possible, there will be separation of the plant electrical functions from the major mechanical equipment and steam piping. This requirement drives the control and key electric functions (switchgear, MCCs and cable spreading) to the generator side of the plant with main steam, hot reheat, and cold reheat piping on the turbine front standard side.
- Designated space will be reserved (with physical provisions for removal) for condenser tube replacement and condenser water box removal. O&M activities will not be impeded by structural steel, piping, conduit, cable trays, etc.
- All equipment coolers will have space reserved for removal of coolers/tubes.
- The turbine room crane will be capable of complying with the turbine generator supplier requirements for maintenance including required hook height and requirements for a main hook for major turbine components and a second light duty crane hook for small components. In general, the turbine room crane will be capable of lifting the generator rotor in its removed location outside the generator. The second hook will be capable of overturning the heaviest shell component.

- The condensate pumps will be removable through a hatch in the operating floor with no interfering piping or electrical cable trays.
- Maintenance access space will be made available to perform maintenance activities near the physical location of major equipment including Condensate Pumps, Boiler Feed Pumps, and other major equipment as may be required during equipment laydown reviews.

2.6 SITE-SPECIFIC DESIGN CRITERIA

2.6.1 Temperatures

Basis for plant performance:

Design dry bulb, °F	89.0
Design wet bulb, °F (Max. 1% incidence temperature per ASHRAE)	79.3

Note that hot day design basis conditions define the standard for performance but are rarely available to be directly tested during performance testing, thus test temperature conditions must be corrected to design day conditions with correction factors and correction curves being used to make the adjustments. Objective agreement on these factors is often a critical point in determining representative test procedures which adequately characterize the true levels of performance for the plant.

Basis for design of HVAC equipment:

Climatic conditions for the design of HVAC systems shall be based on Lexington, Kentucky. The climatic data set from the 2009 ASHRAE Fundamentals Handbook shall be used for design calculations. For heating design the 99.6% parameters shall be used. For ventilation design the 0.4% design parameters shall be used. For air conditioning design the 1.0% parameters shall be used.

2.6.2 Elevation

Site elevation, ft above MSL	875 feet

2.6.3 Basic Structural Design Criteria

The building code to be used for the project is the Kentucky Building Code (KBC) 2007.

Snow loads

Snow design shall be in accordance with KBC 2007, utilizing the inputs below:

- Minimum ground snow load = 15 lb/ft2

Wind loads

Wind design shall be in accordance with KBC 2007 utilizing the inputs below:

- 3 second gust = 90 miles/hr
- Exposure category = B

Seismic Loads

Seismic design shall be in accordance with KBC 2007 utilizing the inputs below:

- Occupancy category = III

- Site (soil) class = D
- Seismic design category = C or D, contractor to verify exact location & category with building official

Frost Penetration

Underground fire water piping shall have a minimum depth of 30 inches to the top of the pipe. All other underground piping and foundations shall have a minimum depth of 36 inches.

2.6.4 Precipitation

Point precipitation frequency estimates from NOAA Atlas 14 for Louisville, Kentucky:

Annual average, inches	44.54
10 year, 24-hour, inches	6.90
25 year, 24-hour, inches	7.86
100 year, 24-hour, inches	9.34

2.6.5 Storm Water

- Design storm return period for collection system, years 25

2.6.6 Water Source

Raw water supply will be provided from Lake Herrington utilizing the existing EW Brown Unit 1 and Unit 2 intake structure and potable water will be provided by extension of the site municipal water main.

A raw water analysis is not included within the Feasibility Study. The study has been performed based on assumed surface water estimated to be representative of typical river water with TSS 150 or less. The Raw Water Specification is included in the table below.

Raw Water Specification

Parameter	Units	MIN	MAX	Design Basis
Ammonia	mg/L as N	N/A	N/A	< 0.25
Ammonium	mg/L	N/A	N/A	< 0.32
Barium	mg/L	0.045	0.085	0.085
Conductivity	µmhos/cm	196	554	554
Fluoride	mg/L	0.26	0.62	0.62
Iron, Total	mg/L	0.09	7.4	7.4
Iron, Dissolved	mg/L	-	-	-
Manganese, Total	mg/L	0.04	0.43	0.43
Manganese, Dissolved	**mg/L**	**-**	**-**	**-**
Particle Size	see attached			
pH	-	7.28	8.11	8.11

Raw Water Specification

Parameter	Units	MIN	MAX	Design Basis
Silicon	mg/L as SiO_2	3.13	13.5	13.5
Silt Density Index, SDI_5	% plugging/min	16.9	17.9	17.9
SDI_{10} (Note 3)	% plugging/min	8.1	8.9	8.9
SDI_{15} (Note 3)	% plugging/min	5.6	6	6
TDS	mg/L	190	330	330
TOC	mg/L	2.7	4.7	4.7
Total Hardness	mg/L as $CaCO_3$	80	240	240
TSS	mg/L	2	150	150
Turbidity	NTU	1	497	497
Total Phosphorous	mg/L	0.09	0.24	0.24
Total Inorganic Phosphate	mg/L	N/A	N/A	0.3
Ortho Phosphate	mg/L	N/A	N/A	N/A
Filtered Ortho-Phosphate	mg/L as PO_4	N/A	N/A	< 0.2
Phosphate	mg/L as PO_4	< 0.16	< 0.8	< 0.8
Phosphate, dissolved	mg/L	-	-	< 0.16
CATIONS				
Calcium	mg/L as $CaCO_3$	60	156	156
Magnesium	mg/L as $CaCO_3$	32	82.4	82.4
Potassium	mg/L	2.0	4.5	4.5
Sodium	mg/L	9	44	44
ANIONS				
Chloride	mg/L	15	46	46
M-alkalinity	mg/L as $CaCO_3$	54	152	152
Bicarbonate	mg/L as $CaCO_3$	-	-	-
Carbonate	mg/L as $CaCO_3$	-	-	-
Nitrate	mg/L as N	0.67	1.3	1.3
Nitrate	mg/L as NO3	-	-	-
Silica	mg/L as SiO_2	0.78	N/A	8.8
Sulfate	mg/L	40	100	100
Sulfite	mg/L as SO3	-	-	-
Carbon Dioxide	ppm (vol)	< 5	6	6
TRACE METALS				
Aluminum	mg/L	0.61	4.4	4.4

Raw Water Specification				
Parameter	**Units**	**MIN**	**MAX**	**Design Basis**
Arsenic	mg/L	-	-	-
Boron	mg/L	0.024	0.22	0.22
Cadmium	mg/L	-	-	-
Chromium	mg/L	-	-	-
Copper	mg/L	0.0025	N/A	<0.05
Lead	mg/L	-	-	-
Mercury	mg/L	-	-	-
Nickel	mg/L	-	-	-
Selenium	mg/L	-	-	-
Silver	mg/L	-	-	-
Strontium	mg/L	0.14	0.42	0.42
Zinc	ppm as Zn	0.011	0.099	<0.099

The raw water analysis is to be fully developed prior to proceeding with detailed design.

2.6.7 Noise Limits

The NGCC facility will be designed to meet all requirements of the jurisdiction having authority.

The equipment will be designed for a near field noise emitting criterion of 85 dBA maximum at 3 feet from the equipment (in a free field) with exceptions. Where practicable, acoustical insulation and enclosures will be used as required for equipment that would otherwise exceed this criterion. The noise limit will not exceed 85 dBA accumulative for all areas of the site, regardless of individual noise emitted from each piece of equipment.

Certain equipment noise may exceed this criterion, even with noise control measures, particularly within enclosures or rooms. In this case, signs indicating that hearing protection is required will be provided. Locations where noise levels can be expected to exceed limits stated above are the turbine steam chest, the boiler feed pumps, large air compressors, and steam generator safety valves. The HRSG power-actuated pressure relief valves will be equipped with discharge silencers.

It is expected that the far field noise emissions limit will be 55 dBA at the property line.

2.6.8 Geotechnical Data

Geotechnical data has not been provided. It is anticipated that the following information is required to further develop the proposed EW Brown NGCC facility:

- Characterization of type (i.e. cohesive, cohesionless, sand, clay, silt)
- Subsurface profile
- Allowable bearing pressures
- Angle of repose and allowable open cut slopes

- Applied lateral soils forces on foundations and braced excavations
- Short term and long term settlement expectations.

It should be qualified that the recommended data may not list all required parameters for engineering purposed and it is expected of the EPC Contractor to obtain all required parameters via a geotechnical analysis. EPC Contractor is responsible for performing or contracting a geotechnical analysis.

2.7 WASTEWATER

The wastewater collection and transfer system will be provided to collect, monitor, and discharge of the facility wastewater streams including the following.

- Oily Wastewater
- HRSG Blowdown
- Cooling Tower Blowdown
- Gas Turbine Wash Water

All wastewater lift stations will be furnished with sump pumps installed in 100 percent capacity pairs. Sump pumps will be vertical sump pumps with the motor installed above the sump cover.

2.7.1 Sanitary Wastewater

The sanitary wastewater will be collected from the various points of origin in the facility and gravity feed (unless deemed impractical) to the relocated EW Brown sanitary septic field.

2.7.2 Oily Wastewater

Plant wastewater that has the potential for oil contamination will be collected and routed through an oil water separator.

The separator will be capable of removing entrained oil to a maximum instantaneous concentration of 10 ppm. A level probe with high level switches and leak detection devices will be provided. This system will be designed so that separated oily waste can be removed from the plant via vacuum truck. Separated wastewater will be periodically sampled by means of a grab sample and routed to the plant wastewater collection sump (PWCS).

Site run-off and non-oil contaminated wastewater drains will be collected and routed to the PWCS.

2.7.3 Plant Wastewater

Plant wastewater will be discharged to the existing EW Brown outfall.

The plant wastewater discharge will be automatically monitored and measured as required by the plant wastewater permits and all applicable federal, state and local codes. Provisions also will be made to provide grab samples. Sample collections on the water discharge piping to facilitate the collection of grab samples will be provided. All other waste streams will be directed to the locations indicated above.

Treated water will be combined with cooling tower blowdown and discharged through the outfall.

2.7.4 Cooling Tower Blowdown

Cooling tower blowdown will be routed directly to the outfall.

Cooling tower blowdown discharge will be monitored and measured as required by the plant wastewater permits and all applicable federal, state and local codes. Provisions to provide grab samples also will be made. Sample connections on the waste discharge piping to facilitate the collection of grab samples will be provided.

2.7.5 HRSG Blowdown

HRSG blowdown water will be quenched with service water and discharged to the PWCS. Hot drain piping will be designed to accommodate temperatures up to 212°F.

2.7.6 Combustion Turbine Water Wash

The CTG water wash system will be provided with a double wall, fiberglass holding tank or concrete sump sized to contain the wastewater from two complete CTG water wash cycles. The tank system will be provided with connections and designed for vacuum truck removal.

2.8 ELECTRICAL INTERCONNECTION

The scope of the EPC Contract will include the plant with the associated 345 kV switchyard provided by the Owner.

During plant startup and shutdown, the power required for the plant's electrical auxiliary systems will be supplied from the utility system through the unit auxiliary transformers and associated generator step-up transformers.

Black start is not provided.

2.9 COMMUNICATIONS

External communication links between the plant and outside parties will be provided via telephone and high speed data links. Internal communications will be via internal plant telephone system. Paging and remote area communications will be via a radio system or a page/party loud speaker system. A fiber optic backbone system will be used for plant control and other plant networks.

2.10 CODES AND STANDARDS

Design will be in accordance with the applicable U.S. codes and standards in effect at the date of contract. Codes, standards and regulations applicable to a particular system will be defined in system specific specifications.

The following is an alphabetical listing of codes and standards from nationally recognized organizations, which will be used in the design of the plant. Throughout this document, when reference is made to Codes and Standards it will mean the codes, standards and guides that are specifically listed in this section.

- Air-Conditioning & Refrigeration Institute (ARI)
    - Forced-Circulation Air-Cooling and Air-Heating Coils (ARI Standard 410)
- Air Moving and Conditioning Association (AMCA)

- American Concrete Institute (ACI)
    - ACI 318 Building Code Requirements for Reinforced Concrete – Ultimate Strength Design Method
- American Gear Manufacturers Association (AGMA)
- American Institute of Steel Construction (AISC)
    - Load & Resistance Factor Design, AISC Manual of Steel Construction, 13th Edition
    - Code of Standard Practice for Steel Buildings and Bridges
- American Iron and Steel Institute (AISI)
- American National Standards Institute (ANSI)
    - ANSI MC96.1 Temperature Measurement Thermocouples
- American Society of Civil Engineers (ASCE)
    - ASCE 7 Minimum Design Loads for Buildings and Other Structures
- American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
- American Society of Mechanical Engineers (ASME)
    - ASME Boiler and Pressure Vessel Code
    - ASME B31.1, Pressure Piping, Power Code
    - ASME TDP-1, Recommended Practices for the Prevention of Water Damage to Steam Turbines Used for Electric Power Generation Fossil-Fueled Plants
- American Society for Testing Materials (ASTM)
- American Water Works Association (AWWA)
    - AWWA M9 Concrete Pressure Pipe
    - AWWA M11 Steel Pipe Manual
    - AWWA M45 Fiberglass Pipe Design
- American Welding Society (AWS)
    - AWS D1.1 Structural Welding Code
    - AWS D10.4 Recommended Practices For Welding Austenitic Chromium - Nickel Stainless Steel Piping And Tubing
    - AWS D10.8 Welding Of Chromium-Molybdenum Steel Piping And Tubing
    - AWS D10.10 Recommended Practices For Local Heating Of Welds In Piping And Tubing
    - AWS D10.11 Guide For Root Pass Welding Of Pipe Without Backing Rings
    - AWS D10.12 Guide For Welding Mild Steel Pipe
- Anti-Friction Bearings Manufacturers Association (AFBMA)
- Compressed Gas Association (CGA)
- Concrete Reinforcing Steel Institute (CRSI)
- Federal Aviation Administration (FAA)

- Federal Communications Commission (FCC)
- Factory Mutual (FM)
    - FM Data Sheet 7-101, Fire Protection for Steam Turbines and Electric Generators
- Heat Exchange Institute (HEI)
- Hydraulic Institute Standards for Design and Testing of Pumps (HIS)
- Institute of Electrical & Electronics Engineers (IEEE)
- The Instrument, Systems, and Automation Society (ISA)
    - ISA S5.1
    - ISA Y32.20
    - ISA RP18.1 Specifications and Guides for Use of General Purpose Annunciators
    - ISA S5.1 Process Instrumentation Terminology
    - ISA S75.01 Control Valve Sizing Equation
    - ISA S75.02 Control Valve Capacity Test Procedures
- Insulated Cable Engineers Association (ICEA)
- International Code Council (ICC)
    - International Building Code 2006
- Kentucky State Statues
    - Kentucky Building Code
    - 803 KAR 2 (Kentucky Occupational Safety and Health)
    - Kentucky State Plumbing Code
- Manufacturer's Standardization Society of the Valve and Fitting Industry (MSS)
- National Association of Architectural Metals Manufacturers (NAAMM)
- National Association for Corrosion Engineers (NACE)
- National Electrical Manufacturers Association (NEMA)
- National Electrical Safety Code (NESC)
- National Fire Protection Association (NFPA)
    - NFPA 1 Fire Prevention Code
    - NFPA 10 Standard for Portable Fire Extinguishers
    - NFPA 12 Standard on Carbon Dioxide Extinguishing Systems
    - NFPA 13 Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems
    - NFPA 15 Standard for Water Spray Fixed Systems for Fire Protection
    - NFPA 20 Standard for the Installation of Stationary Pumps for Fire Protection
    - NFPA 24 Standard for the Installation of Private Fire Service Mains and their Appurtenances

  - NFPA 30 Flammable and Combustible Liquids Code
  - NFPA 50A Standard for Gaseous Hydrogen Systems at Consumer Sites
  - NFPA 50B Standard for Liquefied Hydrogen Systems at Consumer Sites
  - NFPA 54 National Fuel Gas Code
  - NFPA 70 National Electrical Code
  - NFPA 72 National Fire Alarm Code
  - NFPA 73E Standard for Safety in the Work Place
  - NFPA 75 Standard for the Protection of Electronic Computer/Data Processing Equipment
  - NFPA 80 Standard for Fire Doors and Fire Windows
  - NFPA 85 Boiler and Combustion Systems Hazards
  - NFPA 90A Standard for the Installation of Air-Conditioning and Ventilating Systems
  - NFPA 110 Standard for Emergency and Standby Power Systems
  - NFPA 214 Water Cooling Towers
  - NFPA 220 Standard on Types of Building Construction
  - NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations
  - NFPA 780 Standard for the Installation of Lightning Protection Systems
  - NFPA 850 Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations
  - NFPA 2001 Standard on Clean Agent Fire Extinguishing Systems
- National Roofing Contractors Association (NRCA)
- National Standard Plumbing Code (NSPC)
- Occupational Safety and Health Act (OSHA)
- Pipe Fabrication Institute (PFI)
- Plumbing and Drainage Institute (PDI)
- Prestressed Concrete Institute (PCI)
- Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
- Specification for Structural Joints Using ASTM A325 or A490 Bolts
- The Society for Protective Coatings (SSPC)
- Tubular Exchanger Manufacturers Association (TEMA)
- Underwriters Laboratories (UL)

3 MECHANICAL SYSTEMS AND EQUIPMENT

The power block will be comprised of one or two combustion turbine generators (CTG) and one steam turbine generator (STG) to establish either a 1-on-1 or 2-on-1 combined cycle configuration. Each CTG will be fueled with natural gas as the only fuel. Each CTG will exhaust into a horizontal triple-pressure, reheat, natural circulation heat recovery steam generator (HRSG) that will generate steam for the STG. The HRSG(s) will be equipped with natural gas-fired duct burners to permit the plant to achieve higher output during hot ambient conditions, typically seen during the summer months.

The HRSG(s) and CTG(s) will be located outdoors and the STG indoors. In addition, other support facilities such as the water chemistry sampling laboratory, CEMs enclosures, chemical feed area, central control room and electronics room will be located indoors. The self-contained emergency diesel generator, hydrogen gas storage and main step-up transformers will be located outdoors.

3.1 COMBUSTION TURBINE GENERATORS

Each CTG with hydrogen cooled synchronous generator will be installed outdoors and will be housed in manufacturer-supplied enclosures. The CTG combustor design will be for a single fuel (natural gas) with performance heating. The NGCC facility does not intend to inject water or steam to control emissions limits.

The main features of each CTG package are:

- Turbine lube oil system with dual coolers, filters and feeding system
- Single fuel, utilizing gas performance heating
- Inlet air filtration system with silencing
- Inlet air evaporative cooling system
- Fire protection system
- Local control panels
- Compressor water wash system (off-line and on-line system), one per block
- Static starting system (one per CTG, if multiple CTGs are implemented then the two systems will be capable of starting either CTG)
- Turbine controls, including advisory and control instrumentation

Each base-mounted, single-shaft CTG and the multi-stage, axial flow air compressor will have modulated inlet guide vanes and a full complement of CTG accessories. Specific terms will be outlined in the EPC Agreement.

Generators coupled with the CTG(s) and the STG will be hydrogen cooled. Common sources of hydrogen and carbon dioxide will supply the needs of the power block generators.

3.2 HEAT RECOVERY STEAM GENERATOR (HRSG)

3.2.1 General

Each HRSG will be a triple-pressure, reheat, natural circulation type with horizontal gas flow and vertical tubes in all heat transfer bays. The HRSG(s) will be designed for a 30-year life span and will include features to minimize corrosion and account for the cyclic operation expected with an intermittently loaded combined cycle plant.

The components are designed to be built as distinct prefabricated modules to maximize the quality of workmanship and minimize the time and cost of field installation.

The HRSG evaporator sections include large steam drums to ensure proper steam purity and to reduce surge during start-up and operating transients. Downcomers will be configured for proper circulation. The HP, IP, and LP evaporative drums will be designed with a water retention time of five minutes. The heat transfer surface will be of the extended surface type, consisting of spiral fining continuously welded to the tubes. Economizer and evaporator sections will consist of assemblies of finned tubes. All pressure parts will be fully drainable and ventable for filling and proper operation.

The inlet ductwork and HRSG casing will be internally lined. The ductwork and boiler casing will be designed using proven methods for positive-pressure heat recovery boilers to maintain low outer surface temperatures and total thermal expansion.

A system of platforms, stairways and ladders will provide access to valves and instrumentation. Access for inspection and maintenance will be provided by suitably located doors in the casing and ductwork. For safety, all major platforms will include two means of egress.

The HRSG will be equipped with a selective catalytic reduction (SCR) system for NO_x control for CTG providing greater than 12 ppm NOx and a carbon monoxide (CO) catalyst. An aqueous ammonia system will be provided in order to supply reactant for the SCR system.

Each HRSG will employ a natural gas-fired duct burner system with modulating firing capability.

A stack damper will be included in each HRSG stack in order to reduce heat loss during shutdown periods and promote quicker restart. The entire HRSG including all ductwork and stack up to ten feet downstream of stack dampers will be completely insulated in order to further reduce heat loss during shutdown.

3.2.2 SCR System for NO_x Control (If Provided)

An SCR system will be incorporated into each HRSG to meet the NO_x emission limits. The emission limits will be met over the full range of operation, from peak load to minimum load, including the full range of design ambient temperatures.

The SCR system design and location will include consideration of operating temperature requirements for proper catalyst performance, flow straightening devices, ammonia injection grids and mixing zones.

The SCR system casing will be of the same construction and cross section as the HRSG casing. Access man-ways and catalyst loading openings in the casing will be provided and will be sufficient to facilitate removal and installation of the catalyst modules without the need for cutting or welding any of the casing components. A monorail and hoist system to facilitate installation and removal of the catalyst sections also will be provided. The hoist system will extend out over an open area at grade for lifting and setting materials from maintenance carts or pallets.

The SCR design will include space for the addition of 50 percent more catalyst beyond that included in the base SCR system design. Sampling ports on the HRSG also will be provided to facilitate monitoring of catalyst performance, and CEM sampling connections upstream of the catalyst sections will be provided for continuous monitoring of NO_x and CO at the CTG discharge.

The Contractor will be responsible for obtaining a warranty from the SCR Catalyst Vendor indicating that the installed catalysts will provide NO_x emissions reduction from the guaranteed combustion turbine emissions, including contribution from the duct burners, to meet the NO_x requirements for a minimum period of 36 months after the substantial completion date for the plant. Upon completion of the plant warranty period, the Contractor will assign the Catalyst Vendor warranty to the plant.

The SCR system will be designed based on the use of a 19 percent aqueous based ammonia system. The aqueous ammonia is converted to a vapor product via a vaporization skid provided with the HRSG. This ammonia vapor is diluted with air and injected into the flue gas stream to support the NO_x reduction reactions.

Refer to 3.17 AMMONIA SYSTEM for details on the unloading, storage and forwarding systems.

3.2.3 Carbon Monoxide (CO) Catalyst

Each HRSG shall be provided an oxidation catalyst for emissions control of carbon monoxide, VOC’s and formaldehyde.

The oxidation catalyst provided shall have a five year proven record of performance in combustion turbine exhaust applications and shall be the precious metal coating on a metallic or ceramic substrate type.

The oxidation catalyst shall be designed to achieve the specified stack emissions based on the inlet emissions from the CTG operating at any ambient condition, and from 50 percent load up to full load.

The oxidation catalyst shall be located downstream of the duct burner.

The catalyst frame shall be designed with space to allow an additional future layer of catalyst to be added.

The oxidation catalyst will be provided with catalyst loading/removal hatch, personnel access doors, drains, and other accessories to allow for proper installation and maintenance of the oxidation catalyst.

3.3 FUEL SYSTEM

Natural gas will be the only fuel for the plant. Initial filtration, pressure regulation and tariff metering will be provided before the gas supply line enters the power block area. This equipment will be housed in a fenced area located near the power block.

Natural gas will be delivered to the site boundary at approximately 500 psig. Depending on the combustion turbine technology selected for final design, natural gas compressors may be required to boost the fuel gas pressure such that the minimum fuel gas pressure is in compliance with the CTG vendor’s requirements. Natural gas compression must take into consideration any fuel metering and conditioning equipment between compressor outlets and the combustion turbine fuel gas module.

Fuel gas heating will be provided using IP feedwater after the IP economizer to the minimum gas temperature in compliance with the gas turbine manufacturer’s fuel supply specification. A complete system will be provided for each CTG including a heater, moisture and leakage detection, an isolation system and a drain tank. To protect against pipeline liquids and moisture during start-up, an electric start-up heater will be provided. All equipment will be designed in accordance with the gas turbine manufacturer’s recommendations.

Additional filtering, if required, per CTG manufacturer’s fuel specifications, will be provided after the fuel gas heating by means of individual fuel filters and moisture detectors for each gas turbine. Fuel gas piping after the final filter will be stainless steel.

Additional non-tariff metering will be provided within the power block to measure the fuel gas flow to each gas turbine and each duct burner system. These will permit the performance of each individual piece of equipment to be measured. Accuracy will be in accordance with requirements for EPA 40CFR75APPD monitoring of plant emissions.

Final gas pressure trim regulation at the respective gas turbines and duct burners will be provided as required by the combustion turbine and duct burner control systems.

3.4 STEAM TURBINE GENERATOR

The steam turbine generator will operate at 3600 rpm and sliding pressure at part load. The turbine arrangement will be determined by the STG vendor such that efficiencies and operational flexibility is optimized.

The main features of the steam turbine are:

- HP, IP and LP steam stop valves including start-up and normal operation strainers as required
- Lube oil system with dual oil-to-water coolers, main and back-up AC and emergency DC oil pumps, lube oil purifier and oil reservoir
- Hydraulic oil system
- Complete lube oil system, including lube oil purification equipment and initial oil supply
- Turning gear
- Steam seal system
- Instrumentation for performance testing
- Turbine controls, including advisory and control instrumentation

3.5 MAIN, REHEAT AND LOW PRESSURE STEAM SYSTEMS

Steam will be generated by the heat recovery steam generator(s) and piped to the steam turbine. The HRSG(s) provide steam at three pressure levels: superheated high pressure (HP) steam, superheated intermediate pressure (IP) steam, and superheated low pressure (LP) steam.

If the 2 x 1 NGCC arrangement is to be implemented, high pressure steam lines from each HRSG will be headered and piped to the steam turbine via the main stop valves. Cold reheat from the HP turbine exhaust will be divided into two streams by means of balancing control valves. Each of these streams will be mixed with IP steam from its respective HRSG and delivered to that HRSG's reheater. Hot reheat lines from the reheater of each HRSG will be headered and piped to the IP steam turbine via the stop/trip valves. Low pressure steam lines from each HRSG will be headered and piped to the LP steam turbine via admission valves. If the 1 x 1 NGCC arrangement is to be implemented, the steam and condensate flows will be routed in a similar manner but will not be required to be headered.

Isolation valves will be provided at each of the HP, IP and LP HRSG outlets in accordance with ASME code in order to separate ASME B&PV Section I Code piping from ANSI B31.1 piping. Inlet and outlet valves will be provided to allow hydrostatic testing of all HRSG sections.

The HP, IP and LP systems will be provided with a steam turbine bypass for use during start-up and shut-down. The bypass will be sized to permit a smooth transition from bypass to steam turbine operation during start-up and shut-down and to minimize pressure transients on a steam turbine trip. The bypass will be sized to pass the design unfired steam flow.

3.5.1 Main and Reheat Steam Systems

Main steam leaves each HRSG superheater outlet via one line. Main steam attemperators will be provided by the HRSG manufacturer to control main steam temperature. Water from the feedwater system will be injected as required into these attemperators to maintain the desired temperature at each HRSG's main steam outlet header. A temperature element will be provided after each attemperator to control the main steam outlet temperature conditions.

High pressure steam will feed the steam turbine through the steam turbine main stop valves. The main stop valves will be connected directly to the turbine control valve steam chest and are part of the STG manufacturer's supply. Pressure, temperature and flow elements will be provided in each HRSG's main steam line to monitor and control the steam conditions.

A motorized stop valve will be provided in each main steam line where the steam from each HRSG is combined into one header. Each HRSG's main steam line also has ASME B&PV Code Section I stop/nonreturn valves.

The cold reheat system conveys the cold reheat steam from the high pressure turbine exhaust to each HRSG reheater. Reheat attemperators will be provided by the HRSG manufacturer in the HRSG secondary reheater inlet. Water from the feedwater system will be injected as required into these attemperators to maintain the desired temperature at each HRSG reheat steam outlet header. A temperature element will be provided after each attemperator to control the reheat outlet steam temperature conditions.

The cold reheat line on each HRSG has a motorized isolation valve. The full flow high pressure turbine exhaust line has a piston actuated check valve in the vicinity of the steam turbine in order to protect the steam turbine against overspeed in the event of a steam turbine trip.

The temperature of the cold reheat steam exiting the high pressure turbine will be monitored. The steam turbine control system will be configured to throttle the steam turbine governor valves when operating with one (or both gas turbines in the 2 x 1 NGCC arrangement) at reduced load in order to limit the steam turbine cold reheat exit temperature from exceeding 750°F.

The hot reheat system conveys hot reheat steam from each reheater in the HRSG outlet header to the inlet of the STG combined reheat stop valves. Pressure and temperature elements will be provided in each hot reheat line in order to monitor and control the steam conditions.

In the 2 x 1 NGCC arrangement, the hot reheat line in each HRSG has a motorized isolation valve to permit operation of one HRSG while the other is out of service. Parallel reheat steam lines will be sized and laid out to result in equal pressure drops in individual lines to maintain equal steam distribution to the HRSGs.

Valves will be provided to allow for hydrostatic pressure testing of each pressure level of the HRSG.

The main steam cold reheats and hot reheat piping drains will be designed to be in accordance with ASME Standard TDP-1, Part I, "Recommended Practices for the Prevention of Water Damage to Steam Turbines used for Electric Power Generation."

3.5.2 Vent and Blowdown Systems

Continuous and intermittent blowdown from each HRSG will be routed to the blowdown tank. Systems will be designed to minimize steam venting outside the building. Maintenance drains will be routed to the HRSG sump.

3.5.3 Auxiliary Steam System

The normal source of auxiliary steam will be attemperated steam from the cold reheat system. Condensate will be used as the source of attemperating water. An auxiliary boiler sized to deliver 200 psig superheat will be provided to meet the steam turbine superheat requirements for turbine seals as provided by the steam turbine supplier.

The auxiliary steam system provides a source of low pressure steam to provide backup sealing steam for the steam turbine. During normal operation above 25 percent load, steam turbine sealing steam will be provided by leakoff steam from the HP stage.

During start-up and low load operation (below 25 percent load), main steam will be let down into the cold reheat system which in turn will supply steam to the steam turbine steam seal system.

The auxiliary steam system will also be used to supply steam for heating the buildings.

3.6 CONDENSATE AND FEEDWATER SYSTEMS

In addition to providing feedwater to the boiler, the condensate and feedwater systems will provide attemperating spray water to the following equipment and systems:

- Boiler superheater and reheater attemperators
- Turbine gland steam system
- Auxiliary steam spray attemperators
- Steam turbine HP and LP bypass steam conditioning

Feedwater system design flow will be based on the HRSG design steam flow, including additional requirements for auxiliary steam services. Feedwater piping will comply with ASME B&PV and B31.1 requirements, as applicable.

3.6.1 Condenser

The condenser will be a two-pass single shell and tube deaerating type, specifically designed for steam surface condenser service. This unit will be designed to condense steam from the turbine under both summer and winter conditions as defined in the appropriate heat balances. The condenser shell will be mounted on fixed supports and will be connected to the LP turbine exhaust by means of an expansion joint. Circulating water passes through the condenser tubes and condenses the turbine exhaust steam in the condenser shell. The condenser will also have the capability to handle steam bypass in the amount of 100 percent of full unfired HRSG steaming capacity (no duct firing). The equipment will be designed and constructed in accordance with the standards of HEI. Performance calculations will be based on HEI standards for steam surface condensers. The condenser tube material will be stainless steel.

The condensate will be collected in the condenser hotwell and withdrawn by condensate pumps. The hotwell will be sized for a minimum of three minutes of storage capacity from normal level to low level trip at full condensate flow.

Where practical, the enthalpy of steam being admitted to the condenser will be limited to 1,190 BTU/lb unless allowed by the condenser manufacturer.

Desuperheater for steam flows going into the condenser will be installed as far from the condenser as practical, always exceeding the manufacturer’s recommendations, to ensure complete evaporation of the spray water.

Drains to the condenser will be continuously sloped to the condenser to avoid a low point where water can collect.

The condenser flows will be characterized under all operating conditions that could provide additional load on the condenser, thermal cycling, and erosion effects. These will be considered in the condenser design and in the design of connections into the condenser to ensure that proper orifice design is incorporated and that condenser connections have internal provisions to minimize the potential for erosion damage to the condenser internals. The internal provisions will be either a perforated distribution pipe or a baffle meeting all HEI and EPM recommendations.

High energy level steam dumps, particularly team turbine bypass headers will be distributed throughout the entire condenser to avoid excessive internal steam velocities above 500 ft/sec at 2 inches Hg absolute to avoid localized hot spots.

3.6.2 Condensate Pumps

The system will consist of two 100 percent capacity, vertical, centrifugal, can-type condensate pumps that take suction from the condenser hotwell. The pumps will be driven by constant-speed electric motors. The pumps will have their impellers keyed to the shaft to ensure impeller rotation when the pump starts. Each will be sized at guarantee conditions plus a 10 percent flow margin. The pump head is based on normal flow plus 10 percent surge margin. The pumps will be designed for NPSHR at single pump run out conditions that should be approximately 70 percent load for one pump. The condensate will be deaerated in the condenser to remove oxygen and other noncondensible gases and, thus, prevent corrosion as well as equipment from becoming air-bound.

The condensate will be chemically treated by injecting ammonia (and possibly an oxygen scavenger) to adjust the pH to minimize corrosion.

The condensate system also provides water to cycle chemical feed, seal water to equipment, and make-up water to miscellaneous systems. In addition, the condensate system furnishes water for the hot reheat steam bypass and LP steam bypass of the IP and LP turbines respectively.

The condensate pumps will be located near the condenser hotwell. The condensate pumps raise the condensate pressure in order to overcome the friction losses in piping and equipment and the pressure and elevation differentials between the condenser and the HRSG LP drum level.

The condensate flows from the condenser hotwell into a header. The header distributes the flow to the condensate pumps. The suction pipe of each pump will be provided with a gear operated butterfly isolation valve, a basket type strainer, a thermal expansion relief valve, and an expansion joint. A check valve followed by a gear operated isolation valve will be provided in the discharge line of each pump. The pump discharges will be headered and piped, via the gland steam condenser, to the LP economizer module in each HRSG.

Seal water to the condensate pump stuffing box will be supplied from a tap in the pump discharge header. A pressure reducing orifice plate will be provided on each condensate pump seal water supply line that reduces the seal water pressure to the required level.

Two vent lines will be provided for each condensate pump. One from the pump discharge elbow with a normally closed isolation valve, the other from the high point of the pump suction can with a locked open isolation valve. The suction can vent line keeps the can from becoming air bound. The valve in the discharge elbow vent line will be opened only for pump priming at initial start-up.

Instrumentation will be provided in accordance with ASME PTC-6 as necessary for HRSG performance testing.

3.6.3 Hotwell High Level Dump

The hotwell high level dump line to waste will be located downstream of the gland steam condenser (GSC). The line contains a control valve and, upon reaching a high-high level in the condenser, condensate will be discharged to the appropriate waste stream in order to protect the steam turbine blades from water damage.

3.6.4 Minimum Recirculation Flow

The condensate system minimum flow recirculation line originates downstream of the GSC and discharges into the condenser above the maximum hotwell level. This line provides minimum flow recirculation protection for the condensate pump and the GSC. The line will be sized for the minimum flow requirement of the condensate pump or the GSC, whichever is larger. A flow control valve with dual setpoints will be provided to regulate the minimum flow with one condensate pump or two condensate pumps in operation.

3.6.5 Air Evacuation System

The air evacuation system will be capable of removing air and other noncondensible gases from the condenser steam space, which includes the condenser volume with hotwell empty, as well as the condenser neck and the low pressure turbine casings, prior to or during plant start-up, i.e., during the hogging operation by means of mechanical vacuum pumps. The system will also be able to remove air in-leakage as well as other noncondensibles from the condenser during normal operation (holding). This allows the system to maintain the desired condenser vacuum and minimizes corrosion. The oxygen content of the condensate as it leaves the condenser will be less than 10 ppb.

3.6.6 Vacuum Breaker

A vacuum breaker line with a DC motor-operated gate valve will be provided to break the vacuum in the condenser. This is required in emergencies.

After the turbine trips or at turbine coast-down, the valve in the vacuum breaker line may be opened by the operator, in accordance with the turbine manufacturer's instructions, in order to admit air into the condenser shell. This raises the pressure at the low pressure turbine exhaust and slows the turbine rotor. The windage effect on the LP turbine blading acts as a brake and slows the machine down quickly. A screen mesh will be provided at the inlet of the vacuum breaker line to prevent debris from entering the condenser. Water is maintained above the vacuum breaker gate valve to provide an air seal. A level gauge shows the water level. Occasional water makeup will be performed manually.

3.6.7 Condensate Polisher

A full flow Powdex® type condensate polisher will be provided with a full capacity bypass. The condensate polisher will be capable of being bypassed during periods when polisher operation is not desired.

The EPRI guideline "Cycle Chemistry Guidelines for Combined Cycle/Heat Recovery Steam Generators (HRSGs), Final Report, March 2006 (Report - 1010438)" shall be used as a basis for condensate polisher effluent quality requirements. The normal limits from the report are identified below:

- Cation Conductivity: ≤ 0.2 µS/cm (at 25°C)
- Sodium: ≤ 3 ppb
- Silica: < 10 ppb

The condensate polisher shall have the following features:

- Two 100% capacity resin tanks with holding pumps, skid mounted

- One advanced precoat system complete with advance precoat tank, mixer, auxiliary tank, precoat injection pump, precoat recycle pump, filter element
- One air surge tank
- One local facility DCS operator station (controls shall be integrated into facility DCS)
- Sample panel connections
- Piping, valves, instrumentation and controls

Design the condensate polisher location such that the Powdex polisher vessels have an additional six feet of headroom to properly install and remove elements.

3.6.8 Feedwater System

The feedwater system will consist of one full-capacity HP boiler feed pump (BFP) for each HRSG. The boiler feed pumps take suction from the LP economizer outlet. The HP discharge from each pump will be piped to the HP economizer of each HRSG. The interstage discharge from each pump will be routed to the IP economizer. The HP discharge will also furnish water to separate desuperheaters for the HRSG superheater and the HP steam bypass to cold reheat. The interstage discharge will also furnish water for desuperheaters for the HRSG reheater.

Control valves will be provided on each of the HP and IP headers for respective drum level controls. The HP system will employ a separate start-up and main control valve in parallel, while the IP system will employ a single valve. Additional parallel control valves may be employed on HP and IP systems to reduce pressure during unfired operation.

Valves will be provided that allow for hydrostatic pressure testing of all sections of the HRSG.

IP economizer outlet water will be used for fuel gas heating.

Instrumentation will be provided in accordance with ASME PTC-6 as necessary for HRSG performance testing.

3.6.9 Flow Accelerated Corrosion

Where feedwater, boiler water, or economizer temperatures are between 250°F and 450°F, flow accelerated corrosion (FAC) piping design will be considered. The following design parameters will be taken into consideration when designing these systems; some or all may be employed as required:

- Limiting average fluid velocities to not more than 15 ft/sec
- Minimizing close-coupled geometries (i.e., numerous valves, fittings and direction changes in rapid succession)
- Using long radius elbows
- Using P11 (or higher alloy) materials to improve chemical resistance to FAC
- Using feedwater chemistry programs to keep pH over 9.4 and in a non-reducing atmosphere

3.7 HEAT REJECTION SYSTEMS

The heat rejection system will be a wet system and will include a cooling tower/circulating water/surface condenser arrangement.

3.7.1 Cooling Tower

The circulating water (CW) system supplies cooling water to the main condenser during plant operation.

Circulating water from a mechanical draft cooling tower will be used as cooling water. The design inlet condenser cooling water temperature will be based on an 11°F approach to the design wet bulb temperature. The site ambient design conditions for the tower are the one percent dry bulb temperature and the mean coincident wet bulb temperature. The cooling water temperature rise through the condenser will be approximately 20°F.

The cooling tower will be of fiberglass construction.

Circulating water pumps will be provided to pump cooling water from the cooling tower basin through the circulating water system piping to the condenser and through the return piping to the cooling tower. The components of the piping system comply with the specifications and standards listed in ANSI B31.1, except for butterfly valves that comply with the AWWA standard. The circulating water piping will have a designed low point for drainage and a means to either pump or gravity drain all lines.

3.7.2 Circulating Water Piping and Pumps

Circulating water pumps will be provided to pump cooling water from the cooling tower basin through the circulating water system piping to the condenser and through the return piping to the cooling tower. Pre-stressed reinforced concrete circulating water pipe will be utilized. The circulating water piping will have a designed low point for drainage and a means to pump or gravity drain all lines.

Two 60 percent capacity circulating water pumps, one 100 percent capacity auxiliary cooling water pumps, valves, piping, instrumentation, and controls will be provided. The purpose of the auxiliary cooling water pumps is to provide circulating water to the auxiliary closed cooling water heat exchangers and to fill the circ water lines and vent the water boxes prior to starting the circulating water pumps.

3.8 CLOSED COOLING WATER SYSTEM

The following equipment will be cooled by the CCW system:

- Gas Turbine Lube Oil Coolers
- Gas Turbine Generator Hydrogen Coolers
- Gas Turbine Generator Seal Oil Coolers
- Gas Turbine Starting System Load Commutating Inverter (LCI) Heat Exchanger
- Steam Turbine Lube Oil Cooler
- Steam Turbine Generator Hydrogen Cooler

- Steam Turbine Generator Hydrogen Seal Oil Cooler
- Boiler Feed Pump Coolers
- Steam and Water Sampling Panel Coolers

Heat exchangers will be designed for an approach temperature of 6°F to the circulating water inlet temperature. In addition, where practical, flow velocities will be greater than six feet per second to discourage settlement of zebra mussels.

There will be two 100 percent capacity, horizontal, centrifugal, double suction, motor-driven, CCW pumps. The total dynamic head of the CCW pumps will be based on the pressure drop through the piping loop with the highest resistance. Manual throttle valves provided at the outlet of each cooler balance flows through the remaining loops. Temperature control valves will be used to regulate flows through lube oil equipment systems where required by the manufacturers.

The CCW pump suction head will be maintained by means of a CCW head tank located at a level above the highest piece of equipment. Make-up water to the CCW head tank will be city water. With the entire CCW system indoors, no antifreeze chemicals will be required. A pot feeder will be provided to allow inhibitor chemicals to be manually added to the CCW system periodically. Since the CCW system is an entirely closed system, no blowdown is required.

The respective equipment manufacturers specify the CCW flow requirements for the individual equipment based on a maximum cooling water temperature.

There will be two 50 percent-capacity shell and tube type CCW heat exchangers. The CCW heat exchangers will be cooled by the auxiliary cooling water (ACW) system that uses circulating water as the cooling medium.

The rated capacity of each pump will be equal to the total cooling demand of the equipment, plus a 10 percent margin.

3.9 WATER TREATMENT

The retired E. W. Brown Unit 1 and Unit 2 intake structure will be retrofitted to provide raw makeup water to the combined cycle plant addition for use in the cooling tower, service water and potential future cycle makeup (existing cycle makeup treatment system will be utilized).

3.9.1 Raw Water Supply System

The retrofitted system will have to meet requirements as defined by Phase II of Section 316(b) of the Clean Water Act. Currently, Phase II of Section 316(b) is suspended and new guidelines are anticipated to be issued for existing facilities mid-2013. At present, the EPA has instructed regulators to address facilities on a case-by-case basis using best professional judgment. It is currently speculated that the revised rule when issued will require cooling towers or, if not feasible, then 90% of the reduction in organism losses that would result with cooling towers. In its current suspended form, Phase II of Section 316(b) also specifies the new combined cycle as an "existing facility" as the new plant will be constructed in place of an existing facility and will utilize the existing intake structure while not increasing the design capacity of the intake structure. Therefore, in evaluating the cost and regulatory implications of retrofitting the existing Unit 1 and 2 cooling system intake structure for use in the new combined cycle plant makeup water system, the following has been considered:

- Use of Unit 1 and 2 intake structure for the NGCC facility will not increase the total flow rate of the intake structure above that of the design capacity for the system.
- Use of Unit 1 and 2 intake structure for the NGCC facility target design to result in a flow velocity lower than 0.5 ft/s, thus minimizing fish impingement and entrainment significantly.
- A closed cycle cooling system with a wet mechanical draft cooling tower designed for five cycles of concentration is being implemented at the combined cycle plant.

Based on the above, the following modifications will be incorporated in the Unit 1 and 2 intake structure for use as raw makeup water to the combined cycle plant:

- Refurbishment of existing Unit 1 and Unit 2 raw water pumps for reliability and system condition improvements.
- Traveling screens will be replaced with new, fine mesh, basket screens to minimize impingement of aquatic life.
- Flow velocities in each of the two pump bays will be targeted to be below 0.5 ft/s, thus minimizing entrainment of aquatic life.
- A new high pressure screen wash system will be installed.
- Provisions for future installation of a low pressure wash system and a fish return system will be included in the new screen design.

The proposed modifications to the intake bay meet the requirements set forth by Phase II of Section 316(b) for existing facilities (currently suspended). The modifications also meet Phase I requirements for new facilities. It is possible that some testing will be required after plant startup to document losses due to entrainment and impingement. If losses due to entrainment are too high then the low pressure spray systems and fish return troughs can be readily added to the system.

3.9.2 Potable Water System

Potable water will be provided by the extension of service from the municipal water main. A single interface point with the water main will be made and routed into the NGCC facility. Backflow preventers and water meters will be provided by the EPC contractor.

3.9.3 Cycle Makeup Water Treatment

The steam cycle makeup water will be provided by the existing E. W. brown cycle makeup water treatment system for steam/condensate cycle makeup.

The NGCC facility demineralization system will include a demineralized water storage tank and pumps.

3.10 PLANT WASTEWATER COLLECTION AND TREATMENT SYSTEMS

3.10.1 Sumps and Drains

The building sumps will be provided with duplex pumps to handle the wide range of flows required during startup. These sumps will be equipped with two 100 percent capacity pumps with alternating start. The sumps and associated coating, piping material, instrumentation, pumps, and valve materials will be designed for the appropriate service, considering proper operation and maintenance. Sumps that receive frequent washdown from material handling systems will be provided with duplex pumps.

3.10.2 Wastewater Collection and Transfer

The process wastewater streams will be collected in the plant wastewater collection sump (PWCS). A system of redundant pumps will be furnished to forward wastewater to the outfall.

All sumps that have the potential to handle corrosive/abrasive liquids will be constructed of corrosion/abrasion resistant materials including the sump pumps and interconnecting piping.

The generation of liquid waste streams and their final disposition will be shown on the plant's Water Mass Balance (WMB) diagram.

3.10.3 Sanitary Sewer

The sanitary wastewater will be collected from the various points of origin in the facility and gravity feed (unless deemed impractical) to the existing Metropolitan Sewer District main.

3.10.4 Spill Containment System SPCC plan

A Spill Prevention, Control and Countermeasures (SPCC) plan conforming to all EPA (40CFR112) requirements will include lined concrete containment pads and curbs (dikes) around oil insulated transformers, chemical storage tanks, storage of lubricants and used oil areas. All containments shall be fitted with pump out sumps.

Water from these areas may be pumped to either the plant wastewater collection sump pump or disposed of off-site, as determined by testing of the contents of the containment.

Plant wastewater that has the potential for oil contamination will be collected and routed through an oil water separator.

The separator will be capable of removing entrained oil to a maximum instantaneous concentration of 10 ppm. A level probe with high level switches and leak detection devices will be provided. This system will be designed so that separated oily waste can be removed from the plant via vacuum truck. Separated wastewater will be periodically sampled by means of a grab sample and routed to the plant wastewater collection sump (PWCS).

3.11 WATER CHEMISTRY CONTROL

Water chemistry based on the steam/condensate/feedwater power cycle System shall be based on EPRI guidelines, and if more stringent, major Equipment suppliers recommendations. The Facility shall use an all-volatile treatment in a oxidizing environment AVT(O) for the condensate, feedwater and HRSG evaporative circuits. The following guidelines pertain:

Electric Power Research Institute (EPRI)

1010437	Cycle Chemistry Guidelines for Shutdown, Layup and Startup of Combined Cycle units with Heat Recovery Steam Generators, Final Report, March 2006
1010438	Cycle Chemistry Guidelines for Combined Cycle/Heat Recovery Steam Generators (HRSGs), Final Report, March 2006

1019799	Heat Recovery Steam Generator Cycle Chemistry Instrumentation, Final Report, November 2010

The circulating water system cycles of concentration shall be based on wastewater permit outfall requirements; optimize the cooling tower fill & material selection, and to minimize water consumption and maintenance costs. The cooling tower should be designed to operate between 3 and 5 cycles of concentration (COC), with typical operation at 4.5 COC.

3.11.1 Cycle Chemical Feed System

The cycle chemical feed Systems shall maintain proper feedwater-steam-condensate cycle water chemistry by injecting chemicals into the condensate/feedwater System.

Ammonia shall be fed into the condensate System to maintain a pH between 9.2-9.6. The ammonia shall be injected at the condensate pump discharge (and downstream of the condensate polisher).

Capped chemical injection ports shall be provided on the HRSG steam drums to allow future chemical injection however; initially no chemical injection is planned for the drums. Contractor should not provide a tri-sodium phosphate chemical feed skid. The cycle chemical feed System major Equipment consists of ammonia feed pump skid with the following components:

- Two 100% capacity ammonia metering pumps
- Calibration column, suction strainers, and pulsation columns
- Backpressure regulator
- Instrumentation
- Purge piping connections
- Local control panel
- Stainless steel piping & valves
- Shop primed and finish painted carbon steel skid

The ammonia feed pump skid shall take suction out of an Owner supplied chemical storage tote resting on the plastic above ground secondary containment sump. Contractor shall provide the plastic containment sump. Concrete curbing shall be installed around the plastic tote sump and feed skid and sloped to a dry sump. Concrete inside the containment shall be provided with an ammonia resistant coating. The feed pump skid shall have a purge line connection to the demineralized water supply System, to allow flushing the chemical feed skid and piping up to the injection point for maintenance access. Vent lines from the tote and feed pump skid shall be routed outdoors. All piping, valves, instrumentation, controls and other components that come in contact with the chemical feed streams shall be made of chemical resistant material.

The cycle chemical feed Equipment shall be located inside the steam turbine building near the condensate polisher Equipment. Forklift access shall be provided to allow delivery of the chemical storage totes.

Stainless steel tubing shall be used to route the ammonia feed to the condensate System injection points. A chemical injection quill shall be used at the injection pipe.

Eyewash and safety showers shall be provided nearby.

3.11.2 Circulating Water Chemical Feed System

The circulating water chemical feed equipment will be furnished to inhibit scaling and corrosion of components in the circulating water circuit and to control biological growth in the cooling tower. Equipment for this system is described in the table below.

Table 3-2 Circulating Water Chemical Feed System

Equipment	Total Quantity	Design Capacity
Acid Feed Pumps	2	100%, peak load
Sulfuric Acid Storage Tank	1	30-day capacity or 1.5 times bulk delivery volume, whichever is larger
Hypochlorite Feed Pumps	2	100%, peak load
Hypochlorite Storage Tank	1	15-day capacity or 1.5 times bulk delivery volume, whichever is larger
Scale/Corrosion Inhibitor Feed Pumps	2	100%, peak load
Non-Oxidizing Biocide Feed Pumps	2	100%

Each set of feed pumps will be totally skid-mounted, complete with piping, valves, instruments and controls.

The acid and hypochlorite feed pumps will take suction out of bulk storage tanks. The scale/corrosion inhibitor and the non-oxidizing biocide feed pumps will take suction out of Owner-supplied totes.

Acid feed system will be provided to inject sulfuric acid into the cooling towers for alkalinity control. An FRP acid mixing trough will be furnished to mix the concentrated sulfuric acid with circulating water. It will be installed in a suitable location of the tower to maximize mixing.

A sodium hypochlorite feed system will be provided to feed hypochlorite solution on a shock treatment basis to control biological growth in the cooling towers. The hypochlorite solution will be injected below the waterline of the cooling tower basin by means of monel diffusers.

The circulating water chemical feed equipment (except acid storage tank) will be located indoors in a cooling tower water treatment building. Eyewash and safety showers will be provided as required by OSHA.

3.11.3 Steam and Water Sampling Panel

The water quality control system equipment (sample panels) will perform the following functions:

- Continuously receive and condition water and steam samples for automatic analysis

- Provide continuously flowing grab samples at the sample panel sink
- Display locally and in the plant DCS the results of the chemical analysis
- Sends analysis data to the plant DCS for archiving and historical trending
- Alarm off-specification system chemistry in accordance with adjustable, preset signal limits
- Forward signals for control of cycle and circulating chemical feeds to the plant DCS

Samples will be collected from various points in the plant and routed to the central sample panel where the pressure and temperature of each sample will be reduced for safe handling using pressure reducing valves and sample coolers. Following conditioning, the pressure, temperature and flow of each sample will be measured and indicated. The sample lines will then split into several streams. One stream will be for grab sample. The other streams will be directed to specific conductivity, cation conductivity, pH, sodium, silica and dissolved oxygen analyzers for continuous monitoring as required.

A local sample panel will be furnished to measure circulating water specific conductivity and pH.

Grab samples from the sample panel will be tested periodically and the results logged and reported in the chemistry laboratory. Equipment for this system is described in the following table.

Table 3-3 Water Quality Control Sample Panels

Equipment	Total Quantity	Design Capacity
Main Sample Panel	1	TBD
Local Circulating Water Sample Panel	1	TBD

The main sample panel will consist of the following components:

- Isolation/Block Valves
- Primary Sample Coolers
- Pressure Reduction Valves
- High Pressure Reduction Valves
- Thermal Shutoff Valves
- Pressure, Temperature and Flow Indicators
- Backpressure Regulators
- Conductivity and pH Cells
- Conductivity and pH Monitors
- Sodium, Silica, and Dissolved Oxygen Analyzers
- Primary Cooling Water Flow Switch

- If required, a chiller system for secondary cooling to control sample temperatures to 77°F (± 1°F)

The local sample panel will consist of the following components:

- Isolation/Block Valves
- Pressure, Temperature, and Flow Indicators
- Conductivity and pH Cells
- Conductivity and pH Monitors

The main sample panel will be located indoors in an air-conditioned room. The local circulating water sample panel will be placed near the cooling tower. The local sample panel will be suitably protected from the elements.

Table 3-4 below provides general guidelines for sampling. EPRI guidelines and boiler/steam turbine manufacturer's recommendations will be consulted for specific water and steam monitoring requirements.

Table 3-4 EPRI Sampling Guidelines

Sample Description	Parameter									
	SC	CC	pH	DO	Na	SiO_2	NH_3	Cl	PM	TOC
Turbine steam (reheat/superheated steam)		C*			C	C		G		G
Drum/evaporator water (blowdown or downcomer) (Note 3)	C	C	C	C	C	C		C		
Economizer inlet (Note 3)	C	C	C	C	C		D		C	
Saturated Steam (Note 2)		C			C	D				
Cycle Make-up (Demin.) Water Treatment System Effluent	C			C	C	C				C
Condenser Air In-leakage (Note 1)										
Condenser Leak Detection Trays		C			C					
Condensate Pump Discharge	C	C*	C	C						
Condensate Polisher Discharge		C			C	C				
Condensate Storage Tank Effluent	C				C					

SC – specific conductivity, CC – cation conductivity, pH – pH, DO –dissolved oxygen, Na – Sodium, SiO_2 – Silica, NH_3 – Ammonia, Cl – Chloride, PM – Particle Monitoring, TOC – Total Organic Carbon

Note 1: Monitored continuously or once per shift

Note 2: HRSG drum carryover and iron monitoring shall be done through grab sample testing.

Note 3: Provide local corrosion product monitors for HP, IP and LP circuits

*Both Cation Conductivity and Degassed Cation Conductivity to be monitored

"C" means continuous, "D" means daily, "G" means grab sample

3.12 SERVICE WATER SYSTEM

The service water system served from the raw water system distributes low-pressure water throughout the power station for the following uses:

- CTG evaporative cooling system
- Hose stations for maintenance washdowns

The service water system consists of a storage tank, pumps and distribution piping network.

3.13 FIRE PROTECTION SYSTEM

The fire protection scope described herein has been developed in accordance with NFPA 850 and generally accepted engineering practices and is consistent with previously approved approaches to fire protection for other power plants throughout the United States. This design approach will require an insurance underwriter, local and/or state review and approval, and may require code clarifications or design variances where general code requirements exceed typical industry design practice for power generating facilities.

The existing E. W. Brown Unit 3 fire protection system will be extended to serve the fire protection supply requirements of the NGCC facility. The Unit 3 system consists of two 3000 gpm diesel fire water pumps and dedicated fire water storage tanks. The fire water supply system will provide fire-fighting water to yard hydrants, hose stations, water spray and sprinkler systems. The system will supply the design maximum water demand for any automatic suppression system plus flow for fire hydrants or hose stations per NFPA requirements.

The distribution system will have flush connections at a minimum of every 150 feet. The system will also have flush connections to eliminate dead ending the piping during the flushing procedure.

The main fire header will consist of PVC, HDPE, or cement lined ductile-iron pipe, a minimum of eight-inches nominal in diameter and will loop around the power block, with service main branch lines to auxiliary structures and facilities as necessary. The main header will serve strategically located yard hydrants and hose stations. Applicable hydrants, valves and other appurtenances required by code will be included.

The fire water distribution system will incorporate sectionalizing valves so that a single failure in the yard loop piping will not impact service to both automatic and manual systems serving the same area. The boiler and turbine structures will have dual feeds from the loop system. Fire hydrants will be spaced at approximately 250-foot intervals around the fire loop. The hydrants will be located in accordance with NFPA 24, NFPA 214, NFPA 850 and local fire codes. Valves that require periodic testing will be accessible.

Automatic sprinkler systems, either wet pipe or deluge type, will be provided in the areas listed below. This list delineates the areas of the plant that will be protected by sprinkler systems per the International Building Code (IBC) and/or NFPA 850.

- Lube Oil Systems (except at the gas turbines which are protected by their own carbon dioxide flooding systems)
- Hydrogen Seal Oil Systems
- Indoor Hydrogen Systems
- Large Oil-Filled Outdoor Transformers
- Steam Turbine/Generator Bearing Housing
- In Offices (but not in the control room)
- Below All Operating Floors

3.13.1 Fire Alarm and Detection

Fire detection, protection and alarm practices shall follow an Owner accepted station philosophy and shall be compatible with the overall Site control and instrumentation and as required by the relevant NFPA codes.

The fire alarm system shall be an intelligent addressable type system using FlashScan™ signaling line or equivalent circuits.

Cable routes shall be protected by fast acting fire detection and protection systems offering a high speed of response and back up facility.

3.13.1.1 Alarms

Alarm control panels shall accept signals from the detecting devices and alarm in the control room and initiate release of the protection systems where they are provided. Local alarms and indication shall also be provided.

A proprietary fire alarm system shall be provided for the project with local structure fire alarms, automatic fire detectors, and fire signaling panels as required by design codes and in accordance with NFPA 72.

3.13.1.2 Detection

Smoke detection systems shall be provided in switchgear rooms and amenity areas where provided. Smoke detection shall be provided in these locations to standards specified by the relevant NFPA codes.

3.13.2 Fire Service Mains

The main fire header will loop around the power block, with service main branch lines to auxiliary structures and facilities as necessary. The main header shall serve strategically located yard hydrants and hose stations. Applicable hydrants, valving, and other appurtenances required by code shall be included.

The service main piping material shall be 12” minimum ductile iron or HDPE approved pipe.

The fire water distribution system shall incorporate sectionalizing valves so that a single failure in the yard loop piping shall not impact service to both automatic and manual systems serving the same area. The steam generator and steam turbine generator structures shall have dual feeds from the loop system. Fire hydrants shall be spaced at approximately 250-foot intervals around the fire loop. The hydrants shall be located in accordance with NFPA 24, NFPA 214, and local fire codes. Valves requiring periodic testing shall be accessible.

An underground fire hydrant ring main shall be provided with strategically placed hydrant connections to suit the Site / equipment / building configuration. All hose connection points shall be fitted with connectors compatible with the local fire service and meeting with their approval.

The external hydrant system shall be extended such that each building is provided with at least one hydrant within a distance of 50 ft. Hydrant locations shall take into account the need to keep hose lengths below 250 ft. However, the minimum distance shall be the lesser of the distances listed and those required by the relevant NFPA code. Each hydrant point shall be located with due regard for its security; it shall not be obstructed and shall not become inaccessible under fire conditions due to falling walls, smoke or heat.

3.13.3 Water Based Fire Suppression Systems

Sprinkler and fixed spray systems will be designed and installed in accordance with NFPA 13 and NFPA 15, respectively. Fire protection systems will be provided as stated in the following table:

Area	**Suppression System**	**Detection**	**Actuation**
Steam turbine generator bearings	Preaction water spray	Rate compensated heat detectors	Automatic
ST lube oil equipment	wet pipe sprinkler	Frangible bulb	Automatic
Lube oil piping below the turbine deck and turbine appearance lagging.	wet pipe sprinkler with F-500 wetting agent	Frangible bulb	Automatic
Lube oil piping in the turbine building mezzanine and ground floor	wet pipe sprinkler with F-500 wetting agent	Frangible bulb	Automatic
Central control room	Class III standpipe system	Smoke detectors	Manual
Electrical switchgear room	portable extinguishers	Smoke detectors	Manual
Main and auxiliary transformers	deluge	Heat detectors	Automatic
Administration building	Preaction Sprinkler	Smoke and heat detectors	Automatic
Pump house	dry pipe sprinkler	Frangible bulb	Automatic
Fire pump house	wet pipe sprinkler	Frangible bulb	Automatic
Water treatment building	Portable extinguishers		Manual

3.13.3.1 Transformer Protection

Single, stand alone transformers with a rating of greater than 100kVA separated from other transformers, buildings and critical equipment using fire walls and spacing as acceptable to Owner’s insurance carrier may not require automatic deluge protection. When fire suppression systems are required, oil filled transformers shall be provided with a fixed automatically initiated dry pilot water deluge system. Specific technical design requirements for dry pilot water deluge follows:

- Where automatically initiated water spray systems are required, they shall be arranged such that water is released via discharge nozzles, either automatically or manually from a fire safe position, at a suitable pressure and in such a form as to extinguish any fire outbreak in the minimum of time.
- Suitable provisions shall be made to protect the system from possible freeze damage. Lagging and trace heating shall only be used where the use of dry mains is not possible.
- All specified equipment items shall be protected via automatic operation in response to suitably located thermal detectors of a type, which conform to the requirements of NFPA 15.

3.13.3.2 Miscellaneous Areas

A standpipe system designed in accordance with the requirements of NFPA 14 shall be provided for the turbine structures. The standpipe system shall be designed for a hose outlet pressure of 65 psig at the respective design flow required by NFPA 14 as permitted in NFPA 14, Section 5-7 (1), Exception 1. The standpipe system shall incorporate 2-1/2-inch hose valve outlets for fire department or brigade use and 1-1/2-inch hose valve outlets for occupant use. The 1-1/2 inch hose outlets shall include hose reels with 100 feet of collapsible fire hose.

Cooling towers should be protected per NFPA 214: Standard on Water-Cooling Towers.

3.13.4 Fire Extinguishing Systems

The following areas shall be provided with non-water based fire protections systems:

Area	Suppression System
DCS equipment rooms	FM 200

Carbon dioxide suppression systems shall be designed to NFPA 12 “Carbon dioxide extinguishing systems”. The exciter enclosure system shall consist of an initial and extended discharge to maintain the concentration during the coast down period of the turbine generator.

Rooms which contain electronic equipment, and are generally unmanned, shall be provided with a suitable form of extinguishing system which can be isolated for manned entry. Use of Halon is not acceptable.

3.13.5 Portable Fire Extinguishers

Augmenting the fixed fire protection system, portable multipurpose dry chemical extinguishers will be located throughout the project. These extinguishers will be sized, rated, and spaced in accordance with NFPA 10, with the exception of areas associated with the storage and processing of natural gas. Portable extinguishers will be at least 20 pounds capacity with a minimum rating of 10A:60B:C. Supplemental CO2 extinguishers having a minimum rating of 20B:C will be located to serve electrical equipment rooms. Handcart extinguishers will also be provided in the steam turbine generator structures as necessary for specific hazards.

A proprietary fire alarm system will be provided for the project with local structure fire alarms, automatic fire detectors, and fire signaling panels as required by design codes and in accordance with NFPA 72.

3.14 COMPRESSED AIR SYSTEMS

This section describes the compressed air system including air compressors, air dryers/purifiers and air receivers, including all accessories. One local control panel with remote start/stop capability will be furnished for manual and automatic control of the compressed air system. Each compressor will be sized for 100 percent capacity and will incorporate a lead/lag control scheme.

The compressed air system will provide both service air and instrument air through two separate distribution systems.

Two air-cooled oil-free air compressors will be provided, each to be skid mounted, complete with, but not limited to, the following accessories and appurtenances:

- Intercooler, aftercooler and separators
- Dry type air inlet filter/silencer at each compressor
- Lubrication system
- Drive motor, directly connected with a flexible coupling
- Interconnecting piping, valves, and wiring
- Instrumentation, controls and associated electrical equipment
- Hardwired signals to DCS including service air header pressure, instrument air header pressure and instrument air dew point. In addition, each compressor will be equipped with a communication link for remote monitoring from the DCS.
- Painting, insulation, and sound proofing as required

Two 100 percent heatless regenerative desiccant type dryers will be provided, each with the following accessories and appurtenances:

- Air pre-filter designed to remove 100 percent of all particles larger than 1.0 microns
- Air after filter designed to remove 100 percent of all particles larger than 1.0 microns
- Instrumentation, controls and associated electrical equipment
- Interconnecting piping (including piping from dryers to air compressors), valves and wiring
- Exhaust mufflers and flow restrictor if required to limit noise during dump and purge cycles
- All structural supports

Two vertical air receiver tanks (one for service air and one for instrument air), each with the following equipment:

- Automatic Drains
- Safety Valves
- Local Instrumentation

3.15 HEATING, VENTILATING, AND AIR-CONDITIONING SYSTEMS

Enclosures will be heated, ventilated, and air-conditioned, as indicated below, to provide proper environmental control to meet equipment protection and safety requirements as well as to provide personnel comfort in areas normally continuously occupied. In general, electric unit heaters will be used for heating.

The buildings and electrical equipment enclosures will be ventilated using a combination of louvers and power ventilators and heated with electric unit heaters. Ventilation fans will be provided for the switchgear room. HVAC will be provided for the laboratory area located in the water treatment area. The central control room and DCS room located in the turbine structure will be provided with a packaged HVAC system to provide complete temperature and humidity control for personnel comfort and equipment protection.

HVAC will also be provided for the Battery Room, CEMS enclosure, and any other areas with equipment that requires a controlled temperature to be maintained.

3.16 BULK GAS SYSTEMS

Bulk gas storage facilities will consist of the following:

- Nitrogen gas, stored in bottles, for blanketing the boiler and feedwater heaters when drained or shutdown and providing a nitrogen blanket for the demineralized water storage tanks. Such use must be monitored when personnel access is possible or required.
- Carbon dioxide will be stored in a bulk tank with sufficient capacity for three complete purges of the generator.
- Hydrogen will be stored in bottles in quantities sufficient for two complete fills of the generator in addition to onsite generation capable of supporting twice the vendor indicated leakage rates.

3.17 AMMONIA SYSTEM (IF SCR PROVIDED)

For installations requiring an SCR, the ammonia system will be based on the use of aqueous ammonia (19% by weight).

The ammonia unloading system will be designed for truck delivery utilizing self-unloading-type trucks. Truck deliveries will have on-board provisions to prevent unacceptable emissions of ammonia fumes.

Two ammonia storage tanks shall be provided for the power block. The two storage tanks total capacity shall equal 14 days ammonia use when the power block is operating at full load conditions. The storage tanks shall include platforms with stair and ladder access to the top and end of the tanks to access valves, level gages, instrumentation, etc. The ammonia tanks shall be installed on concrete piers to provide sufficient suction head to the ammonia forwarding pumps. An emergency eyewash/shower shall be located by the storage tank and pump skids.

All ammonia system piping and valves will be stainless steel ASTM A-312 Grade 316/316L from the unloading stations to the vaporization system. The use of copper bearing materials or galvanized materials is not acceptable in any part of the system in contact with ammonia.

Ammonia leak detection and alarm equipment will be furnished in areas where ammonia is being handled or stored.

4 ELECTRICAL SYSTEMS AND EQUIPMENT

4.1 INTERCONNECTION TO THE GRID

The NGCC Power Block will be interconnected at 345 kV to the transmission system at a NGCC switchyard provided by the Transmission System Operator to be located adjacent to the power plant. The GSU transformer high voltage bushings will be the EPC contract terminal point with the designated point of interconnection at the adjacent NGCC switchyard.

4.2 ELECTRIC POWER SYSTEM

The power block will be comprised of one or two combustion turbine generators (CTG) and one steam turbine generator (STG) to establish either a 1 x 1 or 2 x 1 combined cycle configuration. For the specific electric power system configurations refer to One Line Diagrams 189895-0MP-E1001 through 189895-0MP-E1004).

Electric power from each unit will be generated at the generator vendor's standard voltage, with a power factor range of 0.85 lag to 0.90 lead at the generator terminals.

Each generator will be complete with the phase and neutral CT's for protective relaying (generator differential, voltage, over-current, etc.), metering and control functions. Each generator will be high resistance grounded for the purposes of limiting ground current in the event of an internal fault. The protection would be provided using micro-processor based relaying with provisions for sequence of events recording and triggering oscillography in the event of a fault for rapid analysis and power delivery quality.

The output of each generator will be connected to a unit dedicated GSU transformer via isolated phase (iso-phase) bus. A generator circuit breaker will be included for each CTG and STG with two units provided with redundant Unit Auxiliary Transformer tap buses.

The isolated phase bus duct will be self cooled and rated for full unit export, with fault duty rating coordinated with the available fault levels, and have reduced current taps to provide power to two unit auxiliary transformers (UAT). The UAT iso-phase taps will have a fault duty rating coordinated with the generator and transmission system fault levels.

Accessories required for partial discharge monitoring of the generator shall be installed in the iso-phase bus, with sensors installed at the generator terminal compartment and several feet down the iso-phase bus. The number of links in the iso-phase bus shall be the minimum required for equipment isolation.

Each GSU transformer will be a three-phase transformer. The foundation and oil containment area for all transformers will be designed for replacing fully assembled equipment without installing any additional structural supports. Each GSU Transformer will be provided with manual, de-energized, high voltage (HV) side no-load tap changers, and station class surge arresters installed on the transformer HV terminals. The HV terminals of each GSU transformer will be connected to a 138 kV line terminal in the adjacent plant switchyard. Power will be transmitted to the plant switchyard through overhead conductors.

The UATs will each be two winding transformers with the HV rated for the CTG manufacturer's standard voltage, and LV winding rated 6.9 kV (4.16 kV for the 1-on-1 F Class Option). The UAT transformers will each be rated for 100% of the full electrical operating load of the running plant, and will be electrically installed between the generator breaker and the GSU transformer, to provide a source of unit power during unit startup and operation.

4.3 AUXILIARY POWER SYSTEM

The auxiliary power supply equipment includes the unit auxiliary transformers, 7 kV switchgear (4 kV switchgear for the 1-on-1 F Class Option), 480 volt secondary unit substations (SUS) with dry type, close coupled transformers, 480 volt motor control centers (MCCs), 480/277-volt distribution panelboards and 208/120-volt power panels. The auxiliary/power equipment will distribute electrical power to the plant auxiliary equipment. Electrical equipment with the exception of transformers will be installed in rooms with a conditioned environment, except as approved by the Owner.

The maximum rating of each unit auxiliary transformer will be sized to provide 100% of the required auxiliary power to the power block under all operating conditions. A design allowance of 20% will be used in sizing each transformer. The transformer impedance will be selected to provide adequate voltage regulation and motor starting capability under all operating conditions. An automatic load tap changing transformer may be required to meet voltage regulation and short circuit criteria.

The continuous current rating, short-circuit interrupting capability, and short time current carrying capability of the medium voltage (MV) switchgear will be coordinated with the ratings of the unit auxiliary transformer and the characteristics of the downstream connected loads. Two independent medium voltage switchgear lineups will be provided for the power block. Each UAT will feed a switchgear lineup through dedicated circuit breakers. MV circuit breaker relaying and metering will be intelligent in design, and will be capable of directly communicating with the plant DCS system.

Large (larger than 200HP) electrical loads, such as Boiler Feed Pumps, will be sourced from the medium voltage switchgear using circuit breakers. All medium voltage switchgear lineups will include feeder breakers required to supply the connected load plus at least two additional spare units for each lineup for future use.

The rating of each power transformer connected to a 480V secondary unit substation will be rated to supply the total connected 480 volt load under all operating conditions. A 20% design allowance will be used in sizing each transformer. Transformer impedances will be selected to provide adequate voltage regulation and motor starting capability under all operating conditions. The transformers of a secondary unit substation will be fed from different MV switchgear busses.

Secondary unit substations will be of Main-Tie-Main bus configuration. The continuous current ratings and interrupting ratings of the main breakers, tie breakers, feeder breakers, and main bus will be coordinated with the ratings of the power transformers and the connected loads. The secondary unit substations will include feeder breakers required to supply the connected load, with 20% additional equipped spaces for future use. Main, tie, and motor feeder breakers will be electrically operated with intelligent electronics providing protective relaying and monitoring functions. Breaker relaying will communicate directly with the plant DCS system to transmit status and operating quantities to the plant operators.

MCC feeder breakers will be manually operated. The continuous current rating of the motor control center main bus will be as required to supply the total running load under all operating conditions, plus a 20 percent design allowance. The bus bracing and the interrupting ratings and continuous current ratings of the combination starters and feeder breakers will be based on the available fault current and the electrical characteristics of the connected loads. Each MCC will include the combination starters and feeder breakers required to supply the connected load, plus additional units of sizes and types for future use as specified later. All protective devices, trip units, etc. will be intelligent by design and will be capable of being networked, and connecting to the plant DCS system to report status and provide operating quantities.

An IRIG-B signal will be distributed to all protective relaying devices for the purpose of event time stamping.

4.4 EMERGENCY POWER

In case of total loss of auxiliary power, batteries will provide emergency power for emergency lighting and critical process systems. Lighting battery packs will provide for emergency lighting, and a stationary battery system will provide critical process loads such as the plant DCS, turbine emergency lube oil pump, DC turning gear motor, BFP DC lube oil pump, and seal oil pump for up to a 2-hour duration, and elevators. Batteries will be high performance vented lead-acid type with sulfuric acid electrolyte.

A standby diesel generator rated 480 VAC will be provided to support the 480 VAC essential bus systems for each power unit. This diesel generator will be started automatically on loss of the normal power supply and will support essential loads, including designated HVAC, battery chargers, turbine lube oil and seal oil pumps, AC turning gear motor, BFP lube oil pumps, fire water jockey pump, selected lighting, and other loads required to facilitate the safe shutdown of the plant. Nominal diesel generator size for unit emergency power is 750 kW.

4.5 COMBUSTION TURBINE GENERATOR

Each combustion turbine generator is anticipated to be a totally enclosed, direct-shaft-driven, three-phase, 60 Hz, synchronous machine with a hydrogen-cooled or water cooled (TEWAC) rotor and stator (pending selection of the turbine generator supplier). The generator nominal output voltage will be manufacturer’s standard for this size machine. The generator unit will include a static excitation system, redundant automatic voltage regulators, and power system stabilizer (PSS) equipment.

4.6 STEAM TURBINE GENERATOR

The steam turbine generator is anticipated to be a totally enclosed, direct-shaft-driven, three-phase, 60 Hz, synchronous machine with a hydrogen-cooled rotor and stator (pending selection of the turbine generator supplier). The generator nominal output voltage will be manufacturer’s standard for this size machine. The generator unit will include a static excitation system, redundant automatic voltage regulators, and power system stabilizer (PSS) equipment.

The generator will be equipped with flux probes, continuous partial discharge monitoring, core monitoring, tagging compounds and pyrolosate collectors.

4.7 POWER TRANSFORMERS

Each generator step-up (GSU) transformers will be three-phase, two winding, wye-delta transformer. The neutral point of the HV winding will be solidly grounded. Generator step-up transformer MVA rating will support the respective turbine generator rated output less plant auxiliary loads of a single unit over the design conditions, with a 65° C temperature rise, in accordance with IEEE/ANSI standards.

The unit auxiliary transformers (UAT) will be three-phase, two winding, delta-wye transformer and will be provided with no-load tap changers. The neutral of the UATs will be low-resistance grounded.

The main step-up and auxiliary transformers will be oil-filled and the manufacturer's standard accessories will include magnetic liquid level gauge, dial-type liquid thermometer, electronic winding temperature equipment, pressure-relief device, dissolved gas monitoring system, sudden-pressure relay, bushing monitoring system, bushing-mounted current transformers, valves for top and bottom filter press connections, grounding pads, and an oil preservation device.

4.8 ESSENTIAL SERVICE

A packaged 60 cell 125 volt dc battery will be provided within each combustion turbine auxiliary system.

A 60 cell, 125 volt DC station batteries will be provided with facilities for distribution of BOP 125 VDC. High performance vented lead-acid batteries (stationary) with sulfuric acid electrolyte will be provided having a design life of at least 20 years. Batteries will be installed in a conditioned space, with maximum temperature limited to 77° F, and complying with all codes and requirements including spill containment and personnel safety eye wash station.

The EPC Contractor, in accordance with IEEE 485, will determine the capacity of the BOP station battery. With the actual discharge capacity of the battery at 80 percent of rated discharge capacity, with the battery initially fully charged at the floating voltage specified, and with the battery chargers disconnected, the battery will be capable of supplying the duty cycle specified. The batteries will be sized to allow orderly shut down of the plant under emergent conditions without a source of auxiliary power and without damage to equipment. The batteries will be sized to include operation of the steam turbine DC pumps per the manufacturer's recommendations after loss of normal AC power.

Two 100% capacity battery chargers will be provided. The battery chargers will be sized so that one charger can provide the operating DC load under normal conditions, while maintaining float charge on the batteries. Each charger will have the capacity to recharge the battery in 12 hours following complete discharge, while supplying DC plant loads.

DC panels will be use fused disconnect feeder protection and isolation.

A unit uninterruptible power supply (UPS) will be sourced from the unit battery and will include a voltage regulator, ferroresonant inverter, static transfer switch, a manual bypass switch, and distribution panelboards. The equipment will provide 120-volt AC power to essential plant control, safety, and information systems.

The equipment will supply each plant essential load that would be affected by a loss of power of more than 1/4 cycle in duration, and voltage and frequency deviations from nominal. The equipment will be rated so that one inverter can supply the total plant essential load demand.

4.9 PROTECTIVE RELAYING

Protective relaying devices will be coordinated so that electrical disturbances (fault, overload, etc.) are interrupted at the point nearest the fault, with the next upstream protective device providing backup protection. Phase and ground fault protective devices will trip the respective breaker or starter. Protective devices on medium voltage circuits will operate through a lockout relay (86) or equivalent device or circuit to prevent automatic equipment restart or reclose.

Protective devices will be rated for the maximum available fault current. Each current operated protective relay requires dedicated current transformers not shared with other protection or metering devices.

Protective relays will include provisions for IRIG B signal time stamping.

Current sensing relays will be either the drawout case type or will be provided with test plugs or test switches to permit testing and calibration without disrupting the current transformer (CT) secondary circuit.

Primary and backup relaying will be supplied DC power from separate circuits. Each protective relay will be provided with a separately fused power source. The AC source for each protective relay circuit shall be separately fused.

Protective relays will be provided for:

- Unit
    - Unit differential (87U)
- Generators (Primary and backup devices to be provided for each unit generator)
    - Negative sequence (46)
    - Ground overcurrent (51G)
    - Stator ground (64)
    - Volts/hertz (24)
    - Over/undervoltage(59/27)
    - Over/underfrequency (81O/U)
    - Loss of excitation (40)
    - Reverse power (32)
    - Voltage imbalance (60)
    - Generator differential relay (87G)
    - Inadvertent energization relays (50/81)
    - Out-of-step relay (78)
    - Breaker failure relay (50BF)
    - Back-up distance relay (21)
- Emergency Generator (A single multifunction protective device to be provided)
    - Ground overcurrent (51G)
    - Over/undervoltage(59/27)
    - Over/underfrequency (81O/U)
    - Loss of excitation (40)
    - Reverse power (32)
    - Generator overcurrent (51)
- Power transformers (main step-up and auxiliary transformers)

  - Transformer differential relay (87T)
  - Winding temperature (49)
  - Auxiliary transformer phase overcurrent (51T)
  - Transformer neutral overcurrent relay (51TN)
  - Transformer fault pressure relay (63)
  - Oil level switches (71)
  - Oil temperature (26)
- Medium voltage (MV) and low voltage (LV) buses
  - Bus undervoltage relaying for alarm (MV buses only)
  - Incoming phase and ground time overcurrent
  - Feeder phase and ground overcurrent (MV and LV feeders > 100A)
  - Transformer neutral overcurrent
- MV motors
  - Phase overcurrent (instantaneous and timed)
  - Ground overcurrent
  - Loss of voltage (motor protector)
  - Stator over-temperature resistance temperature detector (RTD) for motors
  - Self-balancing primary differential overcurrent (induction motors greater than 1,500HP)
  - Phase current imbalance (induction motors greater than 1,500HP)
- 480 V motors fed from MCCs
  - Phase overcurrent (instantaneous and timed)
  - Ground timed overcurrent (motors 25HP and above)
- Panels, transformers, heaters, and miscellaneous loads fed from MCCs
  - Phase overcurrent protection
  - Ground overcurrent (feeders 100 A and larger)
- 138 kV Switchyard and Transmission Lines
  - 138 kV switchyard high impedance bus differential
  - 138 kV switchyard breaker failure.
  - 138 kV transmission line current differential via fiber.

  The switchyard and line protection will be in accordance with the requirements specified by the RTO in the Interconnection Facilities Agreement.

Main generator and GSU protective relays will be accessible remotely via Ethernet connectivity through the plant communications system to System Protection Engineers, plant operators and plant engineers.

4.10 METERING

Shorting-type terminal blocks or test plugs will be provided so that instruments can be removed without disrupting CT circuits. Voltage transformer (VT) and CT relaying class accuracy will be considered adequate for panel meter applications.

The following indications will be provided in the control room, through the turbine control system and through the DCS by hard wired or data link (not necessarily time synchronized):

- Generators
    - Generator watts
    - Generator gross watt-hours
    - Generator amperes, three phase
    - Generator vars
    - Generator voltage, three phase
    - Generator frequency
    - Generator power factor
    - Field volts
    - Field amperes
    - Stator temperature (may only be selected or averaged temperatures, depending upon available ports)
- Plant net input/output (measured at the Green River Power Plant Substation).
    - Utility voltage, three-phase
    - MWs
    - MVars
    - Net MW-hours
    - Net MVar-hours
    - Power factor
- Auxiliary power
    - Total real power usage of auxiliary plant loads (watts)
    - Total reactive power usage of auxiliary plant loads (vars)

The following parameters will be indicated locally (and in DCS as indicated):

- Medium voltage switchgear
    - Bus voltage, three phase (DCS)
    - Incoming current, three phase (DCS)
    - Current through feeder breakers, one-phase (DCS)
    - Phase current for motor feeds, three-phase (DCS)
- 480 V switchgear buses
    - Bus voltage, three phase

    - Incoming current, three phase
    - Current through feeder breakers, three-phase
    - Phase current for motor feeds, three-phase
- 480 V MCCs
    - 480 V MCC metering is typically not provided unless required by Owner.
- Local indication of the following for 125 VDC system (unit battery)
    - Battery amperes (at DC switchboard)
    - Bus voltage (at DC switchboard)
    - Charger output volts and amperes
    - Charger alarms (also remote common trouble alarm)
    - Bus undervoltage or ground (at DC switchboard; also remote alarm)
- Local indication of the following for UPS system
    - Inverter input volts and amperes
    - Inverter output amperes, voltage, and frequency
    - Inverter alarms (also remote common trouble alarm)
    - CVT output voltage

4.11 COMMUNICATIONS SYSTEMS

The plant paging system will be radio-based.

Wireless communication network will be installed for all indoor area coverage for the use of operations and maintenance personnel during rounds, PDM routes, and equipment testing using wireless instrumentation.

The Contractor shall provide all communications with AGC, the 161 kV switchyard, and intake structure facilities.

4.12 ELECTRICAL DESIGN CRITERIA / GENERAL REQUIREMENTS

4.12.1 General

The electrical systems, equipment, materials, and installation provided under this contract will be designed in accordance with applicable industry codes and standards, project design criteria, and the other requirements specified in this section.

The following general criteria will be used in designing and specifying the physical properties of the electrical system:

- The maximum allowable steady state voltage variation will be ±5 percent of nominal voltage for the HV system.
- The maximum allowable utility frequency variation is as defined by ECAR.
- The three-phase available short-circuit rating of all EHV switchyard equipment will be 63 kA.

- Equipment short-circuit ratings will be based on the maximum fault current available under all operating conditions identified for the current and future site development. No additional margin will be provided.
- Transformer basic insulation level (BIL) for windings will be as follows:

345 kV system	1050 kV
18 or 21 kV system	150 kV
6.9 kV system	95 kV
4160V system	60 kV

- Electrical clearances will be maintained in accordance with the National Electric Safety Code (NESC) and industry standards.

4.12.2 Motors

All motors will conform to applicable standards of ANSI, IEEE, NEMA, and AFBMA.

All motors will have a nameplate service factor of 1.15 minimum. Motors will be sized so that the connected load does not exceed 90 percent of the 1.0 service factor rating.

Motors will be designed for full voltage starting and frequent starting where required, and will be suitable for continuous duty in the specified ambient. Intermittent duty motors may be furnished where recognized and defined as standard by the equipment codes and standards. Motors will be sized for the altitude and temperature range at which the equipment will be installed.

Except as specified otherwise in the individual paragraphs or technical sections, the torque characteristics of all induction motors at any voltage from 80 percent rated voltage to 110 percent rated voltage will be as required to accelerate the inertia loads of the motor and driven equipment to full speed without damage to the motor or the equipment.

Motors ¾ HP to 200 HP will be rated for operation at 460 volt, 3 phase, 60 hertz.

Motors rated greater than 200 HP, will be rated for operation at 6600V, 3 phase, 60 Hertz (4000V the 1-on-1 F Class Option).

All insulated winding conductors will be copper. All motors will be provided with a Class F insulation system. The temperature rise will not exceed a Class B insulation system temperature rise as defined by ANSI C50.41.

Low voltage motors will be of the totally enclosed (TEFC) type and will have a degree of protection not less than NEMA 3. Medium voltage motors will be furnished with WP-II enclosures. All motors larger than 25 horsepower will be furnished with space heaters. Motors located in hazardous areas will be furnished with the corresponding explosion-proof enclosure NEMA rating.

Motors with intake air filtration shall utilize replaceable/cleanable filters.

All motors requiring pressurized bearing lube oil system shall be equipped with backup slinger rings, non-contact reservoir heaters, and shim pack disc couplings.

4.12.3 Cable and Raceway

The electrical power distribution system will be designed and cable will be sized to limit the allowable voltage drop at the load equipment to three percent of the load nominal voltage rating under normal continuous operating conditions (as allowed per industry standards at the load terminals such as motors). The electrical system design will be based on a motor starting capability greater than or equal to 80 percent of the motor nameplate voltage.

Shielded MV power cable will be 5 kV or 15 kV class and will constructed of stranded copper conductors with ethylene propylene rubber (EPR) insulation and a CPE jacket. The 15 kV class cable insulation level will be 100 percent for 7 kV applications. All 5 kV cable shall be rated 133% insulation level for 4 kV circuit applications.

LV power cables will consist of stranded copper conductors with XLPE insulation rated for a conductor temperature of 90 °C and will have a CPE jacket.

Control and instrumentation cables will consist of stranded copper conductors with Tefzel insulation.

Aboveground circuits will be installed in rigid conduit and cable tray. Underground circuits will be installed in buried conduit, concrete reinforced duct bank, or by direct burial, as required by the final design. Direct-buried cable will be used only for cable runs to outlying areas of the plant and only for those cables not directly associated with plant power production, such as lighting. The main underground duct bank design will accommodate a maximum of 10 percent reserve capacity, as practicable.

Cables of redundant mechanical, electrical, and instrumentation equipment will be routed in separate electrical raceway as practical. Redundant power circuits will be fed from electrically isolated sources. Redundant DCS data highway cables will not be routed in a common conduit.

Penetrations of fire-rated floors and walls will be sealed with a fire and smoke seal rated commensurate with the rating of the penetration.

Cable tray will be designed for a NEMA 20-C rating with a minimum distance between supports of 8 feet.

4.12.4 Grounding, Cathodic Protection, and Lightning Protection

The station grounding system will be designed to protect plant personnel and equipment from the hazards that can occur during power system faults and lightning strikes. The grounding system will be designed to ANSI/IEEE standards 80, 142 and 665.

Switchyard ground grid will be connected to the plant grounding system in a minimum of two areas.

Switchyard shielding requirements will be determined using the “rolling sphere” method, with shield wires and free standing masts provided for adequate protection of equipped areas.

Grounding will conform to all requirements of the NEC and NESC.

Electrical equipment and systems in the power block will be grounded in accordance with the National Electrical Code (NEC). The ground fault return path will be either through a ground conductor, the metal conduit, and/or the metal tray system between power source and load. Any discontinuities will be bonded with an appropriately sized copper conductor.

Cathodic protection and other corrosion control measures will be provided to protect the condenser, metal tanks and underground piping. Cathodic protection systems will be designed and installed according to site specific soil survey results, while conforming to NACE standards.

Lightning protection will be provided in accordance with NFPA 780 and UL 96 for the chimney, building structures, transformers, the absorber modules and tanks. The lightning protection system will be certified with a UL Master Label.

The contractor will provide DCS system power and cabinet grounding in accordance with the manufacturer's requirements.

4.12.5 Lighting Systems

Lighting will be provided in the following areas:

- Building interior equipment, office, control rooms
- Building exterior entrances
- Outdoor equipment within the power block
- Power transformers
- Mechanical draft cooling tower
- Power block perimeter roadways and entrances
- Parking within the power block
- Guard house

Lighting designs will meet the illumination levels recommended in Illuminating Engineering Society (IES) Illumination Level Standards for work areas and will conform to applicable OSHA guidelines. Lighting fixtures shall be selected to reduce light pollution impacts. Light shall be directed downward only from the fixture, and shall be directed to illuminate the feature of interest only.

Photocell control will be provided for outdoor area lighting systems, with photocells ganged to operate multiple fixtures, and accessible without the use of a lifting device.

Emergency lighting for egress and for emergency operations will be fed from local battery packs. Plant perimeter lighting will not be provided. Roadway intersections inside the plant boundaries shall be illuminated. The plant entrance intersection shall be illuminated. Construction road intersections are not required to be illuminated.

4.12.6 Lighting Panelboards

Low voltage distribution panelboards for lighting distribution will be located near the loads. Panelboards will include a minimum of 10 percent spare breakers and 10 percent spare spaces at the completion of work. Panelboards will include a main breaker where required in accordance with the NEC.

4.12.7 Electric Heat Tracing

Heat tracing will be provided, if needed, to regulate process temperatures. Freeze protection will be provided for pipes per process P&ID drawings.

Electrical heat tracing will be self-regulating type, wherever possible, and will be provided with necessary power distribution equipment and status indication on the heat trace control panel. Instrument tubing, where applicable, will use pre-traced, pre-insulated tubing bundles. Enclosures for heated instruments will be vendor standard and will be soft pack, partial, or full enclosure depending on the minimum site ambient temperature. A power available light, common system alarm light, and hand-off-auto switch will be provided on the panel enclosure exterior. A thermostat and contactor will be used to start/energize the heat trace system.

4.12.8 Welding and Convenience Receptacles

Welding receptacles (480 VAC) will be provided in equipment areas that are not accessible by portable equipment. Welding receptacles will be provided on the turbine deck and HRSG platform areas, regardless of portable machine access. Final placement of plant-wide welding receptacles shall be approved by the Owner.

Convenience receptacles (120 VAC) will be provided in the administration, maintenance, warehouse, and office areas as required. Convenience receptacles will also be provided in or at electrical equipment enclosures in the operating areas. Outdoor receptacles will be the ground fault circuit interrupter (GFCI) type. Convenience receptacles will be located so that a 100-foot extension cord will reach all areas requiring power for maintenance activities.

4.12.9 Enclosures and Hazardous Area Classifications

All electrical equipment and enclosures/cabinets/panels will be provided with suitable environmental and corrosion protection. All indoor enclosures will be NEMA 12, except in hazardous locations. Indoor enclosures located in wet areas or areas subject to water wash down will be NEMA 4 or 4X. All outdoor or high moisture area enclosures will be stainless steel. In hazardous locations having a coal dust atmosphere, the enclosures will be NEMA 9. Generally, outdoor enclosures will be NEMA 4, stainless steel construction including hinge. In corrosive or dirty atmospheres, they will be NEMA 4X. All outdoor enclosures will be provided with drains for removal of condensation. NEMA rated enclosures are preferred, but equivalent IEC enclosures are acceptable providing the rating exceeds the NEMA ratings. The following equivalent NEMA (IEC) ratings may be assumed as a guide, NEMA12 (IP55/IP54): NEMA 1 (IP23): NEMA 4 (IP66/IP65) and NEMA 4X (IP56).

The EPC contractor will be required to determine the area classifications for all hazardous areas and provide drawings and supporting documentation for review and prior approval by the Owner’s Engineer.

5 INSTRUMENTATION AND CONTROL SYSTEMS

5.1 GENERAL REQUIREMENTS

This section defines the general design basis for the instrumentation and control equipment including the Central Control Room (CCR) equipment.

The instrumentation and control equipment will be designed such that the performance of all systems and equipment, particularly in terms of reliability and availability, are as defined herein. Under no circumstances will lack of redundancy in the control system effectively reduce the redundancy provision of the main systems and equipment.

Instruments required for performance testing will be provided. Performance test instruments will meet the requirements of the applicable test codes. All instrumentation required for performance testing calculations and testing will be connected to the DCS. The DCS will be supplied with software and hardware to provide real-time performance data.

All instrumentation and control equipment will comply in all respects with the requirements of all applicable U.S. Codes and Standards and be suitable for the prevailing climate at the site unless overruled by the requirements defined herein.

The following sections identify the main functional requirements for the instrumentation and control equipment for the combustion turbine generator (CTG), the steam turbine generator (STG), and associated auxiliary systems. Only requirements of the major systems are described herein, but the scope of the instrumentation and control equipment will include all additional minor and support systems necessary to meet the plant operating requirements.

5.2 DESIGN OBJECTIVES

The instrumentation and control equipment will enable power station operations to be carried out in a safe, effective and reliable manner without invoking equipment or system operational limits. In addition, the control system configuration will support the overall performance guarantees detailed herein.

The design of the instrumentation and control equipment will to the greatest extent employ recognized principles leading to:

- A safe operating environment for personnel
- Protection of the plant operating equipment from damage
- Production of power to meet the needs of the remote dispatcher
- Cost effective control system architecture that is maintainable and allows for future expansion
- High availability
- Maintainability
- Power production at the lowest possible cost

Primary plant control and monitoring will be accomplished from the DCS operator stations that will be located in the Central Control Room. Local controls and indications will be restricted to those necessary for non-routine operations for which there is ample time for a roving attendant to accomplish. Local control systems where provided will allow for proper system maintenance, testing and commissioning, and include provisions for equipment isolation and essential tripping facilities. Where local controls are employed, alarms and indications will be provided to the CCR operator to ensure the local system is configured for the intended operating role and functioning within design parameters.

The extent of remote manual controls, indications, automatic modulating controls, automated sequences, and plant/personnel protection systems will be such as necessary to enable the following operations to be carried out from a single CCR:

- All routine plant operations (including all normal and emergency start-up, shut-down operations and operations when on load)
- All non-routine plant operations for local controls for which there is not ample time for a roving attendant to accomplish

Protection equipment will be provided with an appropriate level of redundancy to secure personnel safety, economic protection of the systems and equipment, environmental protection, and a low probability of loss of generation. In particular no single failure within the protection system will lead to inadvertent operation of the protection system or cause the loss of the protection function.

All equipment will be designed such that any interruption in electrical, pneumatic or hydraulic power supply will not result in injury to personnel and damage to systems or equipment.

A principle design requirement for the instrumentation and control systems will be the minimization of the required number of power station personnel (including operational and maintenance staff).

Where allowed by codes and standards, control systems will utilize multiple transmitters for sensing off-normal conditions for alarm and interlock functions instead of process switches. The preferred scheme for multiple transmitters is the middle of three median select methods. This method will also apply to control system inputs in those loops where redundancy is required for plant availability. DCS maintenance graphics will be developed and provided to allow the operator to select individual transmitters during maintenance periods. Deviation alarms will be provided to alert the operator to differences in transmitter signals.

5.3 CONTROL PHILOSOPHY

5.3.1 General

The overall design of control systems and equipment will be based on a philosophy of centralized operation from the DCS operator stations located in the CCR. The plant will be designed with the level of automation required by operating personnel to control CTG, STG and other plant auxiliaries from the CCR. The plant will be capable of going from minimum stable load to full load in automatic control while all controllers are in automatic, permissives are met, and redundant equipment in standby and ready for service. The operator, when required by the loading requirements, must initiate start-up of major equipment, such as boiler feed pumps and other balance of plant (BOP) equipment.

Full control of all equipment supplied by the CTG and STG vendors will be provided through the vendor-supplied turbine control systems (TCS). Any group control or automatic sequence control provided will be per the manufacturer's standard packages. The CTG and STG control systems will include provisions to allow all normal start-up, operation and monitoring functions from the DCS operator stations.

Systems controlled by programmable logic controller (PLC) will provide complete local "stand-alone" system control and monitoring. Each PLC control system will include a communication interface to allow all normal start-up, operation and monitoring of the associated equipment from the DCS. Additional supplementary control and monitoring will be provided at the local PLC operator stations as required for additional manual operating and maintenance functions. Comprehensive alarming and fault finding actions for all equipment controlled through PLCs will be available through the PLC operator stations. Through the DCS operator stations, the operator will have all necessary information available to evaluate any emergency situation, including the ability to take actions necessary to prevent immediate injury or damage.

The DCS interface with vendor-supplied CTG, STG, or PLC control systems will be through redundant Ethernet gateways. All critical control and safety functions will be hardwired.

Auxiliary equipment that does not require continuous operation for electric power production can be fully integrated in the DCS or be monitored, controlled and protected locally, with limited DCS CCR monitoring (system trouble alarm and status (e.g., pump running) and control (start/stop or stop) from the DCS if applicable). Any auxiliary equipment that requires immediate attention for the safety of personnel or plant will be controlled and alarmed remotely through the DCS, either by grouped or individual alarms as appropriate for the application. Other features of the control strategy will include:

- Hardwired safety interlocks and trip functions will be provided as required by applicable Codes and equipment suppliers.
- Other processes that have personnel safety and/or environmental impact. Safety Integrated Level 3 (SIL-3) will have a dedicated safety hardware platform.
- Minimum reliance will be placed upon roving attendants except as required to perform local system and equipment operational checks, following a prolonged outage or maintenance.

5.3.2 Availability

To maximize plant availability, the design of the control system will incorporate functional and geographic distribution of controllers and inputs/outputs (I/O) to minimize the impact of failures. Single failures within each functional area will not result in a reduction of plant availability. This philosophy will also extend to electrical and pneumatic power supplies for each area.

The instrumentation and control system will be structured to reflect the redundancy provisions of the systems and equipment, so that no single fault within the control system can cause failure of the duty systems and equipment and at the same time cause the standby systems and equipment to be unavailable.

5.3.3 Minimum Staff Requirements

To minimize staffing and provide a consistent operator interface platform the DCS Operator Stations will be utilized as a common operator control, display, alarm, trending, and data logging system for all systems with the exception of a small number of package systems that utilize stand-alone local control. Systems which use stand-alone local control will be provided with remote DCS monitoring and/or control in accordance with the functional requirements of Section 5.3.1 above.

The Contractor will submit a control and monitoring plan which includes a list of all plant systems and summarizes what type of control system will be utilized for each system (DCS, PLC, vendor proprietary, stand-alone local, etc.). For each system that is not directly controlled by the DCS, details will be provided on how each system will be interconnected (communications, hard-wire, etc.) with the DCS for central monitoring and control. The plan will clearly demonstrate that the functional requirements put forth in these specifications are met. Prior to implementation, the control and monitoring plan will be approved by the Owner.

The table below identifies the systems and indicates the distribution of control functions between the DCS and PLC or proprietary systems: (refer to Control System Overview Drawings 140423-CCX-K6001 through 140423-CCX-K6003)

Table 5-1 System/Control System Distribution

System Functional Area	Control System
HRSG and Auxiliaries	DCS
Combustion Turbine Generator and Auxiliaries	CTG Control System
Steam Turbine-Generator and Auxiliaries	STG Control System
Balance of Plant Systems	DCS
HRSG Duct Firing Burner Management	PLC
Water Treatment	PLC
Auxiliary Boiler	PLC

5.3.4 Remote Operator Locations

Certain plant systems will require that remote control room or control stations near the process location are available to properly control and monitor the process. A detailed study will be performed by the Engineer to optimize the plant layout to include the appropriate local control areas to best service plant operations.

5.4 DISTRIBUTED CONTROL SYSTEM (DCS) FUNCTIONAL REQUIREMENTS

5.4.1 General

The DCS system will provide operator controls, alarm data, and plant coordination functions necessary to achieve safe and effective remote control of systems and equipment from the CCR. It will also record and be able to subsequently display system and equipment data and produce logs of statutory and management information which will include environmental emissions, the results of performance calculations, and all data required to meet the requirements of the contracts for electricity sales.

The DCS system design will utilize geographical and functional distribution of control components and I/O to minimize field wiring requirements and impact on Plant operation due to equipment failures.

The DCS will perform both analog and digital control and display duties. It will have resident a high level of diagnostic routines and fault indicators so that failures can be rapidly identified and rectified by plug and play in replacement.

5.4.2 Operator Interface

The normal operator interface, located in the CCR, will be via a number of LCD displays and keyboards or equivalent 'soft' key devices (operator workstations) offering a hierarchy of operator selectable control and display formats. The type of keyboard or soft key device used will allow rapid access from display to display by use of dedicated functional keys or equivalent soft key devices.

The numbers and grouping of the operator workstations will be commensurate with maintaining a satisfactory level of operator workstation facilities following the failure of a full operator workstation system. The central control room will contain all operator workstations and a dedicated supervisor console.

The CCR will include a minimum of four quad 21" LCD, and one 46" LCD screen Operator Workstations. The supervisor console will include a minimum of two dual 21" LCD Operator Workstations. The 46" LCD screen stations will have full functionality as an Operator Workstation but will primarily be used for alarm display.

The CTG and STG will each be provided with two single 21-inch LCD operator stations. The CTG and STG operator stations will be located in the CCR adjacent to the DCS operator stations.

5.4.3 Automated Sequences

To meet the requirements of minimal staffing, sufficient automated sequences will be provided to allow starting/stopping of major system and equipment groups from single initiation, however the system will allow item-by-item starts if required by the operator. Facilities will be provided for informing the operator of the completion of each step in an automated sequence.

5.4.4 DCS Performance

The performance criteria which are to be applied to the DCS will ensure that there is adequate computer free time, network utilization time, program run time and memory utilization under worst case traffic handling conditions. A demonstration of these requirements will be required as a part of acceptance testing at the manufacturer's facility.

In addition to the acceptance testing at the manufacturer's facility, the performance criteria will also be demonstrated as a part of the testing to be witnessed during the operating tests to be carried out during the testing and commissioning on Site.

5.4.5 Validity of Data

The DCS will have the ability to recognize that a particular analog signal is incorrect and to take alternative action or to indicate the doubt inherent in any calculated results or data display using that particular signal.

5.4.6 Fault Diagnostics

The DCS will include a comprehensive fault diagnostic system. Equipment to interrogate the fault diagnostic system will be independent of the operator interface used to control and monitor the operation of the Plant. The diagnostic facility will have the ability to display the DCS system schematically and highlight faulty elements pictorially down to individual I/O card level. The system will also have the ability to report faults on additional equipment or controllers (i.e. PLCs) connected to the DCS. Diagnostics of the DCS communication system (e.g. network connections, switches, routers, port status, etc.) is also required.

The DCS will have the capability for remote diagnostics to be carried out by the manufacturer via landline secure internet connection.

5.4.7 Equipment Tag-Out

The DCS will include a tagging capability for equipment lockout and tagging. DCS operator graphics will display equipment tag-out status. Whenever equipment is put into tagged-out mode, the DCS control logic will set the associated outputs to a "safe" state to prevent inadvertent operation.

5.4.8 Fault Tolerance

Dual redundancy or similar approach will be applicable to all components within the common DCS such that the operator communication cannot be lost following failure of any one major component in the system. Control will be affected by a standard series of processors and I/O capable of both digital and analog functions. Control functions will be distributed around a number of control cards such that a failure will only affect one major functional group. Each functional area will have redundant control modules, power supplies, and communication hardware.

5.4.9 Operator Displays

Operator workstations graphics will show overview and group or detailed information to assist the operator in any type of control action required. Overview displays will provide an at a glance view of plant and major subsystem status, and provide the operator with a graphical view of the process to help with training and visual understanding of control action. These displays must remain uncluttered when designed for control operations.

Graphics and symbols will be designed per the DCS supplier’s standard. All graphic displays will be approved by the Owner. All operator graphics will have consistent graphic symbols and navigation. Graphics will be based on the final P&IDs.

In general, graphics and operator interactions will be designed to use the standard DCS pop-up faceplates.

Operators will be able to easily access specific displays and graphics by pressing dedicated function keys or screen targets, selecting from a list of displays in directories or menus, or by typing display or graphic names.

All DCS graphic displays will be globally available to all operator workstations.

It will be possible to move between related displays and graphics of different detail levels or of the same detail level with a maximum of two operator actions.

It will be possible to cycle through a predefined series of displays with a maximum of one operator action.

Special indication will be used to indicate that a value is invalid or in an alarm condition. Alarm conditions will be displayed consistent with color coding used on the SER and DAS alarm displays.

Faceplates will show dynamic process and status information about a single control loop and will permit an operator to change control parameter values or mode for the loop. Faceplates will be defined to pop up when the appropriate location on a process graphic is selected with the pointing device.

Standard displays will show the operational status of the communication system. The communications parameters of each module connected to the communication system (on-line, off-line, failed, primary failed, back-up failed) will be shown.

Each controllable device will have an accessible permissive display dynamically showing all interlocks, trips and conditions that would prevent operator control or automatic actions. All conditions, including those that are not monitored by the system, will be included in the permissive displays. The DCS control logic will have a “first cause of trip” trap for each major component (e.g., feedwater pumps, etc.). The first cause of trip information will be operator accessible via the permissive/trip displays.

Trend and tabular data displays are related to overview displays and will be provided. Common tabular displays will organize key data to match the plant mode while eliminating unrelated data. Trend data displays will be available from overview and detail displays to allow viewing of real time data as well as historical data.

5.4.10 Coordinated Load Control

The DCS will provide for effective coordination of the HRSG, CTG and STG while meeting the operating requirements for achieving the desired generated output in the safest and most efficient manner.
It will be possible to enter a load demand requirement into the coordination controller to meet system conditions. The coordination controller will output its commands to the CTG and STG such that the individual turbine control systems respond to sudden changes in system frequency with the coordination controller superimposing corrective action according to its pre-set characteristics. The coordination controller will output commands to other systems and equipment as necessary.

It will be possible to enter the load demand either locally by the operator via the operating console or remotely by the load dispatcher. The method of entry will be selectable.

When entering a new or revised load demand requirement it will also be possible to enter a value for the desired rate of change of load during the transition from the previous load demand to the new or revised load demand. The range of loading rates available will be sufficient to meet the required operating conditions of the plant.

The coordinated control system will enable the unit to be brought in and out of service and controlled operationally without exceeding pre-determined load change rate limits. Loading rates will be adopted automatically to ensure that HRSG limits or CTG and STG stress limits are not exceeded.

To prevent tripping of the plant upon loss of a major equipment item, the coordinated load control will reduce the CTG generated output in a controlled manner to pre-determined values commensurate with the power requirements for the available systems and equipment. This will be achieved without exceeding HRSG and STG/CTG safety limits.

The coordination load control system will be capable of maintaining overall control to fully meet the operational criteria of the load dispatcher. Should the requirements specified above for load control (including the requirements for frequency regulation) conflict in any respect with the operational requirements of the load dispatcher, the requirements of the load dispatcher will take precedence.

In addition to the coordinated control functions noted above, the DCS will provide supervisory control for all major plant equipment and systems, and monitor all important process parameters and alarms. The DCS will provide supervisory control and monitoring of the CTG, STG and HRSG duct burners as well as any PLC based control systems noted previously.

5.4.11 External Interfaces

5.4.11.1 Real-time to Management Information Systems

Hardware and software will be provided to allow management information systems that may be provided by others, to interface to the DCS in real-time to allow plant data to be extracted for incorporation into the management computer databases for reporting purposes.

5.4.11.2 Performance Monitoring Systems

Capability will be provided to interface with an external system to access system data for the purposes of plant optimization and performance calculations.

5.4.11.3 Interface with Load Dispatcher

Hardware and software will be provided to interface the load dispatcher to the DCS in real time to allow the exchange of information between the load dispatcher and the DCS. Facilities will be incorporated such that load dispatching commands from load dispatcher may either be registered or blocked at the CCR DCS. Similarly facilities will be provided such that the extent of data available on-line to the load dispatcher can be selected at the CCR DCS.

5.4.12 Communications Network

The proposed form of communications network used in the DCS will be adequate to provide the extent of traffic handling and free time required under the all operating conditions. The communication network will be fault tolerant such that no single failure of a device or cable will prevent communication between the processing equipment and the operator stations.

Fiber optic communications is preferred for all DCS network communications. As a minimum, all DCS, CTG, STG and PLC communications that travel through high electrical noise areas or outside a building structure will be fiber optic.

5.4.13 DCS Cabinets

All cables from external equipment connected to the DCS that are not digitally bussed will be via a terminal strip and not wired directly to DCS I/O. Relays, interposing relays, optical isolators and other isolation equipment will, as far as is practicable, be housed in these panels and can be part of the DCS supplied cabinets. Wiring from these intermediate term strips to the DCS termination cards will be done at the factory and checked during FAT.

Cabinets will be located in environmentally conditioned rooms in the various operating area of the plant. Cabinet and room layout and design will consider access for maintenance and repairs.

Instruments and control devices (transmitters, solenoid valves, etc) will be powered from the DCS to the greatest extent possible.

Each DCS input and out circuit will be fused. Fused circuits will utilize LED blown fuse indicator blocks.

5.4.14 Spare Capacity

The DCS will include 20% spare I/O capacity by I/O type and 20% spare cabinet and terminal space at the time of shipment. Processing capacity and communication network capacity will be sufficient so that use of spare I/O does not impact system performance.

5.4.15 Engineering Support

Two Engineering Workstations (EWS) will be provided for DCS maintenance including design of operator graphics, control strategies, storage and printing of associated documentation, and monitoring of the network and attached equipment.

Electronic copies of user manuals will be loaded onto EWS/Server and be accessible to users via any workstation.

Any PLC control packages provided will be networked and integrated in such a way that all systems can be configured and maintained from a dedicated common PLC EWS.

All EWS locations will be reviewed with and approved by the Owner.

Configuration of the control system will be done from the EWS where it is possible to download the individual control algorithms to the control cards. The system will always record the latest configuration such that faulty cards may be replaced and be reconfigured in minimal time. The system will provide automatic documentation of all control configurations and settings.

The system will use a menu driven technique requiring alterations to a value to be confirmed by the operator before implementation. The system will maintain a record of all changes made.

Equipment will be provided to effectively support and secure control software contained in all user programmable devices during its life cycle i.e. Contract, design, development, installation, operation, maintenance and modification.

Provision will be made to protect and maintain the integrity of the media upon which software resides by the use of unique labels. Unauthorized access to the EWS and other software based systems will be controlled by the use of passwords.

Each EWS will include one 11" x 17" color laser printer for printing system documentation and graphic displays.

5.4.16 Data Storage

5.4.16.1 Logging Equipment

Logging equipment that will record and subsequently display plant conditions, events and alarms prior to, during and subsequent to any operational incident will be supplied. This will provide statutory and management information to permit appropriate operational decisions to be made immediately after an incident and/or post-incident investigations to be carried out.

The loggers will produce a record automatically on initiation by any critical system/ equipment alarm and on any action by the protection system to shut down items of systems/equipment.

Parameters to be recorded for the steam generator, steam turbine generator, plant auxiliary systems and equipment will as a minimum include, but not limited to:

- The sequence of individual system/equipment alarms including those displayed only at the local level
- The position of all main control actuators
- The measured power output
- Speed, vibration, eccentricity and linear displacement of the CTG, STG and feed pumps
- Operational hours and number of starts of the machine
- Fuel consumption
- Steam conditions for the STG
- Fuel supply conditions for the CTG and HRSG
- Critical temperatures
- Pressure, flow and vibration measurements of the systems and equipment
- Environmental emissions
- Commands from the operator workstations

In particular the design of the printer logs will allow pre- and post-event status information to be printed automatically following a major incident.

A log will be provided of all alarms, events, errors and faults associated with the DCS. This will be either event driven or operator initiated.

Log messages will be printed in chronological order. A minimum of two printers will be provided. Automatic changeover facilities will be provided in case of printer failure.

Event and alarm logs will be capable of providing time stamps to events and alarms with a resolution of one second.

The DCS will automatically log all operator events (e.g., start commands, stop commands, set point changes, alarm acknowledgement, manual control, auto control, etc.). The DCS will provide the user with an "on demand" capability to generate operation event reports. Information with operator event reports will include the workstation the event originated from, ID of the user who issued the command, and date and time the operator events occurred.

5.4.16.2 Sequence of Event Recording

In order to determine the precise cause of a trip, a sequence of event recording capability is required. The DCS will include dedicated redundant controllers, and a number of SER capable digital I/O channels will be dedicated to detecting and logging a trip condition and critical parameters to a resolution of one millisecond. These will be trips associated with the turbine supervisory equipment, generator protection, HRSG protection and interconnecting relays.

5.4.16.3 Archives

Sufficient archive equipment will be provided to record and subsequently display alarms, events and process variables necessary to meet statutory requirements and support the achievement of effective control, monitoring, and trouble-shooting of systems and equipment.

All standard, alarm and event logs will be recorded in the archive. Data shall be stored on redundant hard drives (minimum RAID 1) and include sufficient storage to keep all plant data for a minimum of two years. The system shall include provisions for back-up and storage of data files to optical media. Equipment shall be provided to effectively search for, select, display and print the data.

5.4.16.4 Alarms

The DCS will be the primary means of alarm display and storage in chronological order or via a separate DCS driven soft annunciator device.

Alarms will include those generated from digital inputs, derived from analog signals or produced from logic within the DCS. Provision will be made for at least 7 levels of alarm (hi-hi, hi, deviation hi, lo, lo-lo, deviation low and loss of input) and the inclusion of a dead band on the resetting of an alarm.

Displays on the Operator Workstations will be used to bring alarms to the operator's attention, allowing for prioritization of alarms to three levels, e.g. high, medium, or low priority. Visual and audible segregation of alarms by priority will be possible. The prioritization of an alarm will be based on the consequences that the operator can prevent by responding appropriately to it. Overview, plant system and "all alarms" displays will be provided, together with a facility to zone alarms for acceptance. It will be clear without any prior selection, which system/equipment area has caused the alarm to be raised. No more than one operator selection will be required to display the alarm category, status, message and unique identifier. Alarms will be accepted and reset from this display.

Alarms will be displayed in chronological order. Initiation of an alarm will result in both audible and visual warnings. Acceptance of an alarm will cancel the associated warnings.

An alarm is re-settable if it has been accepted and has returned to the normal state. Any messages remaining after alarms have cleared are then required to re-pack. Alarms will not have more than one entry in a system/equipment area page. It will be possible to bypass an alarm such that its action is inhibited. It will be possible to apply limited logic to an alarm to suppress its display when required.

An alarm management philosophy will be established for areas such as alarm priority, alarm trip points, re-alarm dead-band and significant change alarming. The following alarm criteria must be reviewed:

- Conditions that cause multiple alarms. For example, a mill trip will bring in multiple alarms associated with flow and temperature devices
- Common alarms that have no operator action
- Alarm cycling. Once the alarm is active, a dead-band should be set to prevent the alarm from re-arming unnecessarily
- Alarm priority distribution. A system with too many emergency alarms and too few low priority alarms will negate the effect of an emergency alarm
- Alarm grouping. Alarms assigned to an alternate alarm group for review by engineering and support personnel will allow operations alarm screens to remain uncluttered

The DCS will automatically log all operator events (e.g. start commands, stop commands, set point changes, alarm acknowledgement, manual controls, etc.). The DCS will provide the user with an "on demand" capability to generate operation event reports. Information within operator event reports will include the workstation the event originated from, ID of the user issued the commands, date and time the operator events occurred. The DCS alarm system shall also be configured to include system status alarms to alert the operator of any general system alarms or abnormal operating conditions (e.g. demineralized water system in standby mode).

5.4.17 EMI/RFI Interference

5.4.17.1 Electromagnetic Compatibility - Susceptibility

Equipment will not mal-operate due to radio frequency interference, including that generated by adjacent equipment (including fluorescent lamps), portable radio communication transmitters being operated in close proximity, and signals from distant radio, television and radar transmitters.

While the metal enclosure housing of equipment may provide an effective screen to radio frequency interference, the equipment must also function satisfactorily when the housing is opened for maintenance and testing purposes. Undue reliance will not be placed upon the fact that the equipment is grounded, as at radio frequencies the ground impedance may be significant.

All proposed equipment will be type RFI tested to American standards including transducers and initiating devices.

5.4.17.2 Electromagnetic Compatibility - Generation

All reasonable precautions to minimize the generation of interference by their equipment by incorporating adequate screening and filtering. Equipment will not generate interference at a level which could be detrimental to its own performance or that of other equipment, or to the health of personnel.

Interference at radio frequencies will be reduced to below the limits specified by the U.S. standards. The grounding and cabling arrangements will be such that interference does not result.

5.4.17.3 Immunity to Electrical Supply Variation

Equipment will be capable of operating continuously to without malfunction under variations in voltage and frequency, including transient interruptions in supply and cable-borne interference that may be reasonably expected to occur.

5.5 CENTRAL CONTROL ROOM (CCR)

5.5.1 General

All activities associated with the routine operation, control and monitoring of all systems and equipment will be performed from the CCR.

Recognized ergonomic principles will be incorporated into the design of the control room equipment in order to minimize the incidence of operator error and maximize their efficiency.

The overall appearance of the CCR will be that of a prestigious nature. All fixtures and fittings will be of a durable finish. The scope of supply will include all control room furniture, including filing cabinets.

5.5.2 Control Room Equipment

The equipment in the control room will include, but not be limited to:

- DCS control consoles
- Supervisors console
- Computers for administrative and maintenance functions
- File cabinets, operations tool and safety equipment

5.5.3 Lighting Design

With the large use of LCD monitors within the control room, particular attention will be given to lighting arrangements for the CCR such that there are no glare or reflection problems from LCD monitor surfaces when viewed from any normal operating position. This will include the provision of 'up-lighting', anti-reflective VDU filters and matte instrument surfaces, as necessary.

It shall be possible to adjust the lighting level from 20 to 75 foot-candles to suit operational requirements.

5.5.4 Control Consoles

The control console will be a desk type construction with approximately horizontal surfaces containing all operating controls and appropriate vertical surfaces for all displays and be designed to accommodate two operators. The general design of the consoles will minimize ledges and crevices and will be easy to maintain in a clean condition. The control console desk will, in addition to housing the necessary LCD displays and keyboards, provide a suitable horizontal surface for clerical types of duties.

A control panel will be integrated into the console design to house hard wired pushbuttons for master fuel trip (MFT), STG trip, and any other emergency actions required.

The Supervisors console will, in addition to housing the necessary LCD displays and keyboards, provide a suitable horizontal surface for clerical types of duties.

5.5.5 Telephone and Radio Communications

Telecommunications will be provided. Space will be provided for telephones and radio pagers on the Supervisors and Operators consoles and in other Owner designated plant areas.

5.5.6 Electrical Power Supply

All instrumentation, control systems and field equipment will be powered from uninterruptible power supplies (UPS).

5.6 ENVIRONMENTAL MONITORING EQUIPMENT

A continuous emissions monitoring system (CEMS) will be provided to analyze and monitor emissions in the exhaust gas from each CTG/HRSG as the gas passes through the respective CTG/HRSG stack. Concentration levels of oxides of nitrogen (NO_x), oxides of sulfur (SO_x), carbon monoxide (CO), and Ammonia (NH_3).

As a minimum, each CEMS will consist of the following major components:

- Climate Controlled Shelter
- Extractive Sample Retrieval Systems and Transfer Systems (including heated umbilicals)
- Sample Conditioning System
- Analyzer Rack
- CEM System Controller
- Stack Mounted Extraction Probe
- Calibration Gas Cylinders and Regulators
- Data Acquisition System
- Dilution Air System
- Uninterruptible Power Supplies
- Spare Capacity for Future Regulatory Requirements

Each self-contained CEMS with climate-controlled shelter will be provided to monitor emissions in accordance with applicable regulations. The equipment will be designed, fabricated, tested and field certified in accordance with applicable parts of U.S. Environmental Protection Agency 40 CFR Parts 60 and 75 and all State and local regulations. All required reporting will be handled by a common data acquisition system located in the CCR.

Each CEMS will extract samples will from its respective HRSG upstream of the catalyst sections and in the stack via sample probes and electrically heat traced sample lines. After entering a CEMS shelter, the sample will be conditioned to remove moisture and particulate content and forwarded to analyzers for measurement of emissions concentrations. Signals representing concentrations will be wired to the associated CEMS controller.

CEM system controls will consist of the necessary input and output modules, processor, power supply and communication hardware to accept analog and digital field signals, calculate emission parameters and store values in memory for at least a 14-day period. System controllers will be equipped with battery memory back-up allowing information residing in memory to be retained in the event of power failure. A hard-wired interface between the system controllers and the DCS will provide necessary plant operating data (fuel flow, operating status, etc.) to the CEMS. The DCS will also utilize a communication connection to retrieve and indicate emissions data and system alarms associated with the CEMS.

Each system controllers will communicate with a common PC based DAS located in the CCR. The DAS will perform all necessary calculations and generate reports. In the event of a failure of the DAS, the software will be configured to automatically retrieve all missing data from the memory of the system controllers to repopulate the system database and generate reports.

Each CEMS will be installed in a pre-fabricated enclosure with redundant power supplies, HVAC, fire detection, CO and hazardous gas detection, LAN/WAN connections, telephones, and sufficient workspace.

5.7 VIBRATION MONITORING SYSTEM (VMS)

Vibration monitoring equipment will be provided for the CTG, STG, boiler feed pumps, cooling tower fans, and all rotating equipment over 1000 HP. Transducer selection will be based on the type of bearing, equipment orientation (vertical versus. horizontal pump, etc.), potential equipment failure modes and speed of operation.

The VMS will collect all data and provide the required hardware and software to store the data, provide reports, and provide functionality to monitor and predict the status of the rotating equipment. The VMS will also provide data to the DCS for alarming and data display/storage. Access to the VMS data will be through the DCS consoles located in the CCR.

The VMS will also provide data to the DCS for alarming and data display/storage. Vibration signals used for equipment protection will be hard-wired to the DCS from the associated vibration monitor.

5.8 GENERAL TECHNICAL REQUIREMENTS FOR INSTRUMENTATION AND CONTROL SYSTEMS

When designing the instrumentation system every attempt possible will be made to use field bus networking of instruments both digital and analog. Major benefits of reduced wiring costs, capture of more data per instrument, increased future flexibility are to be capitalized on by the use of this technology. In critical or high speed control applications consideration will be given to using standard analog hard-wired instrumentation in lieu of field bus network instruments. Analog instruments where used will include “Smart” electronics and include “Hart” communications capability.

Instrumentation and control components furnished will conform to the requirements described herein, and will be constructed to withstand temperatures and pressures encountered in actual service. Hazardous area type construction components approved and marked for use in hazardous class locations will be provided where required by applicable Code.

Instrumentation manufacturers will be in accordance with the attached Acceptable Equipment Suppliers list.

Any special tools or equipment required for maintenance or calibration of the I&C equipment will be provided.

Unless unavoidable, materials which could be hazardous in normal or fault conditions, will not be used in the construction of equipment or in components used therein. Where such use cannot be avoided, then the prior approval of Owner will be obtained. Risk assessment will be required and the materials will be clearly and unambiguously indicated on the equipment, together with any special instructions. Hazardous will be taken as meaning explosive, toxic, carcinogenic, mutagenic, radioactive, or biologically active in any way. MSDS sheets will be provided.

The instruction manual and the operating instructions will detail the extent to which any hazardous materials are used in the equipment. Instructions will be given regarding the safe handling and disposal of such materials, or components containing or incorporating such materials. Information relating to hazardous materials need not refer to the use of lead in solder but will refer to the use of beryllium, mercury, selenium, asbestos and other toxic elements or compounds that might constitute a hazard in use. The instruction manual will highlight any hazardous effects of damage to or overheating of a component or equipment.

5.8.1 Instrumentation

This section outlines the minimum general requirements for instrumentation and control equipment. More stringent requirements for severe service or specialized applications will be applied.

5.8.1.1 Local Indicators

Pressure indicators will be constructed with solid fronts, black phenolic cases, and will have ½” NPT lower stem mounting connections. Bourdon tubes and sockets will be constructed of Type 316 stainless steel. Indicators will have stainless steel rotary-geared Teflon movements and adjustable self-locking micrometer pointers. Indicators will have 4-1/2 inch dials with weatherproof construction and non-glare glass. Indicators will be ASME Class 2A (0.5% accuracy).

Pressure indicators used on pump discharges and other similar applications will be furnished silicone filled. In-line mounted pressure indicators will be provided with pigtails where required to isolate the indicator from high temperature fluids/vapors. In-line mounted pressure indicators will be provided with diaphragm seals where required to isolate the indicator from corrosive fluids/vapors.

Differential pressure indicators will have 4-1/2 inch dials. Indicators will be provided with a pipe mounting kit.

Temperature indicators will be a bimetallic adjustable angle type with minimum 4-1/2 inch dials. All temperature indicators will be supplied and factory assembled with thermowells.

Pressure and Temperature indicator dial scales will be such that the normal readout of the gauge will be between approximately 1/3 and 2/3 of the dial scale. Unless otherwise designated, dial scale will utilize English units of measure.

5.8.1.2 Temperature Elements

Temperature elements will be dual-element chromel-constantan type (ISA Type E) thermocouples. Dual element chromel-alumel (ISA Type K) will be provided for high temperature applications.

U.S. standard colors will be used for thermocouple leads and extension wiring. Type K will utilize yellow and red leads with yellow exterior jacket insulation. Type E will utilize purple and red leads with purple exterior jacket insulation.

Temperature elements for motor and generator windings will be RTD’s. RTD’s will be the three wire platinum type with a resistance of 100 Ohms at 32 °F. The RTD’s will be ungrounded, ceramic wire-wound or hard glass wire-wound, metal-sheathed and ceramic packed.

Temperature element assemblies will be furnished with aluminum or cast iron, weatherproof connection heads with screwed covers and screw type connection terminals. Temperature element assemblies will be spring-loaded. Assemblies being installed into piping with design temperatures above 900 degrees F will be supplied with Inconel sheaths, all others will be supplied with type 316 stainless steel sheaths. Element diameter will be 0.25 inch unless otherwise noted. Assemblies that require extensions will be furnished with stainless steel extension nipples and unions.

Thermocouples will comply with the limits of error contained in ANSI-MC96.1, Temperature Measurement Thermocouples.

5.8.1.3 Thermowells

Temperature sensors for use in steam or fluid systems will be, unless otherwise noted, provided with thermowells of one-piece, solid-bore, and step-less tapered design. Thermowell material will be ASTM A182 GR F316 stainless steel unless the specific application requires the use of a different material. Maximum bored internal diameter will be 0.387 inch. The design of thermowells will be certified acceptable for the maximum conditions of temperature, pressure, and fluid velocity by methods described in ASME Performance Test Code 19.3-1974, Chapter 1, Paragraphs 8 through 19.

Thermowell outside diameter at the beginning of the taper will be approximately the same as the root diameter of the threads.

Each Thermowell provided as part of a temperature indicator assembly will be furnished with a stainless steel extension nipple and union.

Thermowells with extensions 3 inches or less may be supplied with lagging extensions in place of extension nipples.

Thermowells will be threaded and constructed to allow seal welding after installation.

Thermowell connection sizes will be 1” NPT for services below 750°F and 1-½” NPT for services above 750°F.

5.8.1.4 Protecting Tubes

Protecting tubes will be furnished for all temperature elements in air or gas ducts to provide mechanical support for the temperature elements within the ducts. Protecting tubes will be made of Type 316 stainless steel and will be provided with stainless extension nipples and unions. Protection tubes will be closed end type.

5.8.1.5 Process Measurement Switches

Pressure and differential pressure switches will have ½” NPT port connections with Type 316 stainless steel wetted parts. Switches will be field adjustable, vibration resistant, and will have high repeatability with minimal temperature effect. Switches will have DPDT snap-acting contracts rated for 5 amps at 120 VAC.

Float type level switches will be of the magnetically coupled float and body construction with flanged carbon steel cages and stainless steel floats and internals. Level cages will be provided with 1-inch SW side and bottom connections. Switches will be snap acting magnetically coupled to float. Switches will have DPDT contacts rated for 4A at 120 VAC and 125 VDC.

Switches will be provided with NEMA designated enclosures suitable for the environments and hazardous areas designated. Switches located in non-hazardous areas will be rated NEMA 4.

5.8.1.6 Pressure, Level, and Flow Transmitters

Transmitters shall be of the electronic, diaphragm type with 316 stainless steel diaphragms, flanges, vent valves, bolts and nuts, isolation diaphragms, and 1/4-inch NPT female process connections. Wetted parts in contact with FGD chemistry (slurry, reclaim water, duct condensate) will be made from C-276 or C-22 alloy.

Transmitters shall be microprocessor based with “Smart” electronics. The transmitters shall be capable of being locally or remotely interrogated, configured, tested, or digitally trimmed utilizing a hand-held interface at the transmitter site or from any wiring termination point in the 4-20 mA loop.

Transmitters shall have a minimum accuracy of 0.075 percent of the calibrated span and a minimum turndown capability of 50:1.

Linear integral mount LCD meters shall be provided for all transmitters. LCD meters shall be field configurable at the transmitter to indicate the measured process range.

Transmitters shall be furnished with a two-wire, 4-20 mA output or Foundation Fieldbus® communication. Transmitters shall be furnished with external zero and span adjustments. Transmitters located in non-hazardous areas shall be rated NEMA 4X. Transmitter electronics shall be housed in aluminum enclosures with 1/2-inch NPT conduit connections.

Transmitters shall be factory calibrated. Flow transmitters shall sense differential pressure. Pressure and level transmitters shall measure either gauge pressure or differential pressure.

Differential pressure level or flow transmitters in steam service shall be provided with condensate pots.

Flange mounted level transmitters shall have 3 inch Class 150, 316 stainless steel mounting flanges shall be provided with the necessary 316 stainless steel bolts and nuts. Flange mounted transmitters shall be provided with a calibration ring to be mounted between the transmitter mounting flange and the process flange. The ring shall provide two 1/2-inch female NPT connections.

5.8.1.7 Cage Type Level Transmitters

Cage type transmitters will consist of an electronic transmitter that utilizes a non-contact technology with an external type cage. The technology utilized will be appropriate for the given process conditions. All wetted parts and surfaces will be constructed of Type 316 stainless steel. Heat insulators will be furnished between the sensor and transmitter where required by high process temperature.

The use of displacer type level transmitters will be minimized to minimize maintenance activities. Where the use of a displacer type level transmitter is necessary, the transmitter will meet the guidelines described herein.

Transmitters will be provided with NEMA designated enclosures suitable for the environments and hazardous areas designated. Transmitters located in non-hazardous areas will be rated NEMA 4.

5.8.1.8 Instrument Primary Tubing

English units of measurement will be used with all materials, fittings, and components.

Tubing used to connect instruments to the process line will be stainless steel or copper as required by process conditions except where package systems utilize pipe. Copper tubing will not be allowed to connect process lines to transmitters on any service associated with steam, condensate, or feedwater regardless of temperature or pressure.

Stainless steel tubing will be 1/2-inch OD x 0.065-inch or 0.083-inch wall, ASTM A213 type 316 stainless steel. Stainless steel tubing will be fully annealed, have a carbon content greater than 0.04 percent, not exceeding Rockwell B80 hardness and meet the requirements of ASME B31.1.

Copper tubing will be 3/8-inch x 0.035-inch wall seamless soft annealed or 1/2-inch x 0.049-inch wall or 1-inch x 0.049-inch wall seamless light anneal.

Tubing fittings shall be of the compression, flareless “bite-type”. All threaded fittings used with stainless tubing throughout the plant shall be from a single manufacturer.

5.8.1.9 Manifolds and Blowdown Valves

All pressure sensing devices (indicators, switches, transmitters, etc.), whether differential or static, will be provided with 3 or 2 valve instrument manifolds respectively. Blowdown valves will be provided for instrument installations where process conditions are such that plugging of sensing lines is possible.

Instrument manifolds and blowdown valves will be 316SS and designed, manufactured, and tested in accordance with ASME B31.1.

5.8.1.10 Solenoid Valves

Unless otherwise noted, solenoid valves powered by the DCS or a PLC will be 120 VAC, utilize Class H coils for all services including high temperature applications or Class F coils with mini-change connectors in non high temperature applications, and be suitable for continuous duty. Solenoid valves will be provided with NEMA designated enclosures suitable for the environments and hazardous areas designated.

5.8.1.11 Control Valves, Power Operated Isolation Valves, and Damper Drives

Modulating control and block (open-close) valves will consist of motor operated or pneumatic, spring-opposed actuators with body materials, pressure ratings, and trim suitable for the application. Typically control valves will be globe-body cage type but where service conditions dictate, other types such as butterfly, V-Ball, etc. may be used.

Electric actuators for isolation valves are preferred. Actuators will be provided with local open/close controls mounted on the actuator with a lockable local/remote selector switch. Motor operated actuators will be provided with end of travel and torque switches for stopping motion when the valve reaches the full open or closed position. Actuator enclosures will be of the totally enclosed weatherproof type, NEMA 4 or better.

Each modulating control or block valve will be supplied with the following factory installed, and pre-tubed features and accessories:

- Filter/Regulator sets
- Positioners with input, output, and supply gauges (modulating valves only)

- Quick-change trim
- Hand-wheels for those modulating valves that do not have manual bypasses and may require operation to maintain plant availability
- Volume tanks and failure mode components (if required)
- Position indication integral with the valve shaft or stem
- Volume boosters (if required)
- Quick relief valves (if required)
- Valve open and closed limit switches, proximity type where possible (on/off and as required for control in modulating service)

The control valve data sheets shall also define control valve seat leakage requirements. Seat leakage classification shall be in accordance with FCI 70-2 or MSS-SP-61. The leakage class shall be determined by the service application. Soft-seated valves shall not be provided in services where design temperature conditions exceed 450 °F or where flashing liquids are present.

The control valve data sheets shall also specify the maximum operating shut-off differential pressure and temperature conditions for each control valve. The EPC Contractor shall provide calculations describing the maximum shut-off differential pressure for each control valve. Except for low differential pressure general service applications, control valves shall be provided with shut-off class equal to or exceeding FCI 70-2 Class IV leakage requirements. For high differential pressure severe service applications including steam turbine bypass, feedwater flow control, and boiler feed pump recirculation a minimum shut-off class equal to or exceeding Class V shall be provided.

Asbestos, in any form, is not allowed in gaskets, packing, or any other furnished materials.

Control valves will be provided with isolation, bleed, and bypass valves to permit online maintenance, where this is practical.

The equivalent "A" weighted sound level measured 3 feet downstream of a control valve or system of valves and equipment and 3 feet from the insulated pipe surface will not exceed 85 dBA. This 85 dBA limit is an accumulated limit regardless of individual noise emitters. The noise reduction allowance for thermal insulation will be limited to 3 dBA per inch, up to a total maximum noise reduction of 6 dBA.

5.9 CONTROL SYSTEMS

5.9.1 Programmable Logic Controllers (PLC)

PLC control systems in general will not be specified. PLC systems where used must be approved by the Owner and will utilize Allen-Bradley hardware and software.

Unless specifically noted otherwise, PLC control systems will have redundant processors, power supplies, and communication hardware.

Each PLC system will be fed from the plant 120 VAC UPS.

PLC processors will not be more than 50% loaded for the processing of all I/O, control and monitoring functions. I/O will be partitioned such that redundant equipment I/O is placed on separate cards.

PLC programs will be completely annotated. Descriptions of the intent for each rung in the ladder program will be included in the ladder. The program will utilize the Owner's tag numbers.

Each PLC system will be provided with PC based operator workstations. Each system will be reviewed to determine the number, type, and location of operator workstations to support the functional requirements of the associated system. In environmentally controlled spaces, operator workstations will be standard PC type with 21" LCD display. When located locally to the process equipment, operator workstations will be industrial PC type suitable for the environment where applied and be mounted in a panel with a minimum NEMA 4 rating. All workstations shall be appropriately shaded for sunlight or high light areas as to allow operator reading.

5.9.2 Control System Enclosures

Each control system (DCS or PLC processor, I/O cards, power supply, etc) will be mounted in a NEMA designated enclosure suitable for the environments it is intended for. In general, indoor enclosures will be NEMA 12 and outdoor enclosures or enclosures mounted in process areas will be NEMA 4. If required, the enclosure will be provided with an integral thermostatically controlled space heater and/or air conditioner. Enclosure lids shall be hinged and jointed to allow hands-free access to the enclosed instruments. All EPC Contractor-furnished instrument enclosures shall be easily accessible, without exception.

Enclosures that require regular entry for routine testing or maintenance will be provided with internal lighting.

All I/O cards will be factory wired to interposing terminal strips. Discrete inputs and outputs will be provided with fuses for circuit protection and isolation.

5.10 INSTRUMENT & CONTROL EQUIPMENT INSTALLATION

5.10.1 Installation Accessibility

Field instruments, other than local indicators, will be grouped together as practical to facilitate mounting on instrument racks or standpipes (indoor service), or enclosures (outdoor service).

All process connections, including root valves and inline devices, will be located in areas of convenience for operation, inspection, and serviceability. It will be possible to easily access all I&C devices without the requirement for temporary or non-permanent scaffolding, platforms, and ladders. Final location of I&C devices will be agreed to by the Owner. Double root valves will be used for all instrument process connections on systems where process conditions exceed 600 psig or 750°F.

Generally, instruments will be mounted on a rack or standpipe at an elevation of approximately 4' 6" above equipment base or platform.

Instrumentation will not be installed on handrails, process piping (other than inline instruments), ladders, maintenance access ways, or equipment subject to vibration.

Indicating devices will be positioned to be easily read by an operator.

5.10.2 Instrument Installation

Typical instrument installation detail drawings shall include a bill of material and schematically indicate the instrument installation requirements. The EPC Contractor shall furnish and install all components as required to complete the instrument installations in accordance with typical instrument installation detail drawings and as noted in these specifications.

All instrument installations must strictly comply with the instrument installation detail requirements. Any installations found not to meet this requirement shall be reworked by the EPC Contractor at the EPC Contractor's expense.

All tubing will be continuously supported with tubing supports. Tubing runs less than 24 inches do not require continuous support. Tubing runs, in tray, requiring the use of unions will have tubing bent to lift the union from the tray for ease of inspection, maintenance, and installation.

Special tools will be used for all bending and forming operations. Tubing will be carefully handled to avoid flat spots, kinks, and short bends. All tubing so damaged will be replaced. All piping and tubing will be air blown after erection and before attachment to equipment at either end.

Tubing will be continuously sloped to ensure a wet leg exists for all liquid/steam services. Tubing will be sloped back to the pressure connection to prevent accumulation of condensate in gaseous service. Slope will be ¼-inch per foot minimum. Tubing runs from sensing points to the instrument will be short as possible.

Where possible, instruments will be installed below the source tap for liquid/steam services. Gaseous service instruments will be installed above the source tap.

Tubing runs will be routed to avoid routine maintenance and operations areas.

Tubing runs installed in areas of thermal growth (steam lines) will be furnished with expansion tubing loops in the horizontal direction. Flexible stainless steel armored hoses are prohibited.

Sensing elements will be located with adequate clearance for removal or replacement.

Electric heat tracing will be applied on process and instrument piping, tubing, and devices that are temperature sensitive or susceptible to freezing. Heat tracing will be self-regulating and consistent with industry standards.

5.10.3 Instrument Identification

A labeling system for identification of Instrumentation and Control equipment will be established and be subject to approval by Owner.

All instrumentation and control equipment supplied will be provided with means to identify the Item, type number, serial number, and calibration details.

In addition to the manufacturer's identification, inscriptions to indicate the function of all items of equipment will be provided as detailed below.

Labels made from paper, embossed self-adhesive plastic or metal will not be used.

Permanent labels will be mechanically fixed by screws (self-tapping acceptable) or rivets. Changeable labels will be fixed by coarse threaded screws or suitable clips.

Items of equipment mounted inside cubicles will have labels mounted adjacent to them described as above.

6 CIVIL/STRUCTURAL/ARCHITECTURAL FEATURES

6.1 GENERAL

This section describes the design basis for the civil, structural, and architectural features for the plant.

6.2 POWER BLOCK

The site arrangement for the power block complex will consist of the following general areas:

- Combustion Turbine Generator Area
- Heat Recovery Steam Generator Area
- Steam Turbine Building
- Control/Administration Area
- Warehouse
- Transformer Area

The structures forming the power block will be designed to support and provide personnel access to the mechanical equipment and piping/electrical/control systems associated with power generation.

In general, the structures in the power block area will consist of enclosed steel framing with grating platforms, ladders and stairways for personnel access. Structures and equipment components will be supported by suitable concrete foundations (mat, spread footing, etc.) bearing on existing soils or supported on deep foundations (piles, caissons, etc.). Exceptions to this configuration and specific details of the power block area construction are outlined in the following sections.

6.2.1 Combustion Turbine Area

The CTG area will be an outdoor location adjacent to the HRSGs and the STG. The CTGs will be located on foundations and enclosed in manufacturer supplied enclosures. The combustion turbine enclosure is primarily intended for noise abatement, and personnel access into it during operation is not typical.

6.2.2 Heat Recovery Steam Generator Area

The HRSG area will be an outdoor location with each HRSG, integral exhaust stack, boiler feed pumps, duct burner skid and SCR dilution air blower skid located outdoors. A walk-in enclosure will be included for each boiler drum, and piping will be provided with freeze protection. The duct burner BMS cabinet will be located within an electrical equipment power distribution center (PDC) adjacent to the HRSG.

6.2.3 Steam Turbine Building

The steam turbine area will be comprised of steel frame construction enclosed with acoustical, insulated metal roofing and siding. In general, only grating access will be provided at the mezzanine level. The operating deck level of the turbine will be a concrete slab supported on metal floor decking. A turbine room bridge crane will provide for maintenance of the main steam turbine with a designated lifting bay that allows items to be lowered to the grade slab.

The cycle chemistry area will be provided on the ground floor of the turbine building. The area will include:

- Cycle chemical feed systems
- Sample Panel

The ground floor of the turbine area shall have self-draining sloped floors with trenches and sumps sized to handle draining of equipment without localized flooding.

The steam turbine building ground floor will also contain the condenser, vacuum pump skid, condensate pumps, closed cycle cooling water system, air compressors and associated equipment.

An elevator is not provided within the steam turbine building.

6.2.4 Electrical Switchgear Rooms

Electrical equipment rooms will be enclosed, as necessary, to provide dust protection for sensitive electrical equipment.

6.2.5 Steam Turbine Generator Support Structure

The steam turbine foundation will be designed using finite element analysis. Appropriate static and dynamic analyses will be performed to ensure the OEM's acceptance criteria (e.g., frequencies, mode shapes, and vibration amplitudes) and design code requirements are satisfied. The soil-structure interaction will also be accounted for in the analysis, as appropriate, to capture the effects of soil stiffness on the foundation behavior.

6.2.6 Transformer Foundations

Transformers will be supported on reinforced concrete mat foundations with pedestals. Spill containment for all oil-filled transformers will be provided by a pit with a common corner retention sump; sized at 110 percent of the oil volume for the worst catastrophic failure of a single oil-filled transformer. An additional capacity for 10 minutes of fire water deluge in accordance with NFPA 850 will be provided when fire water deluge is required as described in subsection 3.13. In addition to the deluge fire protection, firewalls between oil-filled transformers and adjacent structures and equipment will also be provided in accordance with the requirements of NFPA 850.

6.2.7 Cooling Tower Pump Forebay

A pump forebay for the circulating water pumps and aux cooling water pump will be located adjacent to the mechanical draft cooling tower. The pump forebay design will be integrated with the cooling tower basin and conform to the Hydraulic Institute Standards. The pump forebay will also be constructed of reinforced concrete and arranged to optimize the performance of the pumps.

6.2.8 Administration/Control Building

The administration building will be comprised of steel frame construction, with a single floor at grade, enclosed with insulated metal siding and built up or single ply membrane roof over metal roof decking. The building will be supported on reinforced concrete spread footers or mat foundations with pedestals.

The administration/control building will provide space for the centralized station control room, training, staff offices, conference rooms, records center, kitchen, water laboratory, locker rooms, instrument, electronic and electrical shops with space for the safety and medical treatment facilities.

The control equipment area will include a DCS server room. The central control room and DCS equipment room will be NERC CIP compliant and will be furnished with a raised floor to support cable installation flexibility.

Interior rooms intended for personnel occupancy will be provided with HVAC, utilities and space adequate for 35 people. Storage space will be ventilated and unheated, with the exception of an area dedicated to the storage of temperature sensitive equipment.

6.2.1 Warehouse/Maintenance Building

The warehouse building will be comprised of steel frame construction, with a single floor at grade, enclosed with insulated metal siding and built up or single ply membrane roof over metal roof decking. The building will be supported on reinforced concrete spread footers or mat foundations with pedestals.

The warehouse/maintenance building will provide warehouse space and a shop area with an office and restroom. The building will be served with compressed air, electrical service, ventilation and utilities to support the storage and maintenance activities.

6.2.2 Miscellaneous Yard Enclosures

The miscellaneous yard enclosures include but are not limited to:

- Cooling tower chemical feed
- Site entrance guard house

6.2.3 Stairways/Access

Stairways, ladders, and access platforms in the power block area will provide access to equipment during operation. Areas requiring routine maintenance will also be accessible through permanent platform systems. These areas will have handrails, guardrails, ladder cages, and/or toe plates as required for fall protection.

6.3 CRANES AND HOISTS

6.3.1 General

Lifting equipment such as overhead cranes and hoists will be provided to service all equipment or areas requiring the frequent or intermittent transfer of goods, parts or equipment for operation and maintenance activities.

6.3.2 Turbine Hall Crane

A turbine crane will be provided to service the steam turbine generator and turbine structure equipment with a designated drop zone that allows items to be lowered to the grade slab. The crane will be rated based on the heaviest serviceable component of the turbine generator to be lifted for maintenance. The crane will have main and auxiliary hooks with electric brakes. The crane will be load tested after assembly.

The crane will be provided with jog/ inching capability for the main and auxiliary hooks and no operator station. A radio remote control will be used in lieu of hard wired pendant.

Access to the crane bridges will be provided for maintenance activities.

6.3.3 Overhead Cranes and Hoists

Monorails or runway beams will be located to facilitate lifting heavy equipment for maintenance and where mobile equipment cannot be used. Hoists and trolleys will be used with the monorails and runway beams in the following areas:

- Boiler feed pumps
- Circulating water pumps
- Cooling tower deck
- HRSG SCR catalyst
- Closed cycle cooling water pumps
- All medium voltage motors

All lifting equipment and cranes will satisfy fully the requirements of the relevant Codes and Standards.

Overhead cranes and hoists will have a capacity capable of lifting the heaviest single item on the equipment covered.

All lifting equipment and cranes will be load tested and certified.

Ultimate limit switches will also be provided for the hoisting mechanisms in both the lowering and hoisting directions to prevent excessive travel.

The maximum safe working load will be labeled and clearly visible on all cranes and hoists. Load limiting devices will be provided.

Control of hoists by hard wired pendants is acceptable.

Over head crane and hoist design will include a checking function to ensure that equipment and structures do not interfere or impede crane travel, or use of pendant control, if applicable.

6.4 SITE WORK

Clearing, earthwork, and grading will be performed as required to construct the project and achieve finished site grades as described in the following sections.

6.4.1 Site Clearing

The site will be cleared of trees, shrubs, and vegetation to the extent necessary. Materials from clearing and grubbing operations will be disposed of off site.

6.4.2 Excavation

Excavation work will consist of the removal and onsite storage of earth, sand, gravel, vegetation, organic matter, loose rock, boulders, and debris to the lines and grades necessary for construction. It is anticipated that excess excavated material could be spread on site.

6.4.3 Site Profile

A grade profile will be established to provide a benched site, with the plant power block at one nominally level elevation. Other areas including the cooling tower and electrical switchyard will be cleared and leveled to the extent necessary to meet the intended use.

6.4.4 Grading

Graded areas will be smooth, compacted, free from irregular surface changes, and sloped to drain. Final earth grade adjacent to equipment and buildings will be below the finished floor slab and will be sloped away from the building to maintain proper drainage.

6.4.5 Water Management

6.4.5.1 General

Water management will be based on the following categorizations of water:

- Storm water (non-contact) - which has not contacted any construction or site features and does not require collection or treatment
- Process wastewater following mechanical treatment

Water collection and handling system, storm water drainage, and related site work will comply with all federal, state and local code requirements, all industry codes and standards and as directed by the Owner.

6.4.5.2 Codes and Standards of Practice

Designs will be based on good engineering practices and methods acceptable to regulatory agencies. Additionally, the following design features will be implemented:

- All basins will be sized to include anticipated sediment loading, based on specified clean-out frequencies;
- All basins will be sized to include incident precipitation (precipitation falling directly in the pond) and local climatic data for evaporation;
- All basins will be designed with sufficient freeboard
- All basin side slopes will be designed to prevent erosion from wind and wave action, and to protect liner damage from ice, temperature extremes, wind uplift, oxidation, and sharp objects. Interior slopes on basins will be no greater than 3:1 (horizontal to vertical).

6.4.5.3 Design Criteria

Storm water management systems during construction and operations will be designed in accordance with KDEP requirements.

All erosion control features, diversion structures, retention basins, channels or other structures designed and constructed for storm water management will be constructed within the property boundaries of the site.

A hydrologic analysis will be performed, using approved engineering analysis methods to quantify the storm water volumes resulting from a storm with a 100-year re-occurrence interval, or as otherwise specified, for both on- and off-site surface storm water (run-on) flows that could occur on the site.

6.4.5.4 Basin Design Criteria

Sizing of basins (also referred to as ponds) will include consideration of seasonal weather patterns, incident precipitation on the basins/ponds, peak process flow, sediment accumulation, and evaporation. Basins will be designed to allow access for the removal of sediment during periods of dry weather and based on an assume removal frequency of every 5 years, unless otherwise specified below. Where anticipated water depth is greater than 4 feet, the design will include safety features, such as appropriately sloped sides, ramps and egress features, to mitigate hazards inherent to water bodies.

The design of lined ponds will, at a minimum, meet State of Kentucky wastewater detention basin requirements and include a low point sump for manual pump out. The design will also incorporate requirements of Dam Safety regulations where applicable. More stringent liner criteria will be adhered to where required by regulation or as listed below. Textured flexible membrane liner (FML) will be designed and installed on all side slopes which are not protected by soil covers.

6.4.5.5 Storm Water Management

All storm water falling on the site or which might otherwise run-on to the site will be accounted for and managed as described below. All temporary and permanent storm water management system will preserve the existing site drainage patterns to the maximum extent feasible and promote the protection of ground and surface water. The conveyance and collection systems will consist of ditches, swales, berms, culverts and other diversion structures.

Erosion control features will be designed and constructed to minimize the downstream impact of all on- and off-site flows around and across the site.

6.4.5.6 Management during Construction

During the plant construction phase, temporary erosion and sediment control measures will be installed, maintained, relocated and modified, as required by local, state and federal regulations and site specific permits. These will be removed when no longer required or incorporated into the permanent construction if properly designed for long-term service.

Storm water management systems implemented during construction will comply with the same collection, conveyance, storage and management requirements as permanent systems and will be based on water classifications described above or otherwise applicable to the area of construction.

6.4.5.7 Storm Water

The site will be graded to manage and direct the run-on flow for a 100-year re-occurrence interval storm around the site perimeter, to the extent feasible. Where infeasible, diversion structures will be designed and constructed to direct run-on away from site features and off the site without contacting any site features. Features include all construction including, but not limited to, rail ballast, facilities, landfills, and future facilities.

Storm water which falls onto site areas undisturbed by construction and future facilities will be directed off the site without being collected. Constructed channels or erosion control structures will be designed and constructed to minimize downstream erosion from storm water conveyed off-site.

6.4.6 Roads

6.4.6.1 General

All permanent road works will be designed, constructed and specified in accordance with relevant applicable US standards and codes of practice. Bituminous Pavement surfaces and sub-grade materials will adhere to the Kentucky Transportation Cabinet Standard Specification for Road and Bridge Construction.

6.4.6.2 Materials

Mix-designs and related material testing for concrete and Plantmix Bituminous Pavements (Asphalt), gradation for base course aggregate, bituminous aggregate, concrete aggregate including source location will be provided. Testing to verify strength, compaction, placement, and gradation of material placed will verify compliance to Kentucky Transportation Cabinet specifications.

6.4.6.3 Design

Roadway design will conform to the following:

- Minimum paved road width of 24 feet
- Minimum centerline radius of curvature of 50 feet, unless restricted
- AASHTO HS20-44 loading conditions
- Maximum longitudinal slope of approximately 6 percent
- Maximum transverse gradient of approximately 2 percent
- Concrete surfacing is required for all truck traffic turn points exceeding 45 degrees

6.4.7 Landscaping and Fencing

The plant fencing will be extended to include the combined cycle facility and will also include the main entrance security building. Temporary construction fencing will be provided as required.

6.5 CIVIL/STRUCTURAL DESIGN CRITERIA

6.5.1 General

The design criteria discussed in this section will govern the technical requirements for designing civil/structural elements.

6.5.2 Codes and Standards

Structural design will be in accordance with the applicable local codes and regulations and the U.S. codes and industry standards referred to in this section.

Structural design will be in conformance with the publications listed in Table 6-2, to the extent they apply, unless the applicable Building Codes require a more conservative or stronger design.

Table 6-2 Codes and Standards

Organization	Publication
American Concrete Institute (ACI)	ACI 117/117R: Standard Specifications for Tolerances for Concrete Construction and Materials and Commentary, latest edition
	ACI 315: Details and Detailing of Concrete Reinforcement
	ACI 318/318R: Building Code Requirements for Structural Concrete and Commentary (latest edition)
	ACI 360 Design of Slab on Grade
	ACI 530/530.1R: Building Code Requirements for Masonry Structures and Specifications for Masonry Structures and Commentaries (latest edition)
American Institute of Steel Construction (AISC)	AISC: Specification for Structural Steel Buildings -Allowable Stress Design and Plastic Design and Supplement No. 1
	AISC: Load and Resistance Factor Design Specification for Structural Steel Buildings
	AISC: Seismic Provisions for Structural Steel Buildings
	AISC: Specification for the Design of Steel Hollow Structural Sections
	AISC: Specification for Allowable Stress Design for Single-Angle Members
	AISC: Code of Standard Practice for Steel Buildings and Bridges
American Society of Civil Engineers (ASCE) Publications	ASCE 7: Minimum Design Loads For Buildings and Other Structures (latest edition)
American Welding Society (AWS) Publications	D1.1 Structural Welding Code-Steel, (latest edition)
	D1.4 Structural Welding Code- Reinforcing Steel
The Association of Iron and Steel Institute	AISI: Specifications of the Design of Cold Formed Structural Steel Members (latest edition and supplements)

Table 6-2 Codes and Standards	
Organization	**Publication**
Metal Buildings Manufacturer Association (MBMA) Publications	Metal Building Systems Manual, (latest edition)
Steel Deck Institute	Design Manual for Composite Deck, Form Decks and Roof Decks – Publication No. 30, April 2001
	Diaphragm Design Manual, 1991
Steel Joist Institute (SJI) Publications	Standard Specifications, Loads Tables and Weight Tables for Steel Joists and Joist Girders (latest edition)
Research Council On Structural Connections (RCSC	RCSC: Specification for Structural Joints Using ASTM A325 or A490 Bolts

6.5.3 Design Loads

Design loads and load combinations for all buildings, structures, structural elements and components, handrails, guardrails, and connections will be determined according to the criteria specified in this section (Table 6-3), unless the applicable building code requires more severe design conditions. Loads imposed on structural systems from the weight of all temporary and permanent construction, occupants and their possessions, environmental effects, differential settlement, and restrained dimensional changes will be considered.

Table 6-3 Design Loads	
Load Types	**Criteria/Source**
Dead Loads	Dead load is the weight of all materials forming a permanent part of the completed structure, including fixed service equipment and operating contents. ASCE 7, Tables C3-1 and C3-2.
Pipe Support, major piping	Specifically determined, including thermal and dynamic loads, and verified against final pipe routing and analysis.
Pipe Support, other piping and electrical conduit and cable tray	Design for uniform area loads, plus a concentrated phantom load located to create maximum moment and shear.
Live Loads	Movable loads, such as people, equipment, tools, and components during construction, operations, and maintenance; maximum loads likely to be imposed by intended use or occupancy, but not less than the loads in Table 6-3, nor actual equipment weight.
Impact Loads	Table 6-4 loads allow for ordinary impact conditions. Reciprocating or rotating machinery, elevators, cranes, pumps, and compressors will have specific calculations addressing dynamic forces.
Soil and Hydrostatic Loads	Below grade structures will include lateral soil pressure, hydrostatic pressure or buoyancy, and potential surcharge loads from normal service or construction.
Wind Loads, buildings and structures	In accordance with IBC 2006 section 1609, with these inputs: 3 second gust = 90 miles/hr Exposure category = B
Snow Load	In accordance with IBC 2006, Section 1608, utilizing a minimum ground snow load of 52 lb/ft^2. Drift loads shall be applied to roof discontinuities and roof regions shielded by large roof-mounted

Table 6-3 Design Loads	
Load Types	**Criteria/Source**
	equipment or machine penthouses.
Ice Loads	Applicable to steel lattice type structures and guy cables. An ice density of 57 pounds/ft^3 will be used.
Seismic Loads, buildings (by building, if appropriate)	In accordance with IBC 2006, Section 1613, with these inputs: Occupancy category = III Seismic design category = D Site (soil) class = B-C Design spectral acceleration at short periods S_{DS} = 0.47 Design spectral acceleration at 1 second periods S_{DS} = 0.27
Construction Loads, roads	AASHTO HS 20.
Construction Loads, railways	Cooper E80.

The live loads used in the design of buildings and structures will be the maximum loads likely to be imposed by the intended use or occupancy, but will not be less than the minimum uniform live loads presented in Table 6-4. Components of the structural system may be designed for a reduced live load in accordance with the local building code. Roofs will be designed to preclude instability resulting from ponding effects by ensuring adequate primary and secondary drainage systems, slope, and member stiffness.

Table 6-4 Minimum Uniform Live Loads	
Area	**Live Load, psf**
Ground Floor Slabs	
HRSG area	250
Combustion Turbine area	250
Steam Turbine area	250
Shops, warehouses	250
Other structures	100
Suspended Floors	
Steam Turbine operating floor	Weight of major components, but not less than 600 for slab design and 300 for frame design
Storage Areas	Weight of stored material, but not less than 150
Other Concrete Floors	100
Grating Floors	100
Roofs	25 (Additionally, 300 lb. concentrated load for roof surfaces subject to maintenance workers and 2000 lb concentrated load for primary roof members.)
Stairs	100

6.5.3.1 Buildings and Other Structures

Building superstructure support systems will consist of vertically braced steel frames with horizontally braced steel floor and roof framing as required. The superstructure will provide an integrated gravity and lateral load resisting system to transfer loads to the reinforced concrete foundation. Position of bracing will meet spatial requirements for access and maintenance.

The turbine/generator building superstructure will be designed to be isolated from the turbine/generator and boiler feed pump pedestals to minimize transmission of vibration.

6.5.3.2 Construction Loads

Construction or crane access considerations may dictate the use of temporary structural systems. Special considerations will be made to ensure the stability and integrity of the structures during any periods involving use of temporary bracing systems.

6.5.3.3 Wheel and Crawler Loads

Wheel and crawler loads will be considered for roadway pavements, buried piping, culverts, and embankments. Roadway subgrades, pavements, and structures will be designed for ash haul road traffic will be designed as specified in subsection 6.8.7. Roadway subgrades, pavements, and structures will be designed for HS20 loads.

6.5.4 Grading and Drainage

Final earth grade adjacent to equipment and buildings will be below the finished floor slab and will be sloped away from the structure to maintain drainage.

Permanent unprotected slopes in cut or fill will be no steeper than 3.0H:1V. The minimum grading slope in the main plant complex will be 1 percent, or as appropriate for surface type, conveying storm water runoff away from permanent facilities.

6.5.5 Backfilling and Compaction

Areas to be backfilled will be prepared by removing unsuitable material before placing the fill. The bottom of the excavation will be examined to reveal loose or soft areas. Such areas will be excavated fully and backfilled with compacted fill. Backfilling will be done in uniform layers of specified thickness. Soil in each layer will be properly moistened to obtain its specified density. To verify compaction, representative field density and moisture-content tests will be made during compaction.

Structural fill supporting foundations and under roads and parking areas subjected to heavy crane loads will be compacted to a minimum of 95 percent of the Modified Proctor maximum dry density in accordance with ASTM D 1557. Backfill under parking and construction areas where large cranes are not used will be compacted to 95 percent of Modified Proctor. Embankments, dikes, and backfill surrounding structures will be compacted to a minimum of 90 percent of Modified Proctor. General backfill will be compacted to at least 90 percent of Modified Proctor.

6.5.6 Concrete

Reinforced concrete structures will be designed in accordance with ACI 318, Building Code Requirements for Reinforced Concrete. Cooling tower basin will be designed in accordance with ACI 350R, Environmental Engineering Concrete Structures.

6.5.7 Foundations

6.5.7.1 General Criteria

Foundations will be designed using reinforced concrete to resist the loading imposed by the building, structure, or equipment being supported. The foundation design will consider the following:

- Soil bearing capacities.
- Deep foundation capacities.
- Lateral earth pressures.
- Allowable settlements.
- Structure, equipment, and environmental loadings.
- Equipment performance criteria.
- Access and maintenance.
- Temporary construction loading.

Foundations will be designed using static analysis techniques assuming rigid elements and linear soil pressure distribution so that the allowable settlement and bearing pressure criteria are not exceeded. Foundations will be proportioned so that the resultant of the soil pressure coincides as nearly as possible with the resultant of the vertical loading. The minimum factors of safety against overturning, sliding, and net uplift will be 1.5.

Geotechnical exploration, testing, and analysis information will be used to determine the most suitable foundation system. Elastic (short-term) and consolidation (long-term) foundation settlements will be calculated and limited to the following approximate design values:

- Total settlement—1.5 inch
- Differential settlement--0.1 percent slope between adjacent column support points. Allowable settlement is higher for tanks. These settlements will be calculated on an individual basis.

Exposed surfaces of foundations exposed to contact with petroleum products due to spray, spills, drips, etc. will receive an appropriate coating system to prevent absorption and staining of the concrete.

6.5.7.2 Special Foundation Requirements for Natural Draft Cooling Tower

The foundation component for the natural draft cooling tower will be a circular or polygon shaped pile supported reinforced concrete foundation. The foundation will be proportioned so that the bearing and allowable settlement criteria will not be exceeded, with no uplift permitted and no increase in allowable bearing for wind load. Design settlement, elastic plus consolidation, will be limited to approximately 1 inch.

6.5.7.3 Special Foundation Requirements for Rotating Equipment

The foundation systems for major rotating equipment will be sized and proportioned so as not to exceed the bearing and settlement criteria and to ensure satisfactory performance of the equipment. In addition to a static analysis, a dynamic analysis will be performed to determine the fundamental frequencies of the foundation system. To preclude resonance, fundamental frequencies of the foundation associated with rigid body motion will be 25 percent removed from the operational frequency of the equipment. Should the foundation system not meet this criteria, the dynamic behavior of the foundation will be evaluated and compared to ISO 10816, Mechanical Vibration-Evaluation of Machine Vibration by Measurements on Nonrotating Parts, Parts 1 through 6. The resultant vibration level will not exceed the limit for evaluation of this standard. Where required, the foundation will also be designed to meet steam turbine generator manufacturer's requirements. The foundations for major rotating equipment shall be isolated from adjacent equipment.

6.5.7.4 Equipment Bases

All equipment will be supplied with an equipment base suitable for its operation. Where the equipment could induce vibration problems, the base will have adequate mass to dampen vibration motions. Special consideration will be given to vibration and stiffness criteria where specified by an equipment manufacturer.

Equipment bases may be concrete or an integral metal skid. Concrete bases will have minimum temperature and shrinkage reinforcing; unless it is determined that additional reinforcement is required for the equipment loads.

Exposed surfaces of foundations exposed to contact with petroleum products due to spray, spills, drips, etc. will receive an appropriate coating system to prevent absorption and staining of the concrete.

6.5.8 Steel Structures

Steel framed structures will be designed in accordance with the AISC Specification for Structural Steel Buildings, Allowable Stress Design and Plastic Design, or AISC Load and Resistance Factor Design Specification for Structural Steel Buildings.

Construction of steel structures will use design practices defined by local building codes, but not less than those defined in Table 6-5.

Table 6-5 Structural Steel Design

System	Criteria
Rigid Frames (pre-engineered metal buildings, piperack, cantilevered supports)	AISC Type 1, for specified design loads.
Braced Frames (all structures other than the above)	AISC Type 2, for specified design loads, recognizing zero connection moment capacity.
Lateral Building Drift, rigid frame structures	(Story or building height)/100 under wind, ASCE 7 for seismic.
Lateral Building Drift, braced frame structures	(Story or building height)/200 under wind, ASCE 7 for seismic.
Vertical Bracing Members	Detailed for concentric loading, unless analyzed for work point eccentricity. Compression and tension capable, "pinned" at all connection points.
Horizontal Bracing Members	Detailed for eccentric loading. Compression and tension capable, "pinned" at all connection points.
Unbraced Length, flexural, secondary framing	Span length, unless connected to an engineered diaphragm by engineered shear connections.
Unbraced Length, flexural, primary framing and truss chords	Panel point distance, or connecting beam spacing where secondary beams are connected to engineered horizontal load path.
Unbraced Length, compression, major axis	KL = span length.
Unbraced Length, compression, minor axis	KL = truss panel point distance, or largest distance between

Table 6-5 Structural Steel Design	
System	**Criteria**
	incident members with depth greater than or equal to (2/3 x subject member depth).
Unbraced Length, pipe bracing in ducts	KL/r = 120, checked for vortex shedding in flow and thermal restraint forces.
Deflection, floors and roofs, live load only	Span/240, vertical, unless attached to more rigid, brittle members.
Deflection, floors and roofs, dead and live load combined	Span/240, vertical.
Deflection, girts	Span/360, horizontal.
Deflection, crane and hoist support beams (without "impact")	Span/600, vertical; span/400, lateral.
Deflection, duct plates (between stiffeners)	Span/100, normal operations only.
Deflection, duct plate stiffeners	Span/240, normal operations only.
Deflection, grating (100 psf uniform load)	1/4 inch maximum.

6.5.8.1 Pre-engineered Buildings

Design of the structural framing, if accomplished by pre-engineered metal building manufacturer, will be in accordance with the MBMA Metal Building Systems Manual.

Framing configurations will conform to the architectural floor plans.

Small pre-engineered buildings will be moment frame or vertically braced steel frame.

6.5.9 Construction Materials

6.5.9.1 Structural Concrete

Materials for concrete will comply with ACI 301, Chapter 2. Materials will be handled and stored as recommended in ACI 304, Chapter 2.

Construction of concrete structures will use materials as defined in Table 6-6.

Table 6-6 Structural Concrete Materials		
Class	**Use**	**F'$_c$ 28 Day Strength , psi**
A	Mud slabs, fill, duct bank	3,000
B	General	4,000
C	Cooling towers, basins, structures in contact with water	5,000
Grout	Structure to concrete bearing surface	5,000
Material	**Usage**	**Requirements**
Cement	In accordance with mix design, local supply	ASTM C150, Type I (unless soils contain high sulfates, then ASTM C150,Type V).
Water	In accordance with mix design, local supply	Potable, or clean and free of deleterious materials.

Table 6-6 Structural Concrete Materials		
Class	**Use**	**F’$_c$ 28 Day Strength , psi**
Aggregate	In accordance with mix design, local supply	ASTM C33. (verify that local aggregates are not reactive)
Reinforcing Steel, main	As required by design	ASTM A615, Grade 60.
Reinforcing Steel, ties and stirrups	No. 4 or as required by design	ASTM A615, Grade 60.
Welded wire fabric	As required by design	ASTM A185.
Forms	All exposed concrete surfaces (not flatwork)	Plywood or modular steel.

6.5.9.2 Structural Steel

Structural steel will be detailed and fabricated in accordance with the AISC Code of Standard Practice and the AISC Specification for Structural Steel Buildings. Construction of steel structures will use materials as defined in Table 6-7

Table 6-7 Structural Steel Materials	
Material	**Criteria**
General Use Steel Shapes, Plates, Appurtenances	Multicertification ASTM A36/A572, Grade 50, or ASTM A992.
Steel Tube, rectangular or square	ASTM A500, Grade B.
Bolts	ASTM A325 or A490.
Weld Filler Metal	70 ksi tensile strength.
Extreme Corrosion-Resistant Stainless Steel	ASTM A167, type as required.
Guardrail and Handrail Pipe	1-1/2 inch diameter, ASTM A53, Type E or S, Grade B. Hot dipped galvanized.
Steel Grating	3/16 inch by 1-1/4 inch bearing bars, galvanized. Furnish with serrated surface for exterior and inclined applications.
Toe board, kickplate and grating panel ends	ASTM A36 or ASTM 1101, hot dipped galvanized
Anchor Bolts, sized for design loads	ASTM F1554, Grade 36.
Anchor Bolts, sized for design loads and pretensioned	ASTM F1554, Grade 105.
Miscellaneous Channels, Angles, Plates, and Embedded Shapes	ASTM A36.
Stair Stringers	ASTM A36, C10 minimum.
Stair Treads	Steel grating, galvanized, cast abrasive or bent checker plate nosings. Furnish with serrated surface for exterior and inclined applications.
Conveyor Walkway	Galvanized, expanded metal grating with serrated surface for exterior applications. Or inclined surfaces.
Metal Deck, roof	1-1/2 inch profile depth, 22 gauge minimum, galvanized.
Metal Deck, form	1 inch profile depth, 24 gauge minimum, galvanized.

6.6 ARCHITECTURAL DESIGN CRITERIA

6.6.1 General

The buildings and building systems will be designed based on the applicable codes and requirements as determined by the local Building Code Official. Assumed codes include the International Building Code (IBC 2006 as amended by local County and/or the City), International Energy Conservation Code (IECC 2000), fire code, and applicable life safety codes.

A building code analysis will be performed and occupancy and type of construction established for each building.

The design and material selections in the interior building/office areas will be driven by functionality and established Owner architectural standards.

The buildings will be designed for accessibility complying with the applicable regulations and standards.

Exterior entrances in certain high traffic areas will be furnished with vestibule and two separate exterior doors. As a minimum, a vestibule will be provided at primary entrance to the administration building, warehouse, maintenance building, and water treatment building.

6.6.1.1 Exterior Architecture Criteria

The exterior architectural systems provide a durable, weathertight enclosure to protect systems and personnel and allow for a controlled interior environment. Exterior architectural systems will conform to the following general design criteria for main plant buildings and principal yard buildings (Table 6-8).

Table 6-8 Exterior Architecture Criteria

Item	Criteria
Walls	Consist of insulated or uninsulated metal wall panel. Building enclosures may also be pre-engineered. Exposed surfaces to be non-reflective.
Roofs	Consist of a built-up or single-ply membrane over insulation and a metal roof deck. Metal standing seam roofing may also be used.
Masonry	Consist of concrete block, which may be utilized for enclosure and separation purposes.
Thermal Insulation	Will have insulation incorporated into the walls and roofs for thermal design.
Acoustical Insulation	Will have insulation incorporated into the walls and roofs for acoustical design.
Louvers	Will include stormproof louvers as required by the ventilation design. Selection will comply with site design wind loads.
Windows	Include windows, frames, and glazing. Selection will be based on project and environmental requirements.
Personnel Doors	Will include hollow, metal type personnel doors. Insulation and fire rating criteria will be dictated by the interior and environmental requirements. Owner may request a window in certain doors. Steam generator and turbine building doors will be motor operated sliding type due to high differential pressure.
Equipment Access Doors	Will include large exterior doors of the rolling metal type, with weather seals and windlocks.
Finish Painting	Exterior steel materials not galvanized or factory finished will be finish painted. Colors will be selected and may be subject to Federal State or local requirements. Exposed surfaces to

Table 6-8 Exterior Architecture Criteria	
Item	**Criteria**
	be non-reflective.

6.6.1.2 Interior Architecture Criteria

The interior architectural systems provide a functional, low maintenance, aesthetically pleasing environment. The materials in Table 6-9 have been selected to provide durability and offer flexibility in responding to occupant demands, while satisfying project and code requirements.

Interior architectural systems will conform to the following general design criteria (Table 6-9) for main plant buildings and principal yard buildings.

Table 6-9 Interior Architecture Criteria	
Item	**Criteria**
Partitions	Partitions constructed of masonry, drywall, or metal wall panel.
Windows	Interior fixed windows as required by the occupancy. Rated and nonrated glazing will be installed in accordance with fire retardant criteria where applicable.
Personnel doors	Hollow, metal type personnel doors. Insulation and fire rating criteria will be dictated by the interior and environmental requirements. Owner may request a window in certain doors.
Concrete slabs	Garages, stores and mechanical/electrical/communications areas – Concrete slab sealed with concrete hardener.
Ceilings	Ceilings in finished areas of the main buildings and principal yard buildings will generally consist of suspended, exposed grid, lay-in acoustical type systems. Wet areas will consist of moisture resistant materials.
Floor coverings	Floor coverings in finished areas will generally consist of resilient tiles or carpet tiles. Floor coverings in control and electrical equipment rooms may be static dissipative. High moisture areas will incorporate unglazed ceramic tiles.
Wall coverings	Glazed wall tiles will be used in shower and toilet rooms as required for maintenance and sanitary requirements. All other finished area wall coverings will be identified in the painting section.
Finish painting	Interior areas will be coated where required for chemical resistance, light reflection, or aesthetics. Interior masonry walls will be coated with a white gloss finish to a height of 8 feet.
Sanitary facilities	Toilet and shower facilities and associated accessories will be provided where required to meet code and project requirements.

6.6.2 Architectural Codes and Standards

Normally occupied areas such as control rooms and shop offices will be designed in general accordance with the requirements of the latest applicable IBC codes and standards. Allowable variances and applicable local code interpretations should be established before project commencement.

Other areas will be designed to meet OSHA requirements for worker safety, and to eliminate confined space work areas.

Life safety will be considered and incorporated into the facility's design, both site and buildings.

6.6.3 Plant Layout

The plant will be laid out to provide the spaces required for the equipment and for maintenance and operation. Access aisles and clearances will accommodate operation, routine maintenance, and equipment removal. Provisions will also be made for personnel walkways to all equipment for maintenance and operations, doors, stairs, and other access points. Vertical access hatches will be located to facilitate moving equipment and materials. Fire separation walls and floors will be provided in accordance with code requirements.

The buildings will be designed to use durable, low maintenance materials and systems compatible with facility's location and function.

6.6.4 Materials

6.6.4.1 Concrete Masonry

Concrete masonry units will be hollow, normal weight, nonload-bearing, Type 1 conforming to ASTM C 129, or load bearing Grade N, Type 1 conforming to ASTM C 90.4, as appropriate. Concrete masonry units will be reinforced as required.

6.6.4.2 Preformed Metal Siding

Preformed metal siding panels will be fabricated from galvanized sheet steel. Exterior and interior face panels will be 24 gauge minimum. Exterior siding will be either an insulated or an uninsulated field-assembled system. Uninsulated siding panels will meet the same finish and strength characteristics as the insulated siding system.

The wall system will be designed to withstand the specified wind loading with practical and economical support girt spacing.

Exterior panel surfaces exposed to weather will be coil coated with Hylar 5000/Kynar 500, or equivalent finish. The siding finish color will be selected from among the siding manufacturer's standard colors if possible. The final finish will be non-reflective. The interior surface of the exterior panels will be finished with manufacturer's standard baked-on enamel finish. When required, the interior liner panels will be galvanized sheet steel. Exposed panel surfaces will have manufacturer's standard baked-on enamel finish.

6.6.4.3 Roofing

Roofing for all major structures will consist of a built-up membrane over insulation and a metal deck. Roof decks will be welded to the support structure. A layer of insulation will be installed on top of the metal roof deck and totally secured to the roof deck. The insulation will be covered with a built-up roofing system topped with gravel. The completed roof system will meet the requirements for a Factory Mutual Class I rating.

The roof system will have a minimum slope of ¼ inch per foot toward the roof drains. Roof drains with expansion joints will be provided at the low edge of the roof and will be located as determined by the detailed design. The roof drains will be set in galvanized steel pans and flashed appropriately.

A membrane and roof expansion joint will be used to separate areas where a major change in structural framing occurs.

Cant strips and vertical wood nailers will be attached to the roof decks with expansion clearance from walls and parapets with insulation placed in the clearance space.

6.6.4.4 Metal Roll-Up Doors

Roll-up doors will be furnished with uninsulated door curtains constructed of interlocking roll-formed galvanized steel slats to withstand the specified wind pressure. In high traffic areas roll up doors will be motor-operated and furnished with manual chain operated backup feature. Chain operated roll up doors are suitable where access is infrequent.

6.6.4.5 Hollow Metal Doors, Frames, and Hardware

Interior and exterior personnel doors will be flush hollow metal on pressed steel door frames and will include hinges, locksets, closers, weather-stripping, and accessory hardware. Fire doors and frames will conform to NFPA No. 80 for the class of door furnished. Wood doors will not be used.

6.6.4.6 Louvers

Louvers will be both the operable and inoperable types, fabricated of extruded-aluminum section alloy and provided with stainless steel fastenings and removable aluminum bird screen. Louvers will have paint finish meeting the specified finish requirements of the adjacent metal siding. Blades will be storm proof. The louver-free area will be a minimum of 50 percent of the louver face area. Louvers will be designed for manual or gravity operation.

6.6.4.7 Floor Finish

Floor finishes will generally be concrete, steel troweled to a smooth surface and finished with a seal hardener.

Concrete floors in electrical, DCS, and switchgear rooms will have sealer.

Floors in personnel areas, including offices and the control room, will receive vinyl composition resilient tile.

The toilet facilities will receive unglazed ceramic mosaic tiles.

6.6.4.8 Coatings

Except as otherwise specified, exterior wall surfaces, structures, and structural components exposed to the weather will be painted or treated to protect them from corrosion in accordance with the applicable codes, industry standards, and manufacturer's recommendations.

6.6.4.9 Structural and Miscellaneous Steel (Except Pre-engineered Buildings), Indoors or Outdoors

All exposed nonfire-protected structural steel and miscellaneous steel work (for piping hangers, duct supports, cable tray supports, other similar supports, stairways, etc.), including friction/bearing connections, will be hot dipped galvanized per ASTM 123. After erection, damaged primer and/or all unprimed steel surfaces will be touched up with an appropriate cold spray galvanize touch up system in the field.

All exposed structural steel work to be fire protected will be shop coated with a self-curing, inorganic zinc primer or paint that is suitable for fire protection material in shop.

Structural and miscellaneous steel will be hot-dip galvanized per ASTM 123,

All mild steel items such as hand rails, toe plates, stair stringers, gratings, checkered plates, plate ductwork (other than HVAC), and switchyard steel will be hot-dip galvanized per ASTM 123. HVAC ductwork will be G-60 or G-90 grade galvanized steel. The switchyard steel will have a minimum zinc coating thickness of 65 microns.

All structural bolts, nuts, and washers except high strength (A-490 or equivalent) will be mechanically or hot-dip galvanized. High strength bolts and nuts (A-490 or equivalent) will be coated with a suitable self-priming, high-build epoxy coating after installation in the field. All remaining bolts, nuts, and washers will be galvanized or coated carbon steel.

All doors (personnel) and frames will receive supplier's standard primer in the shop and finish coat in the field. Roll-up doors will be primed and finish coated in the supplier's shop. Touchup will be performed as required with a compatible primer using SSPC-SP 3, Power Tool Cleaning standard. The color selection will be by Owner.

6.6.4.10 Masonry Walls and Concrete Floors

Surfaces exposed to chemical contaminants will be coated with polyester- or vinylester-based coatings. Exposed interior masonry wall surfaces in office areas will be coated with one coat of acrylic filler and a compatible finish coat.

6.6.4.11 Gypsum Wallboard

Exposed surfaces will receive one coat of sealer and compatible acrylic finish.

6.7 MISCELLANEOUS SERVICES FOR YARD BUILDINGS

6.7.1 Plumbing, Sanitary and Fire Protection

6.7.1.1 Potable Water

A potable water system will serve the entire site. This line will be metered and then distributed to the buildings on site.

Water service will be sized per plumbing code requirements to satisfy flow and pressure requirements for all potable uses including administration areas, vehicle maintenance, wash bay and general storage garage areas. The potable line will be protected with appropriate back flow prevention devices.

Piping will be type L hard copper with wrought copper fittings and non-lead solder. In the rare instance that under floor piping is required, type K soft copper will be used.

6.7.1.2 Domestic Water Heaters

The domestic hot water system will be point-of-use electric type. The water heaters will be sized to accommodate the heating of water to the lavatories, sinks, and showers.

6.7.1.3 Plumbing Fixtures and Floor Drains

Plumbing fixtures will include sensor operators on all flush valves for urinals and water closets thus providing automatic operation. These sensors will be hard-wired to reduce maintenance requirements. Fixtures will be industrial strength to withstand greater levels of abuse. Floor drains will be provided in mechanical room and toilet rooms and other areas as required by code and will serve multiple industrial waste drainage areas. These floor drains will be selected to match the floor finishes in these designated areas. Trench drains will be provided at the vehicle doors in the vehicle maintenance and wash bay areas. An oil/water separator will be required for the normal discharge of the trench drains since there is a potential for fuels/oils/greases to accumulate on the floors. Provide trap seal primers if required by code or local authority.

6.7.1.4 Sanitary Service

Sloping, materials and cleanouts will be provided according to locally enforced codes and standards. Sanitary line will be connected to sewer outside the facility.

6.7.1.5 Fire Protection System

The primary fire protection system will be a wet pipe system for most areas of the facility and will satisfy the latest NFPA 13 requirements. Occupancy classifications and related sprinkler densities will be coordinated with the authority having jurisdiction as the design commences. The EPC Contractor is to provide a dry-type fire protection system or occupancy separation (as permitted by code) for electrical and communication rooms. Coordinate intended system design of these spaces with Owner.

7 OPTIONAL SCOPE

7.1 DUAL FUEL COMBUSTION TURBINE CAPABILITY

An optional capital cost to provide the ability to fire distillate fuel oil is included within the capital cost estimate for each NGCC option. The dual fuel capability scope includes the unloading and storage of distillate fuel oil, CTG dual fuel combustor and water injection system.

7.2 BYPASS STACK/DIVERTER DAMPER (F CLASS)

An optional capital cost to provide the ability to operate in simple cycle mode is included within the capital cost estimate for each F class NGCC option. The bypass stack scope includes the bypass stack and diverter damper with seal air to permit simple cycle operation of the combustion turbine.

Green River Operating Flexibility Whitepaper

HDR Project No. 211611
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Client Review

Green River Operating Flexibility Whitepaper

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GREEN RIVER OPERATING FLEXIBILITY WHITEPAPER

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GREEN RIVER OPERATING FLEXIBILITY WHITEPAPER

EXECUTIVE SUMMARY

HDR has prepared this document at the request of LG&E and KU Services Company to analyze cycle and/or design modifications that impact the reliability and operational flexibility of the proposed Natural Gas Combined Cycle (NGCC) at the Green River site. Cycle design factors, including the gas turbine(s) to be used are yet to be determined. The base cycle configuration assumed for this document is an F or H class 2x1 duct fired combined cycle with a nominal net output of 760 MW at average day ambient conditions.

The objective of this discussion is to identify and evaluate alternatives to this base configuration that could be considered to minimize and/or avoid the loss of the full facility output upon the failure of individual plant components or systems. This will be presented and measured in terms of the probability of maintaining 50% of the plant load upon the failure of any major plant component. In this manner, the impact to the overall transmission system from incorporation of the plant and its associated forced or unplanned outages can be better evaluated. For this evaluation, the probability of maintaining plant load incorporates historical component reliability values as reported by NERC, ORAP, and EPRI.

For the base 2x1 F-class configuration, there are single point failures (such as loss of the circulating water system and/or condenser, gas supply to the site, etc.) that can occur which could result in a complete loss of the facility output, nominally 760 MW. Similarly loss of either gas turbine in the base 2x1 configuration will result in a reduction of roughly half of the plant's full load output. The loss of load associated with the trip of a single CTG/HRSG train, including the corresponding loss of generation in the STG from reduced steam production is roughly 380 MW, depending on how heavily the remaining CTG/HRSG can be fired. The loss of the STG corresponds to an immediate generation reduction of up to nominally 375 MW (STG generator size), which is the same impact as the loss of a single CTG. Subsequently, upon a steam turbine trip, limitations in the design of the condenser and steam turbine bypass system would likely require a further reduction in output and/or eventual plant shutdown.

Reliability and availability have various definitions and evaluation criteria throughout the industry but for purposes of this paper "reliability" is defined as the percentage of available operating hours that the plant is not in a forced outage. Reliability does not consider lost generation or the time associated with scheduled maintenance outages. A review of industry data shows that the average full load fleet reliability for this type of plant is generally considered to be 93%-95%. As noted above, this paper reviews options which attempt to mitigate the loss of full plant output with an objective to maintain 50% output upon a single component or system failure. As such, the probability of being able to maintain nominally 375 MW output (or nominally 50% load) is the focus of this analysis and the work presented herein.

From the range of alternatives to increase the probability of maintaining part load generation upon the failure of major components and systems, the most feasible to be evaluated (compared to a standard 2x1 configuration) have been identified as follows:

- Incorporation of HRSG Bypass Stacks
- Converting to a two independent power generation 1x1 plant configuration
- Converting to two 1x1 single-shaft generator configuration

To quantify the probability of maintaining both full load and 50% load capacity from the various plant configurations, Table 1 was prepared. The values presented in this table summarize a probabilistic assessment of the alternatives given the reliability factors outlined in Table 2 for each major generation component. All numbers in Table 2 are based on EPRI reliability data for F-class combined cycle facilities, namely forced outage plus unscheduled maintenance factors.

Note that balance of plant outages, typically considered to be unlikely due to redundancy of equipment, are not included in the listed probability numbers.

Table 1: F-class Combined Cycle Configuration Probability Matrix (w/o BOP considerations)

	2 x 1 Multi-Shaft w/out Bypass Stack	2 x 1 Multi-Shaft w/ Bypass Stack	2 x (1 x 1) Multi-Shaft w/out Bypass Stack	2 x (1 x 1) Multi-Shaft w/ Bypass Stack	2 x (1 x 1) Single-Shaft w/out Bypass Stack
750 MW	93.39%	93.39%	92.39%	92.39%	92.17%
375 MW	98.85%	99.87%	99.85%	99.85%	99.84%

Table 2: Summary of EPRI Major Component Unscheduled Outage Factors

	Forced Outage Factor	Unscheduled Maintenance Factor	Total Forced / Unscheduled Outage Factor
CTG (each unit)	1.59	0.79	2.4%
HRSG (each unit)	0.21	0.26	0.5%
STG (each unit)	0.81	0.26	1.1%

Table 1 demonstrates the probability that each plant configuration could achieve the listed MW output. For example, the base 2x1 configuration can achieve 375 MW with one combustion turbine off-line, resulting in a calculated probability of 98.85%. Incorporating bypass stacks into the arrangement is estimated to raise the plant's 375 MW probability to 99.87% because the 375 MW can be achieved during an STG or HRSG outage as well which adds approximately 1% probability.

The estimated impact on the probability of maintaining a 375 MW output upon a major component or system failure, as well as the estimated capital cost impact for each of the alternatives is summarized in Table 3.

Table 3: Alternatives Impact Comparison Table (for 50% load or 375 MW probability)

Alternative	375 MW Probability	Benefit	Capital Cost	System Outage Managed	Notes
Base 2x1 Configuration	98.85%				
HRSG Bypass Stacks	99.87%	+1.00%	$12,500,000	STG/Heat Rejection	Potential impacts to permitting / operations
HRSG Vent / Water Cap	99.60%	+0.75%	$13,000,000	STG/Heat Rejection	Substantial additional footprint requirements
Two by 1x1 Configuration	99.85%	+1.00%	$50,000,000	All	Few scenarios resulting in full loss of output
Single Shaft Configuration	99.84%	+1.00%	$37,500,000	All	Siemens estimates +0.2% cycle efficiency increase

The HRSG Bypass Stack alternative can increase the probability that the base plant configuration can maintain 375 MW of output with a relatively low capital cost impact; however it also has potential environmental/permitting impacts that could inhibit plant operations and the overall feasibility of this option. In particular, selection of the CTG and understanding if an HRSG SCR is required to achieve 12 ppm outlet NOx is a critical parameter in determining the ability of the plant to operate utilizing HRSG bypass stacks noting that an SCR is not required for the F(5)ee model to achieve 12 ppm NOx, but is required for the Siemens H-class turbine. It is not thought that the environmental impacts will be detrimental to this configuration due to low operating hours; however the issue should be reviewed and confirmed prior to selecting this arrangement. The two 1x1 and single-shaft plant configurations have fewer failures within the power block that could result in a full loss of both trains and therefore also improve part load (i.e. 375 MW) reliability; however the capital cost of these alternatives is much higher due to the additional steam turbine and associated equipment.

Other alternatives for increasing plant part load reliability that were examined but not considered feasible include simple cycle plant configurations, dual fuel capability, and steam venting capability. The simple cycle alternative was deemed less favorable because of the resulting high heat rate. The dual fuel option had limited benefit due to high reliability of the gas supply and potential for redundant gas pipelines. The viability of providing sufficient water supply for the HRSG venting alternative from a capital and operation cost and footprint perspective is questionable.

Balance of plant systems for the base 2x1 configuration were the basis to evaluate potential impacts on plant reliability with standard levels of system redundancy. In general, additional equipment redundancy or configuration modifications within the balance of plant systems will not significantly increase the plant reliability as these systems are already designed with redundancy so as to have minimal impact on reliability. Major balance of plant equipment for which failure could cause a full plant outage should be redundant in both function and power source for all configurations.

1.0 INTRODUCTION

1.1 PURPOSE AND OBJECTIVES

The purpose of this document is to analyze cycle and/or design modifications that impact the reliability of the proposed Natural Gas Combined Cycle (NGCC) at the Green River site. The specific gas turbine(s) to be used in the cycle are yet to be determined, but for the purposes of this document the base cycle is assumed to be an F or H class 2x1 with a nominal net output of 760 MW at average day ambient conditions. In order to minimize the impact to the overall transmission system from incorporation of the plant, the optional modifications analyzed are those that will decrease the likelihood of a loss of the entire generation output, limiting the impact to that of a single generator (nominally 375 MW, combined CTG output and loss of full load STG output).

HDR has prepared and is in the process of updating a Feasibility Analysis (Reference 1) which provides a detailed evaluation of the likely cycles under consideration and the correlating heat rate, cost of generation, and life-cycle costs for each of those cycles. The variations from gas turbine class and supplier are covered in detail in the Feasibility Analysis. This paper is neutral to gas turbine type but focuses on general cycle reliability and operating flexibility options. Potential single points of failure are identified, and mitigating alternatives are analyzed to determine the cost, efficiency, and other potential impacts of incorporating those alternatives.

In the base configuration, the gas turbines cannot operate for an extended period if the steam turbine is offline, because the base configuration does not include HRSG bypass stacks, therefore the HRSGs must produce steam when the gas turbines are operating. A steam turbine bypass to the condenser is included in the base cycle, thus steam from the HRSGs can bypass the steam turbine to the condenser, or be vented. If steam from the HRSGs is vented, the make-up water rate to the cycle can only be sustained for a short period with the base configuration water treatment equipment.

Several alternatives to mitigate the loss of the entire plant output have been analyzed, including:

- HRSG Bypass Stacks which would allow the gas turbines to continue to operate as simple cycle machines without most of the balance of plant steam/water systems.
- Alternative Cycle Configurations, such as two individual 1x1 arrangements with two steam turbines in which a loss of balance of plant systems (primarily the condenser) would only result in losing one CTG/STG and half plant output.
- Building additional redundancy within potential single point failures in balance of plant equipment.
- Dual fuel gas turbines to alleviate total loss of output with the loss of natural gas supply.
- Incorporation of steam venting capacity and increases in water system capacity to allow extended operation of the HRSGs when venting steam while the steam turbine is offline and condenser is unavailable for bypass.

The following events have not been evaluated in this paper, which focuses primarily on cycle arrangement/equipment alternatives:

- Operator error
- Pipe, tank, or pressure vessel rupture
- Structural failure (buildings, supports, etc)
- Fires

- Physical damage in the electrical system and/or loss of the switchyard beyond the GSUs that would result in a full plant outage.
- Loss of off-site gas supply
- Acts of God (hurricanes, tornadoes, floods, etc.)
- Sabotage (vandalism, terrorism)

Section 2 of the report provides a description of the base configuration cycles for comparison to the alternatives considered. Section 3 includes an analysis of the various alternatives that were considered that impact output reliability. Section 4 provides high level cost estimates for the most feasible solutions identified in Section 3.

2.0 BASE PLANT CONFIGURATION OVERVIEW

2.1 GENERAL

This Section provides on overview of the base configuration for the Green River Combined Cycle plant. HDR's Feasibility Analysis describes the proposed NGCC facility plant configuration, integration, and site specific design criteria, although much of the site specific information requires update for the Green River site. Project schedule, plant performance, operational impacts, capital cost, lifecycle economics, air emissions, and water consumption estimates are provided for comparison in that document.

2.1.1 Gas Turbine Technology Summary – Brief with reference to Feasibility Analysis

Two arrangements were reviewed specifically for the Green River Site: 1) 2x1 Siemens F(5)ee – Lightly Fired, and 2) 2x1 Siemens H – Heavily Fired. In addition to the Siemens F(5)ee and H turbines, GE 7F5, GE 7F7, and MPS GAC model turbines were also reviewed in both 1x1 and 2x1 configurations with various levels of duct firing to increase STG output, but these configurations were only analyzed for the E.W. Brown site. The potential cycle modifications discussed throughout the balance of this document are neutral to the gas turbine type selected and level of duct firing except where noted.

2.1.2 Definition of Base Plant Configuration

As identified in the Feasibility Analysis, the Base Configuration for the Green River NGCC facility will consist of two combustion turbine generators (CTGs) with evaporative cooling and fuel gas heating. Each combustion turbine will exhaust to a triple pressure, heat recovery steam generator (HRSG) with a low temperature economizer (LTE) and reheat section. High pressure steam generated by the HRSG will supply high pressure (HP) steam to the steam turbine throttle of a single steam turbine generator (STG) at a maximum pressure of 2400 psia; the pressure will slide downward as steam load to the steam turbine decreases. Steam will exhaust from the HP section of the STG, mix with intermediate pressure (IP) steam within the HRSG, and then will be reheated via the HRSG before entering back into the IP steam turbine section of the STG. Lastly, a low pressure (LP) steam induction on the STG will be supplied by the LP boiler of the HRSG. The steam turbine will be of a single reheat, fully condensing design. The heat rejection system will include a deaerating, wet surface condenser with heat rejected to a mechanical draft cooling tower.

Air quality control systems for the NGCC facility consist of dry, low NO_x burners for controlling NO_x emissions from the CTGs, and a selective catalytic reduction (SCR) system to further reduce NOx from the waste stream if the combustion turbine is not capable of producing NOx emissions of 12 ppm or less. An oxidation catalyst for CO reduction has also been assumed as the base option.

The plant will be designed as an outdoor plant with the steam turbine and boiler feedwater pump(s) located indoors. Each CTG will be located outdoors within enclosures provided by the CTG manufacturer.

The base configuration NGCC arrangement evaluated herein has been held to the following general thermal cycle design constraints:

- Natural gas as the primary fuel (higher heating value of 22,029 Btu/lb),
- Evaporative cooling is included for operation at ambient conditions above 60 °F
- Fuel gas performance heating is included (level of heating varies depending on CTG selection)
- Triple pressure heat recovery steam generator (HRSG) with low temperature economizer (LTE).
- Low temperature economizer (LTE) recirculation to maintain 140°F water temperature to the LTE.
- LTE bypass to avoid condensate steaming within the LTE
- 1050°F/1050°F main steam and reheat steam temperatures
- 2400 psig steam turbine throttle with sliding pressure as steam load decreases
- Dearating condenser
- A minimum stack exit temperature of 180 °F
- Light duct burner firing is incorporated into the 2x1 F(5)ee NGCC to maintain summer day net plant electrical output equal to that achieved at the unfired, annual average design conditions.
- Supplemental firing up to a nominal output of 760 MW net, degraded at summer design conditions for the 2x1 H-Class configuration.
- Forced draft, wet cooling heat rejection system with 11°F cooling tower design approach and 6°F condenser design approach temperatures.

A single F-class and H-class cycle were selected as "representative" for each technology class. Plant performance, water consumption, and estimated project cost for the representative cycles as developed in the Feasibility Analysis for the Green River site are summarized below for reference in the following Sections. Additional details for each factor can be found in the Feasibility Analysis.

Table 2.1.2-1. Green River Combined Cycle, Average Ambient, New and Clean

Description	Gross Plant Output (MW)	Gross Plant Heat Rate (Btu/kWH - HHV)	Auxiliary Power Percentage (%)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWH - HHV)	Net Plant Efficiency (% - HHV)
2x1 Siemens F(5)ee	705.2	6,510	2.27%	689.2	6,661	51.28%
2x1 Siemens H	853.5	6,325	2.97%	828.1	6,519	52.40%

Table 2.1.2-2. Green River Combined Cycle Facility Water Consumption and Wastewater Discharge Rates (5 Cycles of Concentration Cooling Tower)

Option	Description	Cooling Tower Water Consumption (Gallons/MWH)	Misc. Water Consumption (Gallons/MWH)	Cycle Water Consumption (Gallons/MWH)	Total Water Consumption (Gallons/MWH)	Plant Wastewater Discharge (Gallons/MWH)
1	2x1 Siemens F(5)ee	239	0.09	11.1	251	49
2	2x1 Siemens H	244	0.07	11.9	256	51

Table 2.1.2-3 Green River Plant Designs, Estimated Total Project Cost ($1,000)

Project Costs	2x1 Siemens F(5)ee	2x1 Siemens H
Plant Net Capacity (MW)	689.2	828.1
EPC Cost ($1,000)	$511,057	$586,164
Owner's Costs		
Total Owner Indirects	$84,825	$86,325
Owner Contingency	$51,106	$58,616
LTSA	$3,459	$3,459
Total Project Cost ($1,000)	**$650,446**	**$734,564**
Total Project Cost ($/kW)	$944	$887

2.1.3 Balance of Plant Systems

Balance of Plant (BOP) systems that may have alternatives which impact system reliability/flexibility are defined for the base configuration in Section 3.5.

2.1.3.1 Gas Interconnection

Natural gas will be supplied to the NGCC facility via a new 11-mile long 20 inch lateral served by Texas Gas. Gas pressure at the tie-in point (supply side of 11-mile pipe) is nominally 600-psig. Delivery pressure to the site is anticipated to be nominally 550-psig. Required gas pressure varies depending on selected CTG, however it is anticipated that gas compression will be required for the Green River site. Note that the previous site considered in the Feasibility Analysis did not require gas compression; therefore the values above from the Feasibility Analysis do not include compressors in the cost estimate or performance factors.

The on-site fuel gas system includes metering, regulation, and liquids collection & separation. Each CTG train includes scrubbers with liquids storage, individual electric start-up heaters for each combustion turbine and individual performance heaters and dewpoint heaters. Pressure reducing stations will be provided as required to meet the pressure and cleanliness requirements of the CTG manufacturer. Pressure reduction to meet the natural gas pressure requirements of the HRSG duct burners will be provided with the HRSG(s).

2.1.3.2 Circulating Water

Cooling for the steam condenser is provided by circulating water from a new mechanical draft wet cooling tower. The cooling tower will be designed with nominally an 11 °F approach and a 20 °F range on a 1% incident design day. The condenser design approach temperature is anticipated to be 6 °F. The circulating water system will be designed for five cycles of concentration. Make-up to the cycle will be from the make-up water system described in the following section.

2.1.3.3 Make-up Water

It is anticipated that the existing Green River water intake structure will be utilized for make-up water, although alternatives including a new intake remain under consideration. The existing site water treatment equipment requires refurbishment and the style of clarifiers at the existing site are not ideal for the cycling nature of a combined cycle plant, therefore the base configuration assumes new clarifiers more adept for heavy cycling operation will be installed for initial treatment of the raw water.

A demineralized water treatment system will provide the water quality required by the HRSG(s) and steam turbine manufacturers. The demineralized water treatment system includes new first pass reverse osmosis and cation/anion exchange mixed bed technology. The NGCC facility will include redundant forwarding pumps and a demineralized water storage tank.

2.1.3.4 Electrical Interconnection (to high-side of GSU)

Each CTG and the STG will have a main generator step-up transformer with a nominal output voltage of 161 kV. A new switchyard for the NGCC facility will interface with the existing LG&E/KU transmission system.

2.1.3.5 Auxiliary Power Source

An auxiliary transformer fed from a tap on the isolated phase bus from each CTG will be provided. Each auxiliary transformer will have sufficient capacity to operate the entire NGCC facility for full redundancy of aux power supply.

2.1.4 Reliability Data

HDR reviewed several in-house, OEM, and industry technical sources to obtain typical plant reliability data for comparison with the alternatives discussed in the next Section. Data varies widely depending on the source and assumptions made in evaluating the data. In general, OEM reliability projections significantly exceed what has actually been observed in industry data reviews and therefore industry data is primarily used as the basis for the reliability data in this report. As to be expected, there is much more actual operating data available for F-class technology plants then for the newer H/J class technology.

Taking into consideration the array of data, HDR anticipates reasonable full load reliability for a well maintained and operated 2x1 plant to be nominally 94% in the base plant configuration. The probability of being able to maintain nominally 375 MW output (or nominally 50% load) is substantially higher than the full load reliability because that output can be maintained with a major component out of service. For example, in the base 2x1 F-class configuration, the full load 760 MW output is unachievable if any of the generators (two CTGs or the STG) or any of the auxiliary support systems are out of service, resulting in the full load reliability of nominally 94%. The 375 MW output can be achieved with one CTG offline, which substantially increases the probability of the 2x1 plant being able to achieve that output. Likewise, if HRSG bypass stacks are incorporated, the 375 MW output could also be achieved by running the two CTGs during an STG outage. Individual component outage factors to be used to calculate those probabilities were determined from industry data as summarized in the next Section. A listing of the base 2x1 F-class configuration probability of maintaining 750 MW and 375 MW output and how it compares with other potential configurations is presented in Table 5.0-1.

2.1.4.1 Industry Data

The Electric Power Research Institute (EPRI) is one of the most reliable sources of information for power industry operating information. EPRI has published several documents relating to combined-cycle plant reliability and availability, including a paper titled Risk-Based Assessment of Unplanned Outage Events and Costs for Combined-Cycle Plants developed in conjunction with Strategic Power Systems, Inc. and published in the Journal of Engineering for Gas Turbines and Power in February 2013 (Reference 2). That paper includes the following Table and Figure relevant to the plant reliability discussion:

Figure 2.1.4-1 (from Reference 2): Combined Cycle Plant Outage Data

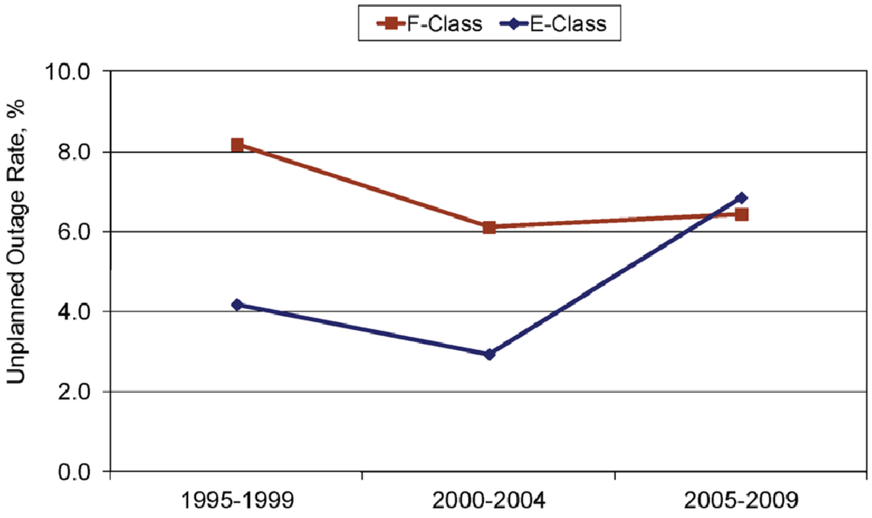
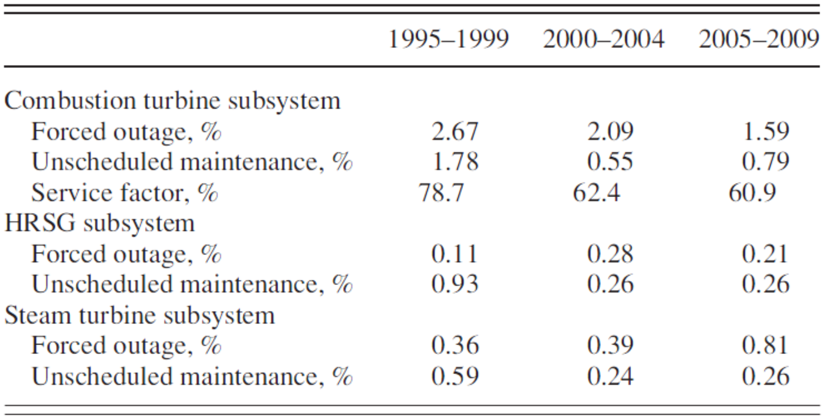


Table 5 Average outage factors for subsystems: F-class

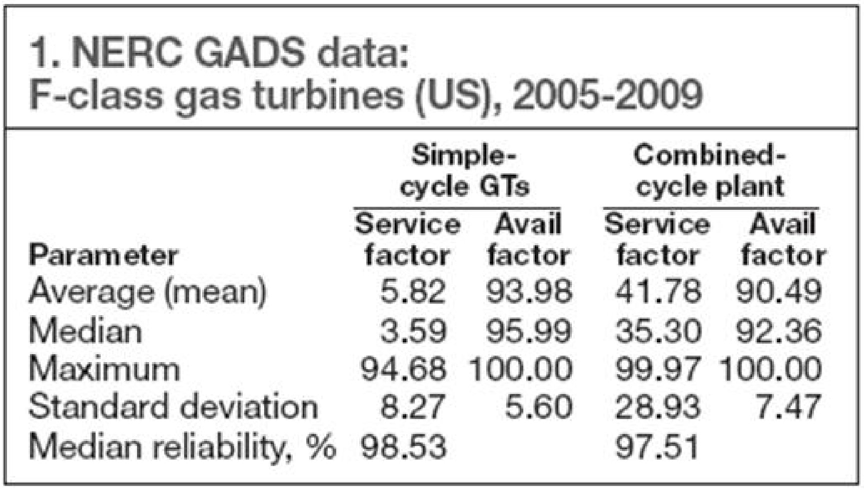


	1995–1999	2000–2004	2005–2009
Combustion turbine subsystem			
Forced outage, %	2.67	2.09	1.59
Unscheduled maintenance, %	1.78	0.55	0.79
Service factor, %	78.7	62.4	60.9
HRSG subsystem			
Forced outage, %	0.11	0.28	0.21
Unscheduled maintenance, %	0.93	0.26	0.26
Steam turbine subsystem			
Forced outage, %	0.36	0.39	0.81
Unscheduled maintenance, %	0.59	0.24	0.26

The data in the EPRI figures is based on over 200 F-class plants in various configurations. As can be seen in the figures, the industry average for an F-class combined cycle Unplanned Outage Rate over the past 10-years is nominally 6%. Also of note from the data is that the combustion turbines are the biggest contributor to the outage rate, and the HRSG and steam turbine have relatively low outage rates respectively.

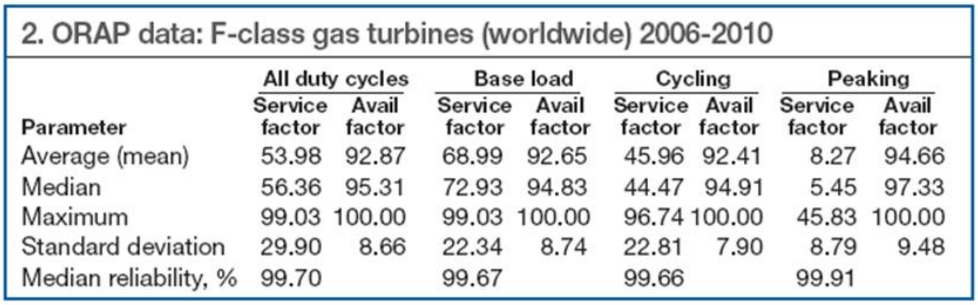
Another widely accepted database for availability and reliability data is NERC GADS data. Reference 3 is a Combined Cycle Journal paper on RAM Analysis which includes two independent sources of data for F-class combined-cycle plants, NERC GADS data and ORAP data developed by Strategic Power Systems. Summary tables from that paper are reprinted below:

Figure 2.1.4-2 (from Reference 3): NERC and ORAP F-class reliability data



1. NERC GADS data:
F-class gas turbines (US), 2005-2009

	Simple-cycle GTs		Combined-cycle plant	
Parameter	Service factor	Avail factor	Service factor	Avail factor
Average (mean)	5.82	93.98	41.78	90.49
Median	3.59	95.99	35.30	92.36
Maximum	94.68	100.00	99.97	100.00
Standard deviation	8.27	5.60	28.93	7.47
Median reliability, %	98.53		97.51	



2. ORAP data: F-class gas turbines (worldwide) 2006-2010

	All duty cycles		Base load		Cycling		Peaking	
Parameter	Service factor	Avail factor	Service factor	Avail factor	Service factor	Avail factor	Service factor	Avail factor
Average (mean)	53.98	92.87	68.99	92.65	45.96	92.41	8.27	94.66
Median	56.36	95.31	72.93	94.83	44.47	94.91	5.45	97.33
Maximum	99.03	100.00	99.03	100.00	96.74	100.00	45.83	100.00
Standard deviation	29.90	8.66	22.34	8.74	22.81	7.90	8.79	9.48
Median reliability, %	99.70		99.67		99.66		99.91	

3.0 ANALYSIS OF PLANT RELIABILITY/FLEXIBILITY ALTERNATIVES

This Section describes potential cycle modifications to the base configuration described in Section 2 that can increase the operating flexibility of the plant. The modifications analyzed are intended to reduce the probability of the full plant output generation loss. Most failures that result in a full loss of output are related to the steam turbine and the coincident loss of the condenser which precludes use of the STG steam bypass system.

3.1 HRSG BYPASS STACKS

The most straight-forward method of decoupling gas turbine operation from the steam turbine is the installation of HRSG bypass stacks. The bypass stacks are installed with a diverter damper at the discharge of each CTG to direct the turbine exhaust gas to atmosphere rather than through the HRSGs. Siemens states in standard turbine cut-sheets that CTG reliability can be increased through the utilization of a diverter and bypass stack for combined cycle plants. The G class and H class machines have been designed primarily for combined cycle applications, thus bypass stacks are typically not installed for supporting simple cycle operation. HRSG bypass stacks would allow one or both gas turbines to operate as simple cycle units anytime there are issues with the balance of plant equipment preventing steam turbine operation.

Figure 3.1-1: Typical gas turbine bypass stack and diverter dampers

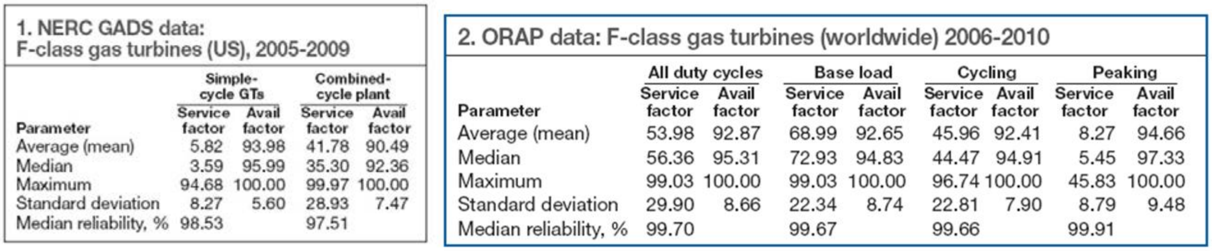
Bypass stacks will also provide benefit in allowing more flexibility during plant start-up, as a single CTG can be started more quickly when bypassed without concern for uniform thermal heating of the HRSG(s) therefore allowing the full CTG output to be available much more quickly.

The Siemens F(5)ee configuration fired for 760 MW (fully degraded) has a nominal new and clean gross output from each CTG of 232 MW while the STG (utilizing fired steam) is producing a maximum of 374 MW (Reference 1: “2 x 1 F(5)ee Average Day, 760 MW Design - Fired” heat balance). Incorporation of HRSG bypass stacks would result in over 375 MW (net, fully degraded) still available in the event of a steam turbine trip or related auxiliary outage. The power output would be at a simple cycle heat rate (nominally 10,000 BTU/kWh) and as such would not provide an economic dispatch in this configuration, however the combustion turbines could be dispatched this way indefinitely for grid stability until the issue with the STG could be resolved. Performance characteristics for some of the combustion turbines under consideration are provided in Table 3.6-8 of the Feasibility Analysis. The bypass stacks will have minimal impact to the combined cycle performance. An estimated 0.5 in H_20 increase in exhaust backpressure on the CTG as a result of the bypass damper and additional ductwork will result in an approximate 100 kW decrease in net plant output and less than 5 btu/kWhr increase in net plant heat rate.

Bypass stack dampers require maintenance to prevent excessive leakage and the corresponding loss of energy/efficiency. However, the maintenance required is scheduled and therefore would not significantly impact the unit forced outage rate. If properly specified and maintained, experience from several F-class bypass damper users indicate that transition from combined-cycle to simple-cycle can be completed without issue.

The overall impact on system reliability from incorporating bypass stacks is difficult to quantify as it is a function of the forced outage rates for the steam turbine auxiliary systems. A reasonable approximation for the impact is comparing the difference between reliability factors for simple cycle and combined cycle plants. The first figure below provides NERC GADS data showing reliability for F-class gas turbines in simple cycle and combined cycle arrangements. As can be seen in the table, from 2005-2009 the median reliability for simple cycle gas turbines (98.53%) was nominally 1% higher than that of combined cycle gas turbines (97.51%). Therefore, it is expected that incorporating HRSG bypass stacks as described will increase overall gas turbine reliability by nominally 1%. The estimated overall impact to plant reliability for this alternative is summarized in Table 5.0-1.

Figure 3.1-2: NERC GADS data for simple and combined cycle arrangements (Reference 2)



1. NERC GADS data:
F-class gas turbines (US), 2005-2009

	Simple-cycle GTs		Combined-cycle plant	
Parameter	Service factor	Avail factor	Service factor	Avail factor
Average (mean)	5.82	93.98	41.78	90.49
Median	3.59	95.99	35.30	92.36
Maximum	94.68	100.00	99.97	100.00
Standard deviation	8.27	5.60	28.93	7.47
Median reliability, %	98.53		97.51	

2. ORAP data: F-class gas turbines (worldwide) 2006-2010

	All duty cycles		Base load		Cycling		Peaking	
Parameter	Service factor	Avail factor	Service factor	Avail factor	Service factor	Avail factor	Service factor	Avail factor
Average (mean)	53.98	92.87	68.99	92.65	45.96	92.41	8.27	94.66
Median	56.36	95.31	72.93	94.83	44.47	94.91	5.45	97.33
Maximum	99.03	100.00	99.03	100.00	96.74	100.00	45.83	100.00
Standard deviation	29.90	8.66	22.34	8.74	22.81	7.90	8.79	9.48
Median reliability, %	99.70		99.67		99.66		99.91	

Estimated cost for incorporation of HRSG bypass stacks into the cycle is discussed in Section 4.

3.1.1 Emissions Impacts

Although plant reliability increases with the incorporation of bypass stacks, the operation of the gas turbines with the HRSG bypassed could be impacted by the plant air permit and could make achieving an approved permit more complex. In particular, NOx and CO may exceed the base combined cycle limits because the turbine exhaust gas does not pass through the SCR and/or CO catalyst to reduce those emissions. Not all of the gas turbine options require SCR for the anticipated permit limit of 12 ppm NOx. As noted in the Feasibility Analysis the Mitsubishi 501 GAC and the Siemens 8000 H are the only turbines of those reviewed which will require installation of SCR in the HRSG.

If the selected turbine's emissions do exceed permit levels, the permit may be structured with a rolling average that would allow temporary operation of the gas turbines with the HRSG bypassed until the HRSGs could be returned to service. The overall emissions resulting from bypass stack operation are anticipated to be relatively small. Assuming the combustion turbines in the base 2x1 F configuration are dispatched as simple cycle units utilizing bypass stacks for 1% of the year (88-hours of operation), the net increase in emissions over the combined cycle equivalent is estimated to be less than 9 tons of NOx, 3 tons of CO, and roughly 0.5 tons of VOC.

3.2 WATER SUPPLY CAPACITY ENHANCEMENTS

With incorporation of full HRSG steam vent valves in the Unit HRH headers, the CTGs can operate temporarily in the event of an STG trip coincident with a loss of the condenser by venting the steam from the HRSG. This scenario could occur with a major failure in the condenser or condensate pumps, or anywhere within the circulating water system that would prevent the use of the steam condenser bypass. The length of time the system can operate with the steam vents open is a function of on-site water storage and the make-up water system's capacity for providing demineralized water. The Raw Water Pre-Treatment system (clarifiers) effluent shall be the supply to the water treatment system. The water treatment system shall consist of two x 100% redundant trains of ultra-filtration, 2-pass reverse osmosis, electro-deionization, and a mixed bed. The Feasibility Analysis Water Balance for the 2x1 F(5)ee configuration on an average day (Appendix C, Drawing WMB-2) shows a demineralized water make-up flow to the cycle of 33 GPM.

The base configuration includes pricing for a demineralized water storage tank sized at nominally 200,000 gallons, which provides ample capacity for the normal make-up water flow rate of 33 GPM. The demineralized water treatment consists of multiple trains which in an emergency could provide a maximum demineralized water generating capacity of nominally 70 gpm, which is well below the make-up requirements for the HRSGs with vented steam.

Condensate to the HRSGs for the 2x1 F(5)ee configuration on an average day (Heat Balance NGCC 6 – Average Day) is shown as 1,562,200 lb/hr (or roughly 3,125 GPM). The base configuration 200,000 gallon demineralized water tank would be capable of supplying the 3,125 GPM for roughly one-hour. Approximately 180,000 gallons of demin water tank capacity would be required for each hour of operation with the HRSGs venting steam.

Assuming that the gas turbines must be able to finish a base loaded day of operation (normally considered16-hours), sufficient demineralized water storage would be required to account for a loss of the steam turbine at the beginning of the day. There are two options for supplying that demineralized water capacity.

- Install nominally 3,000,000 gallons of demineralized storage capacity to supply the HRSGs for the remainder of the base loaded operation or until the issue in the steam/water cycle is fixed, or
- Reserve space for emergency water treatment trailers and provide sufficient tank capacity to cover operation until the trailers arrive.

The footprint to accommodate either of these scenarios would be substantial. For the first option, assuming the 3,000,000 gallons of capacity is split into two tanks, each tank would have rough dimensions of 75’ diameter x 45’ height.

Preliminary discussions with GE Water indicated that demineralized water trailer capacity of this magnitude would need to be logistically planned out 3 weeks prior to this type of situation. GE Water estimated that approximately 8 trailers would be required to support this situation. Once the trailers were aligned for delivery, they could arrive, be interconnected, and generating sufficient capacity within approximately 12-hours. To supply water for the intermediate period, the on-site demineralized storage in that scenario would be nominally 2,125,000 gallons. The balance of water treatment pumping and piping would need to be sized for 3,125 GPM to service the trailers once on-site. The 2,125,000 gallon capacity would consist of two tanks of roughly 65’ diameter x 45’ tall. In addition, a reserved footprint of approximately 100’ x 50’ would be required for the estimated eight demineralizer trailers that would be required to serve the 3,125 GPM flow. Due to the footprint requirements and time requirements to deliver and interconnect the trailers, this option is not considered to have merit and was not evaluated further.

The water costs for operating with HRSG vents open would be extreme, in addition to the cost of generation from the reduced heat rate of operating the combustion turbines without the steam turbine. Operation in this mode should only be considered for allowing grid stability from the combustion turbines for a short period in the event of a failure in the steam condenser, or somewhere else within the balance of plant systems that prevents operation of the steam condenser bypass.

The increase in reliability from incorporating these options is slightly less than that of the HRSG bypass stack scenario, because this scenario requires the HRSGs and feedwater systems to be fully functional for the gas turbines to continue operation. EPRI published a 2003 paper titled: Steam Turbine and Generator Designs for Combined-Cycle Applications: Durability, Reliability, and Procurement Considerations

(Reference 4). Section 9 of that report contains reliability data for steam turbines of greater than 180 MW over a five year analysis period. The data shows reliability for combined cycle installation steam turbines as 99.66%, or a corresponding forced outage rate of 0.34%. The same report also notes a 0.09% forced outage rate for the generator, yielding a total forced outage rated for the STG of 0.43%. The report also lists the most common forced outage events for STGs greater than 100 MW (Reference 4, Table 9-7). A review of the equipment causing the steam turbine outages confirms that HRSG steam vents located in the Unit HRH headers would allow continued gas turbine operation in almost all of the listed scenarios. It is expected that incorporating the identified water capacity provisions to allow the gas turbines to operate without the condensate and/or circulating water system will increase overall plant reliability by nominally 0.75%.

This scenario offers an advantage over the HRSG bypass stack alternative in that exhaust gas would still pass through the HRSGs as normal, therefore the potential permitting concerns identified in 3.1.1 would not exist. However, due to the water consumption, additional footprint, and the costs of the additional equipment this alternative is not considered a viable option for further consideration.

Costs for incorporating additional water storage capacity are discussed in Section 4.

3.3 ALTERNATE CYCLE CONFIGURATIONS

3.3.1 Standard Two individual 1x1 cycles

This alternative evaluates the principle behind utilizing two 1x1 NGCC plants side-by-side providing full redundancy of the STG and condenser as opposed to the base plant configuration of a 2x1 NGCC facility with a single STG. By employing this alternate configuration, there would be four generating units instead of three, thus losing either a gas turbine or steam turbine to a trip is less detrimental to system stability as only half of the plant generating capacity would be directly impacted.

The negative impacts of this alternate configuration come down to the heat rate and costs associated with the plant(s). A 1x1 configuration based upon the F-Class technology previously evaluated for LG&E's 2018 NGCC plant has an estimated heat rate of 6,527 Btu/kWh – HHV while the 2x1 utilizing the same combustion turbine technology has an estimated gross heat rate of 6,510 Btu/kWh – HHV. Although the combustion turbines used in either configuration produce the same output and heat rate, the bottoming cycle's heat rate will differ between a 1x1 and 2x1. Steam properties are a major driver of cycle efficiency, and the higher the flow, the higher the efficiency, thus a steam turbine sized to be operated with steam produced by two HRSGs will be a more efficient generator of energy compared to a steam turbine sized for a single HRSG's steam generation.

It is assumed, for the purposes of this whitepaper, that two 1x1 plants will have the same heat rate as a single 1x1, because the gross heat rates will be identical and the balance of plant (BOP) equipment that can be shared will not significantly impact the final net heat rate as the auxiliary loads for both configurations modeled prior (1x1 and 2x1) were equal on a percent of gross output basis (2.29%).

As stated previously, there will be a negative impact upon the cost for this generation when the configuration is modified from a single 2x1 to two 1x1 plants. This is due to the fact that more equipment will be required to support the additional steam turbine and GSU and other BOP equipment required in a Two 1x1 arrangement. The cost of generation will be between that of a single 1x1 and a single 2x1, because some of the BOP equipment can be reliably shared between the two generation trains, resulting in a reduction of costs from a single 1x1 on a $/MWH basis. In an effort to present multiple options for LG&E's future generation, costs were developed for 1x1 and 2x1 F-Class NGCC facilities. It was found that a 2x1 configuration utilizing the same combustion turbine technology and supplementary firing methodology would have a levelized cost of generation 6.39% lower than that of a 1x1.

3.3.2 Single Shaft Generator

If LG&E determines that the two individual 1x1 arrangement is the preferential route, a secondary option that can be evaluated is single-shaft versus multi-shaft. A single-shaft configuration consists of one gas turbine/HRSG and one steam turbine tied to a single generator, while the more typical multi-shaft arrangement consists of one gas turbine, one steam turbine, one HRSG, and two generators.

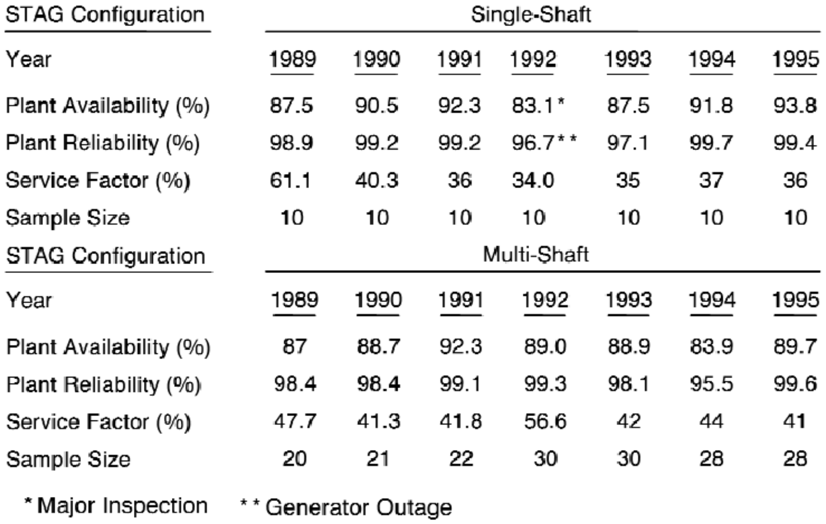
There are two schools of thought with respect to the design of a single-shaft 1x1; one is to install the generator in between the combustion turbine and the steam turbine while the other is to install the steam turbine between the combustion turbine and the generator. The largest difference between the two arrangements is that the option with the generator between the gas turbine and the steam turbine requires a clutch on the steam turbine. Although the clutch represents an additional potential maintenance issue, it does allow for a much greater operational flexibility. Without the clutch (via the installation with the steam turbine between the gas turbine and the generator), the gas turbine cannot operate independently of the steam turbine. If it is desired to avoid installing a clutch on the steam turbine, the final result will be a substantially decreased reliability as compared to the 2x1 or multi-shaft 1x1 configurations.

A technical review of the single shaft configuration presented at the 2004 ASME Joint Power Conference prepared by Siemens (Reference 5) provided the following summary of the steam turbine clutch:

> The clutch is a synchronous self-shifting device that engages automatically at rated speed as soon as the steam turbine tries to overrun the gas turbine-generator. It disengages automatically when the steam turbine speed drops below the speed of the gas turbine.
>
> The primary reason for the clutch is to ensure independent gas turbine and steam turbine operation below steam turbine rated speed. The clutch is especially advantageous during startup and gas turbine simple-cycle operation while the produced steam is led into the condenser by means of full capacity HP-/IP-/LP-bypass stations. The clutch design allows rotating of the steam turbine when the gas turbine has stopped, which takes into consideration the different cool-down times of gas and steam turbine. The clutch also allows accommodating two journal/thrust bearings on the shaft-train by compensating gas and steam turbine thrust as well as thermal expansion and Poisson contraction, both being imposed primarily by the generator.

The single-shaft design can be employed to minimize the footprint of the power block(s) in an effort to more efficiently use the land available, while also reducing the amount of major equipment purchases (two GSUs for two single-shaft 1x1 plants as opposed to four). Also, in a paper published by engineers from GE (Reference 6 – GE GER3767c), it was shown that the single-shaft 1x1 plants they evaluated repeatedly (but not constantly) outperformed multi-shaft 1x1 installations they evaluated on an availability and reliability basis between 1989 and 1995 on an average of 1 percent and 0.26 percent respectively. GE’s explanation for these operating characteristics is that they are a result of simplicity of control and operation and proper maintenance practices. GE’s single-shaft arrangement literature states that “single-shaft arrangements are particularly advantageous for modern reheat combined cycle plants. It simplifies the starting and steam bypass systems associated with multiple heat recovery steam generators and a single steam turbine.” Conversely, any problem with the GSU, generator, or clutch will result in loss of both the STG and CTG for that side of the plant. Reference 6 provides the following comparison of single-shaft and multi-shaft reliability and availability data:

Figure 3.3-1: STAG Combined Cycle Plant Operating Statistics (Source: GE document GER-3767C)



STAG Configuration	Single-Shaft						
Year	1989	1990	1991	1992	1993	1994	1995
Plant Availability (%)	87.5	90.5	92.3	83.1*	87.5	91.8	93.8
Plant Reliability (%)	98.9	99.2	99.2	96.7**	97.1	99.7	99.4
Service Factor (%)	61.1	40.3	36	34.0	35	37	36
Sample Size	10	10	10	10	10	10	10

STAG Configuration	Multi-Shaft						
Year	1989	1990	1991	1992	1993	1994	1995
Plant Availability (%)	87	88.7	92.3	89.0	88.9	83.9	89.7
Plant Reliability (%)	98.4	98.4	99.1	99.3	98.1	95.5	99.6
Service Factor (%)	47.7	41.3	41.8	56.6	42	44	41
Sample Size	20	21	22	30	30	28	28

* Major Inspection ** Generator Outage

The 2004 Siemens technical review also listed that a 0.1% reduction in auxiliary power consumption can be achieved due to the ability to use a common lube oil system and only a single generator for the CTG and STG. The paper also notes a generator efficiency increase associated with the use of a hydrogen cooled generator (for both steam/gas turbine) whereas an air cooled generator is more typical for the steam turbine in a multi-shaft arrangement. Siemens estimated that the combined impact of the auxiliary power reduction and efficiency gain results in a net cycle efficiency increase of 0.2% in comparison to a 1x1 multi-shaft configuration.

3.3.3 Simple Cycle

In an effort to simplify the plant as much as possible, another option is to install simple cycle capacity instead of combined cycle. This would require 3 or more of the F-Class combustion turbines to reach the same level of generation. Although the generating assets would be completely independent of one another, thus significantly reducing the potential to lose all power production via a single failure, the performance penalties should be heavily considered. As referenced prior, the heat rate of a 2x1 combined cycle was estimated to be 6,510 Btu/kWh – HHV and the 1x1 combined cycle was estimated to have a heat rate of 6,527 Btu/kWh – HHV; these are considerably better than the combustion turbine's gross heat rate of 9,901 Btu/kWh – HHV without heat recovery. An impact of this magnitude would result in a plant that is much more costly to operate, thus reducing the potential to be dispatched competitively.

3.4 DUAL FUEL REVIEW

The loss of natural gas to the site would also result in a full loss of plant output. A full loss of natural gas, while possible, is considered remote. HDR has not attempted to validate gas supply reliability/availability rates typically guaranteed by the gas supplier. The gas supply to the Green River site requires compression to achieve the gas pressure needed for normal operation of the gas turbines. It is assumed that redundant gas compressors would be installed at 3 x 50% capacity or more.

Configuring the gas turbines for dual fuel service will allow for full plant output in the event of a loss of gas supply. Each of the gas turbines considered offers dual fuel capability, although the emissions guarantees shown in the Feasibility Analysis are impacted when burning distillate oil. The Feasibility Analysis reviewed dual fuel capability (natural gas and distillate fuel oil) options for each NGCC configuration evaluated based on providing a dual fuel combustion turbine with water injection NOx control and 36 hours of distillate fuel oil storage. The application of dual fuel capability does not present an impact to the performance of the combined cycle unit. The availability and maintenance costs will be negatively impacted by dual fuel operation as a function of fuel oil fired operating hours. No change in CTG performance or overall plant performance is noted when firing natural gas on a dual fuel combustion turbine.

An alternative to fuel oil to provide fuel supply redundancy is interconnection to a second gas supply. Interconnection to a second gas supplier has been reviewed separately and is not quantified here. Tie-in to a second gas supply would avoid the environmental concerns associated with the fuel oil option, and likely makes more long-term economic sense both for achieving redundancy and maintaining competitive fuel pricing.

Pricing for dual fuel combustors was obtained from the CTG OEMs and a summary of the anticipated project cost impact for incorporating dual fuel capability is provided in Section 4.

3.5 BALANCE OF PLANT SYSTEMS

The base configuration is generally designed to include features to minimize single point failures that could result in a plant outage. This section reviews some of the areas within the balance of plant that a single failure could potentially result in a full loss of output and possible mitigations for avoiding those instances.

The Feasibility Analysis assumed that the design and redundancy of major auxiliary equipment will prevent complete loss of any main equipment item in event of the failure of the auxiliary equipment. The redundancy assumed for the NGCC facility was specified as follows:

- Condenser – 1 x 100%
- Cooling Tower – 1 x 100% (with one spare cell at summer ambient conditions)
- Condensate Pumps – 2 x 100%
- Boiler Feed Pumps – 1 x 100% (per HRSG with warehouse spare element)
- Condenser Vacuum Pumps – 2 x 100%
- Circulating Water Pumps – 2 x 60%
- Closed Cooling Water Pumps – 2 x 100%
- Raw Water Supply Pumps – 2 x 100%
- Auxiliary Cooling Water Pump – 1 x 100% (supports plant standby operation only when STG is off-line to supply closed cycle cooling water system)
- Generator Step-up Transformers- 1 x 100% (per CTG and STG)
- Unit Auxiliary Transformers - 2 x 100%

Of the primary equipment items listed above, only the condenser, cooling tower, boiler feedwater pumps, and auxiliary cooling water pumps and generator step-up transformers do not include redundancy in the base plant configuration

Without converting to the two individual 1x1 arrangement discussed in Section 3.1.1, there is no practical way of providing condenser redundancy as it is designed in conjunction with the steam turbine in a standard 2x1 arrangement. In addition, the steam turbine can operate at reduced load off a single gas turbine / HRSG train, therefore any failures resulting in loss of a single gas turbine or HRSG, such as trip of the 1 x 100% boiler feed pump for either HRSG, will not directly cause the loss of the entire plant output unless there is a loss of the condensing capability.

Although there is only one cooling tower, the system includes inherent redundancy as each cell will have a dedicated fan, and only half of the fans will be fed from each side of the redundant auxiliary power system.

The lack of redundancy of the boiler feedwater pumps and GSU's can only affect the specific unit they are associated with and therefore only reduce plant output by the respective unit capacity.

The non-redundant auxiliary cooling water pump is only used with the main circulating water pumps are not in operation and therefore cannot affect generation under normal operating scenarios. Other balance of plant systems where a loss of the system could result in a full plant outage include the following:

- Control Air
- Condensate Air Extraction
- Circulating Water
- Closed Cycle Cooling Water
- Condensate
- DCS related failures
- Electrical system related failures

Each of these systems include redundancy features in the base plant configuration to reduce the probability of a full plant outage.

4.0 CAPITAL COST ADJUSTMENTS

This Section provides high level pricing for the most feasible operating flexibility modifications identified in Section 3.

4.1 BYPASS SYSTEMS ESTIMATE

4.1.1 HRSG Bypass Stacks

HDR obtained budgetary pricing from HRSG OEMs for material supply of HRSG bypass stacks and diverters. On a budgetary basis, the cost per HRSG for inclusion of a bypass stack on a unit in this size range is \$3M-\$4M. HDR had previously estimated the cost for addition of HRSG bypass stacks and diverters to the base 2x1 F-class configuration at \$12,500,000. If installation of HRSG bypass stacks is to be considered, firm pricing for the stacks should be obtained to validate the budgetary pricing provided in support of this effort.

4.1.2 HRSG Venting / Water Storage Capacity

The cost of the modification to allow for extended venting of the HRSGs can be broken into the valves required for the venting and the cost of water storage. The cost of the valves themselves is roughly \$500,000 based on similar projects that incorporated similar valves. For purposes of this estimate, it is anticipated that nominally 3,000,000 gallons of additional demineralized water tank storage would be required to allow the gas turbines to continue operation throughout the balance of the day if the steam turbine or auxiliary system was lost at the beginning of a base loaded period. The estimated cost for incorporating the additional water storage is estimated to be roughly \$12,000,000.

The total cost impact for incorporating equipment to allow for extended HRSG venting operation into the base configuration including additional water storage, HRSG vent valves, and interconnecting piping requirements is estimated to be \$13,000,000. If this option is to be further considered a more refined cost estimate should be prepared.

4.2 TWO 1X1 CYCLE IMPACT

While some balance of plant systems can be shared in the two 1x1 plant configuration, such as gas compression, water treatment, and wastewater discharge, the two independent steam turbines and associated condensers, cooling towers, and pumps result in a significantly higher capital cost.

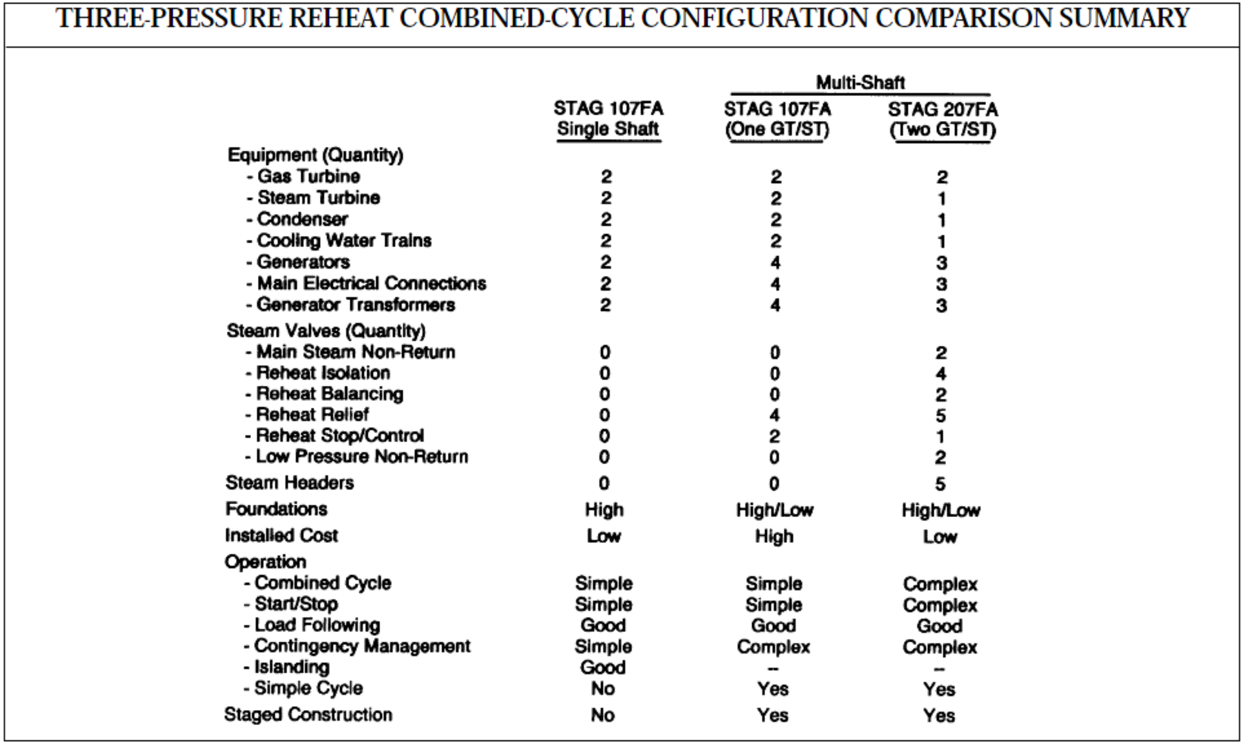
HDR reviewed the previously developed cost estimates for the 1x1 and 2x1 plant configurations. After accounting for the balance of plant systems that could be shared between the two 1x1 cycles, the resulting total project cost is estimated to rise at least $50,000,000 or nominally 8% higher than the base 2x1 plant configuration. As noted in Section 3.1.1, the cost of generation for power in this arrangement will also rise slightly as the efficiency of the two smaller STGs is inherently lower than a single larger STG. HDR anticipates the $50,000,000 adder to be the minimum potential price increase and if this alternative is to be considered further a more detailed bottom-up estimate for this configuration should be completed.

4.3 SINGLE SHAFT IMPACT

OEM data on the cost impact of the Single Shaft arrangement varies. Siemens Technical Evaluation (Reference 5) states: "Based on (*Siemens*) experience it can to be stated that the costs (*for the single shaft configuration*) are in the range of 2-3% lower than a 1-on-1 multishaft."

GE's review of single shaft economics (Reference 6) is more generalized, stating that: The installed cost is approximately equal for multi-shaft and single-shaft systems; however, there are trade-offs that may influence a specific application. GE's review also provided a qualitative comparison of the different arrangements, as shown in Figure 4.3-1.

Figure 4.3-1: Comparison of Single-Shaft to Multi-Shaft Arrangements (Source: GE document GER-3767C)



THREE-PRESSURE REHEAT COMBINED-CYCLE CONFIGURATION COMPARISON SUMMARY

		Multi-Shaft	
	STAG 107FA Single Shaft	STAG 107FA (One GT/ST)	STAG 207FA (Two GT/ST)
Equipment (Quantity)			
- Gas Turbine	2	2	2
- Steam Turbine	2	2	1
- Condenser	2	2	1
- Cooling Water Trains	2	2	1
- Generators	2	4	3
- Main Electrical Connections	2	4	3
- Generator Transformers	2	4	3
Steam Valves (Quantity)			
- Main Steam Non-Return	0	0	2
- Reheat Isolation	0	0	4
- Reheat Balancing	0	0	2
- Reheat Relief	0	4	5
- Reheat Stop/Control	0	2	1
- Low Pressure Non-Return	0	0	2
Steam Headers	0	0	5
Foundations	High	High/Low	High/Low
Installed Cost	Low	High	Low
Operation			
- Combined Cycle	Simple	Simple	Complex
- Start/Stop	Simple	Simple	Complex
- Load Following	Good	Good	Good
- Contingency Management	Simple	Complex	Complex
- Islanding	Good	--	--
- Simple Cycle	No	Yes	Yes
Staged Construction	No	Yes	Yes

Both GE and Siemens indicate that while there may be some capital cost savings by utilizing a single-shaft configuration, the cost impact is not drastic. Assuming based on Siemens statement that 2% project cost could be saved with a single-shaft arrangement, the overall price impact to the base 2x1 configuration would be approximately $37,500,000. If a single-shaft arrangement is to be selected, it should be based on the cycle benefits described in Section 3.3.2 rather than the capital cost impact. HDR anticipates the $37,500,000 adder to be the minimum potential price increase and if this alternative is to be considered further a more detailed bottom-up estimate for this configuration should be completed.

4.4 DUAL FUEL CYCLE

Budgetary quotations for providing dual fuel combustors for each gas turbine were obtained from GE, Siemens, and MHI and are summarized in Table 4.4-1 below.

Figure 4.4-1: OEM Dual Fuel Cost Adder Summary

Supplier	Model	Dual Fuel Adder
Siemens	F(5)ee	$2,500,000
Siemens	8000H	$4,200,000
GE	7FA	$1,700,000
MPS	GAC	$3,500,000
MPS	J	$3,500,000

In addition to the cost adder to the CTG(s), dual fuel capability requires installation of the fuel oil storage tank (anticipated to be sized for 36-hours operation) and oil unloading, forwarding, and preparation equipment. HDR estimated the total cost adder for dual fuel conversion of the 2x1 F(5)ee plant as $11.25M in the Feasibility Analysis (Reference 1).

5.0 SUMMARY AND DISCUSSION

The base plant configuration for the proposed Natural Gas Combined Cycle at the Green River site includes redundancy provisions and features that mitigate the consequences of a failure resulting in the full loss of plant output. Providing full protection against loss of a single generator is not feasible, and loss of either of the gas turbines in the base 2x1 configuration will result in dropping roughly half the plant's full load output. The loss of load associated with a trip of a single CTG/HRSG train, including the corresponding loss of generation in the STG from reduced steam production totals nominally 380 MW. The most likely event to cause the loss of the full plant output in the base 2x1 plant configuration is an incident resulting in a loss of condensing capability, such as a failure of the vacuum system, circulating water system, or the condenser itself. Incorporation of one of the bypass arrangements reviewed would increase the probability that the CTG's could remain in operation during a loss of the STG/condenser which would limit the generation reduction in that event to nominally 375 MW, which is roughly the same impact as the loss of a single CTG.

The alternatives that provide the most feasible impact to plant reliability and operating flexibility are as follows:

- Incorporation of HRSG Bypass Stacks
- Converting to a two by 1x1 configuration
- Converting to a single-shaft configuration

HDR prepared Table 5.0-1 to illustrate the impact the different configurations have on the probability that the plant could achieve full output (nominally 750 MW) or 50% load (nominally 375 MW). All numbers in the table are based on industry data for F-class combined cycle facilities, as presented in Section 2.1.4. The probability includes forced outage factors and unscheduled maintenance, but does not include scheduled outages that would typically be included in availability statistics, as scheduled outages would not impact the loss of output reviewed in this paper. The combined forced outage and unscheduled maintenance factors used in developing the data are: for the combustion turbine - 2.4%, for the HRSG - 0.5%, and for the steam turbine - 1.1%.

Table 5.0-1: F-class Combined Cycle Configuration Probability Matrix (excluding BOP considerations)

	2 x 1 Multi-Shaft w/out Bypass Stack	2 x 1 Multi-Shaft w/ Bypass Stack	2 x (1 x 1) Multi-Shaft w/out Bypass Stack	2 x (1 x 1) Multi-Shaft w/ Bypass Stack	2 x (1 x 1) Single-Shaft w/out Bypass Stack
750 MW	93.39%	93.39%	92.39%	92.39%	92.17%
375 MW	98.85%	99.87%	99.85%	99.85%	99.84%

As shown in the Table, it has been estimated that the base 2x1 configuration can achieve 375 MW a probability of 98.85%. This probability is substantially higher than the corresponding 750 MW output because the part load output can be achieved with one of the two combustion turbines offline. Incorporating bypass stacks into the arrangement, as shown in the second column of the Table, is estimated to raise the plant's 375 MW probability to 99.87% because the 375 MW can be achieved during an STG or HRSG outage as well.

The estimated capital cost for the most feasible alternatives reviewed is summarized in the below table.

Table 5.0-2: Alternatives Impact Comparison Table

Alternative	375 MW Probability	Benefit	Capital Cost	System Outage Managed	Notes
Base 2x1 Configuration	98.85%				
HRSG Bypass Stacks	99.87%	+1.00%	$12,500,000	STG/Heat Rejection	Potential impacts to permitting / operations
HRSG Vent / Water Cap	99.60%	+0.75%	$13,000,000	STG/Heat Rejection	Substantial additional footprint requirements
Two by 1x1 Configuration	99.85%	+1.00%	$50,000,000	All	Few scenarios resulting in full loss of output
Single Shaft Configuration	99.84%	+1.00%	$37,500,000	All	Siemens estimates +0.2% cycle efficiency increase

As can be seen in Table 5.0-2, each of the Alternatives has unique benefits and restraints. As noted in Section 4.1, the HRSG Bypass Stack alternative can increase plant reliability but also has potential environmental/permitting impacts that could significantly inhibit plant operations and should be fully evaluated prior to moving forward with that arrangement. The redundancy of the two by 1x1 and single-shaft plant configurations provides a limited increase in the probability of achieving each output; however the capital cost of these alternatives is substantially higher.

The other alternatives reviewed were not as favorable, including the following alternatives:

- Simple Cycle Configuration – While the redundancy of multiple CTGs provides a very high probability, the resulting heat rate of the simple cycle configuration would not allow for economic dispatch
- Dual Fuel – The natural gas supply is already considered to have a very high reliability. In addition, redundant gas supply is available and interconnection to a second gas source it likely preferable both from a reliability and economic standpoint
- HRSG Vents - The feasibility of providing sufficient water supply for the high make-up rate required for the HRSG venting alternative is questionable. In addition, the footprint and costs for this option are higher than other alternatives that provide a better benefit to the plant probability of achieving output.

With regard to balance of plant systems, the base 2x1 configuration includes standard levels of system redundancy as identified in Section 3.6. While there is less opportunity for a balance of plant failure to impact the two by 1x1 configurations in comparison to the base 2x1 configuration, additional equipment redundancy or configuration modifications beyond those in the base plant configuration does not significantly increase the achievable plant reliability regardless of the plant configuration considered.

6.0 REFERENCES

1. HDR, March 2013, “New Generation Options Feasibility Study,” prepared for LG&E and KU
2. Grace, D. and Christiansen, T., 2013, “Risk-Based Assessment of Unplanned Outage Events and Costs for Combined-Cycle Plants,” Journal of Engineering for Gas Turbine and Power, February 2013, Vol. 135, The Electric Power Research Institute (EPRI)
3. DellaVilla Jr., S., 2013, “COMMENTARY: RAM Analysis,” CCJ Online (http://www.ccj-online.com/archives/2q-2011/commentary-ram-analysis/)
4. Grace, D. 2003, “Steam Turbine and Generator Designs for Combined-Cycle Applications – Durability, Reliability, and Procurement Considerations,” The Electric Power Research Institute (EPRI), made publicly available December 6, 2006
5. Englebert, C., Fadok, J., Fuller, R., and Lueneburg, B., Siemens Westinghouse Power Corporation, 2004, “Introducint the 1S,W501G Single-Shaft Combined-Cycle Reference Power Plant,” 2004 ASME Power Conference, Paper No. PWR2004-52072
6. Tomlinson, L., and McCullough, S., GE Power Systems, “Single-Shaft Combined-Cycle Power Generation System,” GE Technical Paper No. GER-3767C

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Question No. 10

Witness: David S. Sinclair

Q1.10. Please refer to page 4 of the Application, which references 15% and 17% reserve margin targets.

a. Please explain how the Companies determined that a 15% or 17% capacity reserve margin is appropriate, and provide any supporting documents and/or analyses.

b. Have the companies considered joining an RTO such as MISO or PJM?

  i. If yes, please provide any documents and/or analyses discussing the costs and benefits of joining an RTO.

A1.10.

a. See the response to AG 1-114.

b. The Companies have performed a high-level analysis of the costs and benefits of joining MISO and PJM.

  i. See the response to KIUC 1-2.

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Question No. 11

Witnesses: Paul W. Thompson

Q1.11. Refer to the Direct Testimony of Paul W. Thompson, page 5, lines 8-10.

a. Please provide construction cost estimates for the new Cane Run project provided to the Commission or the parties in Case No. 2011-00375.

b. Please provide any updated construction cost estimates for the new Cane Run project.

A1.11.

a. The requested information may be found on the PSC website in Case No. 2011-00375.

b. The current construction cost estimates are consistent with the estimates used in Case No. 2011-00375.

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Question No. 12

Witness: Paul W. Thompson

Q1.12. Refer to the Direct Testimony of Paul W. Thompson, page 6, line 18. Describe the "valuable experience that will result from constructing and operating" the Brown Solar Facility.

A1.12. If solar generation technology continues to improve in both performance and cost as some industry observers forecast, then there will likely be additional solar generation added to the Companies' grid over time. The Brown Solar Facility will allow the Companies' to gain first-hand experience with operation and maintenance practices and expenses, daily generation forecasting, transmission system impacts, and a host of system integration issues. See also Mr. Sinclair testimony at page 27, lines 6-13.

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Question No. 13

Witness: David S. Sinclair

Q1.13. Refer to the Direct Testimony of David S. Sinclair.

a. Please provide supporting workpapers and data for each table and figure in the testimony.

b. Where not provided, please provide annual data for each table in the testimony.

A1.13.

a. See the responses to PSC 1-22 and AG 1-13(c).

b. See the responses to PSC 1-22 and AG 1-13(c).

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Question No. 14

Witness: David S. Sinclair

Q1.14. Refer to the Direct Testimony of David S. Sinclair, page 5, lines 20-24.

a. Please provide the mentioned sales forecasts, disaggregated by jurisdiction and customer class (with and without DSM).

b. Please provide past LG&E/KU sales forecasts from 2004 to present, disaggregated by jurisdiction and customer class (with and without DSM).

c. Please provide historical LG&E/KU sales from 2004 to present, disaggregated by jurisdiction and customer class (with and without DSM).

d. Please provide past LG&E/KU peak load forecasts from 2004 to present (with and without DSM).

e. Please provide historical LG&E/KU peak load from 2004 to present (with and without DSM).

A1.14.

a. See attached.

b. See attached and response to 1.18(b). Additional requested information is contained in the following filings:

PSC Case Number	**Description**	**Data Provided**
2005-00162	2005 Joint IRP	2004 LF
2008-00148	2008 Joint IRP	2007 LF, History 2004-2007
2011-00140	2011 Joint IRP	2010 LF, History 2008-2010

Estimated DSM impacts to historical sales are attached in file:
Sierra Club_1st_DRs_14c_HistoricalDSMEstimatedImpacts.xlsx

c. See the response to subpart (b).

d. See the response to subpart (b).

e. See the response to subpart (b).

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Question No. 15

Witness: David S. Sinclair

Q1.15. Refer to the Direct Testimony of David S. Sinclair, page 6, lines 9-12.

a. Please provide the hourly load profiles used by the Company in this filing.

b. Please provide the methodology for converting hourly energy requirements to peak demand, including supporting workpapers.

A1.15.

a. See the response to AG 1-13(c).

b. See the response to AG 1-13(c). As described in the Direct Testimony of David S. Sinclair, page 6, footnote 2, a detailed description of the peak demand forecast methodology can be found in Volume II, Technical Appendix, pages 208 - 211 of the 2011 IRP, Case No. 2011-00140. The methodology has not materially changed since the 2011 IRP.

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Question No. 16

Witness: David S. Sinclair

Q1.16. Refer to the Direct Testimony of David S. Sinclair, page 7, line 19 to page 8, line 2.

a. Please provide the economic forecasts for Gross State Product and Employment provided by IHS Global Insight.

b. Please provide the projections of households and population provided by the Kentucky State Data Center.

A1.16.

a. See the response to AG 1-13(c).

b. See the response to AG 1-13(c).

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Question No. 17

Witness: David S. Sinclair

Q1.17. Refer to the Direct Testimony of David S. Sinclair, page 9.

a. Please confirm that the most recent DSM potential studies used by the Companies are the two Cadmus studies referenced in the Companies' pending DSM case, No. 2014-00003.

b. In table 2, is the amount of energy saved from DSM each year the cumulative total?

c. With regards to the reference to "increases in energy efficiency that customers will achieve on their own:"

   i. Identify the resulting level of energy savings and peak demand reduction that the Companies assumed for each year of the 2013 load forecast.

   ii. Produce any supporting analyses and workpapers (in machine readable format with formulas intact) regarding energy efficiency achieved by customers on their own.

A1.17.

a. Cadmus prepared the most recent energy efficiency potential study for the Companies. Cadmus additionally prepared a program planning report as part of the process.

b. Demand and energy savings in Table 2 are cumulative. See the response to PSC 1-10.

c.

   i. See the response to AG 1-26.

   ii. See the response to Question No 17(c)i.

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Question No. 18

Witness: David S. Sinclair

Q1.18. Refer to the Direct Testimony of David S. Sinclair, page 13, lines 7-11.

a. Please describe the changes in model inputs between the 2013 and 2014 load forecasts, including supporting analyses and workpapers.

b. Please produce the 2014 load forecast.

A1.18.

a. See attached and the response to AG 1-13(c). Certain information requested is confidential and proprietary, and is being provided under seal pursuant to a joint petition for confidential treatment. The Companies will continue to review all records and will supplement the data response if additional responsive information is found.

b. See attached.

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Question No. 19

Witnesses: David S. Sinclair/John N. Voyles, Jr.

Q1.19. Refer to the Direct Testimony of David S. Sinclair, page 17, Table 5.

a. Please provide the annual capacity from "Existing Resources" by unit.

b. Please provide the assumed annual generation by unit for "Existing Resources."

c. Is the Company able to purchase energy from the PJM market?

  i. If so, has the Company evaluated PJM energy market purchases as a future option?
    1. If so, please provide any analyses and workpapers used to evaluate PJM energy market purchases.
    2. If not, explain why not.

d. Is the Company able to purchase energy or capacity from the MISO market?

  i. If so, has the Company evaluated MISO energy market purchases as a future option?
    1. If so, please provide any analyses and workpapers used to evaluate MISO energy market purchases.
    2. If not, explain why not.

e. Has the Company developed energy market price forecasts?

  i. If so, please provide with supporting analyses and workpapers.
  ii. If not, explain why not.

f. Has the Company developed capacity market price forecasts?

  i. If so, please provide with supporting analyses and workpapers.
  ii. If not, explain why not.

g. Does the Company have firm transmission access to PJM?

i. If so, please describe and provide supporting documentation and analyses.

h. Does the Company have firm transmission access to MISO?

i. If so, please describe and provide supporting documentation and analyses.

A1.19.

a-b. See the response to Question No. 7.

c. The Companies can and do purchase energy from the PJM market. These decisions are made on a daily and hourly basis by the Power Supply department as part of their efforts to dispatch the generation fleet and meet customers' energy needs in a least-cost manner. Due to the dynamic nature of this activity, no workpapers or formal analyses are produced.

d. The Companies can and do purchase energy from the MISO market. These decisions are made on a daily and hourly basis by the Power Supply department as part of their efforts to dispatch the generation fleet and meet customers' energy needs in a least-cost manner. Due to the dynamic nature of this activity, no workpapers or formal analyses are produced.

e. The Companies developed electricity price forecasts reflecting the six combinations of the three natural gas price forecasts and two CO_2 price scenarios with the following methodology. Certain information requested is confidential and proprietary, and is being provided under seal pursuant to a joint petition for confidential treatment.

- Monthly electricity prices through 2035 were developed for the PJM-West hub ("PJM-W") using AURORAxmp ("Aurora") software.
- Annual average prices for 2036-2042 were extrapolated based on implied on-peak heat rates and the ratios of off-peak and weekend prices to on-peak prices in in 2026-2035.
- Monthly prices for 2036-2042 were derived using monthly average seasonality ratios from the modeled prices for 2026-2035.
- Monthly PJM-South Import ("PJM-SI") prices were developed by applying a discount factor between 87% and 91%, depending on the month and peak type, to the modeled PJM-W prices.
- For each forecast, daily prices by peak type were derived by multiplying the forecasted monthly average prices (by peak type) by an elasticity-adjusted weight that includes a forecasted daily and average monthly loads and a load/price elasticity factor based on historical observations.

- Hourly prices are then calculated by multiplying the daily prices by hourly price multipliers that reflect the historical average ratio of hourly prices to daily prices by peak type.

i. The annual average nominal prices for PJM-South Import are shown in the table below. For the workpapers, See attached.

Electricity Price Forecasts - Annual Average, Around-the-Clock, PJM-SI						
Nominal $/MWh	**Low Gas Zero CO_2**	**Mid Gas Zero CO_2**	**High Gas Zero CO_2**	**Low Gas Mid CO_2**	**Mid Gas Mid CO_2**	**High Gas Mid CO_2**
2013	31.98	36.17	36.77	31.94	36.15	36.84
2014	32.69	37.55	38.88	32.64	37.57	38.91
2015	33.36	38.60	40.17	32.86	38.82	40.37
2016	33.74	39.54	41.69	32.85	39.71	42.16
2017	33.89	40.15	42.78	32.67	40.30	43.44
2018	34.22	41.44	44.45	33.19	41.34	44.98
2019	34.59	42.64	46.24	33.74	42.72	46.69
2020	35.35	43.97	48.47	46.60	53.27	57.32
2021	36.78	46.62	51.67	49.00	56.73	61.38
2022	37.78	49.32	55.19	51.57	60.05	65.56
2023	39.01	51.18	58.16	54.33	63.58	69.57
2024	39.76	52.81	60.68	56.67	66.72	73.05
2025	41.21	55.28	64.04	59.96	70.77	77.90
2026	42.36	57.61	67.21	62.84	74.47	82.20
2027	43.85	60.06	70.69	66.12	78.15	86.74
2028	45.60	61.93	73.67	69.19	81.89	91.38
2029	46.49	64.34	76.40	71.69	85.57	95.28
2030	48.38	67.00	80.08	75.07	89.78	100.17
2031	49.81	69.27	78.93	77.96	94.47	102.49
2032	51.40	71.70	79.11	81.60	98.80	105.11
2033	53.03	73.89	82.67	85.92	103.54	110.71
2034	54.57	76.33	86.71	88.36	107.60	115.57
2035	56.63	78.89	90.91	92.26	112.48	121.58
2036	58.44	81.08	95.55	96.32	117.19	129.29
2037	60.29	83.35	100.46	100.56	122.10	137.50
2038	62.22	85.70	105.65	105.02	127.25	146.27
2039	64.20	88.09	111.07	109.64	132.58	155.56
2040	66.23	90.54	116.77	114.46	138.12	165.43
2041	68.34	93.07	122.76	119.50	143.91	175.93
2042	70.51	95.67	129.07	124.76	149.94	187.11

f. No. The Companies are not members of an RTO.

g. Yes, see the response to AG 1-106.

Per the Companies' Transmission Planning Guidelines all firm purchases and sales are accounted for during our annual transmission expansion plan. Also, per the companies' OATT any transmission customer may request long term firm network or point-to-point transmission service to PJM. As a result of any study performed by the ITO facilities to accommodate that firm request (if any) would be constructed upon confirmation and execution of a service agreement under the OATT.

h. Yes, see the response to AG 1-106.

Per the Companies' Transmission Planning Guidelines all firm purchases and sales are accounted for during our annual transmission expansion plan. Also, per the companies' OATT any transmission customer may request long term firm network or point-to-point transmission service to MISO. As a result of any study performed by the ITO facilities to accommodate that firm request (if any) would be constructed upon confirmation and execution of a service agreement under the OATT.

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Question No. 20

Witness: David S. Sinclair

Q1.20. Refer to the Direct Testimony of David S. Sinclair, page 17, line 12 to page 18, line 1.

a. Please provide any analyses conducted by or for the Companies on the Bluegrass Generation transaction, including supporting workpapers.

A1.20. See the response to Question No. 8.

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Question No. 21

Witness: David S. Sinclair

Q1.21. Refer to the Direct Testimony of David S. Sinclair, page 19, lines 5-14 and page 20, Figure 3.

a. Please provide supporting analyses and workpapers for the load duration curves in each year.

b. Please provide the assumed energy source used to meet the hourly loads in Figure 3 from the following:

   i. DSM
   ii. Purchased power by source
   iii. LG&E/KU generation, by plant or unit (if available)

A1.21.

a. See the response to AG 1-13(c).

b. The Companies do not have the data in the format requested.

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Question No. 22

Witness: David S. Sinclair

Q1.22. Refer to the Direct Testimony of David S. Sinclair, page 22, lines 6-7. Please provide the supporting analyses and workpapers used by the Companies in developing the following risk factors:

a. Load growth

b. Natural gas prices

c. Potential CO2 regulations

d. Any other risk factors considered

A1.22.

a. The high and low scenarios encompass risk factors affecting load growth. See the response to AG 1-13(c). See attached.

b. See Section 4.1.2 of Exhibit DSS-1 and the response to AG 1-183(k)

c. See Section 4.1.3 of Exhibit DSS-1 and the response to AG 1-36.

d. In the context of the testimony referenced, no other risk factors were considered.

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Question No. 23

Witness: David S. Sinclair

Q1.23. Refer to the Direct Testimony of David S. Sinclair, page 22, lines 20-22.

a. Please provide the low and high load forecasts, including supporting analyses and workpapers.

b. Did the Resource Assessment evaluate off-system purchases as an alternative?

   i. If so, please provide assumptions and supporting analyses of off-system purchases as an alternative.
   ii. If not, why not?

A1.23.

a. See the responses to Question No. 22(a) and Exhibit DSS-1, Table 6.

b. Yes, as stated on page 1 in Exhibit DSS-1: "To meet customers' long term needs for capacity and energy, the Companies issued a request for proposals ("RFP") in September 2012 to 165 potential providers." The purpose of the RFP was to solicit potential off-system purchases. See Section 6, Appendix A of Exhibit DSS-1 for all off-system resources that were evaluated.

   i. This information was provided in response to PSC 1-22. The relevant files are included in the 'Analysis' folder.

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Question No. 24

Witness: David S. Sinclair

Q1.24. Refer to the Direct Testimony of David S. Sinclair, page 25, lines 11-13. In developing the scenarios, did the Companies assume a relationship or correlation between any of the variables (load, natural gas prices or CO2 prices)?

a. If so, please identify the assumed correlations between each variable, and produce any analyses and workpapers supporting such correlation.

A1.24. No, the Companies assumed no relationship or correlation between any of the variables.

a. Not applicable.

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Question No. 25

Witness: David S. Sinclair

Q1.25. Refer to the Direct Testimony of David S. Sinclair, page 27, lines 11 to 12. Describe the operational experience the Companies expect to gain through the Brown Solar Project and the value of gaining such experience.

A1.25. See the response to Question No. 12.

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Question No. 26

Witness: John N. Voyles, Jr.

Q1.26. Refer to the Direct Testimony of David S. Sinclair, page 27, lines 19 to 22.

a. Identify the source for the estimated price of solar panels as of late 2012 and late 2013.

b. Identify by when the Companies would purchase or contract to purchase the panels for the Brown Solar Project.

c. State whether you expect the price of solar panels to continue to decline by the time the Companies would be purchasing or contracting to purchase the panels for the Brown Solar Project.

A1.26.

a. The estimated cost of solar panels with direct installation cost (no owner's cost) of $3.80 per Watt in late 2012 is contained in an HDR report dated March 29, 2013. The late 2013 estimate of $2.00 per Watt is derived from the Electric Power Research Institute (EPRI) 4th Q 2013 Solar PV Market Update.

b. The Companies anticipate contracting with a qualified Engineer, Procure and Construct (EPC) firm for the Brown Solar Facility in 2015. The successful EPC vendor will purchase solar panels as a part of their contract with the Companies.

c. Many factors will determine the price of solar panels in the future. The Companies are not experts in forecasting future solar panel pricing. EPRI tracks the solar markets and some industry experts indicate the price of panels will not continue to decline at the same rate as has been seen in the last 3 or 4 years.

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Question No. 27

Witness: David S. Sinclair

Q1.27. Refer to the Direct Testimony of David S. Sinclair, page 28, lines 20-24.

a. Please list the PPA's that were considered in the analysis of "deferring a long-term resource."

b. Please provide the deferral analysis, including supporting workpapers.

A1.27.

a. See Table 26 in Exhibit DSS-1 for a list of PPAs that were considered in the analysis of deferring a long-term resource.

b. See the response to PSC 1-22. The folders containing the relevant files are 02_Analysis\ Phase3\Iteration1\ and 02_Analysis\Phase3\Iteration2\.

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Question No. 28

Witness: David S. Sinclair/John N. Voyles, Jr.

Q1.28. Refer to the Direct Testimony of David S. Sinclair, page 29, lines 6-20.

a. Please provide Standard and Poor's credit rating report for the Company in question.

b. Please provide any other evidence pointing to the financial risks of entering into the PPA.

c. Please provide any analyses conducted by or for the Companies on the PPA mentioned, including supporting workpapers.

d. Please explain the risks associated with a self-build proposal and provide any supporting analyses and workbooks.

A1.28.

a.- c. See the response to AG1-42 as well as Section 6.3 Appendix C in Exhibit DSS-1.

d. A self-build proposal has normal construction risks. To address these risks the Green River NGCC has 10% contingency on the forecasted EPC contract and the Brown Solar has 15% contingency on the forecasted EPC contract. See the responses to PSC 1-30 and 1-31.

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Question No. 29

Witness: David S. Sinclair

Q1.29. Please refer to page 34, lines 1-9, of the direct testimony of David Sinclair.

a. Did the Companies assume no additional energy savings would be achieved from DSM programs after 2018?

   i. If so, explain why.
   ii. If not, please identify the additional, annual energy savings from DSM programs expected to be achieved after 2018.

b. Is it the Companies' position in this case that the Companies are on track with their current and planned DSM programs to exhaust all achievable, cost-effective energy savings by 2020?

   i. If so, explain the basis for the position.
   ii. If not, please identify the incremental energy savings the Companies expect to achieve each year between 2020-2042.

A1.29.

a.i. Currently approved and proposed energy efficiency programming expires at the end of 2018 and no additional energy or demand savings beyond 2018 were included in this analysis. Prior to the end of 2018, energy efficiency programming will be evaluated, advanced, and renewed where appropriate.

ii. Not applicable

b.i. Based on the market potential study prepared by Cadmus, the Companies are on track to exhaust all of the estimated medium-case achievable discretionary electric energy efficiency potential prior to 2020. The study was prepared using existing technologies and costs. Declines in technology costs, the development of new technologies, or the increase in the Companies' avoided energy and demand costs could provide additional energy savings opportunities in the future.

ii. Not applicable

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Question No. 30

Witness: David S. Sinclair

Q1.30. Refer to the Direct Testimony of David S. Sinclair, page 35, lines 6-8.

a. Please provide the short-term PPA.

b. Please provide any analyses on the short-term PPA conducted by or for the companies.

A1.30.

a. There is no short-term PPA at this time.

b. The analyses are ongoing.

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Question No. 31

Witness: David S. Sinclair

Q1.31. Please refer to Exhibit DSS-1, page 1, which refers to a resource adequacy analysis completed in summer 2012. Please produce the resource adequacy analyses referenced.

A1.31. Table 1 in Exhibit DSS-1 summarizes the Companies' resource adequacy analysis. As demonstrated in the Companies' 2011 Integrated Resource Plan, a 15 to 17 percent reserve margin is required to ensure system reliability from a generation supply perspective.[1] The Companies' forecasted reserve margin is 15.1% in 2015 and falls below 15% in 2016, indicating that the Companies will have a long-term need for capacity beginning perhaps as early as 2015, but definitely by 2016.

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[1] See Case No. 2011-00140, The 2011 Joint Integrated Resource Plan of Louisville Gas and Electric Company and Kentucky Utilities Company (KY PSC March 13, 2013).

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Question No. 32

Witness: Gary H. Revlett

Q1.32. Page 6 of Exhibit DSS-1 states, "As more time elapses following the retirement of the Green River coal units, the ability to obtain an air permit for a new NGCC unit without operating constraints (e.g., annual start limitations) becomes more uncertain."

a. Are the Companies referring to their contention that the decrease in emissions from Green River units 3 and 4 can be used to net out the SO2, NOx, and PM emissions from a new NGCC, and thus avoid triggering PSD requirements?

b. If not, please explain the basis for this statement.

A1.32.

a. Yes, this statement does refer to the regulatory limitations on the contemporaneous period used to define increases and decreases in actual emissions when calculating the net emissions increase/decreases for PSD applicability, as defined in 401 KAR 51:001, Section 1(144).

b. Not applicable.

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Question No. 33

Witness: David S. Sinclair

Q1.33. Page 9 of Exhibit DSS-1 states, "According to IHS Global Insight, the Kentucky RGSP is expected to grow by an average of 2.0% per year between the years 2012 and 2042."

a. Please indicate when IHS Global Insight made this prediction regarding the State of Kentucky's real gross state product, and identify and produce the source of that prediction.

b. Please indicate whether the Companies are aware of how the actual real gross state product in 2012 and 2013 compared to the real gross state product projected by IHS Global Insight.

A1.33.

a. See attached.

b. Yes. As of March 2014, RGSP (Millions 2005$) as reported by IHS Global Insight is as follows:

	2012 RGSP	**2013 RGSP**
Actual	146,784	148,269

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Question No. 34

Witness: David S. Sinclair

Q1.34. Page 11, footnote 15, of Exhibit DSS-1 states, “The Mid and High gas price cases are escalated at the 2032-2033 growth rates in EIA’s Reference and Low EUR forecasts, respectively. The Low gas price gas is escalated at the 2023-2033 CAGR.” Please explain why the mid and high gas prices are escalated at a different growth rate, derived from the growth rate in different years, than the growth rate applied to the low gas price.

A1.34. Note that footnote 13 on page 11 of Exhibit DSS-1 contains the sentence in question. The Companies escalated the natural gas price forecasts at different rates to develop a reasonably wide range of price forecasts with rational spreads between each case. For the Low gas price case, the 2032-2033 growth rate was much higher than the Mid gas price escalation rate. Therefore, the Low gas price case was instead escalated at the 10-year (2023-2033) CAGR, resulting in a Low gas price forecast that is more reasonably comparable to the Mid gas price case and a wider range of natural gas prices.

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Question No. 35

Witness: David S. Sinclair

Q1.35. Please refer to the discussion on page 18 of Exhibit DSS-1 regarding the costs considered in the phase 1 screening analysis.

a. Were environmental compliance costs, aside from CO2 costs, considered in the phase 1 screening analysis?

   i. If yes, please indicate all state and/or federal regulations for which compliance costs were considered and provide the compliance costs for each project, if applicable.

A1.35.

a. No. CO_2 costs and other environmental compliance costs were not considered in the Phase 1 screening analysis. The Phase 1 screening analysis evaluated similar proposals against each other; environmental compliance costs for similar proposals were assumed to be the same.

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Question No. 36

Witness: David S. Sinclair

Q1.36. Please refer to Exhibit DSS-1, page 22, table 14, which contains the categories of costs used to calculate the PVRR for projects.

a. Please confirm that environmental compliance costs, aside from CO2 costs, were not considered in the Phase 2 analysis.

i. If that is not correct, please list all state and/or federal regulations for which compliance costs were considered and provide compliance costs for each project, if applicable.

A1.36. a. The statement is incorrect. The Companies did not consider any compliance costs in the form of large capital projects for existing or proposed facilities. However, the Companies did include a price for each ton of NO_X and SO_2 emitted.

i. SO_2 prices for all scenarios and all years were $1/ton. Seasonal NO_X prices for all scenarios and all years were $12.50/ton. Annual NO_X prices varied by gas price scenario. For the Low and Mid gas price scenarios, annual NO_X prices for all years were $30/ton. The table below shows annual NO_X prices for the High gas price scenarios.

Year	Annual NO_X Price ($/ton)
2013-2017	30.00
2018	449.46
2019	459.91
2020	470.61
2021	481.55
2022	492.75
2023	504.21
2024	515.94
2025	527.94

2026	540.22
2027	552.78
2028	565.64
2029	578.79
2030	592.25
2031	606.03
2032	620.12
2033	634.54
2034	649.30
2035	664.40
2036	679.86
2037	695.67
2038	711.85
2039	728.40
2040	745.34
2041	762.68
2042	780.42

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Question No. 37

Witness: Gary H. Revlett

Q1.37. Please refer to Exhibit DSS-1, page 36, which states, "As mentioned previously, if the Green River unit is commissioned after 2018, the analysis assumes the Companies would not be able to offset the new unit's emissions with the retirement of the Green River coal units."

a. Please indicate which "emissions" are being referred to from the new unit (i.e., which pollutants are being referenced).

b. Explain why the Companies would not be able to offset the new unit emissions if the new unit were commissioned after 2018.

A1.37.

a. In the PSD and Title V Permit Revision Application submitted by Kentucky Utilities in March 2014, the NGCC emissions increases associated with the project were significant, but the net contemporaneous emissions increases/decreases were less than significance thresholds, for NO_X, PM, PM_{10}, $PM_{2.5}$, SO_2, and sulfuric acid mist (SAM). However, the net emission increases for CO, VOC and greenhouse gases (GHG) were significant and trigger PSD applicability.

b. Pursuant to the EPA MATS Rule compliance date, the Green River coal-fired units are scheduled to cease operation on April 15, 2015. Per 401 KAR 51:017, the baseline emissions used for netting calculations are the highest two-year average emissions from the existing Green River coal-fired plant which occurred during the previous 5-year period prior to commencing construction of the NGCC. If construction is delayed beyond April 15, 2018, then a full two-year period of existing coal-fired unit emissions would not be available during the previous 5-year period for use in the netting calculations. Thus, additional pollutants would trigger PSD and additional operating constraints would be required.

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Question No. 38

Witnesses: Gary H. Revlett and John N. Voyles, Jr.

Q1.38. Please refer to Exhibit DSS-1, page 36, which states, "Absent this offset, the new unit would likely be subject to additional operating constraints."

a. Please indicate what potential "additional operating constraints" the companies are referring to.

b. Identify the PVRR impact of such additional operating constraints in each of the scenarios that were evaluated.

A1.38.

a. See the response to AG 1-132.

b. No such analysis was performed.

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Question No. 39

Witness: David S. Sinclair

Q1.39. Please refer to Exhibit DSS-1, page 44. Identify and produce the EPRI study that "supported the view that solar panel costs were decreasing."

A1.39. See the response to AG 1-61.

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Question No. 40

Witness: John N. Voyles, Jr.

Q1.40. Please refer to Exhibit DSS-1, page 45, which states that HDR conducted "a conceptual siting study review" of the proposed solar project. Please produce HDR's conceptual siting study.

A1.40. See the response to AG 1-137.

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Question No. 41

Witness: David S. Sinclair

Q1.41. Please refer to Exhibit DSS-1, page 44, which states that the current market price for RECs is $26 and that the companies used three REC prices ($0, $16, and $26).

a. Please explain how the companies decided to use $0, $16 and $26 as the 2016 REC prices, and provide any analyses supporting the use of such REC prices.

b. Identify and produce any projection of the market price in Ohio of solar RECs from Kentucky.

c. Given that the companies used two REC price scenarios lower than the current Ohio market price of $26, why did the companies not use a "high" REC scenario in which REC prices would be higher than current market prices?

d. Did the companies consider how REC prices might be affected by the CO2 price used in the mid CO2 scenario?

   i. If so, please explain.
   ii. If not, explain why not.

A1.41.

a. The $0 REC case was selected to demonstrate the impact on the value of the project of not selling RECs. The $16/REC is the break-even REC price when the capital cost for solar is $2,400/kW. At the time of the 2013 Resource Assessment, the market price in Ohio for solar RECs from Kentucky was $24 to $28 per REC. $26/REC was selected as the midpoint of that range.

b. See the response to KIUC 1-10.

c. The Companies determined the break-even REC price for solar capital costs ranging from $3,500/kW to $4,100/kW. The break-even prices ranged from $57 to $79 per REC.

d. No. It is not clear the impact that CO_2 regulations might have on REC prices in various regions of the country.

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Question No. 42

Witness: David S. Sinclair

Q1.42. Please refer to Exhibit DSS-1, page 46, which states, “In order for the project to break-even, REC prices would need to be considerably higher than current pricing for Kentucky solar RECs; REC prices would need to range from $57 to $79 per REC, which is more in line with prices in New Jersey and Maryland.” Please provide any calculations and/or analyses regarding the break-even REC prices that support this statement.

A1.42. See the response to PSC 1-22. The path and filename of the relevant files are
02_Analysis\Phase3\Iteration3\20130916_P3I3_OutputTemplate)_0073_D17.xlsx
(see “RFPUnitFOM” worksheet) and
02_Analysis\Phase3\Iteration3\20130916_P3I3_PivotDataResults_0073_D14.xlsx
(see “PivotCosts” worksheet).

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Question No. 43

Witness: David S. Sinclair

Q1.43. Refer to the Exhibit DSS-1.

a. Please provide the STRATEGIST input and output files, in machine-readable format, for each alternative option the Companies evaluated in their economic analysis.

b. Please provide the PROSYM input and output files, in machine-readable format, for each alternative option the Companies evaluated in their economic analysis.

c. Please provide supporting workpapers and data for each table and figure in the exhibit.

d. Where not provided, please provide annual data for each table in the exhibit.

A1.43.

a. See the response to PSC 1-22. The relevant files are located in folders titled "Strategist" within each phase and iteration in the "02_Analysis" folder.

b. See the response to PSC 1-22. The relevant files are located in folders titled "PROSYM" within each phase and iteration in the "02_Analysis" folder.

c. See the response to PSC 1-22. The path for the relevant files is 03_Deliverables\20131001_ResourceAssessment\Support.

d. See the response to PSC 1-22. The path for the file containing the annual data for all results of the analysis is 02_Analysis\ 20130905_PivotP2-3Results_0073D10.xlsx.

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Question No. 44

Witness: David S. Sinclair

Q1.44. Refer to the Exhibit DSS-1, page 1. Please provide the costs assumed in the analyses in this filing for compliance of each of the Companies' coal units with the following regulations (please list capital and annual O&M costs separately):

a. Mercury and Air Toxics Standards;

b. Coal Combustion Residuals rule;

c. Effluent Limitations Guidelines;

d. 316(b) cooling water intake rule;

e. NAAQS;

f. Cross State Air Pollution Rule;

g. Clean Air Interstate Rule; and

h. carbon regulations, in any form.

A1.44. The analysis reflects the impacts associated with these regulations to variable operating costs and operating characteristics (e.g., unit capacity and heat rate). The Companies' current investments to comply with these regulations are not reflected in the valuation models. These costs are the same for every alternative. Potential CO_2 regulations are reflected as a $/ton of emission as described in Exhibit DSS-1.

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Question No. 45

Witness: Paul W. Thompson

Q1.45. Refer to the Exhibit DSS-1, page 3.

a. Please provide any communications between the Companies and FERC regarding the Bluegrass Generation project.

A1.45.

a. See the response to Question No. 8. See also the documents in Docket No. EC12-29-000 on the FERC website.

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Question No. 46

Witness: David S. Sinclair

Q1.46. Refer to the Exhibit DSS-1, pages 11-12.

a. Please provide the assumptions and workpapers underlying the natural gas price forecasts.

b. Please provide the assumptions and workpapers underlying the coal price forecasts.

c. Please provide the coal market bid prices used in developing the coal price forecast.

d. Please provide the Wood Mackenzie coal forecasts with supporting inputs, assumptions and workpapers.

A1.46.

a. The assumptions underlying the annual average natural gas price forecasts are detailed in Exhibit DSS-1, page 11. The annual price forecasts were shaped into monthly price forecasts based on the average monthly ratios of monthly forward gas prices to annual average forward gas prices reflected in the 2013-2017 forward gas prices as of September 28, 2012. See the response to AG 1-183(k).

b. The assumptions underlying the ILB-HS, Mine Mouth, Open Position coal price forecast are detailed in Exhibit DSS-1, pages 11-12. See attached. Certain information requested is confidential and proprietary, and is being provided under seal pursuant to a joint petition for confidential treatment.

c. See the response to Question No. 46(b).

d. See attached and see the response to Question No. 46(b). The information requested is confidential and proprietary, and is being provided under seal pursuant to a joint petition for confidential treatment.

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Question No. 47

Witness: David S. Sinclair

Q1.47. Refer to the Exhibit DSS-1, pages 18.

a. Please provide supporting analyses and workpapers for Phase 1 analysis.

b. Please provide the PVRR calculations and supporting workpapers for the Phase 1 analysis.

c. Please provide the following Phase 1 screening analysis costs for each proposal, including:

    i. Fuel/Energy costs
    ii. Start costs
    iii. Hourly operating cost
    iv. Variable O&M
    v. Unit capital costs
    vi. Fixed O&M
    vii. Capacity charge
    viii. Fixed cost for firm transmission service
    ix. Firm gas transportation costs
    x. PPA capacity charge
    xi. PPA financing costs
    xii. CO2 emissions costs

d. To the extent not already provided, please provide all inputs used to calculate the cost of the 10MW solar project.

A-1.47.

a-c. See the response to AG 1-133.

d. See the responses to PSC 1-31 and 1-35.

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Question No. 48

Witness: David S. Sinclair

Q1.48. Refer to the Exhibit DSS-1, pages 22.

a. Please identify the PPA’s that were considered for each iteration of the Phase 2 analysis.

b. Please identify and explain those PPA’s that “passed the Phase 1 screening analysis but were not considered in the Phase 2 analysis.”

   i. Please provide supporting analyses and workpapers for these decisions.

c. Please provide supporting analyses and workpapers for each iteration of Phase 2 analysis.

d. Please provide the PVRR calculations and supporting workpapers for each iteration of the Phase 2 analysis.

e. Please provide the following Phase 2 screening analysis costs for each proposal and resource, including:

   i. Fuel/Energy costs
   ii. Start costs
   iii. Hourly operating cost
   iv. Variable O&M
   v. Unit capital costs
   vi. Fixed O&M
   vii. Capacity charge
   viii. Fixed cost for firm transmission service
   ix. Firm gas transportation costs
   x. PPA capacity charge
   xi. PPA financing costs
   xii. CO2 emissions costs

f. To the extent not already provided, please provide all inputs used to calculate the PVRR of the 10MW solar project.

A1.48.

a. See Tables 15 and 17 on pages 22 and 24, respectively, in Exhibit DSS-1.

b. See Exhibit DSS-1 at page 21.

c-d. See the response to PSC 1-22. The supporting analyses and workpapers for all the iterations in phase 2 are in the '02_Analysis/Phase2' folder.

e. See the responses to PSC 1-22 and AG 1-150.

f. See the responses to PSC 1-31 and 1-35.

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Question No. 49

Witness: David S. Sinclair

Q1.49. Refer to the Exhibit DSS-1, pages 36. Please identify the costs of deferring the building of the NGCC unit by two years, including supporting analyses and workpapers.

A1.49. See Table 27 on page 35 in Exhibit DSS-1. For supporting analyses and workpapers, see the response to PSC 1-22. The folder containing the relevant files is 02_Analysis\Phase3\.

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Question No. 50

Witness: David S. Sinclair

Q1.50. Refer to the Exhibit DSS-1, pages 52-53.

a. Please provide any economic analyses conducted on the PPA considered by the Companies.

b. Please provide any market price analysis used to determine the financial risk of the PPA, including supporting workpapers.

c. Please provide any environmental control costs associated with the PPA that were evaluated by the Companies, including supporting analyses and workpapers.

A1.50.

a. See Section 4.5.2 of Exhibit DSS-1 for the economic analysis of this option.

b. See the response to subpart (a).

c. None. See the response to subpart (a).

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Question No. 51

Witnesses: John N. Voyles, Jr.

Q1.51. Refer to the Exhibit DSS-1, pages 55-56. Please provide documents and analyses used in developing capital costs for the new NGCC.

A1.51. See the responses to PSC 1-30 and AG 1-177.

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Question No. 52

Witness: David S. Sinclair

Q1.52. Please refer to Exhibit DSS-1, page 57, regarding the modeling of the 10MW solar project using PVWatts. Please produce the modeling files, including input and output files, modeling results, and the workpapers and supporting analyses used in the modeling.

A1.52. See the response to AG 1-137.

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Question No. 53

Witness: David S. Sinclair

Q1.53. Please refer to Exhibit DSS-3. Are the Companies assuming that after 2019, DSM has no impact on energy requirements?

a. If yes, please explain the basis for that assumption.

b. If no, please explain why the energy requirements column is unchanged after 2019.

A1.53. No.

a. Not applicable.

b. Refer to Mr. Sinclair’s testimony on pages 8-9.

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Question No. 54

Witness: David S. Sinclair

Q1.54. Please refer to page 4, lines 12-15, of the direct testimony of John Voyles, which describes the Companies' intention to seek bids for turbines that are + 10% of 700 MW.

a. Did the companies evaluate the economics of a 770 MW project?

b. Did the companies evaluate the economics of a 630 MW project?

c. Is it the Companies' position that the economics of a 770 MW NGCC are not substantially different from the economics of a 670 MW NGCC, all other things being equal?

A1.54.

a-c. The Companies did not specifically analyze the economics of a 770 MW and 630 MW projects, but the Companies do not expect those economics to be materially different than the 670 MW project that was modeled. See the response to AG 1-47.

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Question No. 55

Witness: John N. Voyles, Jr.

Q1.55. Refer to the Direct Testimony of John N. Voyles, Jr., page 8. Please provide a detailed construction schedule for the new NGCC including spending over time and by type of spending.

A1.55. See the response to PSC 1-30.

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Question No. 56

Witness: David S. Sinclair/John N. Voyles, Jr.

Q1.56. Refer to the Direct Testimony of John N. Voyles, Jr., page 11, lines 4-10.

a. Please provide any supporting analyses and workpapers for the fixed and variable cost assumptions for the new NGCC.

b. Please provide any supporting analyses and workpapers for the new NGCC's annual generation.

A1.56.

a. Refer to the Direct Testimony of John N. Voyles, Jr., page 9, lines 23-24 for the fixed and variable cost assumptions for the new NGCC. See the responses to PSC 1-34 and AG 1-177.

b. See attached.

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Question No. 57

Witness: John N. Voyles, Jr.

Q1.57. Refer to the Direct Testimony of John N. Voyles, Jr., page 12, lines 4-5. Please provide a detailed construction schedule for the transmission projects including spending over time and by type of spending.

A1.57. The development of a detailed construction schedule will be completed for all transmission projects once the results of the Independent Transmission Organization Generator Interconnection System Impact Study are available.

The initial analysis performed by the Companies' Transmission staff was used to estimate expected upgrade and projects would be necessary to support the Green River NGCC. This preliminary study estimated the cost of the projects required by 2018 to be approximately $100 million. These projects included:

- New substation construction
- Terminal equipment upgrades
- Conductor and line clearance upgrades
- Transformer replacements/additions
- Capacitor installations

All of these projects are expected to be completed by 2018 or sooner to support the Green River NGCC construction, startup and commissioning. Construction for these projects is expected to begin as early as 2015. The estimates and schedule for completion will be refined once the Generator Interconnection study is completed.