EAST KENTUCKY POWER COOPERATIVE, INC.

PSC CASE NO. 2005-00207

INFORMATION REQUEST RESPONSE

COMMISSION'S FIRST DATA REQUEST DATED 8/18/05

ITEM 15

RESPONSIBLE PARTY: DAVID SHAFER

REQUEST: Provide supporting documentation for the conceptual cost estimate from Table 1 of the CAI report.

RESPONSE: CAI based the substation costs estimates on generic cost modules. These costs are typically total installed cost per circuit breaker or per transformer. The units and unit costs are shown in the January 27, 2005 report, Table 1. The basis of the unit costs are total costs of recently completed projects and, therefore, there is no breakdown or supporting documentation that provide additional details.

The transmission lines were estimated using a spreadsheet template of various materials used for transmission line construction and unit labor costs based on recently completed projects. See **Exhibit 15-1** for the spreadsheet templates used for this project.

Exhibit 15 – 1

East Kentucky Power Cooperative
WRECC Transmission System Upgrades
Conceptual Cost Estimates, 2004 Dollars

954 kcmil 54/7 Cardinal, ACSS except as noted
Single pole structures
Costs are based on 500 ft.average span lengths

		Miles	Cost Per Mile	Total Line Cost	EKPC Cost
	New Lines				
1.	Barren County - Magna 161 kV on new R/W	24.00	322,000	7,728,000	7,800,000
2.	Magna - Bristow 161 kV on new R/W, ACSR	1.00	338,000	338,000	325,000
3.	Magna - General Motors 161 kV on new R/W	2.50	338,000	845,000	875,000
4.	General Motors - BGMU Tap 161 kV on new R/W	5.00	338,000	1,690,000	1,625,000
5.	Memphis Junction - BGMU 161 kV D/C on new R/W	8.40	527,000	4,427,000	3,570,000
6a.	Aberdeen - BGMU 161 kV D/C on new R/W	5.00	527,000	2,635,000	2,125,000
6b.	Aberdeen - BGMU 161 kV rebuild	22.00	250,000	5,500,000	7,150,000
7.	Wilson - Aberdeen 161 kV on new R/W	25.00	322,000	8,050,000	8,125,000
	Subtotal New Lines			31,213,000	31,595,000
	Re-conductor or Re-rate				
8.	E. Bowling Green - GM 161 kV re-conductor only	0.15	81,000	~~12,000~~	12,000
9.	Summershade-Barren County 161 kV, Upgrade from 167 F to 212 F	20.14			141,000
9.	K30-Salmons 69 kV, Upgrade from 167 F to 212 F	3.90	3,000	12,000	11,700
10.	K30-L30 69 kV, Upgrade from 167 F to 212 F	1.13	3,000	3,000	3,400
	Subtotal Re-Conductor or Re-rate Lines			27,000	168,100

		No.	Per/CB	Total	EKPC
	161 or 69 kV Substations				
11.	Magna 2-161 kV CB, Line Exits and Relays	2	450,000	900,000	618,000
12.	GM 3-161 kV CB, Line Exits and Relays	3	450,000	1,350,000	869,000
13.	Memphis Jct. 4-161 kV CB, Line Exits and Relays	4	450,000	1,800,000	1,112,000
14.	Aberdeen 2-161 kV CB, Line Exits and Relays	2	450,000	900,000	618,000
15.	East Bowling Green 1-161 kV CB and Relays	1	350,000	350,000	313,000
16.	Barren County 2-161 kV CB, Line Exits and Relays	2	450,000	900,000	715,000
17.	Wilson 1-161 kV CB, Line Exit and Relays	1	450,000	450,000	251,000
18.	Franklin 100 MVA, 161-69 kV Transformer Change Out	1	750,000	750,000	727,000
19.	K30 3-69 kV CB, Line Exits and Relays	3	300,000	900,000	612,000
20.	L28 3-69 kV CB, Line Exits and Relays	3	300,000	900,000	612,000
21.	Pln-Grwd-Wybrn 3-69 kV CB, Line Exits and Relays	3	300,000	900,000	612,000
	Subtotal Substations			10,100,000	7,059,000
	Total Project			41,340,000	38,822,100

East Kentucky Power Cooperative
TRANSMISSION LINE
COST ESTIMATES

December 2, 2004

954 kcmil 54/7 Cardinal
Single pole structures
Costs are based on 500 ft.average span lengths

		Cost per mile S/C 161 kV	D/C 161 kV	Line Cost
1. Barren County - Magna 24 miles on new R/W	ACSS	$321,372		$7,712,930
2. Magna - Bristow 1 mile on new R/W	ACSR	$337,328		$337,328
3. Magna - General Motors 2.5 miles on new R/W	ACSS	$337,328		$843,321
4. Magna - General Motors 5 miles on new R/W	ACSS	$337,328		$1,686,641
5. Memphis Junction - BGMU 8.4 miles D/C on new R/W	ACSS		$527,021	$4,426,981
6a. Aberdeem - BGMU 5 miles D/C on new R/W	ACSS		$527,021	$2,635,107
6b. Aberdeem - BGMU 22 miles of rebuild	ACSS	$249,901		$5,497,826
7. Wilson - Aberdeen 25 miles on new R/W	ACSS	$321,372		$8,034,302
East Bowling Green - General Motors re-conductor only	ACSS	$80,825		
Upgrade from 167 F to 212 F		$2,872		

East Kentucky Power Cooperative
TRANSMISSION LINE
COST ESTIMATE
COST PER MILE
REBUILD AND RECONDUCTOR ON EXISTING R/W

November 29, 2004

Summary of Wood Pole Costs Used
Class:

FT.	1	H1	H2	H3
60	$900	$1,000		
65	$1,000	$1,200		
70	$1,300	$1,500	$1,600	$1,700
75	$1,400	$1,500	$1,800	$1,900
80	$1,500	$1,600	$1,900	$2,000
85	$1,600	$1,800	$2,100	$2,300
90	$1,700	$2,000	$2,300	$2,600

revised 11/23/04

Summary of Steel Pole Costs Used
Class:

FT.	LD1 (CL1)	LD2 (H1)	LD3 (H2)	LD4 (H3)	LD6 (H5)
60	$2,277	$2,385	$2,505	$2,732	$3,348
65	$2,574	$2,706	$2,859	$3,126	$3,849
70	$2,816	$2,969	$3,144	$3,434	$4,236
75	$3,065	$3,239	$3,440	$3,753	$4,640
80	$3,321	$3,519	$3,746	$4,085	$5,058

$1.50 used $ per lb.
per Fred Coon on 9-1-04
weathering steel direct embed

FT.	1	H1	H2	H3
60	$919	$1,044	$1,176	$1,317
65	$1,037	$1,174	$1,319	$1,474
70	$1,161	$1,311	$1,471	$1,659
75	$1,293	$1,457	$1,651	$1,836
80	$1,433	$1,611	$1,799	$2,021
85	$1,560	$1,773	$1,976	$2,216
90	$1,692	$1,920	$2,163	$2,420

Cost at $18.00 per cu. ft

Top Diameter

FT.	1	H1	H2	H3
60	8.594	9.231	9.868	10.504

Butt Daimeter

FT.	1	H1	H2	H3
60	16.022	17.012	18.002	18.992
65	16.485	17.472	18.459	19.447
70	16.950	17.935	18.920	20.078
75	17.417	18.400	19.555	20.538
80	17.886	18.866	19.847	21.000
85	18.184	19.334	20.313	21.464
90	18.485	19.633	20.781	21.929

Volume in cobic feet

FT.	1	H1	H2	H3
60	51	58	65	73
65	58	65	73	82
70	65	73	82	92
75	72	81	92	102
80	80	89	100	112
85	87	99	110	123
90	94	107	120	134

ALUMINUM COMPANY OF AMERICA SAG AND TENSION DATA

East Kentucky Power Cooperative

Conductor CARDINAL 954.0 Kcmil 54/ 7 Stranding ACSR
M:\PROJ\EKPC\324001\303CostEst\954 cond. sag ten.PRFTime:08:28AM Date:12/02/2004
Area= .8462 Sq. In Dia= 1.196 In Wt= 1.229 Lb/F RTS= 33800 Lb
Data from Chart No. 1-838
English Units

Span= 500.0 Feet NESC Heavy Load Zone
Creep IS a Factor Rolled Rod

Design Points					Final		Initial	
Temp F	Ice In	Wind Psf	K Lb/F	Weight Lb/F	Sag Ft	Tension Lb	Sag Ft	Tension Lb
0.	.50	4.00	.30	2.698	14.22	5953.	14.11	6000.*
32.	.50	.00	.00	2.284	14.88	4820.	14.60	4910.
-20.	.00	.00	.00	1.229	12.23	3150.	11.77	3273.
0.	.00	.00	.00	1.229	12.95	2976.	12.46	3093.
30.	.00	.00	.00	1.229	13.98	2759.	13.45	2865.
60.	.00	.00	.00	1.229	14.95	2582.	14.41	2678.
90.	.00	.00	.00	1.229	15.87	2433.	15.32	2520.
120.	.00	.00	.00	1.229	16.75	2307.	16.19	2386.
167.	.00	.00	.00	1.229	17.72	2182.	17.49	2211.
212.	.00	.00	.00	1.229	18.39	2103.	18.35	2108.

* Design Condition

East Kentucky Power Cooperative
COST ESTIMATE
SINGLE CIRCUIT 161 KV TRANSMISSION LINE
954 kcmil ACSS 54/7 Cardinal
1. Barren County - Magna 24 miles on new R/W
7. Wilson - Aberdeen 25 miles on new R/W

December 1, 2004

CAPITAL COST ESTIMATE:

DESCRIPTION	UNIT	QUANTITY	MATERIALS Unit Cost	MATERIALS Cost		LABOR Unit Cost	LABOR Cost		TOTAL COST	
Mobilization	Lot	1				$20,000	$20,000	0%	$20,000	0%
Remove existing line	miles	0				15,000	0	0%	$0	0%
Clearing	acres	145.5				6,000	872,727	17%	872,727	17%
Roads	mi	0.0				10,000	0	0%	0	0%
Poles and Str. Hardware	Lot	1	701,600	$701,600	14%	762,000	762,000	15%	1,463,600	28%
Guys and Anchors	Lot	1	112,000	112,000	2%	112,000	112,000	2%	224,000	4%
Insulators	Lot	1	478,890	478,890	9%				478,890	9%
Cond. & S.W. Hardware	Lot	1	213,600	213,600	4%	254,000	254,000	5%	467,600	9%
Conductor 115 kV	mi	24.00	27,902	669,638	13%	30,000	720,000	14%	1,389,638	27%
Shield Wire	mi	24.00	2,024	48,585	1%	8,000	192,000	4%	240,585	5%
SUBTOTAL 1				$2,224,313	43%		$2,932,727	57%	$5,157,040	100%
Contingency			15% of Subtotal 1						773,556	
SUBTOTAL 2 Labor and Material									**$5,930,596**	77%

Miles of 115kV 24.00 (Material & Labor Unit Price = $247,108 per mile)

OTHER COSTS :

Services :					
Land acquisition, survey plats and licensing		$3,000	per mile	$72,000	1%
Engineering	10 weeks at	$5,000	per week	50,000	1%
Structure and guy staking	60 days at	$1,500	crew day cost	90,000	1%
Construction Inspecion	25 weeks at	$2,700	man weeks	67,500	1%
New right-of-way Needed					
Width (feet) = 100 mi. = 24.00		$3,000 /acre		872,727	11%
		~~$36,364~~ per mile			
EKPC legal fees		$1,000	per mile	24,000	0%
Indirect Cost (EKPC internal costs)		7% of Subtotal 2		415,142	5%
SUBTOTAL 3					$1,591,369 21%
Allowance for Fund Use During Construction		12% of Subtotal 3			190,964 2%
		Total cost per mile =	$321,372	**TOTAL**	**$7,712,930** 100%

BASIS OF ESTIMATE :

A. CLEARING COSTS:

Single Circuit Line

100 ft. right of way width
50% percent of new right of way that needs clearing
145.46 acres of right of way to be cleared

B. SUMMARY OF STRUCTURE QUANTITIES AND PER STRUCTURE COSTS:

	Structure Type	Allowable Angle	Frequency of Use	Qty.
1	Tangent S/C	0 - 1	70%	178
2	Small Angle S/C	2 - 10	15%	38
3	Medium Angle S/C	10 - 44	10%	25
4	Hvy Ang DE pole	45 - 90	5%	13
5				0
	Total Structures		100%	254

Single Pole

Ruling Span used = 500
miles * 5280 / RS+1 =
254 Total structures

21 to pole top
19 conductor sag
25 ground clearance
65 Ht. above ground

75 pole height
10 embedment
66 Ht. above ground

C. MATERIAL and CONSTRUCTION COST CALCULATIONS:

POLE MATERIAL COST :

	Structure Type	Qty.	Wood Poles per Structure	Pole Length and Class	Cost per Pole		Cost Poles per Structure	Pole Cost for Proj.	
1	Tangent S/C	178	1	75H3	1,900		1,900	338,200	
2	Small Angle S/C	38	1	75H3	1,900		1,900	72,200	Guyed
3	Medium Angle S/C	25	1	75H3	1,900		1,900	47,500	Guyed
4	Hvy Ang DE pole	13	1	75H3	1,900		1,900	24,700	Guyed
	Total	254						$482,600	

Hardware and miscellaneous materials per structure include:
Grounding, down lead for ground, number, aerial patrol sign, bolts, brackets, pole bands, arms and pole hardware.

	Structure Type	Qty.	Miscellaneous materials Cost per Structure			Misc. Material for Proj.
1	Tangent S/C	178	$750			$133,500
2	Small Angle S/C	38	750			28,500
3	Medium Angle S/C	25	1,500			37,500
4	Hvy Ang DE pole	13	1,500			19,500
	Total	254			Total	$219,000

POLE LABOR COST :

Includes setting pole and installing pole hardware

	Structure Type	Qty.	Wood. Poles per Structure		Labor per Pole		Cost Poles per Structure	Pole Cost for Proj.
1	Tangent S/C	178	1		3,000		3,000	534,000
2	Small Angle S/C	38	1		3,000		3,000	114,000
3	Medium Angle S/C	25	1		3,000		3,000	75,000
4	Hvy Ang DE pole	13	1		3,000		3,000	39,000
	Total	254					Total	$762,000

GUYS AND ANCHORS :

	Structure Type	Qty.	Assemblies Per St.	$400 material cost per guy: Material Per St.	Material for Proj.	$400 labor cost per guy: Labor Per St.	Labor for Proj.
1	Tangent S/C	178					
2	Small Angle S/C	38	2	800	30,400	800	30,400
3	Medium Angle S/C	25	4	1,600	40,000	1,600	40,000
4	Hvy Ang DE pole	13	8	3,200	41,600	3,200	41,600
	Total	254.0		Total	$112,000	Total	$112,000

INSULATORS:

	Structure Type	Qty.	Per Structure Quantity	Total Project Quantity	Cost Per Unit	Cost Per Structure	Cost for Project	
1	Tangent S/C	178	3	534	700	2,100	373,800	braced post
2	Small Angle S/C	38	3	114	700	2,100	79,800	braced post
3	Medium Angle S/C	25	30	750	15	450	11,250	
4	Hvy Ang DE pole	13	72	936	15	1,080	14,040	
	Total	254.0				Total	$478,890	

CONDUCTOR AND SHIELD WIRE HARDWARE:

Conductor and Shield Wire hardware materials per structure include:
Wire clamps, armor rods, compression fittings, dampers, shackles and miscellaneous materials attached to wires and cables.
Labor cost includes installing complete hardware assembly, including insulators, and attaching to structure.

	Structure Type	Qty.	Material: Cost Per Structure	Material: Total Project Cost	Labor: Cost Per Structure	Labor: Total Project Cost
1	Tangent S/C	178	$800	$142,400	1,000	178,000
2	Small Angle S/C	38	800	30,400	1,000	38,000
3	Medium Angle S/C	25	800	20,000	1,000	25,000
4	Hvy Ang DE pole	13	1,600	20,800	1,000	13,000
	Total	254.0		$213,600		$254,000

D. IN-PLACE STRUCTURE COST: Labor and Materials per Structure

MATERIALS

	Structure Type	Pole	Pole Hardware and Guys	Cond. & SW Insulators Hardware	Total
1	Tangent S/C	1,900	750	2,900	5,550
2	Small Angle S/C	1,900	1,550	2,900	6,350
3	Medium Angle S/C	1,900	3,100	1,250	6,250
4	Hvy Ang DE pole	1,900	4,700	2,680	9,280

LABOR

	Structure Type	Poles Arms and Hardware	Guys and Anchors	Cond. & SW Insulators Hardware	Total	Total Cost Per Structure Material and Labor
1	Tangent S/C	3,000		1,000	4,000	9,550
2	Small Angle S/C	3,000	800	1,000	4,800	11,150
3	Medium Angle S/C	3,000	1,600	1,000	5,600	11,850
4	Hvy Ang DE pole	3,000	3,200	1,000	7,200	16,480

E. CONDUCTOR AND SHIELD WIRE MATERIAL COSTS

Conductor — 954 kcmil 54/7 ACSS Cardinal

1	Conductor per phase
1.229	lb / ft / conductor
5%	for sag, jumpers and construction
5%	for accessories
$1.598	per ft.
$1.30	per lb
$27,902	Material Cost per mile

Shield Wire

1	3/8" EHS Galvanized Steel
0.27	lb / ft
3%	for sag, jumpers and construction
1%	for accessories
$0.369	per ft.
$1.35	per lb
$2,024	Material Cost per mile

East Kentucky Power Cooperative
COST ESTIMATE
SINGLE CIRCUIT 161 KV TRANSMISSION LINE
954 kcmil ACSS 54/7 Cardinal
2. Magna - Bristow 1 mile on new R/W
3. Magna - General Motors 2.5 miles on new R/W
4. General Motors - BGMU Tap 5 miles on new R/W

December 1, 2004

CAPITAL COST ESTIMATE:

DESCRIPTION	UNIT	QUANTITY	MATERIALS Unit Cost	MATERIALS Cost		LABOR Unit Cost	LABOR Cost		TOTAL COST	
Mobilization	Lot	1				$20,000	$20,000	4%	$20,000	4%
Remove existing line	miles	0				15,000	0	0%	$0	0%
Clearing	acres	15.2				6,000	90,909	16%	90,909	16%
Roads	mi	0.0				10,000	0	0%	0	0%
Poles and Str. Hardware	Lot	1	74,550	$74,550	13%	81,000	81,000	14%	155,550	28%
Guys and Anchors	Lot	1	11,200	11,200	2%	11,200	11,200	2%	22,400	4%
Insulators	Lot	1	50,730	50,730	9%				50,730	9%
Cond. & S.W. Hardware	Lot	1	22,400	22,400	4%	27,000	27,000	5%	49,400	9%
Conductor 115 kV	mi	2.50	27,902	69,754	12%	30,000	75,000	13%	144,754	26%
Shield Wire	mi	2.50	2,024	5,061	1%	8,000	20,000	4%	25,061	4%
SUBTOTAL 1				$233,695	42%		$325,109	58%	$558,804	100%
Contingency			15% of Subtotal 1						83,821	
SUBTOTAL 2 Labor and Material									$642,625	76%

Miles of 115kV 2.50 (Material & Labor Unit Price = $257,050 per mile)

OTHER COSTS :

Services :						
Land acquisition, survey plats and licensing		$3,000	per mile	$7,500		1%
Engineering	3 weeks at	$5,000	per week	15,000		2%
Structure and guy staking	5 days at	$1,500	crew day cost	7,500		1%
Construction Inspecion	4 weeks at	$2,700	man weeks	10,800		1%
New right-of-way Needed						
Width (feet) = 100 mi. = 2.50	$3,000 /acre	$36,364 per mile		90,909		11%
EKPC legal fees				2,500		0%
Indirect Cost (EKPC internal costs)	7% of Subtotal 2			44,984		5%
SUBTOTAL 3					$179,193	21%
Allowance for Fund Use During Construction	12% of Subtotal 3				21,503	3%
Total cost per mile =	$337,328			**TOTAL**	**$843,321**	100%

BASIS OF ESTIMATE :

A. CLEARING COSTS:

Single Circuit Line

100 ft. right of way width
50% percent of new right of way that needs clearing
15.15 acres of right of way to be cleared

B. SUMMARY OF STRUCTURE QUANTITIES AND PER STRUCTURE COSTS:

	Structure Type	Allowable Angle	Frequency of Use	Qty.
1	Tangent S/C	0 - 1	70%	19
2	Small Angle S/C	2 - 10	15%	4
3	Medium Angle S/C	10 - 44	10%	3
4	Hvy Ang DE pole	45 - 90	5%	1
5				0
	Total Structures		100%	27

Single Pole

Ruling Span used = 500
miles * 5280 / RS+1 = 27 Total structures

21 to pole top
19 conductor sag
25 ground clearance
65 Ht. above ground

75 pole height
10 embedment
66 Ht. above ground

C. MATERIAL and CONSTRUCTION COST CALCULATIONS:

POLE MATERIAL COST :

	Structure Type	Qty.	Wood Poles per Structure	Pole Length and Class	Cost per Pole		Cost Poles per Structure	Pole Cost for Proj.	
1	Tangent S/C	19	1	75H3	1,900		1,900	36,100	
2	Small Angle S/C	4	1	75H3	1,900		1,900	7,600	Guyed
3	Medium Angle S/C	3	1	75H3	1,900		1,900	5,700	Guyed
4	Hvy Ang DE pole	1	1	75H3	1,900		1,900	1,900	Guyed
	Total	27						$51,300	

Hardware and miscellaneous materials per structure include:
Grounding, down lead for ground, number, aerial patrol sign, bolts, brackets, pole bands, arms and pole hardware.

	Structure Type	Qty.		Miscellaneous materials Cost per Structure			Misc. Material for Proj.
1	Tangent S/C	19		$750			$14,250
2	Small Angle S/C	4		750			3,000
3	Medium Angle S/C	3		1,500			4,500
4	Hvy Ang DE pole	1		1,500			1,500
	Total	27				Total	$23,250

POLE LABOR COST : Includes setting pole and installing pole hardware

	Structure Type	Qty.	Wood. Poles per Structure		Labor per Pole		Cost Poles per Structure	Pole Cost for Proj.
1	Tangent S/C	19	1		3,000		3,000	57,000
2	Small Angle S/C	4	1		3,000		3,000	12,000
3	Medium Angle S/C	3	1		3,000		3,000	9,000
4	Hvy Ang DE pole	1	1		3,000		3,000	3,000
	Total	27					Total	$81,000

GUYS AND ANCHORS :

	Structure Type	Qty.	Assemblies Per St.	$400 material cost per guy: Material Per St.	Material for Proj.	$400 labor cost per guy: Labor Per St.	Labor for Proj.
1	Tangent S/C	19					
2	Small Angle S/C	4	2	800	3,200	800	3,200
3	Medium Angle S/C	3	4	1,600	4,800	1,600	4,800
4	Hvy Ang DE pole	1	8	3,200	3,200	3,200	3,200
	Total	27.0		Total	$11,200	Total	$11,200

INSULATORS:

	Structure Type	Qty.	Per Structure Quantity	Total Project Quantity	Cost Per Unit	Cost Per Structure	Cost for Project	
1	Tangent S/C	19	3	57	700	2,100	39,900	braced post
2	Small Angle S/C	4	3	12	700	2,100	8,400	braced post
3	Medium Angle S/C	3	30	90	15	450	1,350	
4	Hvy Ang DE pole	1	72	72	15	1,080	1,080	
	Total	27.0				Total	$50,730	

CONDUCTOR AND SHIELD WIRE HARDWARE:

Conductor and Shield Wire hardware materials per structure include:
Wire clamps, armor rods, compression fittings, dampers, shackles and miscellaneous materials attached to wires and cables.
Labor cost includes installing complete hardware assembly, including insulators, and attaching to structure.

	Structure Type	Qty.	Material: Cost Per Structure	Material: Total Project Cost	Labor: Cost Per Structure	Labor: Total Project Cost
1	Tangent S/C	19	$800	$15,200	1,000	19,000
2	Small Angle S/C	4	800	3,200	1,000	4,000
3	Medium Angle S/C	3	800	2,400	1,000	3,000
4	Hvy Ang DE pole	1	1,600	1,600	1,000	1,000
	Total	27.0		$22,400		$27,000

D. IN-PLACE STRUCTURE COST: Labor and Materials per Structure

	Structure Type	MATERIALS: Pole	Pole Hardware and Guys	Cond. & SW Insulators Hardware	Total
1	Tangent S/C	1,900	750	2,900	5,550
2	Small Angle S/C	1,900	1,550	2,900	6,350
3	Medium Angle S/C	1,900	3,100	1,250	6,250
4	Hvy Ang DE pole	1,900	4,700	2,680	9,280

	Structure Type	LABOR: Poles Arms and Hardware	Guys and Anchors	Cond. & SW Insulators Hardware	Total	Total Cost Per Structure Material and Labor
1	Tangent S/C	3,000		1,000	4,000	9,550
2	Small Angle S/C	3,000	800	1,000	4,800	11,150
3	Medium Angle S/C	3,000	1,600	1,000	5,600	11,850
4	Hvy Ang DE pole	3,000	3,200	1,000	7,200	16,480

E. CONDUCTOR AND SHIELD WIRE MATERIAL COSTS

Conductor: 954 kcmil 54/7 ACSS Cardinal
- 1 Conductor per phase
- 1.229 lb / ft / conductor
- 5% for sag, jumpers and construction
- 5% for accessories
- $1.598 per ft.
- $1.30 per lb
- $27,902 Material Cost per mile

Shield Wire
- 1 3/8" EHS Galvanized Steel
- 0.27 lb / ft
- 3% for sag, jumpers and construction
- 1% for accessories
- $0.369 per ft.
- $1.35 per lb
- $2,024 Material Cost per mile

East Kentucky Power Cooperative
COST ESTIMATE
DOUBLE CIRCUIT 161 and 69 KV TRANSMISSION LINE
954 kcmil ACSS 54/7 Cardinal
5. Memphis Junction - BGMU 8.4 miles of D/C on new Right of Way
6a. Aberdeen - BGMU Tap 5.0 miles of D/C on new Right of Way

December 1, 2004

CAPITAL COST ESTIMATE:

DESCRIPTION	UNIT	QUANTITY	MATERIALS Unit Cost	MATERIALS Cost		LABOR Unit Cost	LABOR Cost		TOTAL COST		
Mobilization	Lot	1				$20,000	$20,000	1%	$20,000	1%	
Remove existing line	miles					15,000	0	0%	$0	0%	
Clearing	acres	30.5				6,000	183,273	6%	183,273	6%	
Roads	mi	0.0				10,000	0	0%	0	0%	
Poles and Str. Hardware	Lot	1	658,170	$658,170	22%	402,500	402,500	13%	1,060,670	35%	
Guys and Anchors	Lot	1	75,200	75,200	2%	75,200	75,200	2%	150,400	5%	
Insulators	Lot	1	335,940	335,940	11%				335,940	11%	
Cond. & S.W. Hardware	Lot	1	74,400	74,400	2%	89,000	89,000	3%	163,400	5%	
Conductor 115 kV	mi	8.40	55,803	468,747	15%	60,000	504,000	16%	972,747	32%	
Shield Wire	mi	8.40	4,049	34,009	1%	16,000	134,400	4%	168,409	6%	
SUBTOTAL 1				$1,646,466	54%		$1,408,373	46%	$3,054,839	100%	
Contingency			15% of Subtotal 1						458,226		
SUBTOTAL 2 Labor and Material									**$3,513,065**		79%
Miles of 115kV	8.40	(Material & Labor Unit Price =	$418,222	per mile)							
OTHER COSTS :											
Services :											
Land acquisition, survey plats and licensing				$3,000	per mile		$25,200				1%
Engineering		6	weeks at	$5,000	per week		30,000				1%
Structure and guy staking		7	days at	$1,500	crew day cost		10,500				0%
Construction Inspecion		14	weeks at	$2,700	man weeks		37,800				1%
New right-of-way Needed											
Width (feet) = 150	mi. = 8.40		$3,000 /acre				458,182				10%
			$54,545 per mile								
EKPC legal fees							8,400				0%
Indirect Cost (EKPC internal costs)			7% of Subtotal 2				245,915				6%
SUBTOTAL 3									$815,996		18%
Allowance for Fund Use During Construction			12% of Subtotal 3						97,920		2%
		Total cost per mile =	$527,021						**TOTAL**	**$4,426,981**	100%

BASIS OF ESTIMATE :

A. CLEARING COSTS:

Single Circuit Line

150 ft. right of way width
20% percent of new right of way that needs clearing
30.55 acres of right of way to be cleared

B. SUMMARY OF STRUCTURE QUANTITIES AND PER STRUCTURE COSTS:

	Structure Type	Allowable Angle	Frequency of Use	Qty.
1	Tangent S/C	0 - 1	70%	63
2	Small Angle S/C	2 - 10	15%	13
3	Medium Angle S/C	10 - 44	10%	9
4	Hvy Ang DE pole	45 - 90	5%	4
5				0
	Total Structures		100%	89

Single Pole

Ruling Span used = 500
miles * 5280 / RS+1 =
90 Total structures

25 to pole top
19 conductor sag
25 ground clearance
69 Ht. above ground

80 pole height
10 embedment
70 Ht. above ground

C. MATERIAL and CONSTRUCTION COST CALCULATIONS:

POLE MATERIAL COST :

	Structure Type	Qty.	Steel Poles per Structure	Pole Length and Class	Cost per Pole		Cost Poles per Structure	Pole Cost for Proj.	
1	Tangent S/C	63	1	80 LD6	5,058		5,058	318,654	
2	Small Angle S/C	13	2	80 LD6	5,058		10,116	131,508	Guyed
3	Medium Angle S/C	9	2	80 LD6	5,058		10,116	91,044	Guyed
4	Hvy Ang DE pole	4	2	80 LD6	5,058		10,116	40,464	Guyed
	Total	89						$581,670	

Hardware and miscellaneous materials per structure include:
Grounding, down lead for ground, number, aerial patrol sign, bolts, brackets, pole bands, arms and pole hardware.

	Structure Type	Qty.		Miscellaneous materials Cost per Structure			Misc. Material for Proj.
1	Tangent S/C	63		$750			$47,250
2	Small Angle S/C	13		750			9,750
3	Medium Angle S/C	9		1,500			13,500
4	Hvy Ang DE pole	4		1,500			6,000
	Total	89				Total	$76,500

POLE LABOR COST :

Includes setting pole and installing pole hardware

	Structure Type	Qty.	Steel Poles per Structure		Labor per Pole		Cost Poles per Structure	Pole Cost for Proj.
1	Tangent S/C	63	1		3,500		3,500	220,500
2	Small Angle S/C	13	2		3,500		7,000	91,000
3	Medium Angle S/C	9	2		3,500		7,000	63,000
4	Hvy Ang DE pole	4	2		3,500		7,000	28,000
	Total	89					Total	$402,500

GUYS AND ANCHORS :

	Structure Type	Qty.	Assemblies Per St.	$400 material cost per guy: Material Per St.	Material for Proj.	$400 labor cost per guy: Labor Per St.	Labor for Proj.
1	Tangent S/C	63					
2	Small Angle S/C	13	4	1,600	20,800	1,600	20,800
3	Medium Angle S/C	9	8	3,200	28,800	3,200	28,800
4	Hvy Ang DE pole	4	16	6,400	25,600	6,400	25,600
	Total	89.0		Total	$75,200	Total	$75,200

INSULATORS:

	Structure Type	Qty.	Per Structure Quantity	Total Project Quantity	Cost Per Unit	Cost Per Structure	Cost for Project	
1	Tangent S/C	63	6	378	700	4,200	264,600	braced post
2	Small Angle S/C	13	6	78	700	4,200	54,600	braced post
3	Medium Angle S/C	9	60	540	15	900	8,100	
4	Hvy Ang DE pole	4	144	576	15	2,160	8,640	
	Total	89.0				Total	$335,940	

CONDUCTOR AND SHIELD WIRE HARDWARE:

Conductor and Shield Wire hardware materials per structure include:
Wire clamps, armor rods, compression fittings, dampers, shackles and miscellaneous materials attached to wires and cables.
Labor cost includes installing complete hardware assembly, including insulators, and attaching to structure.

	Structure Type	Qty.	Material: Cost Per Structure	Material: Total Project Cost	Labor: Cost Per Structure	Labor: Total Project Cost
1	Tangent S/C	63	$800	$50,400	1,000	63,000
2	Small Angle S/C	13	800	10,400	1,000	13,000
3	Medium Angle S/C	9	800	7,200	1,000	9,000
4	Hvy Ang DE pole	4	1,600	6,400	1,000	4,000
	Total	89.0		$74,400		$89,000

D. IN-PLACE STRUCTURE COST: Labor and Materials per Structure

MATERIALS

	Structure Type	Pole	Pole Hardware and Guys	Cond. & SW Insulators Hardware	Total
1	Tangent S/C	6,058	750	5,000	10,808
2	Small Angle S/C	10,116	2,350	5,000	17,466
3	Medium Angle S/C	10,116	4,700	1,700	16,516
4	Hvy Ang DE pole	10,116	7,900	3,760	21,776

LABOR

	Structure Type	Poles Arms and Hardware	Guys and Anchors	Cond. & SW Insulators Hardware	Total	Total Cost Per Structure Material and Labor
1	Tangent S/C	3,500		1,000	4,500	15,308
2	Small Angle S/C	7,000	1,600	1,000	9,600	27,066
3	Medium Angle S/C	7,000	3,200	1,000	11,200	27,716
4	Hvy Ang DE pole	7,000	6,400	1,000	14,400	36,176

E. CONDUCTOR AND SHIELD WIRE MATERIAL COSTS

Conductor		Shield Wire	
954 kcmil 54/7 ACSS Cardinal			
1	Conductor per phase	1	3/8" EHS Galvanized Steel
1 229	lb / ft / conductor	0.27	lb / ft
5%	for sag, jumpers and construction	3%	for sag, jumpers and construction
5%	for accessories	1%	for accessories
$1.598	per ft.	$0.369	per ft.
$1.30	per lb	$1.35	per lb
$27,902	Material Cost per mile	$2,024	Material Cost per mile

East Kentucky Power Cooperative
COST ESTIMATE
DOUBLE CIRCUIT 161 and 69 KV TRANSMISSION LINE
954 kcmil ACSS 54/7 Cardinal
6b. Aberdeen - BGMU Tap 22 miles of S/C rebuild on existing R/W

December 1, 2004

CAPITAL COST ESTIMATE:

DESCRIPTION	UNIT	QUANTITY	MATERIALS Unit Cost	MATERIALS Cost		LABOR Unit Cost	LABOR Cost		TOTAL COST	
Mobilization	Lot	1				$20,000	$20,000	0%	$20,000	0%
Remove existing line	miles	22				15,000	330,000	8%	$330,000	8%
Clearing	acres	0.0				6,000	0	0%	0	0%
Roads	mi	0.0				10,000	0	0%	0	0%
Poles and Str. Hardware	Lot	1	643,700	$643,700	15%	815,500	815,500	19%	1,459,200	34%
Guys and Anchors	Lot	1	103,200	103,200	2%	103,200	103,200	2%	206,400	5%
Insulators	Lot	1	311,850	311,850	7%				311,850	7%
Cond. & S.W. Hardware	Lot	1	196,000	196,000	5%	233,000	233,000	5%	429,000	10%
Conductor 115 kV	mi	22.0	27,902	613,835	14%	30,000	660,000	16%	1,273,835	30%
Shield Wire	mi	22.0	2,024	44,536	1%	8,000	176,000	4%	220,536	5%
SUBTOTAL 1				$1,913,121	45%		$2,337,700	55%	$4,250,821	100%
Contingency			15% of Subtotal 1						637,623	
SUBTOTAL 2 Labor and Material									**$4,888,444**	89%

Miles of 115kV 22.0 (Material & Labor Unit Price = $222,202 per mile)

OTHER COSTS :

Services :					
Land acquisition, survey plats and licensing			per mile	$0	0%
Engineering	10 weeks at	$5,000	per week	50,000	1%
Structure and guy staking	55 days at	$1,500	crew day cost	82,500	2%
Construction Inspecion	22 weeks at	$2,700	man weeks	59,400	1%
New right-of-way Needed					
Width (feet) = 100 mi. = 22.00		$0 /acre		0	0%
		$0 per mile			
EKPC legal fees				10,000	0%
Indirect Cost (EKPC internal costs)		7% of Subtotal 2		342,191	6%
SUBTOTAL 3					$544,091 10%
Allowance for Fund Use During Construction		12% of Subtotal 3			65,291 1%
		Total cost per mile =	$249,901	**TOTAL**	**$5,497,826** 100%

BASIS OF ESTIMATE :

A. CLEARING COSTS:

Single Circuit Line

75 ft. right of way width
0% percent of new right of way that needs clearing
0.00 acres of right of way to be cleared

B. SUMMARY OF STRUCTURE QUANTITIES AND PER STRUCTURE COSTS:

	Structure Type	Allowable Angle	Frequency of Use	Qty.
1	Tangent S/C	0 - 1	70%	163
2	Small Angle S/C	2 - 10	15%	35
3	Medium Angle S/C	10 - 44	10%	23
4	Hvy Ang DE pole	45 - 90	5%	12
5				0
	Total Structures		100%	233

Single Pole

Ruling Span used = 500
miles * 5280 / RS+1 =
233 Total structures

25 to pole top
19 conductor sag
25 ground clearance
69 Ht. above ground

80 pole height
10 embedment
70 Ht. above ground

C. MATERIAL and CONSTRUCTION COST CALCULATIONS:

POLE MATERIAL COST :

	Structure Type	Qty.	Steel Poles per Structure	Pole Length and Class	Cost per Pole		Cost Poles per Structure	Pole Cost for Proj.	
1	Tangent S/C	163	1	75H3	1,900		1,900	309,700	
2	Small Angle S/C	35	1	75H3	1,900		1,900	66,500	Guyed
3	Medium Angle S/C	23	1	75H3	1,900		1,900	43,700	Guyed
4	Hvy Ang DE pole	12	1	75H3	1,900		1,900	22,800	Guyed
	Total	233						$442,700	

Hardware and miscellaneous materials per structure include:
Grounding, down lead for ground, number, aerial patrol sign, bolts, brackets, pole bands, arms and pole hardware.

	Structure Type	Qty.	Miscellaneous materials Cost per Structure			Misc. Material for Proj.
1	Tangent S/C	163	$750			$122,250
2	Small Angle S/C	35	750			26,250
3	Medium Angle S/C	23	1,500			34,500
4	Hvy Ang DE pole	12	1,500			18,000
	Total	233			Total	$201,000

POLE LABOR COST : Includes setting pole and installing pole hardware

	Structure Type	Qty.	Steel Poles per Structure		Labor per Pole		Cost Poles per Structure	Pole Cost for Proj.
1	Tangent S/C	163	1		3,500		3,500	570,500
2	Small Angle S/C	35	1		3,500		3,500	122,500
3	Medium Angle S/C	23	1		3,500		3,500	80,500
4	Hvy Ang DE pole	12	1		3,500		3,500	42,000
	Total	233					Total	$815,500

GUYS AND ANCHORS :

	Structure Type	Qty.	Assemblies Per St.	$400 material cost per guy: Material Per St.	Material for Proj.	$400 labor cost per guy: Labor Per St.	Labor for Proj.
1	Tangent S/C	163					
2	Small Angle S/C	35	2	800	28,000	800	28,000
3	Medium Angle S/C	23	4	1,600	36,800	1,600	36,800
4	Hvy Ang DE pole	12	8	3,200	38,400	3,200	38,400
	Total	233.0		Total	$103,200	Total	$103,200

INSULATORS:

	Structure Type	Qty.	Per Structure Quantity	Total Project Quantity	Cost Per Unit	Cost Per Structure	Cost for Project	
1	Tangent S/C	163	3	489	500	1,500	244,500	braced post
2	Small Angle S/C	35	3	105	500	1,500	52,500	braced post
3	Medium Angle S/C	23	18	414	15	270	6,210	
4	Hvy Ang DE pole	12	48	576	15	720	8,640	
	Total	233.0				Total	$311,850	

CONDUCTOR AND SHIELD WIRE HARDWARE:

Conductor and Shield Wire hardware materials per structure include:
Wire clamps, armor rods, compression fittings, dampers, shackles and miscellaneous materials attached to wires and cables.
Labor cost includes installing complete hardware assembly, including insulators, and attaching to structure.

	Structure Type	Qty.		Material: Cost Per Structure	Total Project Cost		Labor: Cost Per Structure	Total Project Cost
1	Tangent S/C	163		$800	$130,400		1,000	163,000
2	Small Angle S/C	35		800	28,000		1,000	35,000
3	Medium Angle S/C	23		800	18,400		1,000	23,000
4	Hvy Ang DE pole	12		1,600	19,200		1,000	12,000
	Total	233.0			$196,000			$233,000

D. IN-PLACE STRUCTURE COST: Labor and Materials per Structure

MATERIALS

	Structure Type	Pole	Pole Hardware and Guys	Cond. & SW Insulators Hardware	Total
1	Tangent S/C	1,900	750	2,300	4,950
2	Small Angle S/C	1,900	1,550	2,300	5,750
3	Medium Angle S/C	1,900	3,100	1,070	6,070
4	Hvy Ang DE pole	1,900	4,700	2,320	8,920

LABOR

	Structure Type	Poles Arms and Hardware	Guys and Anchors	Cond. & SW Insulators Hardware	Total	**Total Cost Per Structure Material and Labor**
1	Tangent S/C	3,500		1,000	4,500	9,450
2	Small Angle S/C	3,500	800	1,000	5,300	11,050
3	Medium Angle S/C	3,500	1,600	1,000	6,100	12,170
4	Hvy Ang DE pole	3,500	3,200	1,000	7,700	16,620

E. CONDUCTOR AND SHIELD WIRE MATERIAL COSTS

Conductor — 954 kcmil 54/7 ACSS Cardinal

1 Conductor per phase
1.229 lb / ft / conductor
5% for sag, jumpers and construction
5% for accessories
$1.598 per ft.
$1.30 per lb
$27,902 Material Cost per mile

Shield Wire

1 3/8" EHS Galvanized Steel
0.27 lb / ft
3% for sag, jumpers and construction
1% for accessories
$0.369 per ft.
$1.35 per lb
$2,024 Material Cost per mile

East Kentucky Power Cooperative
COST ESTIMATE
SINGLE CIRCUIT 161 KV TRANSMISSION LINE
954 kcmil ACSS 54/7 Cardinal
East Bowling Green - Gnerla Motors Reconductor only

December 2, 2004

CAPITAL COST ESTIMATE:

DESCRIPTION	UNIT	QUANTITY	MATERIALS Unit Cost	MATERIALS Cost		LABOR Unit Cost	LABOR Cost		TOTAL COST		
Mobilization	Lot	1				$5,000	$5,000	9%	$5,000	9%	
Remove existing line	miles	0				15,000	0	0%	$0	0%	
Clearing	acres	0.0				6,000	0	0%	0	0%	
Roads	mi	0.0				10,000	0	0%	0	0%	
Poles and Str. Hardware	Lot	0	31,935	$0	0%	34,680	0	0%	0	0%	
Guys and Anchors	Lot	0	5,086	0	0%	5,086	0	0%	0	0%	
Insulators	Lot	0	21,779	0	0%				0	0%	
Cond. & S.W. Hardware	Lot	0.25	9,710	2,428	4%	11,560	2,890	5%	5,318	9%	
Conductor 115 kV	mi	1.00	27,902	27,902	48%	20,000	20,000	34%	47,902	82%	
Shield Wire	mi	0.00	2,024	0	0%	8,000	0	0%	0	0%	
SUBTOTAL 1				$30,329	52%		$27,890	48%	$58,219	100%	
Contingency			15% of Subtotal 1						8,733		
SUBTOTAL 2 Labor and Material									**$66,952**		83%

Miles of 115kV 1.00 (Material & Labor Unit Price = $66,952 per mile)

OTHER COSTS :

Services :				
Land acquisition, survey plats and licensing		$3,000 per mile	$0	0%
Engineering	1 weeks at	$5,000 per week	5,000	6%
Structure and guy staking	0 days at	$1,500 crew day cost	0	0%
Construction Inspecion	1 weeks at	$2,700 man weeks	2,700	3%
New right-of-way Needed				
Width (feet) = 100 mi. = 1.00		$0 /acre $0 per mile	0	0%
EKPC legal fees		$1,000 per mile	0	0%
Indirect Cost (EKPC internal costs)		7% of Subtotal 2	4,687	6%
SUBTOTAL 3			$12,387	15%
Allowance for Fund Use During Construction		12% of Subtotal 3	1,486	2%
	Total cost per mile =	$80,825	**TOTAL** **$80,825**	100%

BASIS OF ESTIMATE :

A. CLEARING COSTS:

Single Circuit Line

100 ft. right of way width
0% percent of new right of way that needs clearing
0.00 acres of right of way to be cleared

B. SUMMARY OF STRUCTURE QUANTITIES AND PER STRUCTURE COSTS:

	Structure Type	Allowable Angle	Frequency of Use	Qty.
1	Tangent S/C	0 - 1	70%	8
2	Small Angle S/C	2 - 10	15%	2
3	Medium Angle S/C	10 - 44	10%	1
4	Hvy Ang DE pole	45 - 90	5%	1
5				0
	Total Structures		100%	12

Single Pole

Ruling Span used = 500
miles * 5280 / RS+1 =
12 Total structures

21 to pole top
19 conductor sag
25 ground clearance
65 Ht. above ground

75 pole height
10 embedment
66 Ht. above ground

C. MATERIAL and CONSTRUCTION COST CALCULATIONS:

POLE MATERIAL COST :

	Structure Type	Qty.	Wood Poles per Structure	Pole Length and Class	Cost per Pole	Cost Poles per Structure	Pole Cost for Proj.	
1	Tangent S/C	8	1	75H3	1,900	1,900	15,375	
2	Small Angle S/C	2	1	75H3	1,900	1,900	3,295	Guyed
3	Medium Angle S/C	1	1	75H3	1,900	1,900	2,196	Guyed
4	Hvy Ang DE pole	1	1	75H3	1,900	1,900	1,098	Guyed
	Total	12					$21,964	

Hardware and miscellaneous materials per structure include:
Grounding, down lead for ground, number, aerial patrol sign, bolts, brackets, pole bands, arms and pole hardware.

	Structure Type	Qty.	Miscellaneous materials Cost per Structure	Misc. Material for Proj.
1	Tangent S/C	8	$750	$6,069
2	Small Angle S/C	2	750	1,301
3	Medium Angle S/C	1	1,500	1,734
4	Hvy Ang DE pole	1	1,500	867
	Total	12	Total	$9,971

POLE LABOR COST : Includes setting pole and installing pole hardware

	Structure Type	Qty.	Wood. Poles per Structure	Labor per Pole	Cost Poles per Structure	Pole Cost for Proj.
1	Tangent S/C	8	1	3,000	3,000	24,276
2	Small Angle S/C	2	1	3,000	3,000	5,202
3	Medium Angle S/C	1	1	3,000	3,000	3,468
4	Hvy Ang DE pole	1	1	3,000	3,000	1,734
	Total	12			Total	$34,680

GUYS AND ANCHORS :

	Structure Type	Qty.	Assemblies Per St.	$400 material cost per guy Material Per St.	Material for Proj.	$400 labor cost per guy Labor Per St.	Labor for Proj.
1	Tangent S/C	8					
2	Small Angle S/C	2	2	800	1,387	800	1,387
3	Medium Angle S/C	1	4	1,600	1,850	1,600	1,850
4	Hvy Ang DE pole	1	8	3,200	1,850	3,200	1,850
	Total	11.6		Total	$5,086	Total	$5,086

INSULATORS:

	Structure Type	Qty.	Per Structure Quantity	Total Project Quantity	Cost Per Unit	Cost Per Structure	Cost for Project	
1	Tangent S/C	8	3	24	700	2,100	16,993	braced post
2	Small Angle S/C	2	3	5	700	2,100	3,641	braced post
3	Medium Angle S/C	1	30	35	15	450	520	
4	Hvy Ang DE pole	1	72	42	15	1,080	624	
	Total	11.6				Total	$21,779	

CONDUCTOR AND SHIELD WIRE HARDWARE:

Conductor and Shield Wire hardware materials per structure include:
Wire clamps, armor rods, compression fittings, dampers, shackles and miscellaneous materials attached to wires and cables.
Labor cost includes installing complete hardware assembly, including insulators, and attaching to structure.

	Structure Type	Qty.	Material Cost Per Structure	Material Total Project Cost	Labor Cost Per Structure	Labor Total Project Cost
1	Tangent S/C	8	$800	$6,474	1,000	8,092
2	Small Angle S/C	2	800	1,387	1,000	1,734
3	Medium Angle S/C	1	800	925	1,000	1,156
4	Hvy Ang DE pole	1	1,600	925	1,000	578
	Total	11.6		$9,710		$11,560

D. IN-PLACE STRUCTURE COST: Labor and Materials per Structure

MATERIALS

	Structure Type	Pole	Pole Hardware and Guys	Cond. & SW Insulators Hardware	Total
1	Tangent S/C	1,900	750	2,900	5,550
2	Small Angle S/C	1,900	1,550	2,900	6,350
3	Medium Angle S/C	1,900	3,100	1,250	6,250
4	Hvy Ang DE pole	1,900	4,700	2,680	9,280

LABOR

	Structure Type	Poles Arms and Hardware	Guys and Anchors	Cond. & SW Insulators Hardware	Total	Total Cost Per Structure Material and Labor
1	Tangent S/C	3,000		1,000	4,000	9,550
2	Small Angle S/C	3,000	800	1,000	4,800	11,150
3	Medium Angle S/C	3,000	1,600	1,000	5,600	11,850
4	Hvy Ang DE pole	3,000	3,200	1,000	7,200	16,480

E. CONDUCTOR AND SHIELD WIRE MATERIAL COSTS

Conductor: 954 kcmil 54/7 ACSS Cardinal

1	Conductor per phase
1.229	lb / ft / conductor
5%	for sag, jumpers and construction
6%	for accessories
$1.598	per ft.
$1.30	per lb
$27,902	Material Cost per mile

Shield Wire

1	3/8" EHS Galvanized Steel
0.27	lb / ft
3%	for sag, jumpers and construction
1%	for accessories
$0.369	per ft.
$1.35	per lb
$2,024	Material Cost per mile

East Kentucky Power Cooperative
COST ESTIMATE
SINGLE CIRCUIT 161 KV TRANSMISSION LINE
954 kcmil ACSS 54/7 Cardinal
69 kV upgrade from 167 F to 212 F

December 2, 2004

CAPITAL COST ESTIMATE:

DESCRIPTION	UNIT	QUANTITY	MATERIALS Unit Cost	MATERIALS Cost		LABOR Unit Cost	LABOR Cost		TOTAL COST		
Mobilization	Lot	1				$1	$1	100%	$1	100%	
Remove existing line	miles	0				15,000	0	0%	$0	0%	
Clearing	acres	0.0				6,000	0	0%	0	0%	
Roads	mi	0.0				10,000	0	0%	0	0%	
Poles and Str. Hardware	Lot	0.00	116,533	$0	0%	126,552	0	0%	0	0%	
Guys and Anchors	Lot	0	18,561	0	0%	18,561	0	0%	0	0%	
Insulators	Lot	0	79,475	0	0%				0	0%	
Cond. & S.W. Hardware	Lot	0.00	35,435	0	0%	42,184	0	0%	0	0%	
Conductor 115 kV	mi	0.00	27,902	0	0%	20,000	0	0%	0	0%	
Shield Wire	mi	0.00	2,024	0	0%	8,000	0	0%	0	0%	
SUBTOTAL 1				$0	0%		$1	100%	$1	100%	
Contingency			15% of Subtotal 1						0		
SUBTOTAL 2 Labor and Material									$1		0%

Miles of 115kV 3.90 (Material & Labor Unit Price = $0 per mile)

OTHER COSTS :

Services :						
Land acquisition, survey plats and licensing		$3,000	per mile	$0		0%
Engineering	1.0 weeks at	$5,000	per week	5,000		45%
Structure and guy staking	0 days at	$1,500	crew day cost	0		0%
Construction Inspecion	0 weeks at	$2,700	man weeks	0		0%
New right-of-way Needed						
Width (feet) = 100 mi. = 3.90	$0 /acre			0		0%
	$0 per mile					
EKPC legal fees		$1,000	per mile	0		0%
Indirect Cost (EKPC internal costs)				5,000		45%
SUBTOTAL 3					$10,000	89%
Allowance for Fund Use During Construction	12% of Subtotal 3				1,200	11%
	Total cost per mile =	$2,872		**TOTAL**	**$11,201**	100%

BASIS OF ESTIMATE :

A. CLEARING COSTS:

Single Circuit Line

100 ft. right of way width
0% percent of new right of way that needs clearing
0.00 acres of right of way to be cleared

B. SUMMARY OF STRUCTURE QUANTITIES AND PER STRUCTURE COSTS:

	Structure Type	Allowable Angle	Frequency of Use	Qty.
1	Tangent S/C	0 - 1	70%	30
2	Small Angle S/C	2 - 10	15%	6
3	Medium Angle S/C	10 - 44	10%	4
4	Hvy Ang DE pole	45 - 90	5%	2
5				0
	Total Structures		100%	42

Single Pole

Ruling Span used = 500
miles * 5280 / RS+1 = 42 Total structures

21 to pole top
19 conductor sag
25 ground clearance
65 Ht. above ground

75 pole height
10 embedment
66 Ht. above ground

C. MATERIAL and CONSTRUCTION COST CALCULATIONS:

POLE MATERIAL COST :

	Structure Type	Qty.	Wood Poles per Structure	Pole Length and Class	Cost per Pole		Cost Poles per Structure	Pole Cost for Proj.	
1	Tangent S/C	30	1	75H3	1,900		1,900	56,105	
2	Small Angle S/C	6	1	75H3	1,900		1,900	12,022	Guyed
3	Medium Angle S/C	4	1	75H3	1,900		1,900	8,015	Guyed
4	Hvy Ang DE pole	2	1	75H3	1,900		1,900	4,007	Guyed
	Total	42						$80,150	

Hardware and miscellaneous materials per structure include:
Grounding, down lead for ground, number, aerial patrol sign, bolts, brackets, pole bands, arms and pole hardware

	Structure Type	Qty.	Miscellaneous materials Cost per Structure			Misc. Material for Proj.
1	Tangent S/C	30	$750			$22,147
2	Small Angle S/C	6	750			4,746
3	Medium Angle S/C	4	1,500			6,328
4	Hvy Ang DE pole	2	1,500			3,164
	Total	42			Total	$36,384

POLE LABOR COST :

Includes setting pole and installing pole hardware

	Structure Type	Qty.	Wood. Poles per Structure		Labor per Pole		Cost Poles per Structure	Pole Cost for Proj.
1	Tangent S/C	30	1		3,000		3,000	88,586
2	Small Angle S/C	6	1		3,000		3,000	18,983
3	Medium Angle S/C	4	1		3,000		3,000	12,655
4	Hvy Ang DE pole	2	1		3,000		3,000	6,328
	Total	42					Total	$126,552

GUYS AND ANCHORS :

	Structure Type	Qty.	Assemblies Per St.	$400 material cost per guy Material Per St.	Material for Proj.	$400 labor cost per guy Labor Per St.	Labor for Proj.
1	Tangent S/C	30					
2	Small Angle S/C	6	2	800	5,062	800	5,062
3	Medium Angle S/C	4	4	1,600	6,749	1,600	6,749
4	Hvy Ang DE pole	2	8	3,200	6,749	3,200	6,749
	Total	42.2		Total	$18,561	Total	$18,561

INSULATORS:

	Structure Type	Qty.	Per Structure Quantity	Total Project Quantity	Cost Per Unit	Cost Per Structure	Cost for Project	
1	Tangent S/C	30	3	89	700	2,100	62,010	braced post
2	Small Angle S/C	6	3	19	700	2,100	13,288	braced post
3	Medium Angle S/C	4	30	127	15	450	1,898	
4	Hvy Ang DE pole	2	72	152	15	1,080	2,278	
	Total	42.2				Total	$79,475	

CONDUCTOR AND SHIELD WIRE HARDWARE:

Conductor and Shield Wire hardware materials per structure include:
Wire clamps, armor rods, compression fittings, dampers, shackles and miscellaneous materials attached to wires and cables.
Labor cost includes installing complete hardware assembly, including insulators, and attaching to structure.

	Structure Type	Qty.	Material Cost Per Structure	Material Total Project Cost	Labor Cost Per Structure	Labor Total Project Cost
1	Tangent S/C	30	$800	$23,623	1,000	29,529
2	Small Angle S/C	6	800	5,062	1,000	6,328
3	Medium Angle S/C	4	800	3,375	1,000	4,218
4	Hvy Ang DE pole	2	1,600	3,375	1,000	2,109
	Total	42.2		$35,435		$42,184

D. IN-PLACE STRUCTURE COST:

Labor and Materials per Structure

MATERIALS

	Structure Type	Pole	Pole Hardware and Guys	Cond. & SW Insulators Hardware	Total
1	Tangent S/C	1,900	750	2,900	5,550
2	Small Angle S/C	1,900	1,550	2,900	6,350
3	Medium Angle S/C	1,900	3,100	1,250	6,250
4	Hvy Ang DE pole	1,900	4,700	2,680	9,280

LABOR

	Structure Type	Poles Arms and Hardware	Guys and Anchors	Cond. & SW Insulators Hardware	Total	**Total Cost Per Structure Material and Labor**
1	Tangent S/C	3,000		1,000	4,000	9,550
2	Small Angle S/C	3,000	800	1,000	4,800	11,150
3	Medium Angle S/C	3,000	1,600	1,000	5,600	11,850
4	Hvy Ang DE pole	3,000	3,200	1,000	7,200	16,480

E. CONDUCTOR AND SHIELD WIRE MATERIAL COSTS

Conductor — 954 kcmil 54/7 ACSS Cardinal

1	Conductor per phase
1.229	lb / ft / conductor
5%	for sag, jumpers and construction
5%	for accessories
$1.598	per ft.
$1.30	per lb
$27,902	Material Cost per mile

Shield Wire

1	3/8" EHS Galvanized Steel
0.27	lb / ft
3%	for sag, jumpers and construction
1%	for accessories
$0.369	per ft.
$1.35	per lb
$2,024	Material Cost per mile

EAST KENTUCKY POWER COOPERATIVE, INC.

PSC CASE NO. 2005-00207

INFORMATION REQUEST RESPONSE

COMMISSION'S FIRST DATA REQUEST DATED 8/18/05

ITEM 16

RESPONSIBLE PARTY:

REQUEST: Does the proposed plan meet service and reliability requirements without causing violations of existing transmission facility limits? Explain the response.

RESPONSE: Yes, CAI asserts that as described in our reports, the proposed EKPC Plan C follows the planning criteria (described in our report and in the Response to Item #6 of this Data Request) to ensure that EKPC will reliably service WRECC without causing violations to the electrical service in the surrounding electrical system.

To highlight our major findings, Table 3 in our initial report compared how Plan A (base case) and Plan C (initially proposed service plan) performed with respect to first contingency overloads in either WRECC, EKPC or in neighboring electric systems. CAI identified 24 facilities that had pre-existing NERC category B (single contingency conditions) overloads in Plan A. The proposed EKPC plan resolves 19 of these overload conditions (no longer overloaded), reduces two of these overloads, leaves one pre-existing overload unchanged, and makes two of the overloads worse. Thus, the EKPC plan corrects, reduces or leaves unchanged 22 out of the 24 pre-existing overloads in the base case.

Exhibit 16-1 that follows is extracted from Table 3 described above and describes the two overloaded facilities made worse in Plan C (items 6 and 7 in Table 16) plus an additional five facilities (items 1 through 5) where Plan C resulted in new single contingency overload conditions (i.e. these facilities were not overloaded in Plan A).

Items 1, 2 and 7 in Exhibit 16-1 are all related to service for the WRECC 69 kV region between Memphis Junction and Franklin, Kentucky. The Franklin 161-69 kV transformer is overloaded (109%) in Plan A. Implementation of Plan C results in an additional one percent overloading (to 110%). EKPC has revised their proposed plan to add a new 100 MVA, 161-69 kV transformer at the 69 kV Salmons Substation and to open the existing circuit connecting to the Franklin 69 kV bus.

EKPC has proposed to increase the reliability of service for the WRECC 69 kV region between Memphis Junction and Franklin, Kentucky by converting it from an open loop system to a closed loop system. In order to realize the added reliability advantages of the proposed closed loop system, EKPC has proposed the addition of a new 69 kV switching station at the existing 69 kV Plano Substation. The latest changes in the implementation plan reduce the contingent loading on the 69 kV circuits from Salmons to K30 (item 1, from 117% to 113%) and K30 to L30 (item 2, from 114% to 78%). Opening the new breaker at Plano under contingent conditions further reduces the overloading for the Salmons to K30 69 kV circuit (item 1, from 113% to 102%) but leaves it still slightly overloaded. EKPC therefore further proposes to upgrade the Salmons to K30 69 kV circuit with 556 MCM ACSR conductor which will raise the

summer emergency rating from 30 MVA to 108 MVA and therefore reduce the contingent loading level from 102 to 30 percent. With these added proposals EKPC has raised the reliability of this WRECC 69 kV region from distribution level reliability to full NERC category B compliance.

EKPC directed CAI to update its studies with all refinements made to the proposed plan to date. The results of this study are attached as **Exhibit 16-2**. This report provides an up-to-date assessment of the violations found on the system with and without EKPC's proposed Plan.

TABLE 16
Contingency Overload Comparison - Initial Study
Where Case C Overloads Exceed Case A Loading
(percent of emergency rating values)

Item		Emerg Rating MVA	Case A	Case B	Case C	% Change Case C vs Case A	Comments
1	EKPC: Salmon - K30 69 kV	37	n/a	117	117	n/a	EKPC will upgrade this circuit, new SE=108 MVA (35%)
2	EKPC: K30 - L30 69 kV	54	n/a	114	114	n/a	Opening the breaker at the Proposed new 69 kV Switching Station at Plano Corrects this Overload
3	LGEE-EKPC: Eastview - Stephensburg 69 kV	41	93	96	102	9.7%	LGEE already plans to upgrade, new SE=49 MVA (86%)
4	LGEE: Kosmos - Mill Ck 138 kV	72	96	99	101	5.2%	LGEE already plans to upgrade, new SE=86 MVA (85%)
5	LGEE: Indian Hill - Peabody West 69 kV	27	99	101	102	3.0%	Borderline - Nearly overloaded in Base Case and Just 3% Change, LGEE should Upgrade
6	EKPC-LGEE: Taylor County 161-69 kV transfmr	72	100	99	101	1.0%	Preexisting Problem and less than 3% Change, LGEE should Upgrade
7	TVA-EKPC: Franklin 161-69 kV transfmr	50	109	111	110	0.9%	Replaced by New EKPC Transfmr at Salmons

n/a - below 90% not reported

ADDENDUM 2 STUDY
(Supersedes Addendum Study)

TRANSMISSION SERVICE TO
WARREN RURAL ELECTRIC COOPERATIVE

Prepared for

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative

Prepared by:

CAI Commonwealth Associates, Inc.
engineers • consultants • construction managers

ADDENDUM 2 STUDY
(Supersedes Addendum Study)

TRANSMISSION SERVICE TO
WARREN RURAL ELECTRIC COOPERATIVE

Prepared for

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative

Prepared by:

D.A. Shafer, P.E.
R.D. Cook, P.E.
R.S. Smith

At the offices of
Commonwealth Associates, Inc.
P.O. Box 1124
Jackson, Michigan 49204

August 17, 2005
324001/404

Approved for submittal:

David A. Shafer, P.E.
Manager, Electrical Systems

TABLE OF CONTENTS

TABLES

EXHIBITS

APPENDIX A

INTRODUCTION

Background and Purpose

The Warren Rural Electric Cooperative (WRECC) is presently provided wholesale power by the Tennessee Valley Authority (TVA). WRECC has requested power supply and participation as a member of the East Kentucky Power Cooperative (EKPC). The target date for this service is April 2008.

Commonwealth Associates, Inc. (CAI) prepared a transmission service study to evaluate transmission requirements. A report summarizing the study was completed on January 27, 2005. An addendum to the study was completed on May 26, 2005. Both the first and this second addendum were prepared to study minor changes to the proposed plan for servicing WRECC. This second addendum documents all of the changes since the original study and therefore supersedes the first addendum.

Transmission System Modifications

The transmission system changes are listed below and shown on the attached one-line diagram (Exhibit 2).

1. Change Barren County-Magna 161 kV line length from 24 miles to 28.29 miles.

2. Upgrade the existing East Bowling Green-Oakland 69 kV line with a new 69 kV line consisting of 954 ACSS conductor. This new line will have a length of approximately 8.5 miles. The new ratings are 143/143 MVA summer normal/emergency.

3. Add a circuit breaker at the EKPC East Bowling Green station to eliminate the three-terminal line between TVA EBG-EKPC EBG-GM. Put one transformer on each side of the breaker at EKPC's EBG.

   Note: This change was studied and included in the January report – Phase 2, Case C.

4. Eliminate the BGMU Tap-Memphis Junction 161 kV line and instead loop the line from GM and Aberdeen through Memphis Junction. The distances are as follows:

   a. GM-Memphis Junction 161 kV – 14.96 miles
   b. Memphis Junction-Aberdeen 161 kV – 27.41 miles

   Note: This change was studied and included in the January report – Phase 2, Case C.

5. Open the Warren 69 kV connection with the City of Franklin. Install a 161-69 kV, 100 MVA transformer at Salmons. Connect the Salmons 161 kV bus to the TVA Franklin-Memphis Junction 161 kV line at a point 2.2 miles from the Franklin bus. Add a second Salmons-L28 circuit to loop the lines from Anaconda and Auburn into the Salmons Substation.

6. The 69 kV three-breaker station that was identified at PLNGRWT in the January 27 report will instead be built at Plano. A second PLNGRWT-Plano 69 kV line (1.1 miles) will be built using 556 MCM ACSR conductor to loop the lines from Memphis Junction and East Bowling Green through the new Plano station. The new ratings are 90/111 MVA summer normal/emergency.

7. The existing East Bowling Green-West Bowling Green 69 kV line will be eliminated. A new 69 kV line (3.5 miles) from Memphis Junction to West Bowling Green will be constructed using 556 MCM ACSR conductor. The new ratings are 90/111 MVA summer normal/emergency.

8. Add an Aberdeen-Morgantown 69 kV line (5 miles) using 556 MCM ACSR conductor. Open the existing Morgantown-South Morgantown 69 kV line. The new ratings are 90/111 MVA summer normal/emergency.

9. Remove the Franklin 69 kV capacitor.

Additional Transmission System Modifications for Addendum 2

The additional transmission system changes for this second addendum are listed below.

10. As recommended in the first addendum, upgrade the existing Salmons-K30 69 kV circuit by reconductoring with 556 ACSS conductor. The new rating for this circuit will be 88/108 MVA summer normal/emergency.

11. Upgrade the Summershade – Barren County 161 kV circuit by surveying and adjusting the circuit clearances to permit operation at 212° F. The new rating for this circuit will be 265/327 MVA summer normal/emergency.

12. Minor adjustments of circuit lengths and impedances resulting from further engineering studies for each of the proposed transmission circuits.

SUMMARY OF RESULTS AND CONCLUSIONS

Power Flow Base Case

The above-listed changes were incorporated into the study base case. The new case is labeled Case C, Rev. 7. The same contingencies used in the original study (modified where necessary because of the configuration changes) were used to test the proposed system. Results are provided in Appendix A.

Comparison of Case C and Case C Rev. 7 (also Rev. 6 per the first addendum)

Contingency testing of the new Case C Rev. 6 and Rev. 7 produced almost identical results to Case C, as summarized in the January report, with the following exceptions:

1. The City of Franklin 50 MVA transformer overload is eliminated in Case C Rev. 6 and Rev. 7.

2. The new overload observed on the Salmons-K30 69 kV line (summer normal and emergency ratings 31/37 MVA) in Case C Rev. 6 was eliminated in Rev. 7 by upgrading the circuit summer normal and emergency ratings to 88/108 MVA (item 10 above).

Conclusions

Tables 1 and 2 compare how Plan A (base case), Plan C (Phase 1 as described in the original January 27, 2005 report) and Plan C (Revision 7 as described in this Addendum) perform with respect to first contingency overloads in either WRECC, EKPC, or neighboring electric systems. Table 1 identifies those overloaded facilities in the base case that are improved or left unchanged. Table 2 describes eight situations where the proposed Plan C increases facility loadings.

As shown in these two tables, CAI identified 24 facilities that had preexisting NERC category B (single contingency conditions) overloads in Plan A (21 in Table 1 and 3 in Table 2). The initially proposed EKPC Plan C, Phase 1, resolves 19 of these overload conditions (no longer overloaded), reduces two of these overloads, leaves one preexisting overload unchanged, and makes two of the overloads worse. Thus, the EKPC original Plan C corrects, reduces, or leaves unchanged 22 of the 24 preexisting overloads in the base case.

Table 2 describes the two facilities made worse in Plan C, Phase 1, (items 1 and 2 in Table 2), plus an additional five facilities (items 3 through 7) where Plan C, Phase 1, resulted in new single contingency overload conditions (i.e., these facilities were not overloaded in Plan A). Item 8 shows the one item which was made slightly worse with the Addendum 2 changes.

Items 2, 3, and 4 in Table 2 are all related to service for the WRECC 69 kV region between Memphis Junction and Franklin, Kentucky. The Franklin 161-69 kV transformer is overloaded (109 percent) in Plan A. Implementation of Plan C, Phase 1, resulted in an additional one percent overloading (to 110 percent). As described in this addendum, EKPC has revised their proposed plan to add a new 100 MVA, 161-69 kV transformer at the 69 kV Salmons Substation and open the circuit connecting to the Franklin 69 kV bus, which eliminates the overloads of Item 2 in Table 2.

EKPC further proposes to upgrade the Salmons to K30 69 kV circuit with 556 MCM ACSR conductor, which will raise the summer emergency rating from 37 MVA to 108 MVA and therefore reduce the contingent loading level from 102 to 41 percent.

Items 1, 5, 6, 7, and 8 in Table 2 involve LGEE-owned and LGEE-EKPC interconnected facilities. With the changes proposed in this addendum, EKPC resolves six of the seven problems remaining from the original Plan C. The one percent overload seen in Item 1 (Taylor County 161-69 kV transformer) in the original Plan C is reduced to zero in Addendum 2 Plan C. It is our understanding that LGEE has revised the summer emergency ratings of Eastview to Stephensburg 69 kV to 49 MVA and Kosmos to Mill Creek 138 kV to 86 MVA (items 5 and 6). EKPC has indicated that these revised ratings were provided by LGEE as part of the development of joint planning cases in June of 2005. The revised ratings for these circuits will mitigate the facility overloads to 90 and 85 percent, respectively. Item 7 involves an LGEE facility that had a preexisting borderline loading level (99 percent), and the plan proposed by EKPC increases the loading by only one percent. Item 8 involves an LGEE-EKPC interconnection facility that is limited by EKPC's line conductor. A separate study by EKPC of this area is underway to identify the potential solutions to area problems. These should be reviewed with LGEE.

TABLES

TABLE 1
Contingency Overload Comparison
Where Case A Overloads Exceed Case C Loading

Item	Emerg Rating MVA	Case A (% of Emergency Rating)	Case C Phase 1 (% of Emergency Rating)	Case C Addend 2 (% of Emergency Rating)	% Change Case C vs Case A	Comments
161 & 138 kV Transmission						
TVA: Bowling Green - Lost City 161 kV	180	114	97	95	-16.7%	
TVA: Paradise - Aberdeen Tap 161 kV	350	107	n/a	n/a		
LGEE: Green River - Ohio Co. #1 138 kV	171	106	91	n/a		
LGEE: Green River - Ohio Co. #2 138 kV	171	103	n/a	n/a		
TVA: Gallatin - Hartsville 161 kV	371	105	n/a	n/a		
TVA: Franklin - Portland SS 161 kV	227	102	n/a	n/a		
LGEE: Ohio Co. - Shrewsbury 138 kV	171	103	n/a	n/a		
LGEE: Leitchfield - Shrewsbury 138 kV	96	101	96	95	-5.9%	
TVA-EKPC: Summershade 161 kV	239	101	n/a	n/a		
TVA: Memphis Jct - S. Bowling Gr. T 161 kV	227	101	n/a	n/a		
TVA: Bowling Green - S Bowling Gr. T 161 kV	227	100	n/a	n/a		
161 & 138 Transformers						
TVA: Huntsville 161-69 kV transfmr	50	120	n/a	115	-4.2%	Preexisting Overload - Reduced
EKPC: Bonnieville 138-69 kV transfmr	59	115	115	115	0.0%	Preexisting Overload - No Change
LGEE: Leitchfield 138-69 kV transfmr	86	114	108	106	-7.0%	Preexisting Overload - Reduced
LGEE: Ohio Co. 138-69 kV transfmr	86	100	91	n/a		
69 kV Transmission						
LGEE: Leitchfield - Millwood 69 kV	52	113	95	n/a		
LGEE: Green River - River Queen Tap 69 kV	54	104	96	n/a		
LGEE: Greenville West - River Queen 69 kV	49	103	101	103	0.0%	Preexisting Overload - No Change
LGEE: Caneyille Jct Rosine Jct 69 kV	68	103	n/a	n/a		
LGEE: Echols - Indian Hill 69 kV	56	102	93	n/a		
LGEE: KU Park - Pineville 69 kV	80	101	n/a	n/a		

TABLE 2
Contingency Overload Comparison
Where Case C Overloads Exceed Case A Loading

Item	Emerg Rating MVA	Case A (% of Emergency Rating)	Case C Phase 1 (% of Emergency Rating)	Case C Addend 2 (% of Emergency Rating)	% Change Case C vs Case A	Comments
1 EKPC-LGEE: Taylor County 161-69 kV transfmr	72	100	101	100	0.0%	Preexisting Overload - No Change
2 TVA-EKPC: Franklin 161-69 kV transfmr	50	109	110	n/a		Replaced by New EKPC Transfmr at Salmons
3 EKPC: Salmon - K30 69 kV	37	n/a	117	41		EKPC will upgrade this circuit, new SE 108 MVA (41%
4 EKPC: K30 - L30 69 kV	54	n/a	114	n/a		Opening the breaker at the Proposed new 69 kV Switching Station at Plano Corrects this Overload
5 LGEE-EKPC: Eastview - Stephensburg 69 kV	41	93	102	107	15.1%	LGEE already plans to upgrade, new SE 49 MVA (90%)
6 LGEE: Kosmos - Mill Ck 138 kV	72	96	101	97	1.0%	LGEE already plans to upgrade, new SE 86 MVA (85%
7 LGEE: Indian Hill - Peabody West 69 kV	27	99	102	100	1.0%	Borderline - Nearly overloaded in Base Case and changed by only 1% review with LGEE
8 LGEE-EKPC: Etown - Kargle 69 kV	69	101	99	102	1.0%	Preexisting Problem that changed by only 1% from base case, review with LGEE

1. Phase 1 - As reported in original report dated January 27, 2005
2. Addendum 2 - Additional mitigation as described in this report
3. n/a - below 90% not reported

Overload / Highest Overload

Exhibit 1

Transmission Map

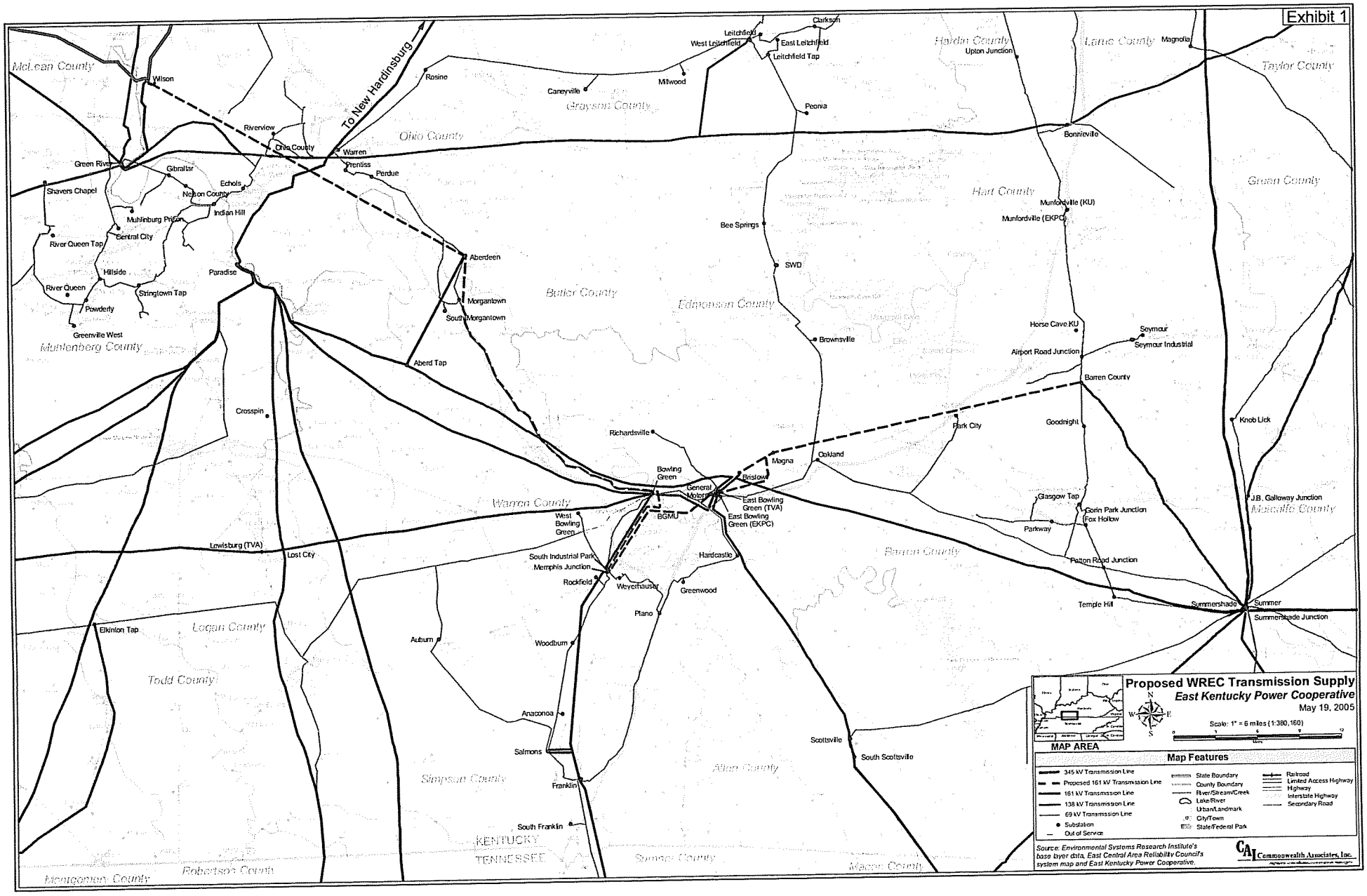
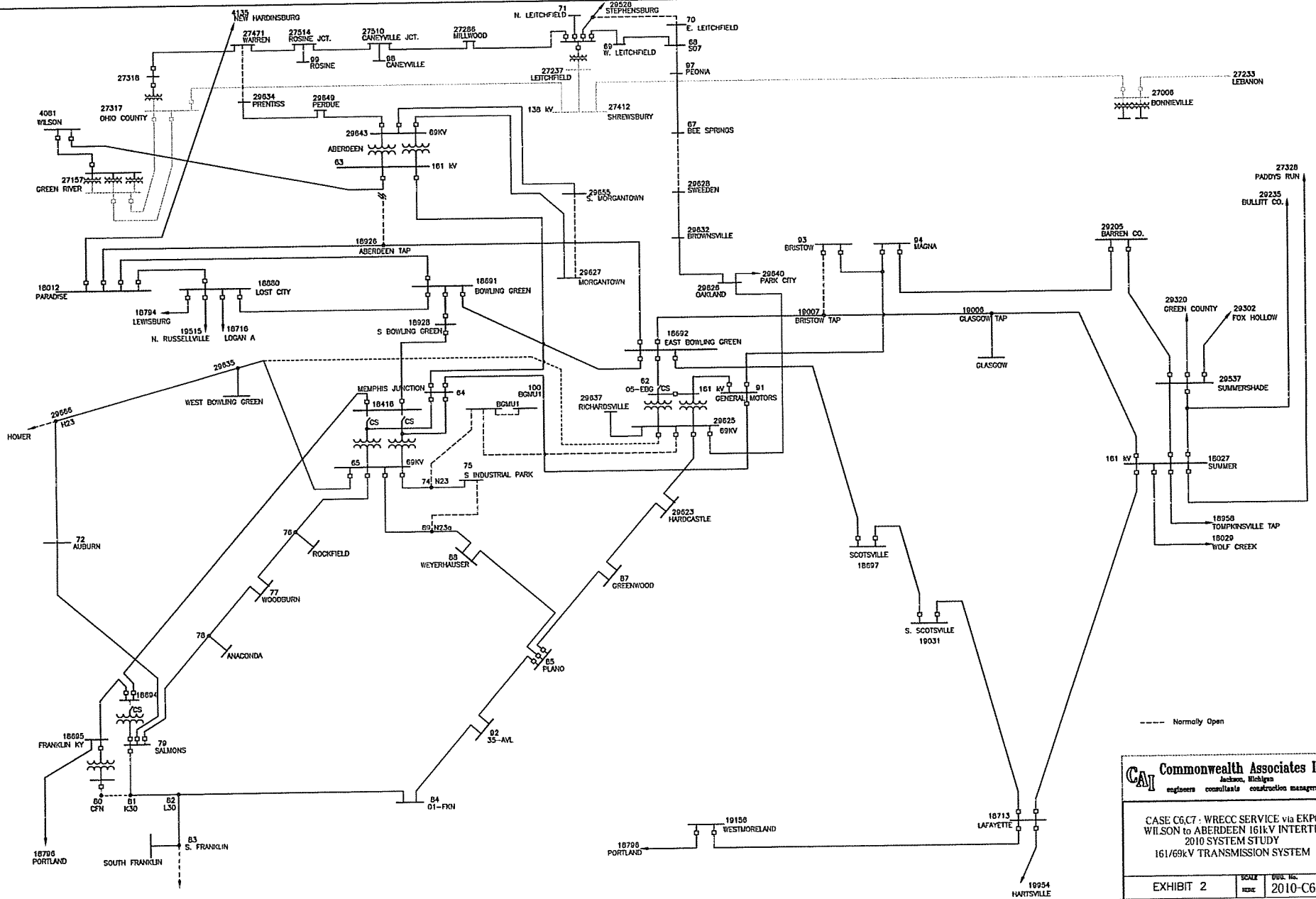


Exhibit 1
To New Hardinsburg
McLean County
Wilson
Rosine
Clarkson
Leitchfield
West Leitchfield
East Leitchfield
Leitchfield Tap
Caneyville
Millwood
Grayson County
Peonia
Hardin County
Upton Junction
Larue County
Magnolia
Taylor County
Riverview
Ohio County
Bonnieville
Green River
Gibraltar
Warren
Prentiss
Perdue
Echols
Shavers Chapel
Nelson County
Indian Hill
Muhlinburg Prison
Central City
River Queen Tap
Hillside
Paradise
River Queen
Stringtown Tap
Powderly
Greenville West
Muhlenberg County
Aberdeen
Morgantown
South Morgantown
Aberd Tap
Butler County
Bee Springs
SWD
Edmonson County
Brownsville
Hart County
Munfordville (KU)
Munfordville (EKPC)
Green County
Horse Cave KU
Seymour
Seymour Industrial
Airport Road Junction
Barren County
Park City
Goodnight
Knob Lick
Crosspin
Richardsville
Bowling Green
Magna
Oakland
Bristow
General Motors
East Bowling Green (TVA)
East Bowling Green (EKPC)
BGMU
Warren County
West Bowling Green
Glasgow Tap
Gorin Park Junction
Fox Hollow
Parkway
J.B. Galloway Junction
Metcalfe County
Lewisburg (TVA)
Lost City
South Industrial Park
Memphis Junction
Rockfield
Weyerhauser
Greenwood
Hardcastle
Barren River
Patton Road Junction
Temple Hill
Summershade
Summer
Summershade Junction
Elkinton Tap
Logan County
Auburn
Woodburn
Plano
Todd County
Anaconoa
Salmons
Franklin
Simpson County
Scottsville
South Scottsville
Allen County
South Franklin
KENTUCKY
TENNESSEE
Montgomery County
Robertson County
Sumner County
Macon County
Proposed WREC Transmission Supply
East Kentucky Power Cooperative
May 19, 2005
Scale: 1" = 6 miles (1:380,160)
MAP AREA
Map Features
345 kV Transmission Line
Proposed 161 kV Transmission Line
161 kV Transmission Line
138 kV Transmission Line
69 kV Transmission Line
Substation
Out of Service
State Boundary
County Boundary
River/Stream/Creek
Lake/River
Urban/Landmark
City/Town
State/Federal Park
Railroad
Limited Access Highway
Highway
Interstate Highway
Secondary Road
Source: Environmental Systems Research Institute's base layer data, East Central Area Reliability Council's system map and East Kentucky Power Cooperative.
Commonwealth Associates, Inc.

Exhibit 2

Case C Rev. 7 One-Line Diagram



Commonwealth Associates Inc.
Jackson, Michigan
engineers consultants construction managers

CASE C6,C7 - WRECC SERVICE via EKPC
WILSON to ABERDEEN 161kV INTERTIE
2010 SYSTEM STUDY
161/69kV TRANSMISSION SYSTEM

EXHIBIT 2 | SCALE NONE | Dwg. No. 2010-C6,C7

APPENDIX A

Case C Rev. 7 Reports

Case Summary EKPC_CaseC_R7

Project Name	EKPC 2010 Summer
Title1	WREC Service Via EKPC
Title2	Case C (Rev 7)
Case Date	8/9/2005

Power Flow File M:\PROJ\EKPC\324001\301PF\Addendum\EKPC_CaseC_R7.bin

Power Flow Controls

Area Control	☑	*SmoothStep*	☑
Remote Control	☑	*XfrmVcon*	☑
GenVar Control	☑	*XfrmFcon*	☑
Solve Method	DSOLVE		

Case Settings

Overload	☑	*VlimMin*	0.9	*RateFactor*	1
VLimit	☑	*VlimMax*	1.1	*AmpFactor*	1
VChange	☑	*VlimChange*	0.1	*RatingNumber*	2
Monitored Set	Monit	2842 Buses			

Contingency

Use Existing Contingencies from Tables *260 Buses*

321 contingencies

EKPC 2010 Summer

WREC Service Via EKPC

Case C (Rev 7)

8/9/2005

Contingency						Voltage Violations			
	Description	kV	Area	Zone	Over load	UnderV	OverV	Change	Not Solved
135	Line Wolf Creek to Wayne Co 161 kV	161	147	167	1	0	0	0	
215	Line Leitchfield to Shrews 138kV	138	211	211	2	1	0	8	
230	Line Green River to 27298 11MUHLNB 69 kV	69	211	211	1	0	0	0	
250	Line Ohio County to Warren 69 kV	69	211	211	1	0	0	0	
252	Line Caneyville Jct to Rosine Jct 69 kV	69	211	211	1	0	0	0	
255	Line Rosine Jct to Warren 69 kV	69	211	211	1	0	0	0	
262	Line Greensburg to Green Co. 69 kV	69	211-220	211-220	1	0	0	0	
405	Line Barren Co. to Horse Cave KU 69 kV	69	220	220	1	4	0	3	
422	Line Coburg Jct to Columbia 69 kV	69	220	220	0	3	0	0	
617	outage of 24952 06CLIFTY to 27447 11TRIMBL	345	206-211	206-211	1	0	0	0	
635	outage of 27001 11BLUE L to 27002 11BLUE L	345-161	211	211	1	0	0	0	
637	outage of 27001 11BLUE L to 27003 11BLUE L	345-138	211	211	1	2	0	0	
670	outage of 27280 11MIL CK to 27331 11PADDYW	345	211	211	1	0	0	0	
725	outage of 26974 11ASHBY to 27281 11MIL CK	138	211	211	1	0	0	0	
742	outage of 27003 11BLUE L to 27296 11MUD LA	138	211	211	0	1	0	0	
830	outage of 27218 11KNOB C to 27358 11POND C	138	211	211	0	5	0	0	
850	outage of 27326 11P WEST to 27328 11PADDYR	138	211	211	1	0	0	0	
855	outage of 27002 11BLUE L to 29235 20BLIT C	161	211-220	211-220	1	0	0	0	
865	outage of 29235 20BLIT C to 29271 20DARWJ	161	220	220	1	0	0	0	
930	outage of 27114 11ETOWN to 27179 11HARDN	138	211	211	2	0	0	0	
940	outage of 27179 11HARDN to 27384 11ROGERS	138	211	211	1	0	0	0	
1010	N2 - ABD-Wilson 1 161kV & EBG-E.Bowl.Gr 1 161kV				2	0	0	0	
	Totals: 22 contingencies cause violations				22	16	0	11	0

Notes:

1. Overloads are based on 100% of Rating 2
2. Undervoltage Limit is 0.90 (pu)
3. Overvoltage Limit is 1.10 (pu)
4. Voltage Change Limit is 0.10 (pu)

Not Solved Codes:

D - Diverged
I - Interrupted
F - Failed, One or More Contingency Commands Failed in PFlow

Area	Area Name	Zone	Zone Name	Contingency Buses	Monitored Buses
130	AECI				
		130	AECI	0	3
		137	AECI-KOK	0	1
				0	4
131	BCA				
		159	CENT-APL	0	5
				0	5
135	DEMT				
		125	DEMT	0	4
				0	4
141	CPLW				
		106	CPL-W	0	2
				0	2
142	DUK				
		111	DUKE.NAN	0	2
				0	2
146	SOCO				
		140	GA-ITS	0	15
		141	APC	0	26
				0	41
147	TVA				
		165	TVAWEST	0	273
		166	TVA_CENT	40	592
		167	TVAEAST	3	425
		168	TVA_MEMP	0	65
		169	ENRON	0	51
				43	1406
148	DOE				
		166	TVA_CENT	0	5
				0	5
151	EES				
		156	SW-LC	0	1
		157	EES_EAST	0	11
		159	CENT-APL	0	10
				0	22
156	DEMK				
		169	ENRON	0	6
				0	6
172	DEAM				
		169	ENRON	0	4
				0	4
173	AEGL				
		169	ENRON	0	3
				0	3
205	AEP				
		250	AEP-AP	0	12
		251	AEP-OP	0	4
		252	AEP-IM	1	1

Area	Area Name	Zone	Zone Name	Contingency Buses	Monitored Buses
		254	AEP-KP	0	20
				1	37
206	OVEC				
		206	OVEC	5	5
				5	5
207	HE				
		207	HE	1	4
				1	4
208	CIN				
		280	CGE	0	14
		281	PSI ENER	4	16
		283	ULHP	0	3
		286	CGE GENS	0	2
		290	PSI GENS	0	2
		291	HE IN PS	0	1
				4	38
209	DPL				
		209	DPL	0	5
				0	5
210	SIGE				
		210	SIGE	1	13
				1	13
211	LGEE				
		211	LGEE	107	567
				107	567
213	HMP&L				
		13	HMP&L	0	8
				0	8
214	BREC				
		1	PJM500KV	7	74
		2	EGYPTIAN	0	4
		3	SOUTHEAS	1	2
		10	PN 13KV	0	26
		20	HEND-UNI	0	20
		30	GREEN RI	0	29
		40	MEADE CO	0	18
		50	JACKSON	0	22
				8	195
220	EKPC				
		220	EKPC	50	393
		901	WARREN O	32	45
		902	WARREN O	8	10
				90	448
356	AMRN				
		316	SEMO	0	2
		321	SOUTHERN	0	1
				0	3
357	IP				
		357	IP_TRAN	0	1
				0	1
361	SIPC				

Area	Area Name	Zone	Zone Name	Contingency Buses	Monitored Buses
		352	SEIEC	0	7
		361	SIPC	0	1
				0	8
362	EEI				
		362	EEI	0	4
				0	4
599	EQ-SPP				
		515	SWPA	0	2
				0	2
				260	2842

EKPC 2010 Summer

WREC Service Via EKPC

Case C (Rev 7)

8/9/2005

Overloaded Facility										Normal System		Overloads	
From	Name	To	Name	Circuit	Base kV	Area	Zone	Ratings Norm	Ratings Emer	MVA	Norm (%)	Count A / B	Max (%)
18691	5BOWL GR	18928	5SBOWL T	1	161	147	166	227	227	71.1	31	1 / 0	129
18416	5MEMJUNC	18928	5SBOWL T	1	161	147	166	227	227	71.0	31	1 / 0	128
18806	5HUNT TN	19278	2HUNTSVI	1	161-69	147	167	50	50	45.6	91	1 / 0	115
27006	11BONNIE	29220	20BONNIE	1	138-69	211-220	211-220	44	59	31.4	71	1 / 0	115
27061	11CN RN6	27062	11CNE RN	1	138	211	211	287	287	252.1	88	1 / 3	111
27116	11ETWN 2	27371	11RADCL	1	69	211	211	52	52	13.1	25	1 / 0	107
27102	11EASTVW	29528	20STEPHN	1	69	211-220	211-220	41	41	1.6	4	1 / 0	107
27237	11LEITCH	27238	11LEITCH	1	138-69	211	211	75	86	64.9	87	2 / 1	106
27179	11HARDN	27180	11HARDN	2	138-69	211	211	120	138	90.2	75	0 / 1	103
27410	11SHLB S	27411	11SHLBYV	1	69	211	211	49	49	15.3	31	0 / 3	103
27168	11GRNV W	27377	11RIVR Q	1	69	211	211	49	49	27.2	56	0 / 1	103
27115	11ETOWN	29374	20KARGLE	1	69	211-220	211-220	57	69	47.1	83	0 / 1	102
27384	11ROGERS	27385	11ROGERS	1	138-69	211	211	93	107	84.6	91	0 / 1	101
29542	20TAYLOR	27437	11TAYLRC	1	161-69	220-211	220-211	72	72	51.2	71	0 / 1	100
												9 / 12	129

Notes:

1. Overloads are based on 100% of Rating 2
2. NS = Normal System Conditions (No Outages)
3. Minimum Reporting Level is 100%
4. Statistical Information (A/B Stats and Maximum Overload)
   A = Serious Overload > 105%
   B = Overloaded Facility between 100% and 105% of Rated Capability

EKPC 2010 Summer
WREC Service Via EKPC
Case C (Rev 7)
8/9/2005

Overloaded Facility From	Name	Contingency To	Name	Circuit	Base kV	Area	Zone	Ratings Norm	Ratings Emer		Overloads MVA	Overloads Norm (%)	Overloads Emer (%)
18691	5BOWL GR	18928	5SBOWL T	1	161	147	166	227	227	NS	71	31	31
	1010		N2 - ABD-Wilson 1 161kV & EBG-E.								293	129	129
											1 / 0		129
18416	5MEMJUNC	18928	5SBOWL T	1	161	147	166	227	227	NS	71	31	31
	1010		N2 - ABD-Wilson 1 161kV & EBG-E.								291	128	128
											1 / 0		128
18806	5HUNT TN	19278	2HUNTSVI	1	161-69	147	167	50	50	NS	46	91	91
	135		Line Wolf Creek to Wayne Co 161 kV	1	161	147	167				57	115	115
											1 / 0		115
27006	11BONNIE	29220	20BONNIE	1	138-69	211-220	211-220	44	59	NS	31	71	53
	405		Line Barren Co. to Horse Cave KU 69	1	69	220	220				68	153	115
											1 / 0		115
27061	11CN RN6	27062	11CNE RN	1	138	211	211	287	287	NS	252	88	88
	670		outage of 27280 11MIL CK to 27331	1	345	211	211				319	111	111
	850		outage of 27326 11P WEST to 27328	1	138	211	211				299	104	104
	637		outage of 27001 11BLUE L to 27003	1	345-138	211	211				294	103	103
	725		outage of 26974 11ASHBY to 27281	1	138	211	211				290	101	101
											1 / 3		111
27116	11ETWN 2	27371	11RADCL	1	69	211	211	52	52	NS	13	25	25
	940		outage of 27179 11HARDN to 27384	1	138	211	211				56	107	107
											1 / 0		107
27102	11EASTVW	29528	20STEPHN	1	69	211-220	211-220	41	41	NS	2	4	4
	215		Line Leitchfield to Shrews 138kV	1	138	211	211				44	107	107
											1 / 0		107
27237	11LEITCH	27238	11LEITCH	1	138-69	211	211	75	86	NS	65	87	75
	250		Line Ohio County to Warren 69 kV	1	69	211	211				91	122	106
	255		Line Rosine Jct to Warren 69 kV	1	69	211	211				91	122	106
	252		Line Caneyville Jct to Rosine Jct 69 k	1	69	211	211				87	116	101
											2 / 1		106
27179	11HARDN	27180	11HARDN	2	138-69	211	211	120	138	NS	90	75	65
	930		outage of 27114 11ETOWN to 2717	1	138	211	211				142	118	103
											0 / 1		103
27410	11SHLB S	27411	11SHLBYV	1	69	211	211	49	49	NS	15	31	31
	635		outage of 27001 11BLUE L to 27002	1	345-161	211	211				50	103	103
	855		outage of 27002 11BLUE L to 29235	1	161	211-220	211-220				50	103	103
	865		outage of 29235 20BLIT C to 29271 2	1	161	220	220				50	101	101
											0 / 3		103
27168	11GRNV W	27377	11RIVR Q	1	69	211	211	49	49	NS	27	56	56
	230		Line Green River to 27298 11MUHLN	1	69	211	211				50	103	103
											0 / 1		103

Overloaded Facility		Contingency								Overloads		
From	Name	To	Name	Circuit	Base kV	Area	Zone	Ratings Norm	Ratings Emer		MVA	Norm (%)	Emer (%)
27115	11ETOWN	29374	20KARGLE	1	69	211-220	211-220	57	69	NS	47	83	68
	215		Line Leitchfield to Shrews 138kV	1	138	211	211				70	123	102
											0 / 1		102
27384	11ROGERS	27385	11ROGERS	1	138-69	211	211	93	107	NS	85	91	79
	930		outage of 27114 11ETOWN to 2717	1	138	211	211				108	117	101
											0 / 1		101
29542	20TAYLOR	27437	11TAYLRC	1	161-69	220-211	220-211	72	72	NS	51	71	71
	262		Line Greensburg to Green Co. 69 kV	1	69	211-220	211-220				72	100	100
											0 / 1		100
											9 / 12		128.9

Notes:

1. Overloads are based on 100% of Rating 2
2. NS = Normal System Conditions (No Outages)
3. Minimum Reporting Level is 100%
4. Statistical Information (A/B Stats and Maximum Overload)
   A = Serious Overload > 105%
   B = Overloaded Facility between 100% and 105% of Rated Capability

EKPC 2010 Summer

WREC Service Via EKPC

Case C (Rev 7)

8/9/2005

Undervoltage Bus	Name	Base kV	Area	Zone	Normal System Voltage (pu)	Voltage Violations A / B	Min (pu)
29339	20HCAVKU	69	220	220	0.9899	1 / 0	0.7733
29428	20MUNFKU	69	220	220	0.9801	1 / 0	0.8052
29427	20MUNFVL	69	220	220	0.9807	1 / 0	0.8198
27496	11FAIRMN	69	211	211	0.9229	1 / 1	0.8775
29252	20COLKU2	69	220	220	0.9707	0 / 1	0.8809
27320	11OLINCO	69	211	211	0.9726	0 / 1	0.8818
29251	20COLKU1	69	220	220	0.9748	0 / 1	0.8854
29255	20COLUMB	69	220	220	0.9782	0 / 1	0.8892
27497	11SMYRNA	69	211	211	0.9351	0 / 1	0.8903
27237	11LEITCH	138	211	211	0.9834	0 / 1	0.8917
27439	11TIPT 1	69	211	211	0.9823	0 / 1	0.8949
29220	20BONNIE	69	220	220	0.9951	0 / 1	0.8969
27441	11TIPT M	99	211	211	0.9893	0 / 1	0.8981
27442	11TIPTOP	138	211	211	0.9824	0 / 1	0.8982
27358	11POND C	138	211	211	0.9941	0 / 1	0.8984
						4 / 12	0.7733

Notes:

1. Minimum Voltage Limit 0.90 (pu)
2. NS = Normal System Conditions (No Outages)
3. Maximum Reporting Level is 90%
4. Statistical Information (A/B Stats and Minimum Voltage)
   A = Serious Undervoltage < 0.88 (pu)
   B = Low Voltages between 0.88 and 0.90 (pu)

EKPC 2010 Summer
WREC Service Via EKPC
Case C (Rev 7)
8/9/2005

OverVoltage Bus	Voltage Violations
No Overvoltage Violations	

EKPC 2010 Summer

WREC Service Via EKPC

Case C (Rev 7)

8/9/2005

VChange Bus	Name	Base kV	Area	Zone	Normal System Voltage (pu)	Voltage Violations A / B	Max (pu)
29339	20HCAVKU	69	220	220	0.9899	1 / 0	-0.2166
29428	20MUNFKU	69	220	220	0.9801	1 / 0	-0.1749
29427	20MUNFVL	69	220	220	0.9807	1 / 0	-0.1608
67	30-BEE	69	220	902	1.0393	0 / 1	-0.1085
97	34-PEO	69	220	902	1.0311	0 / 1	-0.1067
70	15-ELF	69	220	902	1.0193	0 / 1	-0.1047
68	S07	69	220	902	1.0208	0 / 1	-0.1045
71	31-NLF	69	220	902	1.0136	0 / 1	-0.1036
69	09-WLF	69	220	902	1.0177	0 / 1	-0.1032
27238	11LEITCH	69	211	211	1.0176	0 / 1	-0.1031
27236	11LEIT C	69	211	211	1.0162	0 / 1	-0.1017
						3 / 8	-0.2166

Notes:

1. Voltage Change Limit is 0.10 (pu)
2. NS = Normal System Conditions (No Outages)
3. Minimum Reporting Level is 10%
4. Statistical Information (A/B Stats and Maximum Voltage Change)
   A = Serious Voltage Change > 0.12 (pu)
   B = Excessive Voltage Change between 0.1 and 0.12 (pu)

EKPC 2010 Summer
WREC Service Via EKPC
Case C (Rev 7)
8/9/2005

No.	Contingency	Ckt	Base kV	Area	Zone
20	Line Paradise to Hopkinsville 161kV #1	1	161	147	166
22	Line Paradise to Hopkinsville 161kV #2	2	161	147	166
25	Line Paradise to Bowling Green 161 kV	1	161	147	166
27	Line Paradise to Crosspin 161 kV	1	161	147	166
30	Line Paradise to Lost City 161 kV	1	161	147	166
32	Line Paradise to Aberdeen Tap 161 kV	1	161	147	166
35	Line Paradise to Elkton Tap 161 kV	1	161	147	166
37	Line Summer to Lafayette 161 kV	1	161	147	166
40	Line Summer to Tompkin Tap 161 kV	1	161	147	166
42	Line Summer to Glasgow Tap 161 kV	1	161	147	166
45	Line Memphis Junction to SALMONS 161 kV	1	161	147	166
46	Line SALMONS to Franklin Ky 161 kV	1	161	147	166
50	Line Memphis Junction to S. Bowling Green Tap 161 kV	1	161	147	166
52	Line E. Gallatin to Foutain Head 161 kV	1	161	147	166
55	Line Hopkinsville to Lewisburg 161 kV	1	161	147	166
57	Line Hopkinsville to Superior Graphite Tap 161 kV	1	161	147	166
60	Line Hopkinsville to Cadiz Tap 161 kV	1	161	147	166
62	Transformer Hopkinsville	1	161-1	147	166
65	Line Russellville Ky to N. Russellville 161 kV	1	161	147	166
67	Line Bowling Green to E. Bowling Green 161kV	1	161	147	166
70	Line Bowling Green to Lost City 161kV	1	161	147	166
72	Line Bowling Green to S. Bowling Green Tap 161kV	1	161	147	166
75	Line Bowling Green to S. Bowling Green SW 161 kV	1	161	147	166
77	Line E. Bowling Green to Scottsville 161kV	1	161	147	166
80	Line E. Bowling Green to Aberdeen Tap 161kV	1	161	147	166
82	Line E. Bowling Green to Bristow Tap 161kV	1	161	147	166
85	Line Franklin Ky to Portland SS 161 kV	1	161	147	166
87	Line Portland to Portland SS 161 kV	1	161	147	166
90	Line Scottsville to S. Scotsville 161kV	1	161	147	166
92	Line Gallatin to Hartsville 161kV	1	161	147	166
95	Line Lafayette to S. Scotsville 161kV	1	161	147	166
97	Line Lafayette to Hartsville 161kV	1	161	147	166
100	Line Lafayette to Westmoreland 161kV	1	161	147	166
102	Line Springfield to Logan Aluminum 161 kV	1	161	147	166
105	Line Logan Aluminum to Lost City 161kV	1	161	147	166
107	Line Goodlet to Crosspin 161 kV	1	161	147	166
110	Line Lewisburg to Lost City 161kV	1	161	147	166
112	Line Portland SS to Fountain Head 161 kV	1	161	147	166
115	Line Portland SS to Westmoreland 161 kV	1	161	147	166
117	Line Lost City to N. Russellville 161 kV	1	161	147	166
120	Line Dunbar Cave to Elkton Tap 161 kV	1	161	147	166

No.	Contingency	Ckt	Base kV	Area	Zone
122	Line Glasgow Tap to Bristow Tap 161 kV	1	161	147	166
125	Line Tompkinsville to Summer 69 kV	1	69	147	166
127	Line Tompkinsville to Dale 69 kV	1	69	147	166
130	Line Summer to Dale 69 kV	1	69	147	166
132	Line Summer to Wolf Creek 161kV	1	161	147	166-167
135	Line Wolf Creek to Wayne Co 161 kV	1	161	147	167
145	Line Wolf Creek to Huntsville 161 kV	1	161	147	167
147	Line Wolf Creek to Tompkinsville Tap 161 kV	1	161	147	167-166
150	Line Summer to Paddys Run 161kV	1	161	147-211	166-211
152	Line Paradise to New Hardinsburg 161 kV	1	161	147-214	166-3
155	Line Summer to Summer Shade 161 kV	1	161	147-220	166-220
157	Line Summer to Summer Shade Tap 161kV	1	161	147-220	166-220
160	Transformer Franklin KY 161/69 kV #1	1	161-69	147-220	166-901
161	Transformer Salmons 161/69 kV Xfm	1	161-69	147-220	166-901
162	Line Wolf Creek to Russell 161 kV	1	161	147-220	167-220
165	Line Corydon Tap to Green River 161 kV	1	161	211	211
167	Transformer Green River 161/138 kV #1	1	161-138	211	211
170	Transformer Green River 161/138 kV #2	2	161-138	211	211
172	Transformer Green River 161/138 kV #3	3	161-138	211	211
175	Line Green River to River Queen Tap 161 kV	1	161	211	211
177	Transformer Paddys Run 161/138 kV #1	1	161-138	211	211
180	Transformer Paddys Run 161/138 kV #2	2	161-138	211	211
182	Transformer Bonnieville 138/69 kV #1	1	138-69	211	211
185	Line Bonnieville to Lebanon West 138 kV	1	138	211	211
187	Line Bonnieville to Shrews 138 kV	1	138	211	211
190	Line Cloverport to Green River Steel 138kV	1	138	211	211
192	Transformer Green River 138/69 kV #1	1	138-69	211	211
195	Transformer Green River 138/69 kV #2	2	138-69	211	211
197	Line Green River to Green River Steel 161 kV	1	138	211	211
200	Line Green River to Ohio County 161kV #1	1	138	211	211
202	Line Green River to Ohio County 161kV #2	2	138	211	211
205	Transformer Green River Steel 138/69 kV	1	138-69	211	211
207	Line Green River Steel to Smith 138 kV	1	138	211	211
210	Line Lebanon West to Lebanon 138 kV	1	138	211	211
215	Line Leitchfield to Shrews 138kV	1	138	211	211
217	Transformer Ohio County 138/69 kV #2	1	138-69	211	211
220	Line Ohio County to Shrews 138kV	1	138	211	211
222	Line Bonnieville to 27417 11SONORA 69 kV	1	69	211	211
225	Line Eastview to Leitchfield C 69 kV	EQ	69	211	211
227	Line 27154 11GIBRLT to Green River 69 kV	1	69	211	211
230	Line Green River to 27298 11MUHLNB 69 kV	1	69	211	211
232	Line Green River to River Queen Tap 161kV	1	69	211	211
235	Line Green River to 27407 11SHAVR 69 kV	1	69	211	211
237	Line Greenburg to Green River Plaza 69 kV	EQ	69	211	211
240	Line Leitchfield C to Leitchfield 69 kV	1	69	211	211

No.	Contingency	Ckt	Base kV	Area	Zone
242	Line Leitchfield to Millwood 69 kV	1	69	211	211
245	Line Millwood to Caneyville Jct 69 kV	1	69	211	211
247	Line Ohio County to Riverview 69 kV	1	69	211	211
250	Line Ohio County to Warren 69 kV	1	69	211	211
252	Line Caneyville Jct to Rosine Jct 69 kV	1	69	211	211
255	Line Rosine Jct to Warren 69 kV	1	69	211	211
257	Transformer Bonnieville 138/69 kV #1	1	138-69	211-220	211-220
260	Line Eastview to Stephenburg 69 kV	1	69	211-220	211-220
262	Line Greensburg to Green Co. 69 kV	1	69	211-220	211-220
265	Transformer Wilson 345/161 kV #1	1	345-161	214	1
267	Transformer Wilson 345/161 kV #2	2	345-161	214	1
270	Line Wilson to Reid 345 kV	1	345	214	1
272	Line Wilson to Coleman 345 kV	1	345	214	1
277	Transformer New Hardinsburg 69/161 kV #1	1	69-161	214	1-3
280	Transformer New Hardinsburg 69/161 kV #2	2	69-161	214	1-3
282	Line Meade Co to New Hardinsburg 161 kV	1	161	214	1-3
285	Transformer New Hardinsbuurg 138/161 kV	1	138-161	214	1-3
287	Line Wilson to Green River 161 kV	1	161	214-211	1-211
290	Line New Hardinsburg to Cloverport 138 kV	1	138	214-211	1-211
292	Line 62 05-EBG to 91 22-GMC 161 kV	1	161	220	901
293	Line GMC-EBG 161 kV & Xfm EBG 161-69 kV #2		161-69	220	901
296	Line Aberdeen to Memphis Jct 161 kV	1	161	220	901
297	Transformer Memphis Jct 161/69 kV #1	1	161-69	220	901
300	Transformer Memphis Jct 161/69 kV #2	2	161-69	220	901
305	Line 22-GMC to Magna 161 kV	1	161	220	901
308	Line 22-GMC to Memphis Jct 161 kV	1	161	220	901
310	Line 28-BRI to Magna 161 kV	1	161	220	901
312	Line Barren Co. to Magna 161 kV	1	161	220	220-901
315	Transformer Barren Co. 161/69 kV #1	1	161-69	220	220
317	Line Barren Co. to Summershade 161 kV	1	161	220	220
320	Line Bullitt Co. to Summershade Tap 161 kV	1	161	220	220
322	Transformer Fox Hollow 161/69 kV #1	1	161-69	220	220
325	Line Fox Hollow to Summershade 161 kV	1	161	220	220
327	Transformer Green Co. 161/69 kV #1	1	161-69	220	220
330	Line Green Co. to Summershade 161 kV	1	161	220	220
332	Line Green Co. to Tayctp 161 kV	1	161	220	220
335	Transformer Summershade 161/69 kV #1	1	161-69	220	220
337	Line Summershade to Summershade Tap 161 kV	1	161	220	220
340	Line Memphis Jct to 17-RFD 69 kV	1	69	220	901
342	Line 30-BEE to 34-PEO 69 kV	1	69	220	902
345	Line S07 to 09-WLF 69 kV	1	69	220	902
347	Line S07 to 15-ELF 69 kV	1	69	220	902
351	Line 02-AUB to SALMONS 69 kV	1	69	220	901
353	Line ANACONDA to 25-SAL 69 kV	1	69	220	901
355	Line N23 to Memphis Jct 69 kV	1	69	220	901

No.	Contingency	Ckt	Base kV	Area	Zone
357	Line N23 to 26-SIP 69 kV	1	69	220	901
360	Line 17-RFD to 03WBN 69 kV	1	69	220	901
362	Line 03-WBN to Anaconda 69 kV	1	69	220	901
367	Line 25-SAL to K30 69 kV	1	69	220	901
372	Line CFN to Franklin KY 69 kV	1	69	220	901
375	Line K30 to L30 69 kV	1	69	220	901
377	Line L30 to 20-SFN 69 kV	1	69	220	901
380	Line L30 to 01-FKN 69 kV	1	69	220	901
382	Line 01-FKN to 35-AVL 69 kV	1	69	220	901
385	Line 18-PLN to PLNGRWT 69kV	1	69	220	901
387	Line 18-PLN to 35-AVL 69kV	1	69	220	901
393	Line PLANO to 23-WEY 69 kV	1	69	220	901
395	Line 23-WEY to N23A 69 kV	1	69	220	901
397	Line N23A to Memphis Junction 69 kV	1	69	220	901
400	Line 34-PEO to S07 69 kV	1	69	220	902
402	Line Barren Co. to Goodnight 69 kV	1	69	220	220
405	Line Barren Co. to Horse Cave KU 69 kV	1	69	220	220
407	Line Bonnieville to Munfordville 69 kV	1	69	220	220
410	Line Bonnieville to Upton Jct. 69 kV	1	69	220	220
412	Line Burks Jct to Snow Jct 69 kV	1	69	220	220
415	Line Burks Jct to Summershade 69 kV	1	69	220	220
417	Line Coburg to Colburg Jct 69 kV	1	69	220	220
420	Line Coburg to Green Co 69 kV	1	69	220	220
422	Line Coburg Jct to Columbia 69 kV	1	69	220	220
425	Line Coburg Jct to Sewellton Jct 69 kV	1	69	220	220
427	Line 29251 20COLKU1 to Columbia 69 kV	1	69	220	220
432	Line Columbia to W. Columbia 69 kV	1	69	220	220
435	Line Fox Hollow to Gorin Park Jct 69 kV	1	69	220	220
440	Line Fox Hollow to Patton Road Jct 69 kV	1	69	220	220
442	Line Glendale to Stephensburg 69 kV	1	69	220	220
445	Line Goodnight to Gorin Park Jct 69 kV	1	69	220	220
447	Line Green Co to Greensburg 69 kV	1	69	220	220
450	Line Green Co to Summersville 69 kV	1	69	220	220
452	Line Greensburg to McKinneys Corner Jct 69 kV	1	69	220	220
455	Line Horse Cave KU to Munfordville KU 69 kV	1	69	220	220
457	Line JB Galloway to Knoblick 69 kV	1	69	220	220
460	Line JB Galloway to Summershade 69 kV	1	69	220	220
462	Line Kargle to Stephensburg 69 kV	1	69	220	220
465	Line Knoblick to McKinneys Corner Jct 69 kV	1	69	220	220
467	Line Magnolia to Summersville 69 kV	1	69	220	220
470	Line Munfordville to Munfordville KU 69 kV	1	69	220	220
472	Line Patton Road Jct to Temple Hill 69 kV	1	69	220	220
475	Line Russell Springs Jct to Sewellton Jct 69 kV	1	69	220	220
477	Line Salem Jct to Sewellton Jct 69 kV	1	69	220	220
480	Line SSPJTH Tap to Summershade 69 kV	1	69	220	220

No.	Contingency	Ckt	Base kV	Area	Zone
482	Line SSPJTH Tap to Temple Hill 69 kV	1	69	220	220
485	Line Stephensburg to Upton Jct 69 kV	1	69	220	220
487	Line Summershade to W. Columbia Jct 69 kV	1	69	220	220
490	Line W. Columbia to W. Columbia Jct 69 kV	1	69	220	220
492	Line 05-EBG to E. Bowling Green 161 kV	1	161	220-147	901-166
493	Line E. Bowling Green-EBG 161 kV & Xfm EBG 161-69 kV #1		161-69	220-147	901-166
497	Line 09-WLF to Leitchfield 69 kV	1	69	220-211	902-211
500	Line 31-NLF to Leitchfield 69 kV	1	69	220-211	902-211
502	Line 12-CAN to Caneyville Jct 69 kV	1	69	220-211	902-211
505	Line 10-ROS to Rosine Jct 69 kV	1	69	220-211	902-211
507	Line Aberdeen to Wilson 161 kV	1	161	220-214	901-1
510	Line Auburn to H23 69 kV	1	69	220	901
512	Line H23 to W. Bowling Green 69 kV	1	69	220	901
516	Line W Bowling Green to Memphis Junction 69 kV	1	69	220	901
517	Line E. Bowling Green to Hardcastle 69 kV	1	69	220	901
520	Line Hardcastle to Greenwood 69 kV	1	69	220	901
522	Line E. Bowling Green to 06-Oak 69 kV	1	69	220	901
525	Line E. Bowling Green to 16-Rvl 69 kV	1	69	220	901
600	outage of 22667 05JEFRSO to 24952 06CLIFTY	1	765-345	205-206	252-206
602	outage of 24952 06CLIFTY to 24953 06CLIFTY	1A	345-138	206	206
605	outage of 24952 06CLIFTY to 24953 06CLIFTY	1B	345-138	206	206
607	outage of 24952 06CLIFTY to 24959 06DEARB1	1	345	206	206
610	outage of 24952 06CLIFTY to 24960 06DEARB2	2	345	206	206
612	outage of 24952 06CLIFTY to 24962 06PIERC2	1	345	206	206
615	outage of 24952 06CLIFTY to 24962 06PIERC2	2	345	206	206
617	outage of 24952 06CLIFTY to 27447 11TRIMBL	1	345	206-211	206-211
620	outage of 24953 06CLIFTY to 27310 11NORTHS	1	138	206-211	206-211
622	outage of 25181 07RAMSY5 to 25388 08SPEED	1	345	207-208	207-281
625	outage of 25388 08SPEED to 25515 08SPEED	1	345-138	208	281
627	outage of 25388 08SPEED to 27447 11TRIMBL	1	345	208-211	281-211
630	outage of 26473 08TRIMBL to 27447 11TRIMBL	1	345	208-211	281-211
632	outage of 25520 08GALAGH to 27326 11P WEST	1	138	208-211	281-211
635	outage of 27001 11BLUE L to 27002 11BLUE L	1	345-161	211	211
637	outage of 27001 11BLUE L to 27003 11BLUE L	1	345-138	211	211
640	outage of 27001 11BLUE L to 27276 11MIDDLT	1	345	211	211
642	outage of 27001 11BLUE L to 27280 11MIL CK	1	345	211	211
645	outage of 27025 11BUCKNR to 27276 11MIDDLT	1	345	211	211
647	outage of 27025 11BUCKNR to 27447 11TRIMBL	1	345	211	211
650	outage of 27276 11MIDDLT to 27277 11MIDDLT	1	345-138	211	211
652	outage of 27276 11MIDDLT to 27277 11MIDDLT	2	345-138	211	211
655	outage of 27276 11MIDDLT to 27277 11MIDDLT	3	345-138	211	211
657	outage of 27276 11MIDDLT to 27277 11MIDDLT	4	345-138	211	211
660	outage of 27276 11MIDDLT to 27280 11MIL CK	1	345	211	211
662	outage of 27276 11MIDDLT to 27447 11TRIMBL	1	345	211	211
665	outage of 27280 11MIL CK to 27281 11MIL CK	1	345-138	211	211

No.	Contingency	Ckt	Base kV	Area	Zone
667	outage of 27280 11MIL CK to 27281 11MIL CK	2	345-138	211	211
670	outage of 27280 11MIL CK to 27331 11PADDYW	1	345	211	211
672	outage of 27309 11NORTHS to 27310 11NORTHS	1	345-138	211	211
675	outage of 27309 11NORTHS to 27331 11PADDYW	1	345	211	211
677	outage of 27331 11PADDYW to 27326 11P WEST	1	345-138	211	211
680	outage of 27447 11TRIMBL to 27448 11TRIMBL	1	345-138	211	211
687	outage of 26941 113832 T to 26972 11ASHBOT	1	138	211	211
690	outage of 26941 113832 T to 27062 11CNE RN	1	138	211	211
692	outage of 26941 113832 T to 27353 11PLSRDG	1	138	211	211
695	outage of 26942 113842 T to 27277 11MIDDLT	1	138	211	211
697	outage of 26942 113842 T to 27473 11WATTRS	1	138	211	211
700	outage of 26943 113870 T to 26986 11BEARGR	1	138	211	211
702	outage of 26943 113870 T to 27277 11MIDDLT	1	138	211	211
705	outage of 26943 113870 T to 27352 11PLAINV	1	138	211	211
707	outage of 26954 11ALGNQU to 27090 11DIXIE	1	138	211	211
710	outage of 26964 11APPLPA to 26972 11ASHBOT	1	138	211	211
712	outage of 26964 11APPLPA to 27112 11ETHEL	1	138	211	211
715	outage of 26964 11APPLPA to 27277 11MIDDLT	1	138	211	211
717	outage of 26972 11ASHBOT to 27062 11CNE RN	1	138	211	211
720	outage of 26972 11ASHBOT to 27162 11GRADE	1	138	211	211
722	outage of 26972 11ASHBOT to 27266 11MANSLI	1	138	211	211
725	outage of 26974 11ASHBY to 27281 11MIL CK	1	138	211	211
727	outage of 26974 11ASHBY to 27353 11PLSRDG	1	138	211	211
730	outage of 26982 11BARDST to 27021 11BRWNCT	1	138	211	211
732	outage of 26986 11BEARGR to 27257 11LYNDON	1	138	211	211
735	outage of 26986 11BEARGR to 27310 11NORTHS	1	138	211	211
737	outage of 26994 11BG PKW to 27200 11HRSTBR	1	138	211	211
740	outage of 26994 11BG PKW to 27277 11MIDDLT	1	138	211	211
742	outage of 27003 11BLUE L to 27296 11MUD LA	1	138	211	211
745	outage of 27011 11BRCKNG to 27112 11ETHEL	1	138	211	211
747	outage of 27011 11BRCKNG to 27200 11HRSTBR	1	138	211	211
750	outage of 27014 11BRDGHE to 27061 11CN RN6	1	138	211	211
752	outage of 27014 11BRDGHE to 27281 11MIL CK	1	138	211	211
755	outage of 27019 11BRWN N to 27021 11BRWNCT	1	138	211	211
757	outage of 27019 11BRWN N to 27022 11BRWNT1	1	138	211	211
760	outage of 27019 11BRWN N to 27023 11BRWNT2	1	138	211	211
762	outage of 27020 11BRWN P to 27022 11BRWNT1	1	138	211	211
765	outage of 27020 11BRWN P to 27023 11BRWNT2	1	138	211	211
767	outage of 27020 11BRWN P to 27128 11FAWKES	1	138	211	211
770	outage of 27020 11BRWN P to 27273 11MERCR	1	138	211	211
772	outage of 27020 11BRWN P to 27458 11W CLIF	1	138	211	211
775	outage of 27020 11BRWN P to 27458 11W CLIF	2	138	211	211
777	outage of 27021 11BRWNCT to 27022 11BRWNT1	1	138	211	211
780	outage of 27021 11BRWNCT to 27023 11BRWNT2	1	138	211	211
782	outage of 27021 11BRWNCT to 27080 11DANVIL	1	138	211	211

No.	Contingency	Ckt	Base kV	Area	Zone
785	outage of 27031 11CAMPGR to 27062 11CNE RN	1	138	211	211
787	outage of 27031 11CAMPGR to 27328 11PADDYR	1	138	211	211
790	outage of 27032 11CANAL to 27326 11P WEST	1	138	211	211
792	outage of 27044 11CENTRF to 27277 11MIDDLT	1	138	211	211
795	outage of 27044 11CENTRF to 27448 11TRIMBL	1	138	211	211
797	outage of 27048 11CLARK to 27128 11FAWKES	1	138	211	211
800	outage of 27061 11CN RN6 to 27062 11CNE RN	1	138	211	211
802	outage of 27062 11CNE RN to 27328 11PADDYR	1	138	211	211
805	outage of 27080 11DANVIL to 27273 11MERCR	1	138	211	211
807	outage of 27090 11DIXIE to 27328 11PADDYR	1	138	211	211
810	outage of 27127 11FAWK T to 27128 11FAWKES	1	138	211	211
812	outage of 27131 11FERNVL to 27162 11GRADE	1	138	211	211
815	outage of 27131 11FERNVL to 27319 11OKOLON	1	138	211	211
817	outage of 27131 11FERNVL to 27473 11WATTRS	1	138	211	211
820	outage of 27144 11FORD to 27277 11MIDDLT	1	138	211	211
822	outage of 27200 11HRSTBR to 27352 11PLAINV	1	138	211	211
825	outage of 27218 11KNOB C to 27219 11KOSMOS	1	138	211	211
827	outage of 27218 11KNOB C to 27281 11MIL CK	1	138	211	211
830	outage of 27218 11KNOB C to 27358 11POND C	1	138	211	211
832	outage of 27219 11KOSMOS to 27281 11MIL CK	1	138	211	211
837	outage of 27234 11LEBNON to 27268 11MARION	1	138	211	211
840	outage of 27234 11LEBNON to 27273 11MERCR	1	138	211	211
842	outage of 27257 11LYNDON to 27277 11MIDDLT	1	138	211	211
845	outage of 27266 11MANSLI to 27281 11MIL CK	1	138	211	211
847	outage of 27296 11MUD LA to 27319 11OKOLON	1	138	211	211
850	outage of 27326 11P WEST to 27328 11PADDYR	1	138	211	211
855	outage of 27002 11BLUE L to 29235 20BLIT C	1	161	211-220	211-220
857	outage of 27268 11MARION to 29409 20MARION	1	138-161	211-220	211-220
860	outage of 27127 11FAWK T to 29292 20FAWKES	1	138	211-220	211-220
862	outage of 27128 11FAWKES to 29292 20FAWKES	1	138	211-220	211-220
865	outage of 29235 20BLIT C to 29271 20DARWJ	1	161	220	220
867	outage of 29241 20CASEYC to 29390 20LIBERT	1	161	220	220
870	outage of 29241 20CASEYC to 29409 20MARION	1	161	220	220
872	outage of 29271 20DARWJ to 29503 20SHLBYC	1	161	220	220
875	outage of 29409 20MARION to 29410 20MAR IJ	1	161	220	220
877	outage of 29410 20MAR IJ to 29498 20SALOMJ	1	161	220	220
910	outage of 26855 10NTVL13 to 27055 11CLVRPR	1	138	210-211	210-211
912	outage of 27018 11BRWN N to 27178 11HARDN	1	345	211	211
915	outage of 27178 11HARDN to 27179 11HARDN	1	345-138	211	211
917	outage of 27178 11HARDN to 27179 11HARDN	2	345-138	211	211
920	outage of 27178 11HARDN to 27415 11SMITH	1	345	211	211
925	outage of 27055 11CLVRPR to 27177 11HARDBG	1	138	211	211
927	outage of 27055 11CLVRPR to 27442 11TIPTOP	1	138	211	211
930	outage of 27114 11ETOWN to 27179 11HARDN	1	138	211	211
932	outage of 27177 11HARDBG to 27179 11HARDN	1	138	211	211

No.	Contingency	Ckt	Base kV	Area	Zone
935	outage of 27179 11HARDN to 27180 11HARDN	1	138-69	211	211
937	outage of 27179 11HARDN to 27180 11HARDN	2	138-69	211	211
940	outage of 27179 11HARDN to 27384 11ROGERS	1	138	211	211
945	outage of 4130 14N.HAR4 to 27177 11HARDBG	1	138	214-211	1-211
947	outage of 25388 08SPEED to 26473 08TRIMBL	1	345	208	281
948	outage of 26473 08TRIMBL to 27152 11GHENT	1	345	208-211	281-211
949	outage of 27178 11HARDN to 27280 11MIL CK	1	345	211	211
950	outage of 27188 11HIGBY to 27467 11W LEXN	1	138	211	211
951	outage of 27450 11TYRONE to 27461 11W FRNK	1	138	211	211
1010	N2 - ABD-Wilson 1 161kV & EBG-E.Bowl.Gr 1 161kV				

EAST KENTUCKY POWER COOPERATIVE, INC.

PSC CASE NO. 2005-00207

INFORMATION REQUEST RESPONSE

COMMISSION'S FIRST DATA REQUEST DATED 8/18/05

ITEM 17

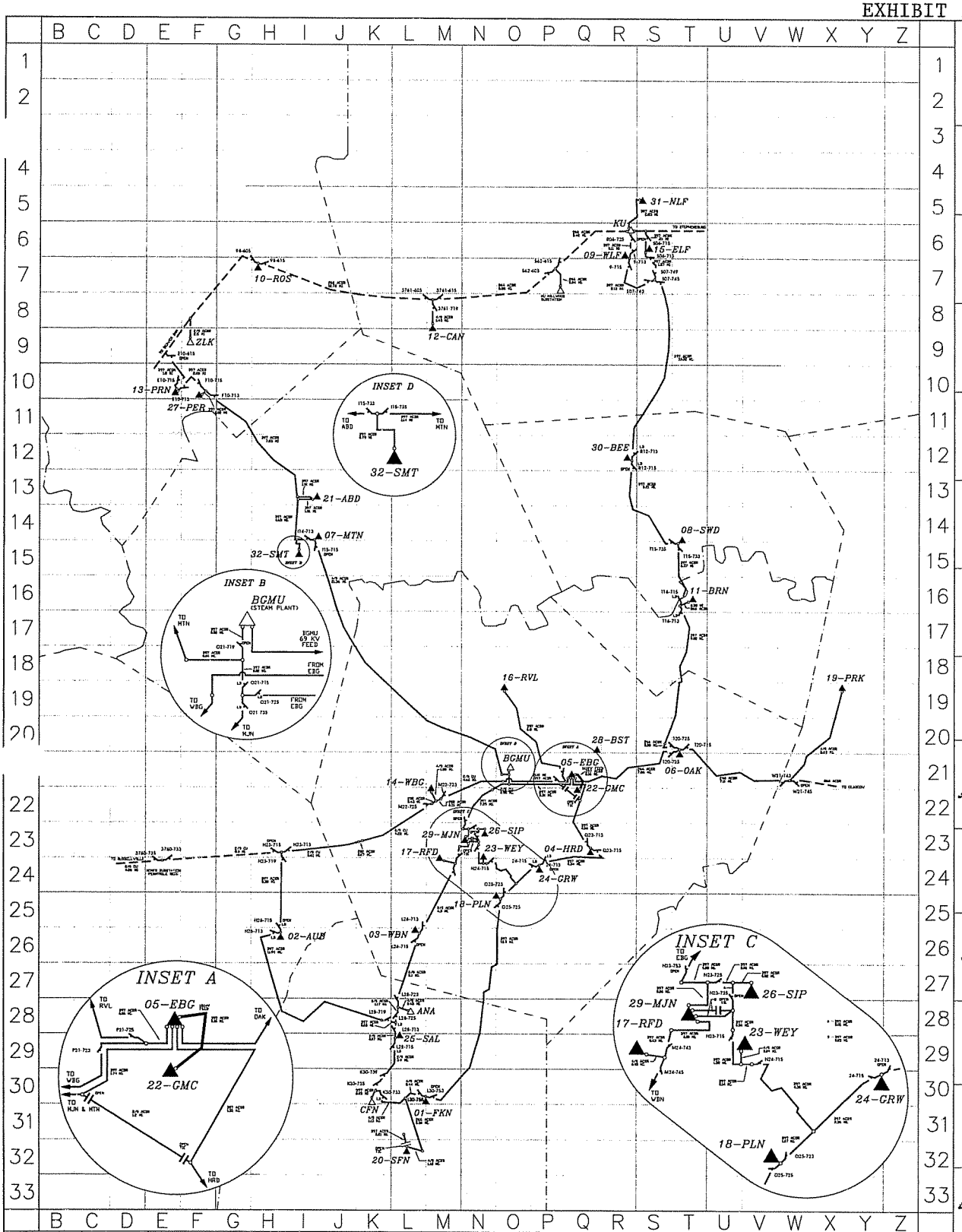
RESPONSIBLE PARTY: MARY JANE WARNER

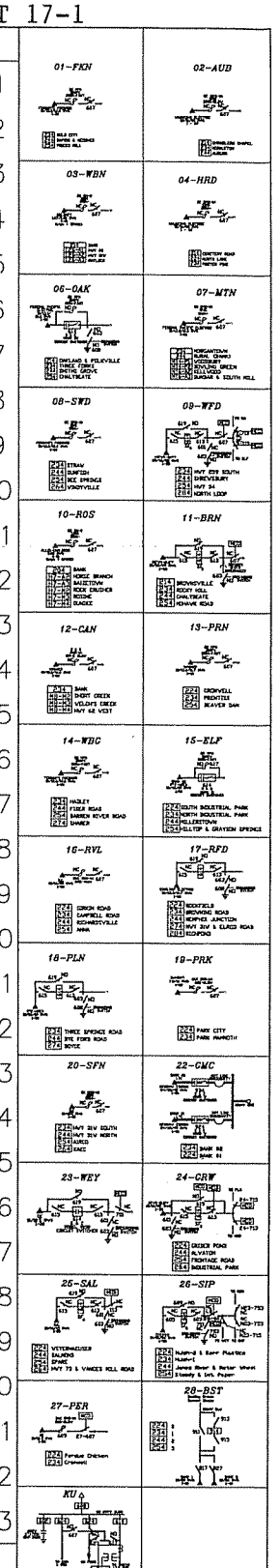
REQUEST: Provide a WRECC system map.

RESPONSE: A one-line diagram of the WRECC system is attached as **Exhibit 17-1**.

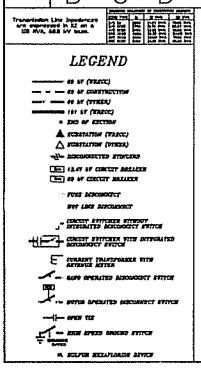
A geographic map of the WRECC system is attached as **Exhibit 17-2**.

EXHIBIT 17-1

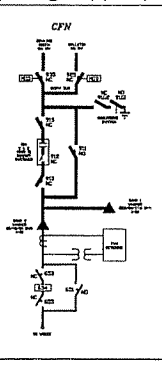




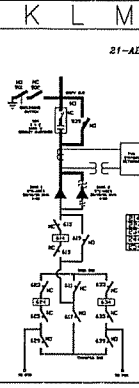
LEGEND



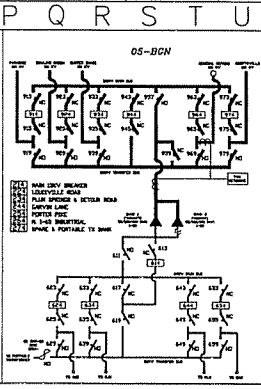
CFN



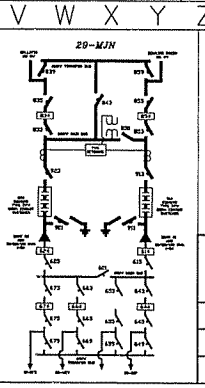
21-ABD



05-BGN



29-MJN

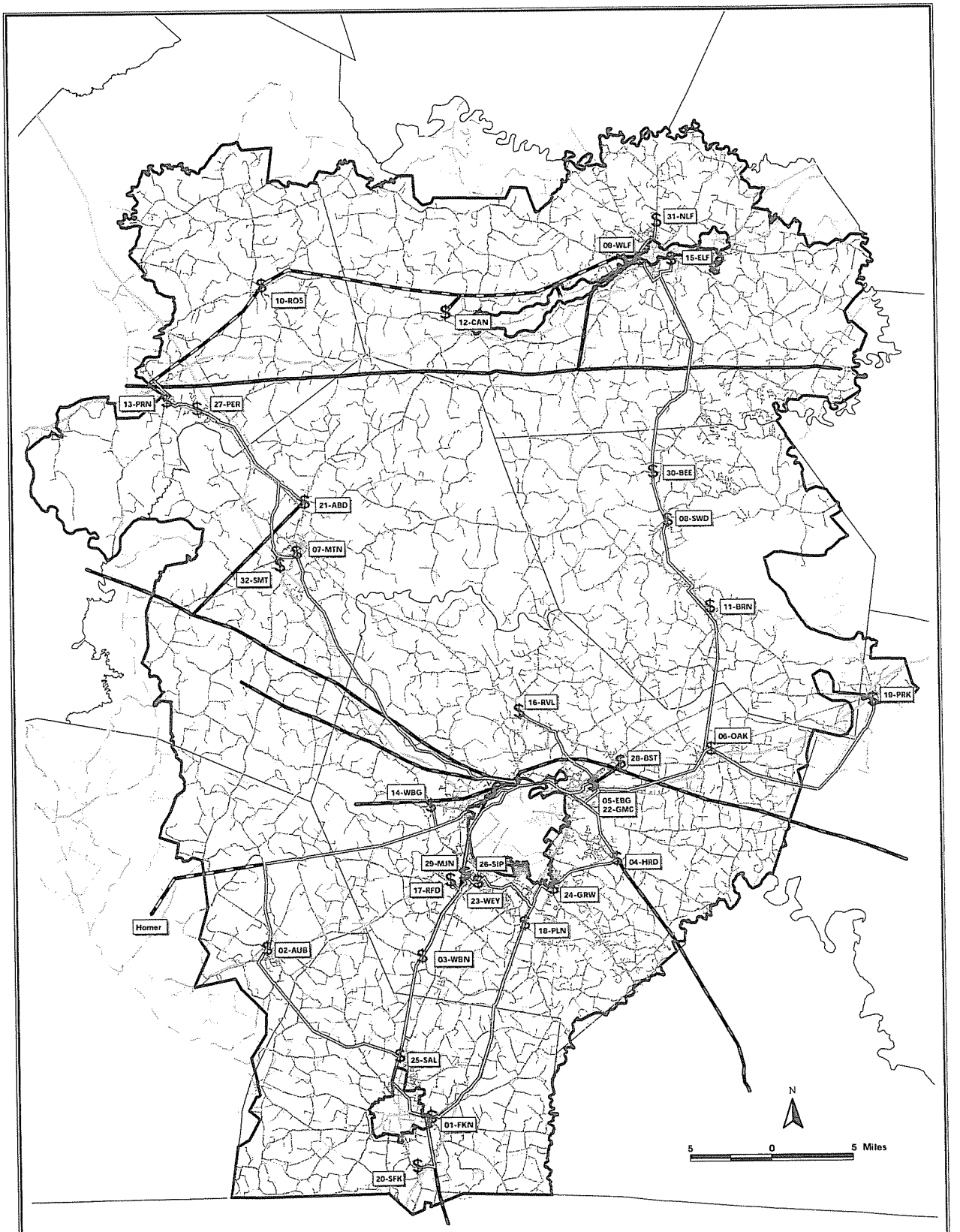


REV	DATE	BY	DESCRIPTION
16	28-APR-03	VMB	CLOSE SWITCH 023-725, OPEN SWITCH L30-733
15	05-AUG-02	VMB	CLOSED SWITCH L30-733
14	14-FEB-02	VMB	ADDED H24-715, TIE TO 18-PLN & 24-GRW
13	11-OCT-00	VMB	ADDED 31-NLF, 32-SMT, & 506-713
12	23-NOV-99	VMB	OPEN R21-715, Closed 715-725
11	20-DEC-98	DAC	BGMU STEAM PLANT ON LINE
10	10-SEPT-97	VMB	MJN Energized
9	17-JUL-96	VRV	Reassign Switch #'s
8	15-APR-96	DAC	Revised FRK/CAN Tx Sizes
7	15-APR-96	DAC	Revised RVL 69 kV Fuse
6	15-APR-96	DAC	Add BST & PER Subs & ELF 69kV Tie
5	15-APR-96	DAC	69kV Switch #'s Revised
4	6-JUN-95	VRV	Changed SAL Switch to 113
3	23-SEP-94	DAC	SIP Energized & CFN Sw 733 Moved
2	09-SEP-93	DAC	ALB/SAL line Energized
1	26-MAY-93	DAC	Initial Release

Warren RECC
RURAL ELECTRIC COOPERATIVE CORPORATION

Designed by TAH	Checked by DAC	69 kV SINGLE LINE DIAGRAM
Approved by	Drawn by DAC	Autocad File: \TRANS\69KV_SLD2010
Date 10/14/92	Scale NOT TO SCALE	Drawing Name: 69KV_SLD2010.DWG
		Sheet 1 of 1

EXHIBIT 17-2



Transmission Lines

Warren RECC

May 6, 2003

EAST KENTUCKY POWER COOPERATIVE, INC.

PSC CASE NO. 2005-00207

INFORMATION REQUEST RESPONSE

COMMISSION'S FIRST DATA REQUEST DATED 8/18/05

ITEM 18

RESPONSIBLE PARTY: JIM LAMB

REQUEST: Provide historical (5 years) existing and projected (5 years) demand for the WRECC system load.

RESPONSE: The Warren RECC 2004 Load Forecast Peaks Summary is shown below. This document is the subject of the Applicant's Petition for Confidential Treatment and is included in that Petition filed this date.

Warren RECC
2004 Load Forecast
Peaks Summary

Winter		*Summer*	
Season	**Coincident Peak Demand (MW)**	Year	**Coincident Peak Demand (MW)**
1999 - 00	[redacted]	2000	[redacted]
2000 - 01	[redacted]	2001	[redacted]
2001 - 02	[redacted]	2002	[redacted]
2002 - 03	[redacted]	2003	[redacted]
2003 - 04	[redacted]	2004	[redacted]
2004 - 05	[redacted]	2005	[redacted]
2005 - 06	[redacted]	2006	[redacted]
2006 - 07	[redacted]	2007	[redacted]
2007 - 08	[redacted]	2008	[redacted]
2008 - 09	[redacted]	2009	[redacted]
2009 - 10	[redacted]	2010	[redacted]

Note: Winter 2004-05 is estimated.
Note: Summer 2005 is not yet available.

EAST KENTUCKY POWER COOPERATIVE, INC.

PSC CASE NO. 2005-00207

INFORMATION REQUEST RESPONSE

COMMISSION'S FIRST DATA REQUEST DATED 8/18/05

ITEM 19

RESPONSIBLE PARTY: JIM LAMB

REQUEST: Provide a description of the methodology used and the workpapers used in estimating future load growth.

RESPONSE: The attached **Exhibit 19-1** provides the methodology description and EKPC load forecast data developed in 2004.

TABLE OF CONTENTS

EXHIBIT 19-1

SEPARATE APPENDICES

APPENDIX	DESCRIPTION
A	Member System Load Forecast Reports
B	Regional Model Results Sales and Customer Forecasts – Definitions, Assumptions, Models Specifications, and Results

SECTION 1.0

EXECUTIVE SUMMARY

Section 1.0
Executive Summary

East Kentucky Power Cooperative Inc. (EKPC) is a generation and transmission electric cooperative located in Winchester, Kentucky. It serves 16 member distribution cooperatives who serve over 475,000 retail customers. Member distribution cooperatives currently served by EKPC are listed below:

Big Sandy RECC	Jackson Energy Cooperative
Blue Grass Energy Coop. Corp.	Licking Valley RECC
Clark Energy Cooperative, Inc.	Nolin RECC
Cumberland Valley Electric	Owen Electric Cooperative
Farmers RECC	Salt River Electric Coop. Corp.
Fleming-Mason Energy Cooperative	Shelby Energy Cooperative, Inc.
Grayson RECC	South Kentucky RECC
Inter-County Energy Coop. Corp.	Taylor County RECC

In April of 2008, EKPC will begin all requirements service to Warren RECC. This summary contains a 20-year projection of peak demand and energy requirements for EKPC, representing the summation of the load forecasts for each of its 16 member distribution cooperatives and starting April 1, 2008, Warren RECC.

EKPC's load forecast is prepared every two years in accordance with EKPC's Rural Utilities Service (RUS) approved Work Plan, which details the methodology employed in preparing the projections. EKPC prepares the load forecast by working jointly with member systems to prepare their load forecasts. Member projections are then summed to determine EKPC's forecast for the 20-year period. Member cooperatives use their load forecasts in developing construction work plans, long range work plans, and financial forecasts. EKPC uses the load forecast in such areas as marketing analysis, transmission planning, power supply planning, and financial forecasting.

Historical and projected total energy requirements, seasonal peak demands, and annual load factor for the EKPC system are presented in Tables 1-1 through 1-3. Internal demand refers to EKPC's peak demand unadjusted for interruptible loads, and net demand refers to EKPC's firm peak demand, taking all adjustments into account. Both are based on coincident hourly-integrated demand intervals. Load Factor is calculated using net peak demand and energy requirements.

EKPC's load forecast indicates that total energy requirements are projected to increase by 3.6 percent per year over the 2004 through 2024 period. Net winter peak demand will increase by approximately 2,500 MW, and net summer peak demand will increase by approximately 2,100 MW. Annual load factor projections are remaining steady at approximately 54 percent.

Energy projections for the residential, small commercial, and large commercial classifications indicate that during the 2004 through 2024 period, sales to the residential class will increase by 3.6 percent per year, small commercial sales will increase by 3.6 percent per year, and large commercial sales will increase by 4.5 percent per year. Class sales are presented in Tables 1-4.

[redacted]

Load Forecast Growth Rates

	2004-2009	2004-2014	2004-2024
Total Energy Requirements	6.5%	4.6%	3.6%
Residential Sales	5.6%	4.2%	3.6%
Small Commercial Sales	6.7%	4.8%	3.6%
Large Commercial Sales	11.5%	7.0%	4.5%
Firm Winter Peak Demand	6.8%	4.8%	3.7%
Firm Summer Peak Demand	7.0%	4.8%	3.7%

Factors considered in preparing the forecast include national, regional, and local economic performance, appliance saturations and efficiencies, population and housing trends, service area industrial development, electric price, household income, and weather.

Table 1-1
Historical and Projected Winter Peak Demand

Season	Total Internal Peak Demand (MW)	Gallatin Steel Interruptible Demand (MW)	Other Interruptible (MW)	Net Peak Demand (MW)
1981 - 82	1,087	0	0	1,087
1982 - 83	845	0	0	845
1983 - 84	1,151	0	0	1,151
1984 - 85	1,125	0	0	1,125
1985 - 86	1,039	0	0	1,039
1986 - 87	983	0	0	983
1987 - 88	1,104	0	0	1,104
1988 - 89	1,114	0	0	1,114
1989 - 90	1,449	0	0	1,449
1990 - 91	1,306	0	0	1,306
1991 - 92	1,383	0	0	1,383
1992 - 93	1,473	0	0	1,473
1993 - 94	1,788	0	0	1,788
1994 - 95	1,621	0	0	1,621
1995 - 96	1,990	75	0	1,915
1996 - 97	2,004	51	0	1,953
1997 - 98	1,789	93	14	1,682
1998 - 99	2,096	108	17	1,971
1999 - 00	2,169	12	17	2,140
2000 - 01	2,322	27	17	2,278
2001 - 02	2,238	129	17	2,092
2002 - 03	2,568	109	24	2,435
2003 - 04	2,612	97	26	2,489
2004 - 05	2,794	135	26	2,633
2005 - 06	2,893	135	26	2,732
2006 - 07	2,999	135	26	2,838
2007 - 08	3,085	135	26	2,924
2008 - 09	3,623	135	26	3,462
2009 - 10	3,726	135	26	3,565
2010 - 11	3,818	135	26	3,657
2011 - 12	3,914	135	26	3,753
2012 - 13	4,033	135	26	3,872
2013 - 14	4,141	135	26	3,980
2014 - 15	4,246	135	26	4,085
2015- 16	4,341	135	26	4,180
2016 - 17	4,466	135	26	4,305
2017 - 18	4,584	135	26	4,423
2018 - 19	4,709	135	26	4,548
2019 - 20	4,823	135	26	4,662
2020 - 21	4,959	135	26	4,798
2021 - 22	5,083	135	26	4,922
2022 - 23	5,208	135	26	5,047
2023 - 24	5,319	135	26	5,158

Table 1-2
Historical and Projected Summer Peak Demand

Season	Total Internal Peak Demand (MW)	Gallatin Steel Interruptible Demand (MW)	Other Interruptible (MW)	Net Peak Demand (MW)
1982	694	0	0	694
1983	789	0	0	789
1984	722	0	0	722
1985	776	0	0	776
1986	857	0	0	857
1987	906	0	0	906
1988	1,055	0	0	1,055
1989	1,010	0	0	1,010
1990	1,079	0	0	1,079
1991	1,164	0	0	1,164
1992	1,131	0	0	1,131
1993	1,309	0	0	1,309
1994	1,314	0	0	1,314
1995	1,518	52	0	1,466
1996	1,540	88	0	1,452
1997	1,650	101	0	1,549
1998	1,675	4	17	1,654
1999	1,754	4	12	1,738
2000	1,941	86	23	1,832
2001	1,980	116	23	1,841
2002	2,120	119	23	1,978
2003	1,996	125	26	1,845
2004	2,197	135	26	2,036
2005	2,294	135	26	2,133
2006	2,377	135	26	2,216
2007	2,461	135	26	2,300
2008	2,930	135	26	2,769
2009	3,017	135	26	2,856
2010	3,098	135	26	2,937
2011	3,174	135	26	3,013
2012	3,250	135	26	3,089
2013	3,341	135	26	3,180
2014	3,426	135	26	3,265
2015	3,508	135	26	3,347
2016	3,584	135	26	3,423
2017	3,680	135	26	3,519
2018	3,773	135	26	3,612
2019	3,870	135	26	3,709
2020	3,955	135	26	3,794
2021	4,059	135	26	3,898
2022	4,155	135	26	3,994
2023	4,249	135	26	4,088
2024	4,340	135	26	4,179

Table 1-3
Historical and Projected Peak Demands
And Total Requirements

Season	Net Winter Peak Demand (MW)	Year	Net Summer Peak Demand (MW)	Year	Total Requirements (MWh)	Load Factor (%)
1981 - 82	1,087	1982	694	1982	3,904,954	40.9%
1982 - 83	845	1983	789	1983	4,099,007	55.4%
1983 - 84	1,151	1984	722	1984	4,095,268	40.6%
1984 - 85	1,125	1985	776	1985	4,264,517	43.3%
1985 - 86	1,039	1986	857	1986	4,470,627	49.0%
1986 - 87	983	1987	906	1987	4,710,898	54.7%
1987 - 88	1,104	1988	1,055	1988	5,122,703	53.0%
1988 - 89	1,114	1989	1,010	1989	5,347,081	54.8%
1989 - 90	1,449	1990	1,079	1990	5,489,092	43.1%
1990 - 91	1,306	1991	1,164	1991	5,958,422	52.1%
1991 - 92	1,383	1992	1,131	1992	6,099,308	50.3%
1992 - 93	1,473	1993	1,309	1993	6,860,902	53.2%
1993 - 94	1,788	1994	1,314	1994	6,917,414	44.0%
1994 - 95	1,621	1995	1,466	1995	7,761,980	54.7%
1995 - 96	1,915	1996	1,452	1996	8,505,621	50.7%
1996 - 97	1,953	1997	1,549	1997	8,850,394	51.7%
1997 - 98	1,682	1998	1,654	1998	9,073,950	61.4%
1998 - 99	1,971	1999	1,738	1999	9,825,866	56.9%
1999 - 00	2,140	2000	1,832	2000	10,521,400	56.1%
2000 - 01	2,278	2001	1,841	2001	10,750,900	53.9%
2001 - 02	2,092	2002	1,978	2002	11,456,830	62.3%
2002 - 03	2,435	2003	1,845	2003	11,568,314	54.2%
2003 - 04	2,489	2004	2,036	2004	12,055,905	55.3%
2004 - 05	2,633	2005	2,133	2005	12,506,284	54.2%
2005 - 06	2,732	2006	2,216	2006	12,974,673	54.1%
2006 - 07	2,838	2007	2,300	2007	13,463,856	54.2%
2007 - 08	2,924	2008	2,769	2008	15,509,448	60.6%
2008 - 09	3,462	2009	2,856	2009	16,542,462	54.5%
2009 - 10	3,565	2010	2,937	2010	17,007,296	54.3%
2010 - 11	3,657	2011	3,013	2011	17,433,751	54.4%
2011 - 12	3,753	2012	3,089	2012	17,916,519	54.5%
2012 - 13	3,872	2013	3,180	2013	18,404,516	54.3%
2013 - 14	3,980	2014	3,265	2014	18,896,493	54.1%
2014 - 15	4,085	2015	3,347	2015	19,373,012	54.1%
2015- 16	4,180	2016	3,423	2016	19,861,626	54.2%
2016 - 17	4,305	2017	3,519	2017	20,366,928	54.0%
2017 - 18	4,423	2018	3,612	2018	20,900,624	53.8%
2018 - 19	4,548	2019	3,709	2019	21,459,656	53.9%
2019 - 20	4,662	2020	3,794	2020	22,023,701	53.9%
2020 - 21	4,798	2021	3,898	2021	22,566,676	53.7%
2021 - 22	4,922	2022	3,994	2022	23,125,176	53.5%
2022 - 23	5,047	2023	4,088	2023	23,685,187	53.6%
2023 - 24	5,158	2024	4,179	2024	24,286,700	53.8%

Table 1-4
2004 Load Forecast
Total Member System Retail Energy Sales

Year	Residential Sales (MWh)	Seasonal Sales (MWh)	Small Comm. Sales (MWh)	Public Buildings (MWh)	Large Comm. Sales (MWh)	Gallatin Steel (MWh)	Other Sales (MWh)	Total Retail Sales (MWh)
1990	3,483,232	9,652	813,371	22,879	653,502	0	3,736	4,986,373
1991	3,755,282	9,791	868,032	25,182	722,743	0	4,029	5,385,059
1992	3,798,270	10,100	913,599	26,549	775,544	0	4,305	5,528,366
1993	4,213,871	10,478	980,290	30,060	970,137	0	5,081	6,209,917
1994	4,268,682	10,591	1,014,549	30,347	1,029,178	0	4,156	6,357,502
1995	4,575,282	11,355	1,098,885	33,261	1,119,902	279,070	5,042	7,122,797
1996	4,857,938	12,629	1,082,019	34,242	1,243,107	640,756	5,552	7,876,243
1997	4,883,875	12,075	1,163,683	33,267	1,258,816	755,279	5,663	8,112,659
1998	5,091,880	11,650	1,230,451	34,263	1,349,895	696,051	5,601	8,419,790
1999	5,303,413	11,652	1,337,008	34,947	1,415,803	901,686	5,757	9,010,267
2000	5,607,950	12,648	1,493,650	38,061	1,498,745	917,983	6,160	9,575,197
2001	5,777,378	12,954	1,490,670	39,197	1,686,653	992,711	6,545	10,006,107
2002	5,946,686	14,703	1,571,381	40,725	1,790,693	1,005,493	6,860	10,376,541
2003	6,156,774	15,487	1,581,188	42,689	1,906,861	1,007,676	7,087	10,717,762
2004	6,497,216	14,307	1,630,602	45,531	1,968,664	961,632	7,694	11,125,647
2005	6,682,941	14,825	1,694,044	46,612	2,132,344	960,781	7,949	11,539,497
2006	6,918,457	15,524	1,757,692	47,856	2,261,427	960,951	8,213	11,970,119
2007	7,183,613	16,294	1,822,141	49,201	2,379,982	960,435	8,483	12,420,150
2008	7,963,634	17,003	2,129,583	50,512	3,137,941	961,056	12,482	14,272,210
2009	8,526,792	17,680	2,257,539	51,802	3,394,380	962,376	14,205	15,224,774
2010	8,769,805	18,327	2,328,603	53,030	3,504,926	962,267	14,639	15,651,597
2011	9,005,166	18,968	2,399,739	54,245	3,589,580	960,119	15,077	16,042,894
2012	9,277,560	19,711	2,467,666	55,471	3,689,892	960,160	15,522	16,485,982
2013	9,568,763	20,495	2,534,710	56,735	3,776,751	960,424	15,968	16,933,848
2014	9,849,132	21,220	2,602,619	58,006	3,876,151	961,931	16,418	17,385,477
2015	10,132,987	21,930	2,670,899	59,279	3,959,598	961,610	16,869	17,823,172
2016	10,418,609	22,671	2,738,146	60,548	4,054,635	959,992	17,326	18,271,927
2017	10,734,638	23,534	2,808,274	61,895	4,130,033	959,696	17,787	18,735,857
2018	11,060,111	24,472	2,880,072	63,309	4,220,103	959,191	18,251	19,225,508
2019	11,411,147	25,495	2,952,552	64,796	4,306,388	959,462	18,717	19,738,557
2020	11,759,902	26,543	3,025,190	66,179	4,397,448	961,566	19,194	20,256,022
2021	12,101,252	27,556	3,096,179	67,552	4,480,296	961,698	19,669	20,754,203
2022	12,447,462	28,578	3,166,734	68,928	4,575,322	959,323	20,150	21,266,497
2023	12,811,267	29,677	3,239,421	70,277	4,650,017	959,018	20,637	21,780,314
2024	13,194,533	30,814	3,314,701	71,684	4,740,172	959,015	21,129	22,332,048

Table 1-4 continued
2004 Load Forecast
Energy Sales and Total Requirements

Year	Total Retail Sales (MWh)	Office Use (MWh)	% Loss	EKPC Sales to Members (MWh)	EKPC Office Use (MWh)	Transmission Loss (%)	Total Requirements (MWh)
1990	4,986,373	5,087	5.7	5,295,459	6,287	3.5	5,489,092
1991	5,385,059	5,333	6.3	5,755,588	6,798	3.4	5,958,422
1992	5,528,366	5,242	6.3	5,903,268	7,559	3.2	6,099,308
1993	6,209,917	5,552	6.0	6,612,687	8,026	3.6	6,860,902
1994	6,357,502	5,614	5.4	6,727,959	8,541	2.7	6,917,414
1995	7,122,797	5,711	5.7	7,558,452	9,197	2.6	7,761,980
1996	7,876,243	6,167	5.0	8,301,379	8,856	2.4	8,505,621
1997	8,112,659	6,349	5.1	8,559,022	8,505	3.3	8,850,394
1998	8,419,790	6,121	4.5	8,821,630	7,236	2.8	9,073,950
1999	9,010,267	6,040	4.8	9,472,955	8,157	3.6	9,825,866
2000	9,575,197	6,605	4.4	10,021,053	7,862	4.9	10,521,400
2001	10,006,107	6,752	4.0	10,426,995	8,205	3.0	10,750,900
2002	10,376,541	6,912	4.9	10,913,425	8,246	4.9	11,456,830
2003	10,717,762	6,911	4.8	11,260,295	8,287	2.7	11,568,314
2004	11,125,647	8,382	4.7	11,685,899	8,329	3.0	12,055,905
2005	11,539,497	8,382	4.7	12,122,725	8,370	3.0	12,506,284
2006	11,970,119	8,382	4.8	12,577,021	8,412	3.0	12,974,673
2007	12,420,150	8,382	4.8	13,051,486	8,454	3.0	13,463,856
2008	14,272,210	8,382	5.0	15,035,668	8,497	3.0	15,509,448
2009	15,224,774	8,382	5.0	16,037,649	8,539	3.0	16,542,462
2010	15,651,597	8,382	5.0	16,488,495	8,582	3.0	17,007,296
2011	16,042,894	8,382	5.0	16,902,113	8,625	3.0	17,433,751
2012	16,485,982	8,382	5.0	17,370,355	8,668	3.0	17,916,519
2013	16,933,848	8,382	5.1	17,843,670	8,711	3.0	18,404,516
2014	17,385,477	8,382	5.1	18,320,843	8,755	3.0	18,896,493
2015	17,823,172	8,382	5.1	18,783,024	8,798	3.0	19,373,012
2016	18,271,927	8,382	5.1	19,256,935	8,842	3.0	19,861,626
2017	18,735,857	8,382	5.1	19,747,033	8,887	3.0	20,366,928
2018	19,225,508	8,382	5.1	20,264,674	8,931	3.0	20,900,624
2019	19,738,557	8,382	5.1	20,806,890	8,976	3.0	21,459,656
2020	20,256,022	8,382	5.1	21,353,969	9,021	3.0	22,023,701
2021	20,754,203	8,382	5.1	21,880,610	9,066	3.0	22,566,676
2022	21,266,497	8,382	5.1	22,422,310	9,111	3.0	23,125,176
2023	21,780,314	8,382	5.1	22,965,474	9,157	3.0	23,685,187
2024	22,332,048	8,382	5.1	23,548,897	9,202	3.0	24,286,700

SECTION 2.0

LOAD FORECAST METHODOLOGY

Section 2.0
Load Forecast Methodology

2.1 Coordination with Member Systems

EKPC prepares a load forecast by working jointly with its member systems in preparing their individual load forecasts. These individual forecasts are included in Appendix A. Member system projections are then summed to determine EKPC's forecast for the 20-year period. Factors considered in preparing the forecasts include national, regional, and local economic performance, appliance saturations and efficiencies, population and housing trends, service area industrial development, electric price, household income, and weather. Each member system reviews the preliminary forecast for reasonability. Final projections reflect analysis of historical data combined with the experience and judgment of the member system manager and staff. In recognition of the uncertainty present in long-term forecasting, both high and low case projections are also prepared.

The general steps followed by EKPC in developing its load forecast are summarized as follows:

1. EKPC prepares a preliminary forecast for each of its member systems which is based on retail sales forecasts for six classes: residential, seasonal, small commercial, public buildings, large commercial, and other. The classifications are taken from the Rural Utilities Services (RUS) Form 7, which contains publicly available retail sales data for member systems. EKPC's sales to member systems are then determined by adding distribution losses to total retail sales. EKPC's total requirements are estimated by adding transmission losses to total sales. Seasonal peak demands are determined by applying peak factors for heating, cooling, and water heating to energy. The same methodology is used in developing each of the 16 member system forecasts.

2. EKPC meets with each member system to discuss their preliminary forecast. Member system staff at these meetings include the manager and other key individuals. The RUS General Field Representative (GFR) is also invited to attend the meetings.

3. The preliminary forecast is usually revised based on mutual agreement of EKPC staff, member system's Manager and staff, and the RUS GFR. This final forecast is approved by the board of directors of each member system.

4. The EKPC forecast is the summation of the forecasts of its 16 members.

There is close collaboration and coordination between EKPC and its member systems in this process. This working relationship is essential since EKPC has no retail members. Input from member systems relating to such things as industrial development, subdivision growth, and other specific service area information is crucial to the preparation of accurate forecasts. Review meetings provide opportunities to critique the assumptions and the overall results of the preliminary forecast. The resulting load forecast reflects a combination of EKPC's structured forecast methodology tempered by the judgment and experience of the member system staff. Over the years, this forecasting process has resulted in projections accepted by and useful to both EKPC and its members. Member cooperatives use their load forecast in developing two, three and four-year work plans, long-range work plans, and financial forecasts. EKPC uses the load forecast in such areas as marketing analyses, transmission planning, generation planning, and financial forecasting.

2.2 Forecast Model Summary

Models are used to develop the load forecast for each member system. A brief overview of each is given in this section with additional information regarding the models and resulting forecasts presented in Sections 4 through 8 of this report.

2.2.1 Regional Economic Model

EKPC has divided its members' service area into six economic regions with economic activity projected for each. Regional forecasts for population, income and employment are developed and used as inputs to residential customer and small commercial customer and energy forecasts. Therefore, EKPC's economic assumptions regarding its load forecast are consistent.

2.2.2 Residential Sales

This class of energy sales is forecasted using regression analysis. Variables include electric price, economic activity, and regional population growth. The number of residential customers is also projected with regression analysis using economic variables such as population. Residential energy use per customer is calculated by dividing the forecasted number of customers into the energy sales forecast.

2.2.3 Small Commercial Sales

Small commercial energy sales forecast results from regression analysis. The number of small commercial customers is forecasted by means of regression analysis on various regional economic data in addition to the resulting residential customer forecast described above. Exogenous variables include real electric price, economic activity, and residential customer growth. Energy use per customer is calculated as with the residential class.

2.2.4 Large Commercial Sales

This class is projected by member systems and EKPC. Member systems project existing large loads. EKPC projects new large loads based on historical development, the presence of industrial parks, and the economy of the service territory.

2.2.5 Seasonal Sales Forecast

Seasonal sales are sales to customers with seasonal residences such as vacation homes and weekend retreats. Seasonal sales are relatively small and are reported by only two of EKPC's member systems.

2.2.6 Public Building Sales Forecast

Public Building sales include sales to accounts such as government buildings and libraries. The sales are relatively small and are reported by only four of EKPC's member systems.

2.2.7 Other Sales

The 'Other Sales' class represents street lighting. This class is relatively small and is usually projected as a function of residential sales. There are 11 member systems that report this class.

2.2.8 Peak Demand and High and Low Cases

Seasonal peak demands are projected using the summation of monthly energy usages and load factors for the various classes of customers. Residential energy usage components include heating, cooling, water heating, and other usage. Using load factors, demand is calculated for each component and then summed to obtain the residential portion of the seasonal peak. Small commercial and large commercial classes use load factors on the class usage to obtain the class contribution to the seasonal peak. High and low case projections have been constructed around the base case forecast. Methodology is discussed in Section 8.

SECTION 3.0

LOAD FORECAST DISCUSSION

Section 3.0
Load Forecast Discussion

3.1 Introduction

Key assumptions and trends used in the preparation of the load forecast are described in this section along with a discussion of the EKPC service area. Projected peak demand, annual energy requirements, and growth rates are summarized. Differences between the 2002 and 2004 load forecasts are discussed.

3.2 Input Assumptions

Key forecast assumptions used in developing the EKPC and member system load forecasts are:

1. EKPC's member systems will add approximately 330,000 residential customers by 2024. This represents an increase of 2.7 percent per year. This includes Warren RECC beginning April 2008.

2. EKPC uses an economic model to help develop its load forecast. The model uses data for 89 Kentucky counties in six geographic regions. The economy of these counties will experience modest growth over the next 20 years. The average unemployment rate will fall from 6.9 percent in 2004 to 5.4 percent in 2020. Total employment levels will rise by over 400,000 jobs. Manufacturing employment will increase from 272,000 jobs in 2004 to 332,000 jobs in 2020. Regional population will grow from 3.5 million people in 2004 to 3.9 million people in 2020, an average growth of 0.8 percent per year.

3. [redacted]

4. By 2024, naturally occurring appliance efficiency improvements will decrease retail sales nearly 400,000 MWh. Appliances particularly affected are refrigerators, freezers, and air conditioners.

5. Residential customer growth and local area economic activity will be the major determinants of small commercial growth.

6. Forecasted load growth is based on the assumption of normal weather, as defined by the National Oceanic and Atmospheric Administration, occurring over the next 20 years. Seven different stations are used depending on geographic location of the member system.

3.3 Discussion of Service Area

In EKPC's service area, electricity is the primary method for water heating and home heating. In 2003, 57 percent of EKPC's member retail sales were to the residential class and residential customer use averaged 1,160 kWh per month. While EKPC's load can be considered primarily residential in nature, Figure 3-1 illustrates that commercial/industrial customers make up an increasingly larger share of total retail sales.

The economy of EKPC's service area is quite varied. Areas around Lexington and Louisville have a relatively high amount of manufacturing industry. The region around Cincinnati contains a growing number of retail trade and service jobs while the eastern and southeastern portions of EKPC's service area are dominated by the mining industry. Tourism is an important aspect of EKPC's southern and southwestern service area, with Lake Cumberland and Mammoth Cave National Park contributing to jobs in the service and retail trade industries. Textile and apparel manufacturing employ a significant number of workers throughout the service area, particularly in the northeastern and southern portions.

3.4 Summary of Results

The forecast indicates that for the period 2004 through 2024, total energy requirements will increase by 3.6 percent per year. Winter and summer net peak demand will increase by 3.7 percent and 3.7 percent, respectively. Annual load factor is projected to remain relatively flat at around 54 percent. Sales to the residential class are projected to increase by 3.6 percent per year, small commercial sales are projected to increase by 3.6 percent per year, and large commercial sales are projected to increase by 4.5 percent per year. These growth rates do include the Warren as a new member beginning April 2008. Table 3-1 summarizes class sales growth rates. Figure 3-2 reports growth rates by class.

The resulting load forecast is for annual energy requirements to increase from 11,568,314 MWh in 2003 to 24,286,700 MWh in 2024. Annual net winter peak demand increases from 2,489 MW to 5,158 MW during the same time period. Table 1-3 on page 7 reports actual and projected total energy requirements, seasonal peak demands, and annual load

factor for the years 1990 through 2024. Figures 3-3, 3-4, and 3-5 illustrate this information graphically.

Actual and projected requirements by customer class are presented in Table 1-4 on pages 8 and 9, with 5, 10, and 20 year average annual energy growth rates reported in Tables 3-2, 3-3 and 3-4. Forecasted monthly sales for the first two years of the forecast are presented by class in Table 3-5. Table 1-4 reports sales to member systems and total requirements, which includes office use and transmission losses. Figure 3-6 reports the winter peak forecast of each of EKPC's member systems.

Table 3-1
Projected Energy and Peak Demand Growth
Compound Annual Rates of Change
Includes Warren RECC

	2004-2009 (%)	2004-2014 (%)	2004-2024 (%)
Total Energy Requirements	6.5	4.6	3.6
• **Residential Sales**	5.6	4.2	3.6
• **Small Commercial Sales**	6.7	4.8	3.6
• **Large Commercial Sales ***	11.5	7.0	4.5
Net Winter Peak Demand**	6.8	4.8	3.7
Net Summer Peak Demand	7.0	4.8	3.7

* *Excluding Gallatin Steel.*
** *Reflects 2005-2010, 2005-2015, 2005-2024.*

EXCLUDES Warren RECC

	2004-2009	2004-2014	2004-2024
Total Energy Requirements	3.5%	3.1%	2.9%
Residential Sales	3.3%	3.2%	3.1%
Small Commercial Sales	3.7%	3.4%	3.0%
Large Commercial Sales*	5.3%	3.9%	2.9%
**Note: Excludes Gallatin Steel*			
Firm Winter Peak Demand	4.0%	3.4%	3.1%
Firm Summer Peak Demand	3.7%	3.3%	2.9%

Figure 3-1
Components of Member System Retail Sales

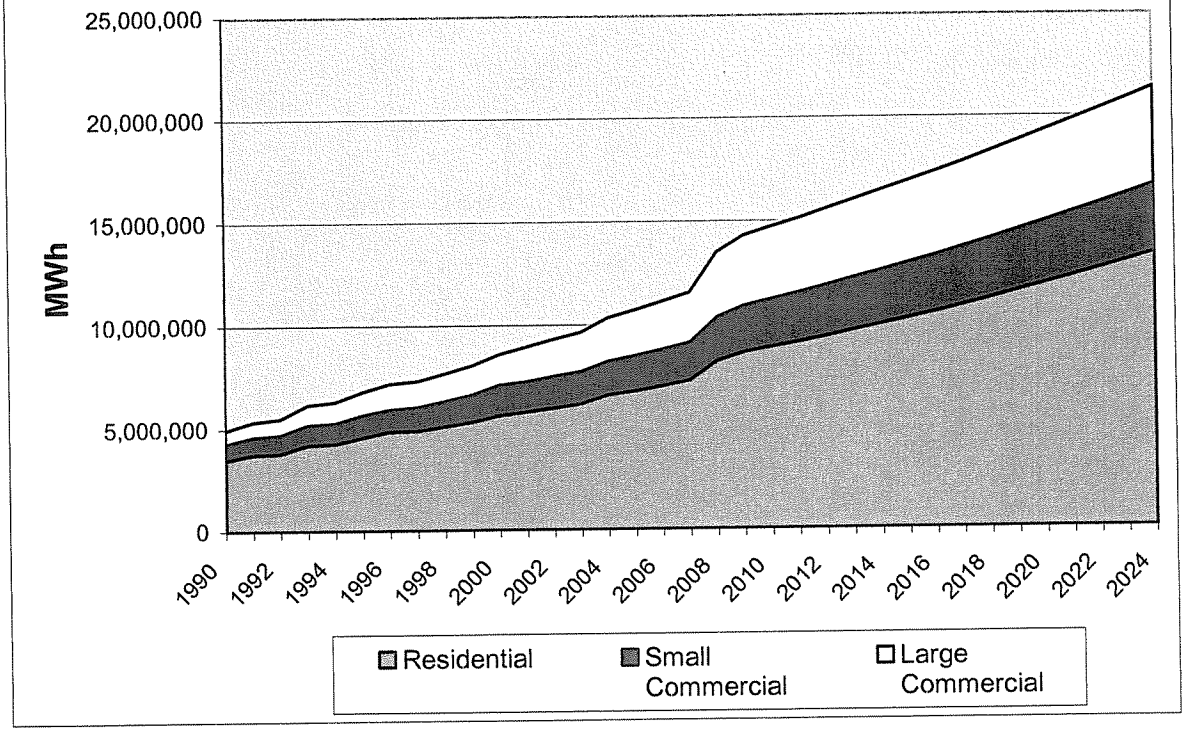


Figure 3-2
Average Annual Sales Growth
2004-2024

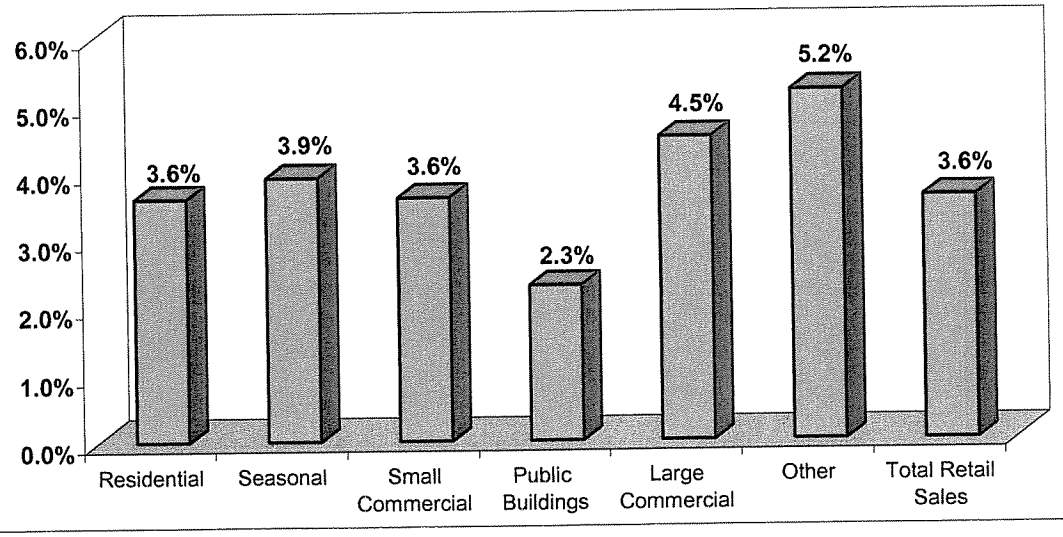


Figure 3-3
EKPC Total Requirements

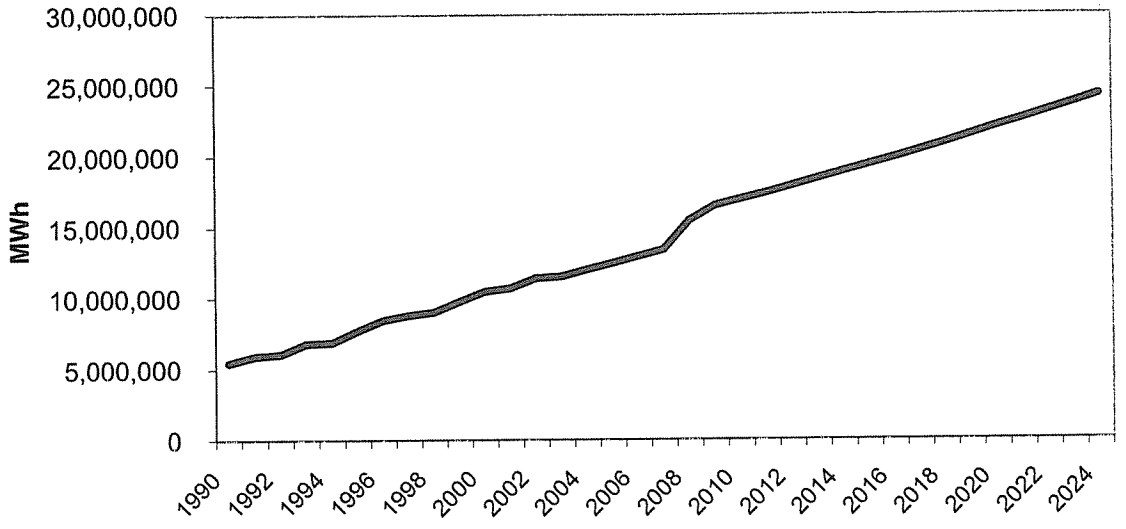


Figure 3-4
Net Peak Demands ~ Historical and Forecasted

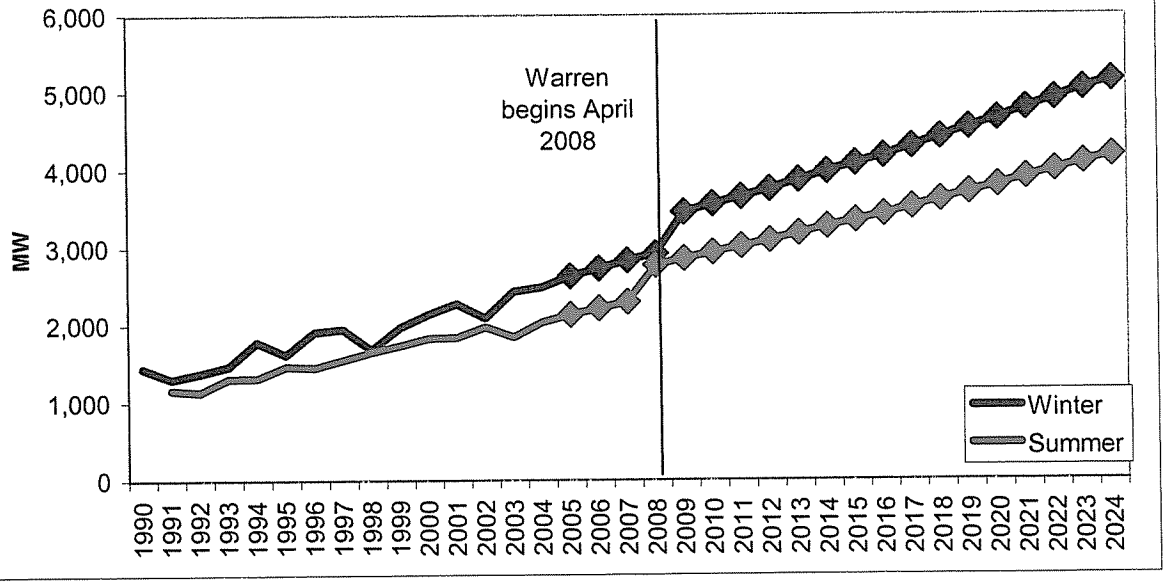
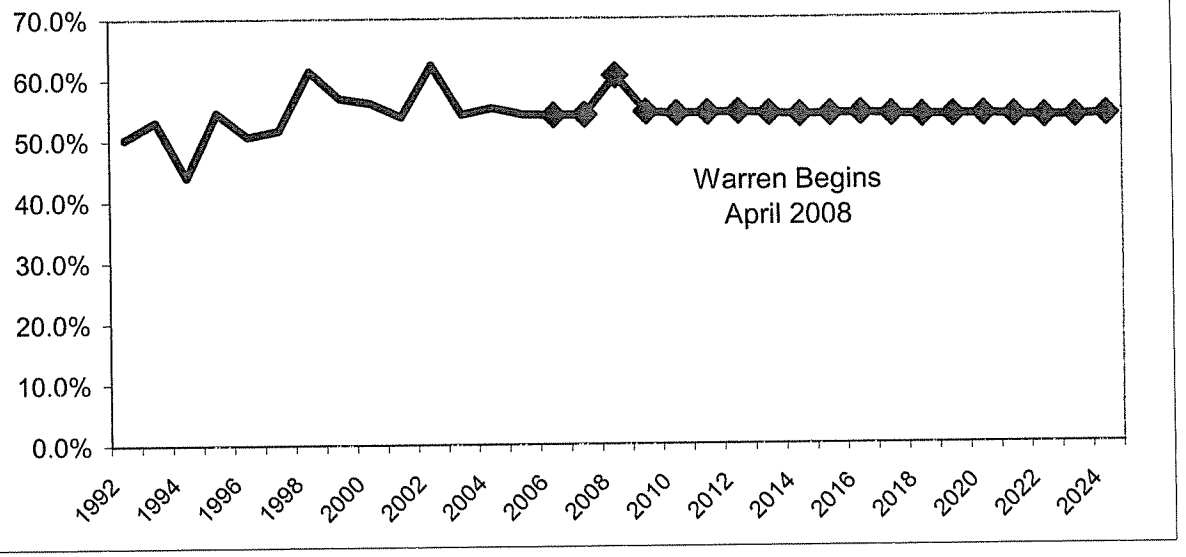


Figure 3-5
Annual System Load Factor
Historical and Forecasted



[redacted]

Table 3-2
Member System Average Annual Energy Growth Rates
2004 – 2009

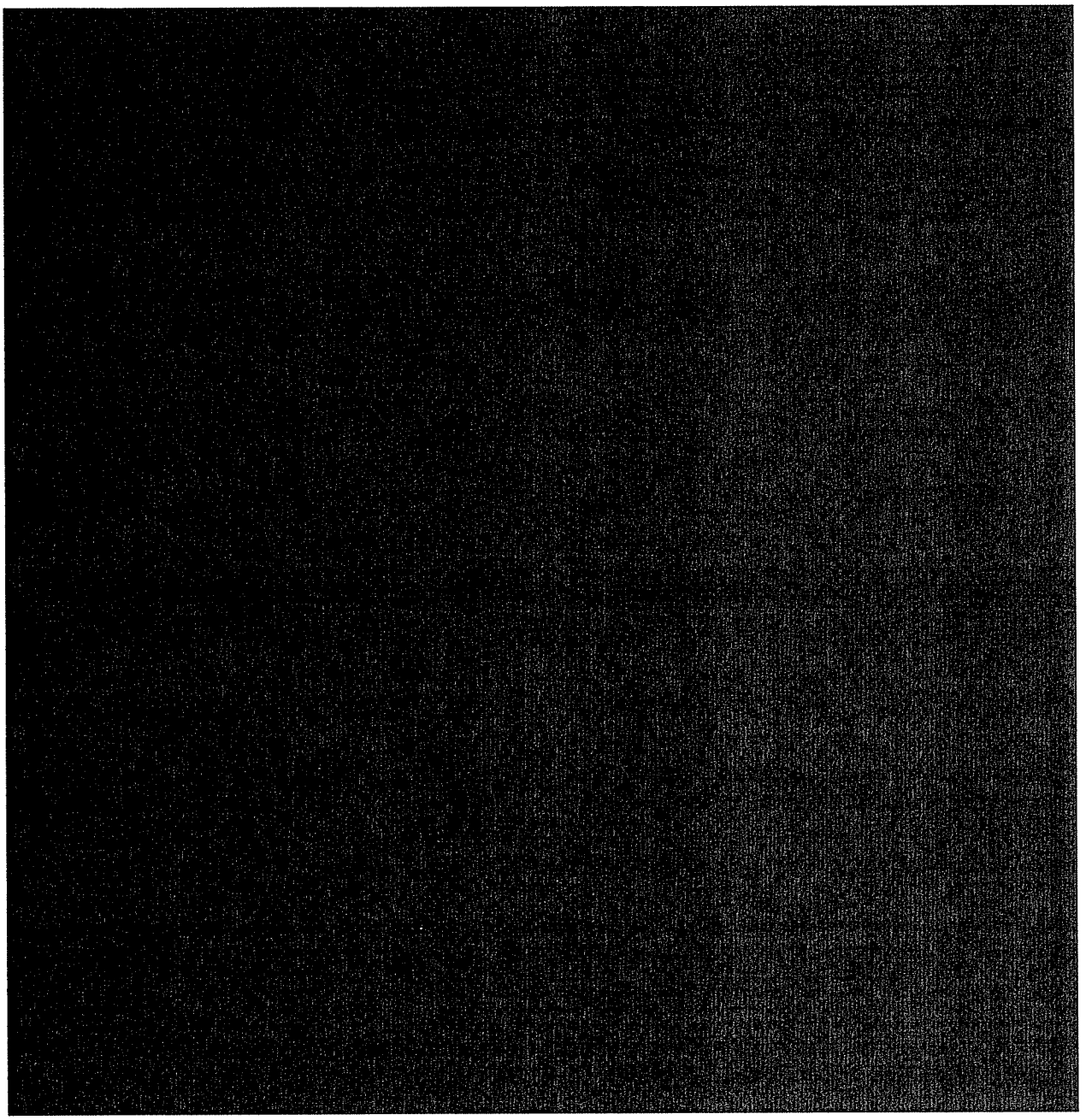


Table 3-3
Member System Average Annual Energy Growth Rates
2004 – 2014

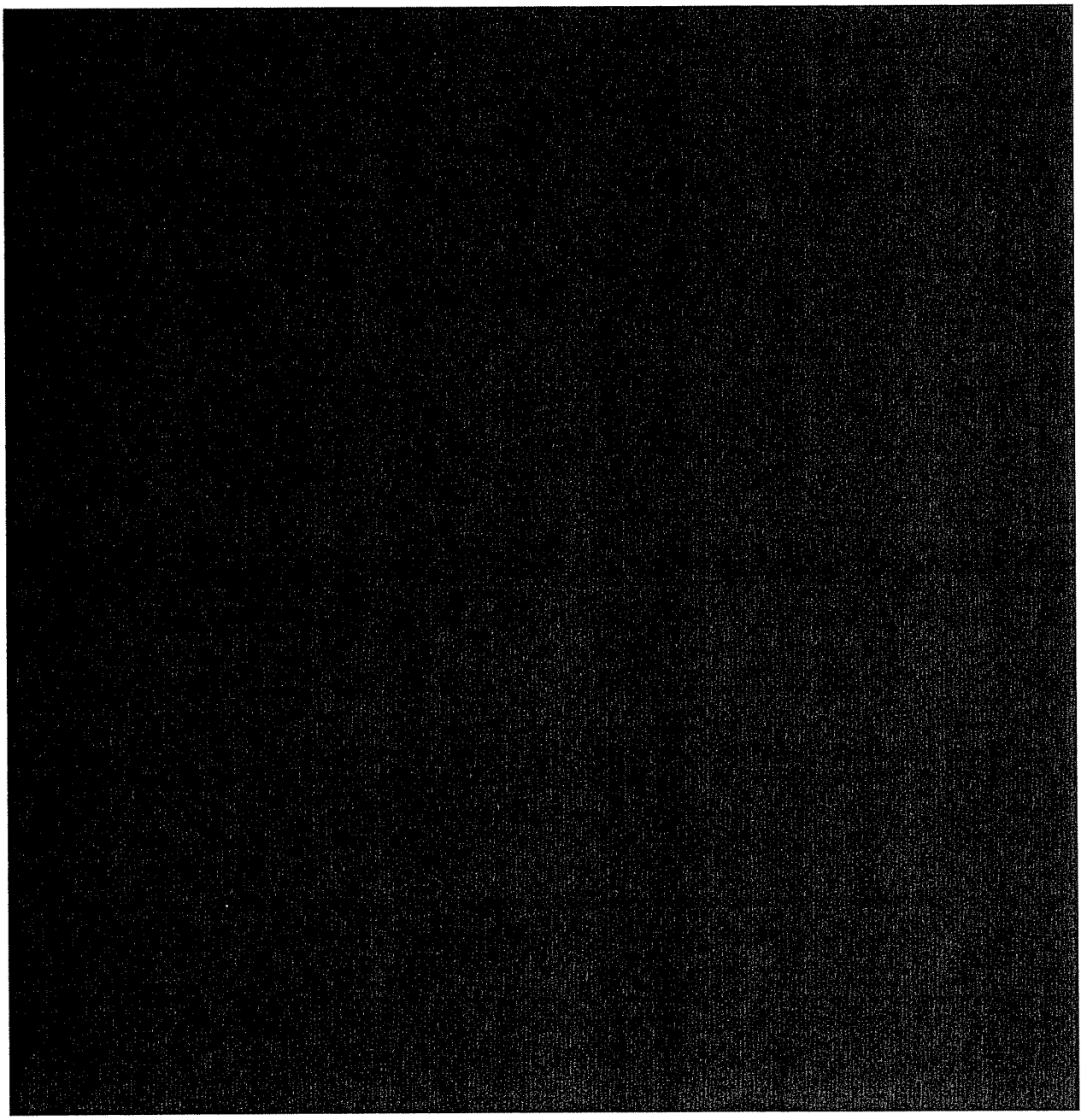


Table 3-4
Average Annual Energy Growth Rates
2004 – 2024

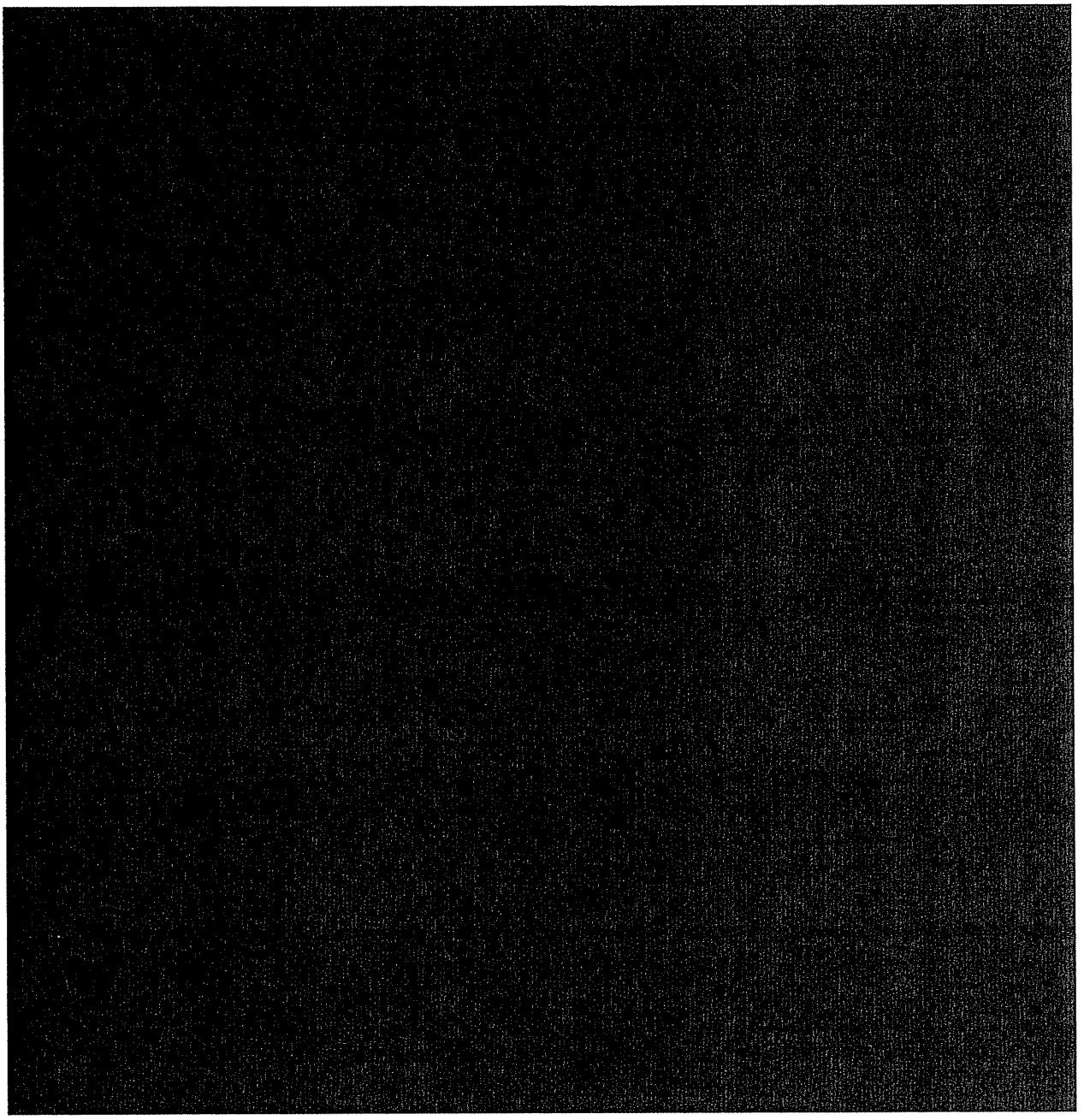


Table 3-5
Monthly Class Energy Sales Forecasts
Excluding Gallatin Steel Sales
2005 – 2006

Year	Month	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Other Sales (MWh)	Total Retail Sales (MWh)
2005	1	742,737	139,397	172,043	821	1,054,998
2005	2	700,501	139,741	174,101	765	1,015,108
2005	3	611,823	137,456	180,969	703	930,951
2005	4	506,392	134,117	176,577	618	817,705
2005	5	441,373	134,067	177,755	567	753,762
2005	6	468,611	142,328	178,974	582	790,496
2005	7	547,573	147,857	180,943	630	877,004
2005	8	552,160	150,926	179,144	626	882,856
2005	9	499,964	148,074	176,159	579	824,775
2005	10	449,644	139,574	182,040	584	771,842
2005	11	530,386	138,403	175,985	673	845,447
2005	12	693,215	142,104	177,653	800	1,013,772
Total		6,744,378	1,694,044	2,132,344	7,949	10,578,715
2006	1	764,405	144,462	182,472	847	1,092,185
2006	2	722,172	144,573	184,633	790	1,052,168
2006	3	635,911	142,846	191,321	728	970,806
2006	4	529,276	139,603	187,280	640	856,798
2006	5	459,763	139,401	188,642	584	788,389
2006	6	484,945	147,742	190,382	601	823,670
2006	7	559,809	153,175	192,108	652	905,743
2006	8	566,531	155,840	190,659	645	913,675
2006	9	514,014	153,459	186,948	599	855,020
2006	10	472,174	144,979	192,276	606	810,035
2006	11	555,912	144,045	186,478	696	887,131
2006	12	716,927	147,568	188,227	826	1,053,548
Total		6,981,837	1,757,692	2,261,427	8,213	11,009,169

Residential sales is the sum of the Residential, Seasonal, and Public Building class sales.

3.5 Major Differences In EKPC's 2004 Load Forecast and 2002 Load Forecast

There are three major changes in the 2004 Load Forecast: 1.) [redacted] 2.) Warren RECC will become a full EKPC member beginning April 1, 2008. 3.) [redacted] Table 3-6 shows the differences between the forecasts. Figures 3-7 and 3-8 compare the peak demand projections for the past several forecasts.

Table 3-6
Forecast Comparison
2004 Versus 2002

		2004	2002	Difference
Residential Sales, MWh	2004	6,497,216	6,376,839	120,377
	2005	6,682,941	6,592,814	90,127
	2010	8,769,805	7,700,500	1,069,305
	2015	10,132,987	9,007,704	1,125,283
Total Commercial and Industrial Sales, MWh	2004	3,599,266	3,813,473	-214,207
	2005	3,826,388	3,990,625	-164,237
	2010	5,833,529	4,813,854	1,019,675
	2015	6,630,497	5,574,495	1,056,002
Gallatin Steel, MWh	2004-2015	960,000	1,005,491	-45,491
Residential Customers	2004	452,930	454,744	-1,814
	2005	464,026	466,269	-2,243
	2010	574,137	524,716	49,421
	2015	639,260	584,719	54,541
Net Winter Peak, MW	2004	2,489	2,528	-39
	2005	2,633	2,631	2
	2010	3,565	3,108	457
	2015	4,085	3,623	462
Net Summer Peak, MW	2004	2,036	2,152	-116
	2005	2,133	2,242	-109
	2010	2,937	2,656	281
	2015	3,347	3,092	255

Note: Warren becomes member in April 2008.

Figure 3-7
Winter Peak Demand Projections
Historical Load Forecast Studies

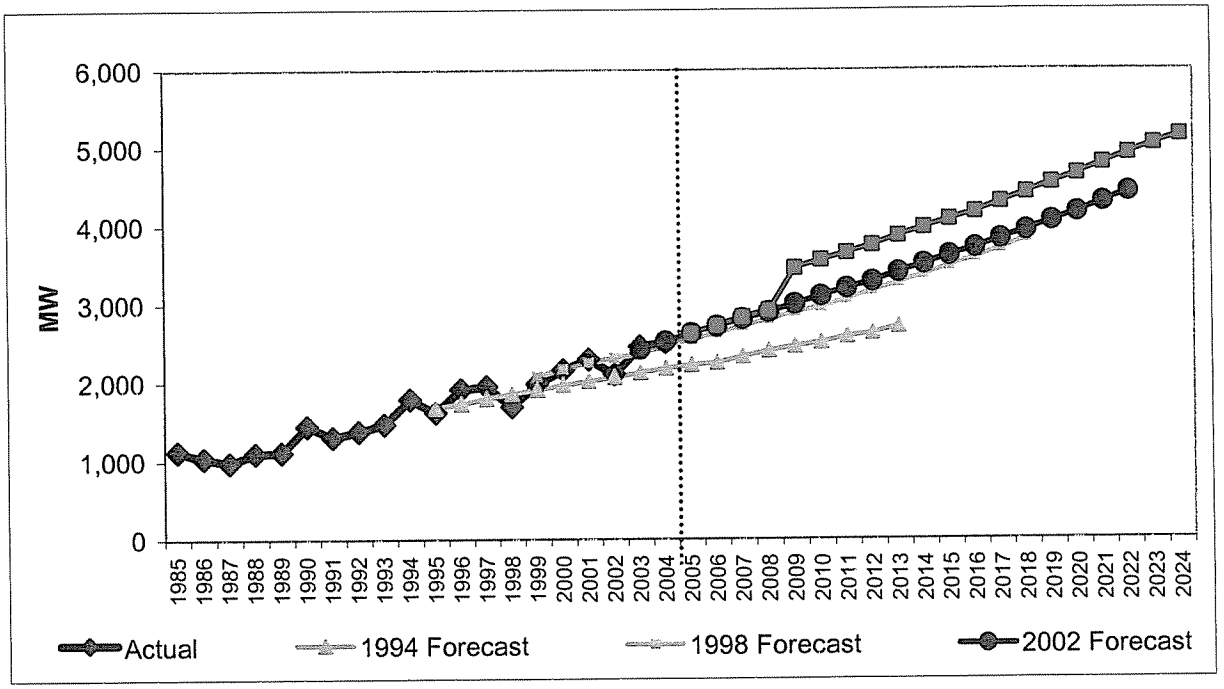
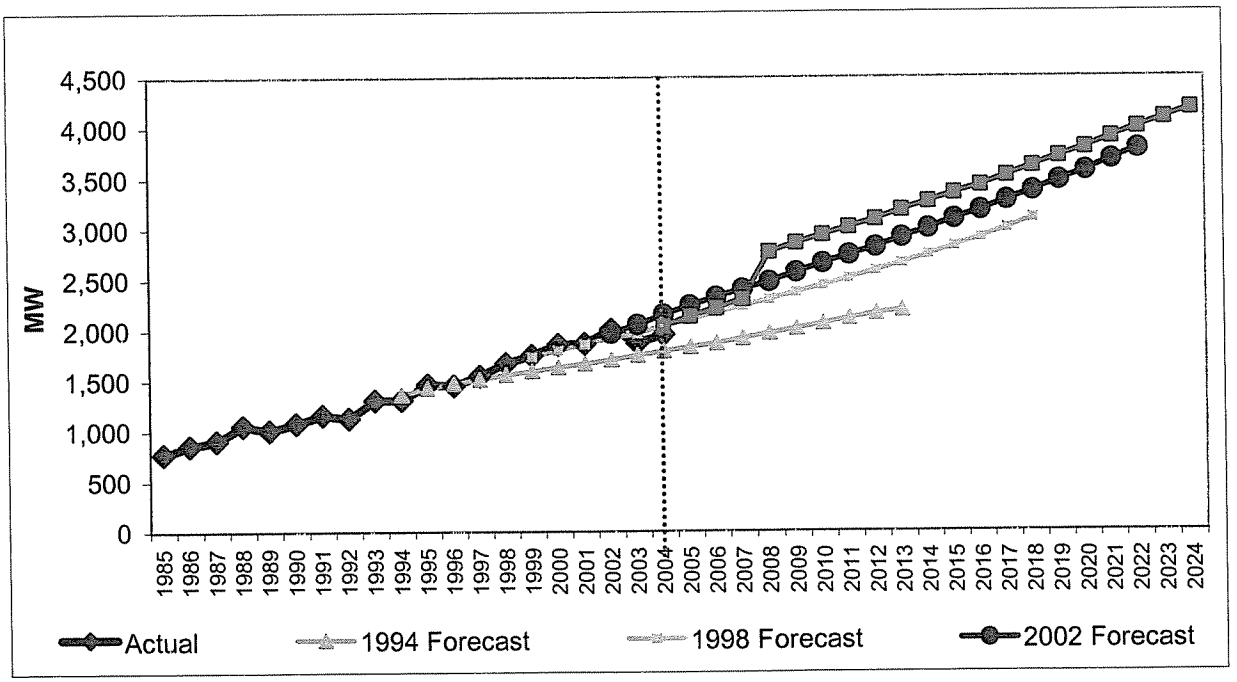


Figure 3-8
Historical Load Forecast Studies
Summer Peak Demand



SECTION 4.0

REGIONAL ECONOMIC MODEL

Section 4.0
Regional Economic Model

Part of EKPC's load forecast methodology includes regional economic modeling. Historical data on population, income, employment levels, and wages are collected at the county level from the U.S. Bureau of Labor Statistics and the U.S. Bureau of Economic Analysis ("BEA") and historical data on labor force size and the unemployment rate are collected at the county level from state sources. The historical county data are combined into six economic regions, and are analyzed and projected into the future. EKPC subscribes to the forecast services of Global Insight, an established consulting firm that supplies economic forecasts to thousands of U.S. firms. Regional economic activity is modeled using Global Insight's forecast of the U.S. economy as a driver. Consistent regional forecasts for population, income, and employment are developed. Population forecasts are used to project residential class customers; regional household income is used to project residential sales; and regional economic activity is used to project small commercial sales. The regional model output for the six regions as well as the SAS code are provided in Appendix B.

Table 4-1
Key Load Forecast Variables Provided
Percent Change

	1980-1990	1990-2000	2000-2010
Population	1%	10%	8%
Total Employment	25%	25%	21%
Manufacturing Employment	2%	12%	14%
Total Income	22%	30%	24%
Per Capita Income	21%	18%	14%

A positive aspect for EKPC's regional modeling is that key variables, shown above in Table 4-1, have a common basis from which forecasts are made. That is, the above variable forecasts are

consistent relative to one another. Population projections are linked to income growth, which is in turn linked to employment growth.

An important variable that is projected by the regional model is regional population. As Figure 4-1 shows, historical population grew rapidly during the seventies and slowed during the second half of the eighties. Presently, population growth has once again begun to increase at a relatively rapid rate. Overall, EKPC's forecast is for moderate growth in population.

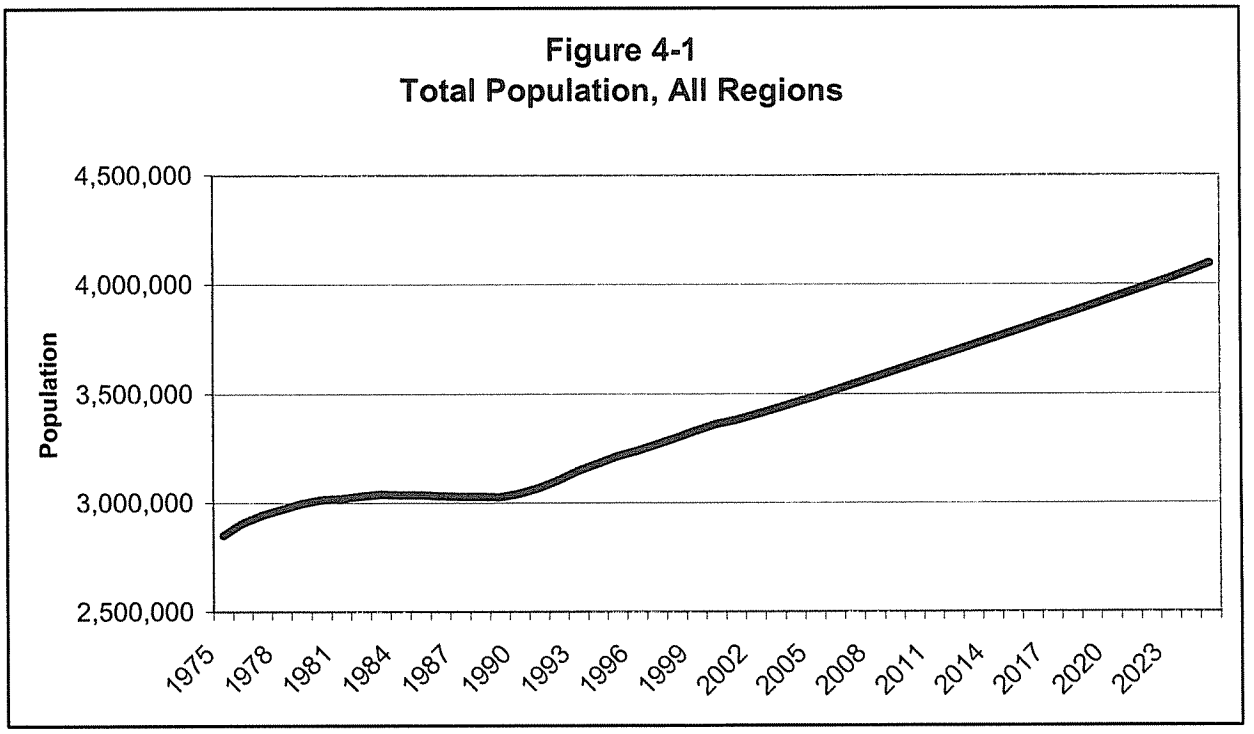


Figure 4-2 illustrates the cyclical nature of income growth, and the sensitivity to the national economy exhibited by EKPC's service area. Whenever employment levels decrease or wage levels fall, personal income will be adversely affected. EKPC's forecast of total regional income is for moderate but steady growth. This variable is important to the load forecast because of its strong effect on appliance purchases.

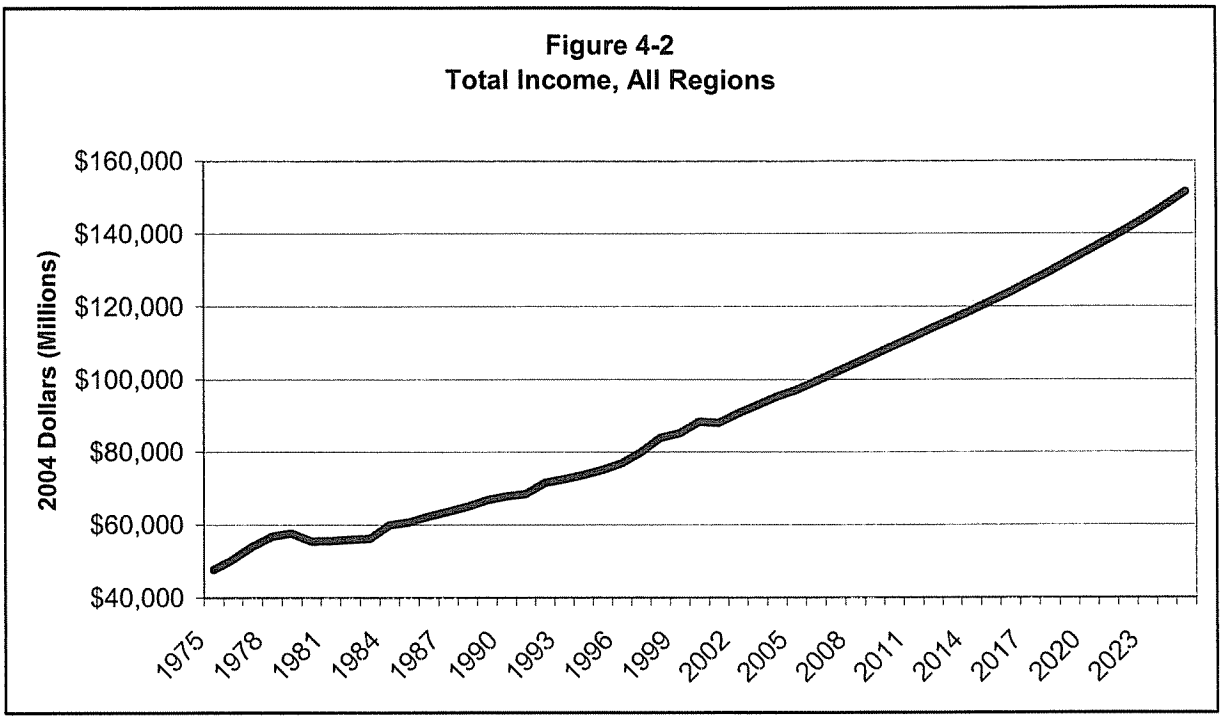
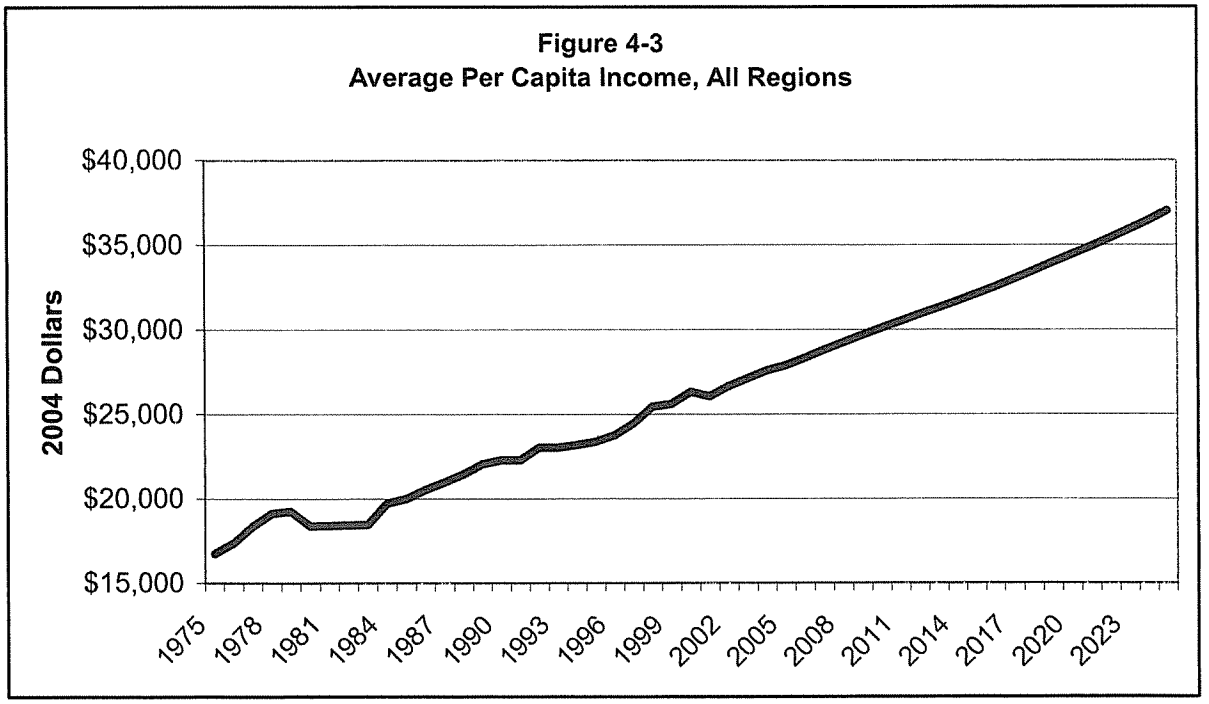


Figure 4-3 represents an interaction of the two previous charts. Per Capita Income (PCY) is defined as personal income divided by total population. In 2004, regional PCY was $28,000. EKPC projects this to increase to $34,000 in constant dollars by 2020.



Total regional employment is tied closely to the national economy. As Figure 4-4 shows, the early eighties was a period of depressed job growth. Since 1984, however, total employment has grown strongly and EKPC's forecast of total employment levels is for moderate growth. One constraint on jobs creation is the labor force, which should grow more slowly than in the past due to two effects.

Figure 4-4
Total Employment, All Regions

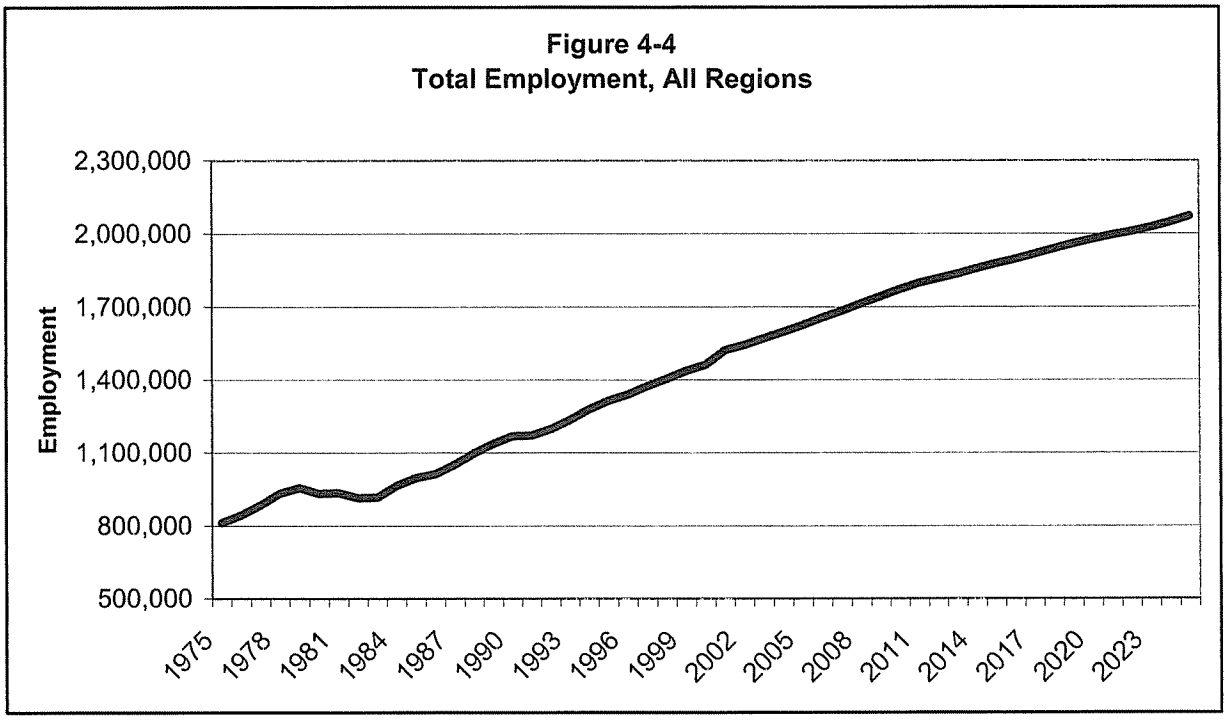
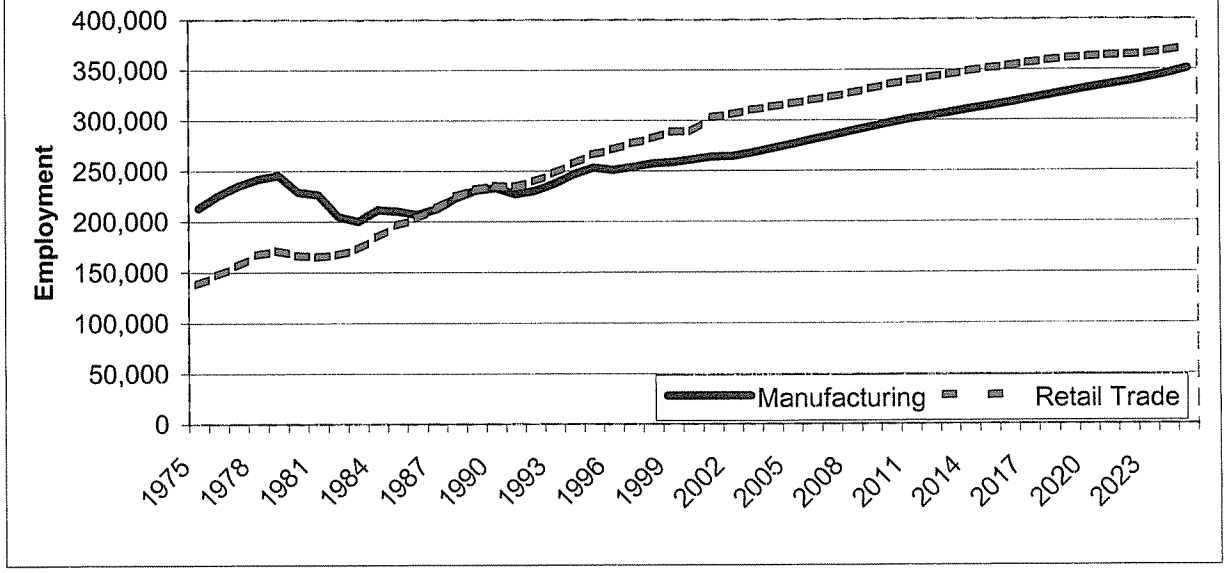


Figure 4-5 shows two components of total employment, manufacturing employment and retail trade employment. In 1975, there were approximately 75,000 more regional manufacturing jobs than retail trade. By the end of the forecast, EKPC projects approximately the same number of manufacturing and retail trade jobs. Kentucky's recent success notwithstanding, the long-term outlook for manufacturing jobs is for moderate growth.

Table 4-5
Manufacturing Employment And Retail Trade Employment
All Regions



Projections of regional economic activity enhance the sales forecasting and strategic planning of EKPC because changes in regional employment and income are important determinants of customer and sales growth. EKPC's regional models use quarterly county-level data to produce regional forecasts of income, employment, wages, population, labor force, and the unemployment rate. The analysis is performed with ordinary least squares regression. Historical regional data are common series and are available from government sources. The quarterly data is then converted to monthly values to use in the load forecasting models.

Some natural regions exist within the EKPC territory. For example, the Central Economic Region defined by EKPC fits closely within the Lexington Standard Metropolitan Statistical Area ("SMSA"). The BEA defines SMSA's as areas of interrelated economic activity that go beyond a single county's boundaries. EKPC's Eastern Region is dominated by the coal mining industry. The Northern Region includes Kentucky counties that border Cincinnati. A list of regions and counties is provided in Table 4-2. Models for these regions provide EKPC with a way of linking the electricity needs of a service area to the rest of the service area's economy in a consistent and reasonable manner. Tables 4-3 through 4-8 report regional economic summaries.

Table 4-2

Regional Economic Model
Counties by Region

Southern Region	Eastern Region	Northeastern Region	Central Region	West Central Region	Northern Region
Adair	Bell	Bath	Anderson	Bullitt	Boone
Allen	Breathitt	Boyd	Bourbon	Hardin	Campbell
Barren	Clay	Bracken	Boyle	Henry	Carroll
Casey	Estill	Carter	Clark	Jefferson	Gallatin
Clinton	Floyd	Elliott	Fayette	Larue	Grant
Cumberland	Harlan	Fleming	Franklin	Marion	Kenton
Green	Jackson	Greenup	Garrard	Nelson	Owen
Hart	Johnson	Lawrence	Harrison	Oldham	Pendleton
McCreary	Knott	Lewis	Jessamine	Shelby	
Metcalfe	Knox	Mason	Lincoln	Spencer	
Monroe	Laurel	Menifee	Madison	Trimble	
Pulaski	Lee	Montgomery	Mercer	Washington	
Russell	Leslie	Nicholas	Scott		
Taylor	Letcher	Powell	Woodford		
Warren	Magoffin	Robertson			
Wayne	Martin	Rowan			
	Morgan				
	Owsley				
	Perry				
	Pike				
	Rockcastle				
	Whitley				
	Wolfe				