

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF LOUISVILLE GAS AND)	
ELECTRIC COMPANY TO MODIFY ITS)	
CERTIFICATE OF PUBLIC CONVENIENCE)	CASE NO.
AND NECESSITY AS TO THE MILL CREEK)	2012-00469
UNIT 3 FLUE-GAS DESULFURIZATION UNIT)	

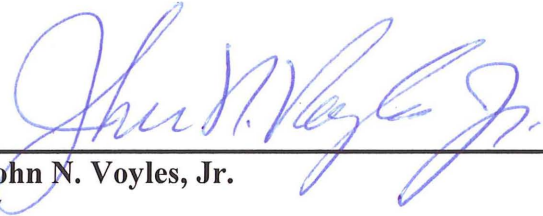
RESPONSE OF
LOUISVILLE GAS AND ELECTRIC COMPANY
RESPONSE TO THE
INFORMATION REQUESTED IN HEARING
DATED JANUARY 3, 2013

FILED: January 9, 2013

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

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



John N. Voyles, Jr.

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 9th day of January 2013.

 (SEAL)

Notary Public

My Commission Expires:

7/21/2015

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

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



Charles R. Schram

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 9th day of January 2013.



Notary Public (SEAL)

My Commission Expires:

7/21/2015

LOUISVILLE GAS AND ELECTRIC COMPANY

Case No. 2012-00469

Response to Information Requested in Hearing
dated January 3, 2013

Question No. 1

Responding Witness: Charles R. Schram

- Q-1. Please provide a copy of the natural gas forecasts which were used as the basis to develop the NPVRR Savings described in Tables 1 and 2 at pages 10 and 12 of John Voyles' Testimony filed on October 25, 2012 in this proceeding. Also, please provide a copy of the natural gas forecasts which were considered at the time of filing this proceeding. In providing these forecasts, please indicate which portions were forecasted by the providing companies (PIRA, CERA, EIA) and which portions were simply escalated by LG&E and on what basis.
- A-1. Please see the attachment which shows the requested natural gas price forecasts. The 2011 Compliance Plan "Base" and "2011 CERA" natural gas price forecasts were used in this proceeding and in LG&E's 2011 Environmental Compliance Plan filing (Case No. 2011-00162) to ensure comparability and consistency of technique between the cases. The "Base" forecast was based on a long-term forecast from PIRA. The "2011 CERA" case was used as a low gas price forecast sensitivity. Also included is the "2012 EIA" price forecast which was the natural gas forecast LG&E reviewed at the time of this filing as a gas price forecast sensitivity. Certain requested information is confidential and proprietary, and is being provided under seal pursuant to a petition for confidential treatment.

The attached spreadsheet shows that the 2012 EIA forecast's levelized price of natural gas from 2016 through 2041 is \$7.55 per mmBTU (in 2016 dollars). As the attachment further shows, the 2012 EIA levelized price is between the levelized prices for the two forecasts LG&E used in its modeling (\$9.88 for the base forecast and \$6.36 for the 2011 CERA forecast). Therefore, the range of projected NPVRR savings for retrofitting (versus retiring) Mill Creek Unit 3 as displayed on pages 10 and 12 of Mr. Voyles's testimony remains reasonable. For ease of reference, the NPVRR savings from Mr. Voyles's testimony are summarized below:

NPVRR Savings Associated with Retrofitting Mill Creek 3 (2011 \$M)

Gas Price	2011 ECR Plan	2012 Update		
		Least-Cost Option	Delay Options	
		New WFGD 4/2016	Refurbished WFGD 4/2016	New WFGD 10/2016 with PPA
Base Case	756	820	794	782
2011 CERA	338	402	376	370

Thus a reasonable margin of NPVRR benefits (i.e., \$402 M) continues to support the retrofit decision for Mill Creek 3 notwithstanding the range of gas price forecasts.

CONFIDENTIAL INFORMATION REDACTED

**Natural Gas Price Forecasts
Henry Hub (\$/MMBtu)**

Nominal	<u>2011 Compliance Plan</u>		<u>2012 EIA</u> ³
	<u>Base</u> ¹	<u>CERA</u> ²	
2012	5.83		-
2013	6.08		4.24
2014	6.32		4.41
2015	6.57		4.62
2016	6.84		4.67
2017			4.79
2018			4.93
2019			5.16
2020			5.39
2021			5.77
2022			6.22
2023			6.58
2024			6.88
2025			7.23
2026			7.56
2027			7.93
2028			8.22
2029			8.57
2030			8.95
2031			9.35
2032			9.81
2033			10.19
2034			10.94
2035			11.67
2036			12.31
2037			12.98
2038			13.68
2039			14.43
2040			15.22
2041			16.05
Levelized (2016-2041) ⁴	9.88	6.36	7.55

¹ 2012-2015 based on 5/28/2010 forward market prices; 2016-2025 based on April 2010 PIRA Long Term Henry Hub Natural Gas Outlook; 2026-2041 held constant to maintain a consistent relationship between gas and coal prices.

² 2012-2035 based on CERA's May 2011 Global Redesign scenario; 2036-2041 escalated at 1.8%.

³ Recently reviewed Energy Information Administration (EIA) forecast for 2013-2035 dated June 2012. Forecast for 2036-2041 is escalated based on the 5-year compound annual growth rate for 2030-2035.

⁴ Levelized value provided for comparison of long term EIA forecast to 2011 Compliance Plan forecasts; Initial year of 2016 is consistent with the 2011 Compliance Plan's implementation of EPA regulations and unit retirement considerations; Discount rate of 6.82%.

LOUISVILLE GAS AND ELECTRIC COMPANY

Case No. 2012-00469

**Response to Information Requested in Hearing
dated January 3, 2013**

Question No. 2

Responding Witness: Lonnie E. Bellar / John N. Voyles, Jr.

- Q-2. Please provide a reconciliation of the spreadsheet handed to Mr. Voyles during the hearing by Vice Chairman Gardner to the \$21 million referenced at the bottom of page 9 of Mr. Voyles' testimony filed on October 25, 2012 and again referenced in Voyles Exhibit 3, page 3, Table 2.
- A-2. The numbers provided at the hearing from Vice Chairman Gardner are from a spreadsheet LG&E provided in response to an inquiry from the Executive Director's Office for detailed support for the statements in LG&E's November 8, 2012 press release related to the Mill Creek and Ghent projects. The spreadsheet shows a total difference for MC3 of \$56 million as compared to the \$21 million referenced in the testimony filed on October 25, 2012 and again on Exhibit JNV-3. The table from Exhibit JNV-3 was as follows:

Table 1 – Capital Costs with New FGD (Nominal \$M)

Equipment	2011 ECR Plan	2012 Update	Change
FGD	74	132	58
Baghouse	140	113	-27
SAM Mitigation/Economizer Modifications	10	-	-10
Total	225	245	21

In LG&E's response to the Commission Staff's First Request for Information, Question No. 8b, the Company clarified that the baghouse capital cost in the table above only included the direct EPC contractor costs of \$113 million and did not include the Owner's Costs of an additional \$14 million, allocated to the baghouse scope of work not included in the prime EPC contractor (Zachry) scope of work.

To these costs, LG&E added an additional \$21 million which represents a proportion of the potential contractor costs above the Target Price allowed under the structure of the EPC contract Guaranteed Maximum provision.¹

Reconciliation:

Table 2 Delta	\$21 million
Baghouse Owner's Cost	\$14 million
WFGD costs above the Target Price Provision	\$10 million
Baghouse costs above the Target Price Provision	\$11 million
Total Reconciliation	\$56 million

¹ Please see LG&E's Response to Commission Staff Request for Information No. 8(b)(filed on November 30, 2012). (Additional Guaranteed Maximum Contingencies of \$10 million for the new WFGD and \$11 million for the baghouse)

LOUISVILLE GAS AND ELECTRIC COMPANY

Case No. 2012-00469

**Response to Information Requested in Hearing
dated January 3, 2013**

Question No. 3

Responding Witness: John N. Voyles, Jr.

- Q-3. Please provide the name of the contractor who is conducting the flow modeling studies referenced in LG&E's response to Question No. 6 to the Commission Staff's First Request for Information.
- a. What is the price of the modeling contract?
 - b. What is the schedule for the referenced modeling?
 - c. Please provide an update on the status of the modeling activities.
- A-3. The full implementation of the Mill Creek ECR Project 26 has a number of critical path elements that run in parallel, one of which is flow modeling. The testimony at the hearing shows the Company has a firm price quote from Babcock Power for the new WFGD at Mill Creek 3. The Babcock Power firm price quote is based on firm price quotes from a number of its suppliers. The supplier's firm price quotes will begin to expire in early February, 2013.

With respect to the name of the contractor who is conducting the flow modeling studies, various contractors are responsible for flue gas flow modeling on the Mill Creek Project. Clyde Bergemann, the supplier of the baghouse equipment, is contractually responsible for flue gas flow modeling from the boiler outlet to the baghouse outlet. BPEI, the supplier of the WFGD equipment, is responsible for the flue gas flow modeling from the outlet of the new fans to the outlet of the WFGD. Zachry is responsible for the modeling of the entire flue gas modification path which incorporates the areas by Clyde Bergemann and BPEI. Clyde Bergemann has contracted with Air Flow Sciences. Zachry and BPEI have contracted with NELS Consulting Services Inc.

- a. The modeling for each unit varies based upon scope. LG&E cannot determine an exact cost for modeling service because the three contractors are responsible for different aspects of the flow modeling and because BPEI and Clyde Bergemann Equipment Purchase Agreements are lump sum contracts.

That notwithstanding, LG&E estimates that the total modeling for each unit will cost approximately \$250,000.

- b. The full construction schedule sequence for Mill Creek Station begins with Unit 4, followed by Units 1 and 2, and then ends with Unit 3. At times, all units will be in some form of detailed design and modeling at the same time over the next four to six months. This engineering work (i.e., detailed ductwork design and flow modeling) is one of the first critical activities in the implementation of the Unit 3 WFGD and baghouse. This work establishes the final design of ductwork which allows the engineering of the entire system (including foundation locations and structural steel design). Completion of the engineering of the system is required to begin the procurement phase of purchasing the ductwork, structural steel and contracts for insulation, lagging, and other components of installation.

The process used in air flow models starts with ductwork location and its associated geometry. Once approval is granted on the Unit 3 compliance plan option, detailed engineering can be completed on the exact location of the ductwork (including foundations to grade). When this detailed engineering is completed to the point of having confidence of exact ductwork geometry, the design can be given to the flow modeling firms to begin their computer modeling (Computational Fluid Design) and physical modeling (a physical scaled model) of the exact ductwork. The modeling outputs identify the internal modifications or additions to the ductwork design needed to be incorporated in the final design that will reduce pressure drop, improve the continuity of flue gas throughout the ductwork, and maximize PAC and sorbent injection effectiveness while balancing the minimization of pressure drop in the entire system.

Modeling for Unit 3 has not yet begun due to the uncertainty whether to build a new WFGD or to rehabilitate Unit 4's existing WFGD for Unit 3's use. Pending the disposition of LG&E's application in this case, the Company has focused on modeling Unit 4 and Units 1 and 2. This approach is based on the expectation that an order from the KPSC establishing final plans for Unit 3 will be received in January, 2013.

- c. Please see responses above.

LOUISVILLE GAS AND ELECTRIC COMPANY

Case No. 2012-00469

**Response to Information Requested in Hearing
dated January 3, 2013**

Question No. 4

Responding Witness: John N. Voyles, Jr.

Q-4. Identify the costs spent to date on the planned retrofit of the Mill Creek Unit 4 FGD for use by Mill Creek Unit 3.

A-4. LG&E has spent approximately \$404,000 to date on the Mill Creek Unit 4 WFGD retrofit portion of the Mill Creek Air Compliance Project. A breakdown of these costs is shown below. All of these costs were for preliminary engineering by the various technology vendors that studied the feasibility of utilizing Unit 4's WFGD to service Unit 3 at a high removal rate of sulfur dioxide in lieu of constructing a new WFGD to service Unit 3. These expenditures were prudent and necessary to determine with greater certainty the cost and feasibility of retrofitting the existing Unit 4 WFGD versus building a new WFGD to service Unit 3.

Unit 4 WFGD Retrofit Cost (as of December 31, 2012 in \$000s)

BPEI	\$151	(Upgrade Studies)
Hitachi	\$71	(Upgrade Studies)
Zachry	\$182	(based on 17% for re-connect cost, which is 17% of cost to date)
Total	\$404	

NOTE: While B&V and Worley Parsons have performed engineering work for the entire Mill Creek ECR Project 26 (total of \$680,000 through December 31, 2012), a specific cost for the Unit 4 retrofit scope is not specifically identifiable but would be de minimis at this point.