PPL companies

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Mr. Jeff DeRouen
Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40601

March 20, 2013

Re: CONSIDERATION OF THE IMPLEMENTATION OF SMART GRID AND SMART METER TECHNOLOGIES
Case No. 2012-00428

Dear Mr. DeRouen:

Enclosed please find and accept for filing an orginial and fourteen copies of Louisville Gas and Electric Company and Kentucky Utilities Company Responses to the Attorney General's Initial Request for Information dated February 27, 2013 in the above referenced matter.

Should you have any questions regarding the enclosed, please contact me at your convenience.

Sincerely,

Rick E. Lovekamp

Rick E. Lovekamp

c: Parties of Record

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

CONSIDERATION OF THE	)	CASE NO.
IMPLEMENTATION OF SMART GRID	)	2012-00428
AND SMART METER TECHNOLOGIES	)	

JOINT RESPONSE OF LOUISVILLE GAS AND ELECTRIC COMPANY AND KENTUCKY UTILITIES COMPANY TO THE ATTORNEY GENERAL'S INITIAL REQUESTS FOR INFORMATION DATED FEBRUARY 27, 2013

FILED: March 20, 2013

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) **SS:**
COUNTY OF JEFFERSON)

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

Edwin R. Staton

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 18th day of March 2013.

Notary Public (SEAL)

My Commission Expires:

7/21/2015

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) **SS:**
COUNTY OF JEFFERSON)

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

Thomas A. Jessee

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 18th day of March 2013.

Notary Public (SEAL)

My Commission Expires:

7/21/2015

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) **SS:**
COUNTY OF JEFFERSON)

The undersigned, **David E. Huff**, being duly sworn, deposes and says that he is Director of Customer Energy Efficiency & Smart Grid Strategy for Louisville Gas and Electric Company and Kentucky Utilities Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and that the answers contained therein are true and correct to the best of his information, knowledge and belief.

David E. Huff

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 18th day of March 2013.

Notary Public (SEAL)

My Commission Expires:

7/21/2015

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) **SS:**
COUNTY OF JEFFERSON)

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

Eric Slavinsky

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 18th day of March 2013.

Notary Public (SEAL)

My Commission Expires:

7/21/2015

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) **SS:**
COUNTY OF JEFFERSON)

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

Paul Gregory "Greg" Thomas

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 18th day of March 2013.

Notary Public (SEAL)

My Commission Expires:

7/21/2015

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) **SS:**
COUNTY OF JEFFERSON)

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

David S. Sinclair

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 18th day of March 2013.

Notary Public (SEAL)

My Commission Expires:

7/21/2015

LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY

CASE NO. 2012-00428

Joint Response to the Attorney General's Initial Requests for Information
Dated February 27, 2013

Question No. 1

Witness: Edwin R. Staton

Q-1. Since the Commission initiated Consideration of *the New Federal Standards of the Energy Independence and Security Act of 2007,* Administrative Case No. 2008-00408, has the company changed its position regarding Smart Grid? If so, how?

A-1. No. The Companies continue to monitor and investigate various smart grid technologies.

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Question No. 2

Witness: Thomas A. Jessee / David E. Huff

Q-2. Are the technologies pertaining to the implementation of Smart Grid definitely known and proven?

a. If yes, explain in detail every aspect from the use of each technology from the company to the end-user.

b. If not, explain in detail what technologies are already advancing/improving as well as those that are envisioned on the immediate time horizon.

A-2. Not all technologies pertaining to the implementation of Smart Grid are known and proven. For example, the Smart Grid Interoperability Panel's focus is to identify, develop, and support mechanisms and tools for objective standards impact assessment, transition management, and technology transfer to assist in deployment of standards-based smart grid devices, systems, and infrastructure. These standards then impact the development and evolution of technologies.

Development of industry standards for smart grid has been underway for several years; however, the development of standards is an ongoing process. In its June 22, 2012 report to the Commission,[1] LG&E-KU described participation in the Smart Grid Interoperability Panel ("SGIP"), a public-private partnership that defines requirements for essential communication protocols and other common specifications and coordinates development of these standards by collaborating organizations. In addition, LG&E-KU has an elected representative on the Smart Grid Implementation Methods Committee ("SGIMC") of SGIP, a working group whose mission is to identify, develop, and support mechanisms and tools for objective standards impact assessment, transition management, and technology transfer to assist in deployment of standards-based smart grid devices, systems, and infrastructure.

[1] Request of Louisville Gas and Electric Company to Cancel and Withdraw the Tariffs for its Responsive Pricing and Smart Metering Pilot Program, Case No. 2011-00440, June 22, 2012, p. 4.

Active involvement in organizations like SGIP and the SGIMC allows LG&E-KU to be engaged in the standards process, and will afford the opportunity to learn from best practices of other utilities. As stated by Dr. George Arnold, National Coordinator for Smart Grid Interoperability at the National Institute of Standards and Technology, "There are many standards needed for the smart grid and they are in varying stages of maturity. Some have been in existence for years and are already realized in products that are being used by industry; others are more recent and are appearing in products but not yet widely deployed; and yet others are still in draft form and will be used in future products when they are finalized."[2]

[2] Opening Remarks by George W. Arnold, National Coordinator for Smart Grid Interoperability National Institute of Standards and Technology, Federal Energy Regulatory Commission Technical Conference on Smart Grid Interoperability Standards, Jan . 31, 2011

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Question No. 3

Witness: Thomas A. Jessee /Edwin R. Staton

Q-3. In light of recent catastrophic storms over the past ten years (for example, the various ice storms, tornadoes, and strong winds), which electric companies have experienced, and for which the company may ultimately have sought regulatory assets, can the company affirmatively state that its basic infrastructure, including all of its generation, transmission and distribution facilities, have proven to be reliable 24 hours a day, seven days a week, 365 days a week? If not, for each and every storm that it affected the utility in excess of two days, please provide the following:

a. The number of days before the company's last ratepayer's electricity was restored for each storm.

b. The average number of days, or hours if applicable, that the average ratepayer's outage lasted for each storm.

c. The average financial loss for the average ratepayer for each storm, if known.

A-3. LG&E's and KU's basic infrastructure has, on the whole, proven to be highly reliable on a round-the-clock basis for many years.

That is not to say that LG&E's and KU's infrastructure has been or ever could be completely impervious to extreme weather or other conditions outside the Companies' reasonable control. Indeed, no such system exists at a reasonable cost. But within the realm of what is cost-effectively reasonable, the Companies' infrastructure has performed reasonably well on the whole.

a. The number of hours before the last ratepayer's electricity was restored is identified by the event duration for each storm included in "Attachment to AG Q-3". Data is not available prior to the implementation of the Outage Management System in 2005.

b. The average number of hours that the average ratepayer's outage lasted for each storm is included in "Attachment to AG Q-3".

c. The Companies do not know the financial loss for the average ratepayer for each storm.

LG&E and KU Storms Exceeding 48 Hour Duration Since 2005

Operations Center/Utility	Detailed Storm Description	Start Date	Start Time	End Date	End Time	Event Duration (hrs)	Avg Cust Duration (hrs)
KU-EAROC	Thunderstorms and tornado	3/2/2012	14:00	3/4/2012	16:00	50	8.5
LGE	Storm	8/13/2011	17:00	8/17/2011	18:00	97	18.6
LGE	Storm	5/23/2011	4:00	5/25/2011	14:00	58	6.1
KU-PINOC	Mountain Snowstorm	12/18/2009	16:00	12/23/2009	17:00	121	20.1
LGE	Wind Storm	2/11/2009	12:00	2/13/2009	23:00	59	8.1
KU-PINOC	Wind Storm	2/11/2009	16:00	2/14/2009	1:00	57	8.6
LGE	Ice Storm	1/27/2009	17:00	2/6/2009	19:00	242	60.4
KU	Ice Storm	1/27/2009	3:00	2/10/2009	0:00	333	58.7
KU	Wind storm from Hurricane "IKE"	9/14/2008	7:30	9/21/2008	22:00	182	18.9
LGE	Wind storm from Hurricane "IKE"	9/14/2008	9:00	9/24/2008	22:00	253	48.0
KU-EAROC	Freezing rain and sleet	2/11/2008	21:00	2/15/2008	18:00	93	15.6
KU-SHEOC	Tornados and wind	2/6/2008	0:00	2/8/2008	0:00	48	8.0
KU-EAROC	Tornados and wind	2/5/2008	20:00	2/9/2008	19:00	95	19.3
KU-ELIOC	Tornados and wind	2/5/2008	21:00	2/8/2008	16:00	67	7.2
LGE	Storm	2/5/2008	23:00	2/8/2008	23:00	72	7.3
LGE	Storm	1/29/2008	18:00	2/1/2008	18:00	72	11.5
LGE	Storm	8/16/2007	15:00	8/18/2007	19:00	52	5.4
KU-PINOC	Storm	4/3/2007	21:00	4/6/2007	3:00	54	10.4
LGE	Storm	5/25/2006	18:00	5/28/2006	0:00	54	6.9
LGE	Storm	4/2/2006	19:00	4/6/2006	8:00	85	9.7
LGE	Storm	3/9/2006	16:00	3/11/2006	16:00	48	2.7

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Question No. 4

Witness: Edwin R. Staton

Q-4. Does the company agree with the Attorney General that electricity is not considered a luxury service but a necessary commodity of modern life? If not, why not?

A-4. In developed countries, electricity is undoubtedly an important part of modern life for the provision of power for heat, cooling, light, cooking, and the delivery of critical community and human services.

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Question No. 5

Witness: Edwin R. Staton

Q-5. Does the company agree that the fundamental reliability of its electric grid - i.e., the delivery of electricity to the end-user 24/7/365 - is paramount to the end-user's ability to monitor and/ or conserve his/her demand or electricity consumption? If not, why not?

A-5. LG&E and KU are committed to providing safe, reliable service at reasonable rates. LG&E's and KU's electrical systems are fundamentally reliable and sound, and provide a reasonable basis for customers to monitor their demand for, and consumption of, electricity, and to implement conservation measures. But when service is interrupted to a customer, it does not frustrate the customer's ability to conserve or monitor electric consumption; rather, it makes those concerns briefly and temporarily irrelevant.

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Question No. 6

Witness: Eric Slavinsky

Q-6. Please state whether the company is aware of any cybersecurity breaches effecting the electric and gas industries that have either occurred in the United States or internationally. If the answer is in the affirmative, please explain the details of the breaches without exposing information that is not already in the public domain.

A-6. The Companies are aware only of information in the public domain or in monitored alerts received from various sources such as the Federal Department of Homeland Security's Industrial Control System Computer Emergency Response Team ("ICS-CERT"). The latter is a controlled-access portal. There are a significant number of examples of breaches reported, typically sanitized or anonymous. Due to the sensitive nature of information regarding critical infrastructure specifics, it is typical within the industry to maintain confidentiality of details.

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Question No. 7

Witness: Edwin R. Staton

Q-7. Please confirm that the company is aware that the prior United States Secretary of Defense Leon Panetta, in speaking on the vulnerability of the nation's electric grid with the consequential safety and security concerns that ensue, warned the Senate Appropriations Committee on Defense that the risk to the United States could even be considered the equivalent of a "digital Pearl Harbor[3] .

a. Is this concern of the vulnerability of the nation's electric grid shared by the company? If not, why not?

A-7. The Companies take seriously the potential consequences of attacks on the nation's electric grid, and particularly on the Companies' facilities. That is why the Companies have taken and continue to take reasonable, prudent steps to protect their infrastructure from physical and electronic threats.

[3] Comments by Secretary of Defense, Leon Panetta, U.S. Senate Appropriations Subcommittee on Defense, Hearing on FY 13 DoD Budget, June 13, 2012.
http://www.appropriations.senate.gov/webcasts.cfim?method=webcasts.view&id=08e51d6c-4a32-4fa4-b09c-a006fa63c976

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Joint Response to the Attorney General's Initial Requests for Information
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Question No. 8

Witness: Eric Slavinsky

Q-8. With regard to cybersecurity in general, can the company unequivocally confirm that its system reliability is not vulnerable to a cybersecurity attack? If not, what could be the consequences? Please explain in detail as much as possible for the following:

a. the company, and

b. the company's ratepayers.

A-8. The Companies strive continually to ensure the security of the computer networks that support the reliability of the Companies' electric system. This hard work is led by a team of qualified, professional employees whose time is dedicated to security of these networks. The Companies also invest significantly in infrastructure, such as firewalls, latest operating systems and intrusion detections system, which enhance the protection of these computer networks. To further protect these computer networks, the Companies also have implemented a number of other processes and periodic activities, including annual cyber vulnerability assessments, anti-virus software, malware protections, user access rights reviews and 24x7 security monitoring of key systems.

The Companies are required to comply with the North American Electric Reliability Corporation ("NERC") Critical Infrastructure Protection ("CIP") Standards. The CIP Standards mandate many industry best practice processes to protect the computer networks associated with assets considered to be critical to the bulk electric system. In response to the CIP Standards, the entire industry, including the Companies, has implemented extensive security enhancements for the computer networks associated with these critical bulk electric system assets. The Companies have also implemented an extensive internal compliance program that helps ensure that the Companies remain in compliance with the CIP Standards. This program includes significant oversight and involvement from the

Companies' senior leadership and internal self-assessments to test the quality of the Companies' implementation.

In spite of the high quality of the Companies' efforts to protect the computer networks that support the electric system reliability, the risk of a cyber security attack remains. No amount of effort could completely eliminate the vulnerability of those networks to a cyber security attack. All organizations, both industry and government, face this vulnerability and are forced to make wise investments based on the risk faced and the effectiveness of the countermeasures. As a result, the Companies' approach has been to remain vigilant in tracking and identifying new threats and implementing appropriate counter-measures, at all times pursuing best practices in cyber security protections that are also prudent expenditures on behalf of ratepayers.

The consequences of a successful cyber-attack could be severe, including disruption of service to customers for substantial periods of time. However, among the measures that the Companies have implemented are measures that will help reduce the risk associated with a successful attack. For instance, the Companies maintain recovery plans for critical systems and those plans are exercised periodically, in some instances system redundancy is maintained allowing for failover to a functioning system, and spare hardware inventory is onsite.

In considering the consequences of a cyber-attack, it is important to also note that the Companies have not experienced any disturbances to operations to date resulting from a cyber security attack.

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Question No. 9

Witness: Eric Slavinsky

Q-9. Please provide the names of the standards, protocols or policies which the company observes and/or implements in its maintaining its system reliability from cybersecurity threats.

A-9. The Companies do not subscribe to a single standard regarding cyber security. They monitor several recognized bodies of knowledge, including but not limited to those listed below, adopting and adapting best practices to the needs of the business.

- NIST – National Institute of Standards and Technology including:
  - NIST SP 800-53, NIST SP 800-82 – These are standards that deal with industrial control system security
  - NIST SP 1108R2 – This is the Smart Grid Framework and Roadmap for Interoperability, including privacy concerns
  - NISTIR 7628 – This is the Guidelines for Smart Grid Cyber Security, including privacy concerns
- ANSI/ISA-99.02.01-2009 –American National Standards Institute (deals with industrial control system security)
- NERC CIP – North American Electric Reliability Corporation Critical Infrastructure Protection
- SANS – SysAdmin, Audit, Networking, and Security
- ITIL – Information Technology Infrastructure Library
- COBIT - Control Objectives for Information and Related Technology
- COSO - Committee of Sponsoring Organizations of the Treadway Commission

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CASE NO. 2012-00428

Joint Response to the Attorney General's Initial Requests for Information Dated February 27, 2013

Question No. 10

Witness: Eric Slavinsky

Q-10. Please provide copies of the standards, protocols or policies which the company observes and/or implements in its maintaining its system reliability from cybersecurity threats.

A-10. The Companies do not subscribe to a single standard regarding cyber security. They monitor several recognized bodies of knowledge, including but not limited to those listed below, adopting and adapting best practices to the needs of the business.

- NIST – http://www.nist.gov/itl/cyberframework.cfm,
  - NIST SP 800-53, NIST SP 800-82 – http://www.nist.gov/el/isd/cs/cybsecfactconsys.cfm
  - NIST SP 1108R2 – http://www.nist.gov/smartgrid/upload/NIST_Framework_Release_2-0_corr.pdf
  - NISTIR 7628 http://www.smartgrid.gov/sites/default/files/pdfs/nistir_7628%20.pdf
- ANSI/ISA-99.02.01-2009 https://www.isa.org/Template.cfm?Section=Standards8&Template=/Ecommerce/ProductDisplay.cfm&ProductID=10243
- NERC CIP – http://www.nerc.com/page.php?cid=2|20
- SANS – http://www.sans.org/critical-security-controls/
- ITIL – http://www.itil.org/en/vomkennen/itil/index.php
- COBIT-http://www.isaca.org/Knowledge-enter/COBIT/Pages/Overview.aspx
- COSO - http://coso.org/IC-IntegratedFramework-summary.htm

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CASE NO. 2012-00428

Joint Response to the Attorney General's Initial Requests for Information
Dated February 27, 2013

Question No. 11

Witness: Eric Slavinsky

Q-11. With regard to cybersecurity in general, can the company unequivocally confirm that its ratepayers' privacy of data cannot be compromised or otherwise divulged to any individual or entity not associated with the company, or a qualified third-party which has issues a non-disclosure statement or the ratepayers? If not, what could be the consequences? Please explain in detail as much as possible for the following:

a. the company, and

b. the company's ratepayers.

A-11. The Companies consider best practices from industry standards including NIST, SANS, and other non-governmental industry organizations such as the American Gas Association (AGA), Edison Electric Institute ("EEI") and the Electric Power Research Institute ("EPRI") to ensure privacy of data. Some of the best practices currently utilized by the Companies include:

- Defense in-depth strategy employing multiple technologies from various vendors to mitigate risk of breaches including perimeter firewalls, intrusion detection and prevention systems, data loss prevention, malware defenses, and email spam filtering.
- Application security and user security protection on applications and databases which store private data. The Companies' and their customers' data are stored inside the internal network protected by the defenses noted. Private customer data disclosed to third parties is transferred through secured communication including encryption.
- Audits and reviews of access to data.
- Implementation of Corporate Data Classification policy.
- Information Security Awareness campaigns conducted for employees to raise awareness of threats to information security.

The Companies are fully committed to the security and privacy of data. The Companies have devoted, and will continue to devote, sufficient resources and management attention to cyber security, and believe that such continued focus will enable the Companies to continue to provide data privacy as well as secure, reliable services to customers.

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CASE NO. 2012-00428

Joint Response to the Attorney General's Initial Requests for Information Dated February 27, 2013

Question No. 12

Witness: David E. Huff

Q-12. If a qualified third-party that has agreed to a non-disclosure statement and obtains ratepayers' private information, what guarantees exist that the information will not be disclosed, whether intentionally or unintentionally?

A-12. General contract terms require confidentiality. In the event a third party is to obtain access to the Companies' systems or ratepayers' private information, additional language is required in the contract covering required actions regarding information technology security. While the Companies cannot guarantee that a contractor will not breach the terms of such agreements, considerations included are provisions such as encryption of data, Companies audit rights, and password protections on contractor systems housing such information.

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Joint Response to the Attorney General's Initial Requests for Information
Dated February 27, 2013

Question No. 13

Witness: Eric Slavinsky

Q-13. Please provide the names of the standards, protocols or policies which the company observes and/or implements in its maintaining its ratepayers' privacy data from cybersecurity threats.

A-13. The Companies do not subscribe to a single standard regarding cyber security. They monitor several recognized bodies of knowledge, including but not limited to those listed below, adopting and adapting best practices to the needs of the business.

- NIST - National Institute of Standards and Technology including:
  - NIST SP 800-53, NIST SP 800-82 - These are standards that deal with industrial control system security.
  - NIST SP 1108R2 - NIST Smart Grid Framework and Roadmap for Interoperability, including privacy concerns.
  - NISTIR 7628 - NIST Guidelines for Smart Grid Cyber Security. Volume 2 of the NISTR 7628 addresses privacy issues.
- ANSI/ISA-99.02.01-2009 - American National Standards Institute (deals with industrial control system security).
- NERC CIP - North American Electric Reliability Corporation Critical Infrastructure Protection
- SANS - SysAdmin, Audit, Networking, and Security
- ITIL - Information Technology Infrastructure Library
- COBIT - Control Objectives for Information and Related Technology
- COSO - Committee of Sponsoring Organizations of the Treadway Commission

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KENTUCKY UTILITIES COMPANY

CASE NO. 2012-00428

Joint Response to the Attorney General's Initial Requests for Information
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Question No. 14

Witness: Eric Slavinsky

Q-14. Please provide copies of the standards, protocols or policies which the company observes and/or implements in its maintaining its ratepayers' privacy data from cybersecurity threats.

A-14. The Company does not subscribe to a single standard regarding cyber security. It monitors several recognized bodies of knowledge, including but not limited to those listed below, adopting and adapting best practices to the needs of the business.

- NIST - http://www.nist.gov/itl/cyberframework.cfm
  - NIST SP 800-53, NIST SP 800-82 - http://www.nist.gov/el/isd/cs/cybsecfactconsys.cfm
  - NIST SP 1108R2 - http://www.nist.gov/smartgrid/upload/NIST_Framework_Release_2-0_corr.pdf
  - NISTIR 7628 - http://www.smartgrid.gov/sites/default/files/pdfs/nistir_7628%20.pdf
- ANSI/ISA-99.02.01-2009 - https://www.isa.org/Template.cfm?Section=Standards8&Template=/Ecommerce/ProductDisplay.cfm&ProductID=10243
- NERC CIP - http://www.nerc.com/page.php?cid=2|20
- SANS - http://www.sans.org/critical-security-controls/
- ITIL - http://www.itil.org/en/vomkennen/itil/index.php
- COBIT - http://www.isaca.org/KnowledgeCenter/COBIT/Pages/Overview.aspx
- COSO - http://coso.org/IC-IntegratedFramework-summary.htm

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KENTUCKY UTILITIES COMPANY

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Joint Response to the Attorney General's Initial Requests for Information
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Question No. 15

Witness: Thomas A. Jessee / Eric Slavinsky

Q-15. Given the vulnerability of the electric grid to cyberattacks, describe what analog (non-digital) means the company will have in place to insure reliability, including but not limited to the maintenance of legacy systems.

A-15. The Companies' Energy Management System ("EMS") system connections to substation devices for SCADA control are accomplished over digital and analog circuits and are not subject to the attack vectors. The Companies have additional switching capability that allows them to switch the analog circuits from one control center over to the backup control center and backup EMS system in less than five minutes; the Companies exercise that switchover monthly. The EMS Servers do run Transmission Control Protocol/Internet Protocol ("TCP/IP"); however, they are isolated from any Internet traffic by firewalls with rules that limit the TCP/IP traffic to and from the internal Companies' internal IP devices. An IP packet from the Internet cannot route through the network and reach the EMS System. The packet would be blocked and discarded.

However, telecommunication vendors (e.g., AT&T and Verizon) have announced and notified customers that they will be retiring all analog technology and circuits over the next few years. The Companies have been told that the retirement will occur between now and 2019, pending Federal Communications Commission ("FCC") approval of the telecommunication vendor proposals. The Companies must replace those analog connections with some other form of communications. The options for replacement from the telecommunications vendors are all TCP/IP based underneath the covers. Another alternative would be to run Company-owned private fiber optic network to substations, also ultimately running TCP/IP over Synchronous Optical Network (SONET) technology. There are a couple of non-TCP/IP options such as a digital channelized private T-1 circuit through telecommunication vendors, but the industry's consensus view is that it will only be a matter of time before telecommunication vendors also desire to retire that technology from their infrastructure as well, creating another network replacement issue in the future.

Over the next few years, pending FCC approval, analog connectivity will no longer be an option. Generally speaking, devices must be configured to communicate over an analog, digital, or TCP/IP connection. Most devices cannot be configured to have multiple types of connections – e.g., one analog, one digital, and one TCP/IP connection on a single device, receiving data on each of them. Devices are configured to talk over one type of connection and to then use the network to provide resiliency for failures. With analog circuits, circuit switching provides the resiliency capability. With TCP/IP networks, routing over multiple paths provides resiliency.

While multiple paths generally protect against some type of network failure, multiple paths to devices do not normally protect against a cyber-attack. In a cyber-attack the perpetrator is generally not attempting to take the network down, but rather compromising the functioning of the devices communicating over the network. So entities will likely have network redundancy for critical infrastructure devices, but that redundancy mitigates risks to reliability of the network and not the risks of a TCP/IP cyber-attack on devices running TCP/IP. Other devices such as firewalls and intrusion prevention devices are used to try to prevent compromise from a cyber-attacker.

The Companies have business continuity plans, back-up systems, and manual processes that are designed to assure operations continue for a variety of events and scenarios.

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Question No. 16

Witness: David E. Huff

Q-16. What are the company's estimated costs to invest in order to fully implement Smart Grid?

a. Do any cost estimates include results of any modeling that may show the degree of exposure to the following risks: (a) hacking; (b) electronic magnetic pulses (EMPs, whether related to solar flares or otherwise); and/ or (c) weather events? If so, provide a list of the modeling software used to produce any estimates, the scenarios and sensitivities examined, and any and all such results.

A-16. The Companies could answer this question with specificity only if they had actually proposed or implemented a large-scale smart-technology deployment; however, the Companies have neither proposed nor implemented such a deployment. Because the Companies do not have a specific, well-defined smart-technology proposal or program to evaluate in the context of this question, the Companies do not have current estimated costs or estimates related to hacking, EMPs, or weather events.

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Question No. 17

Witness: David E. Huff

Q-17. Please explain in detail what benefits, if any, the company expects its ratepayers, to realize because of Smart Grid?

a. Does the company believe that societal benefits are to be considered in evaluating benefits? If so, detail those societal benefits and how they may be used in evaluations? If not, why not?

A-17. The Companies could answer this question with specificity only if they had actually proposed or implemented a large-scale smart-technology deployment; however, the Companies have neither proposed nor implemented such a deployment. Because the Companies do not have a specific, well-defined smart-technology proposal or program to evaluate in the context of this question, the Companies provide below a general response to the extent it is feasible to provide one:

In general, Smart Grid benefits are covered in the *Case Participants Joint Response to the Kentucky Public Service Commission Case No. 2008-00408* Section *6 and 7.*

The Companies do not believe societal benefits should be considered in evaluating benefits. Mr. Bellar stated this in his testimony, citing the Companies joint brief with the Utility Group in Administrative Case 2008-00408.

> These concerns and issues militate against issuing a generally applicable standard at this time, particularly because the Commission may already consider all of the criteria contained in the proposed Smart Grid Investment Standard except "societal benefit" when examining Smart Grid proposals under existing statues and regulations.[4]

Mr. Bellar went on to state, "If the Commission decides to implement such a

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[4] *Consideration of the New Federal Standards of the Energy Independence and Security Act of 2007, Administrative Case No. 2008-00408, Joint Brief of LG&E Energy Corp. et al. at 11 (Jan. 13, 2012).*

standard, the Companies support including some or all of the criteria listed in the EISA 2007 Smart Grid Investment Standard except societal benefits. Social issues should be addressed in legislation by the General Assembly."[5]

Additionally, Mr. Sinclair covers the complexities of including societal costs in his testimony, stating, "[T]here can be much disagreement among parties as to the nature, timing, and amount of societal costs because of the subjective nature of what constitutes a societal cost. Furthermore, one can argue that the costs that society is willing to pay are captured through the political, regulatory, and legal review processes; therefore the Companies' actual costs already reflect societal costs. Given the vagaries associated with the concept of societal costs, I can see where trying to develop a dynamic pricing scheme based on them would be quite problematic and contentious."[6] While this was initially submitted related to dynamic pricing, the rationale and logic hold when attempting to apply societal benefits to other areas.

[5] *Consideration of the Implementation of Smart Grid and Smart Meter Technologies* Administrative Case No. 2012-00428, Lonnie E. Bellar Testimony et al. at 7 (Jan. 28, 2013).
[6] *Consideration of the Implementation of Smart Grid and Smart Meter Technologies* Administrative Case No. 2012-00428, David Sinclair Testimony et al. at 13 (Jan. 28, 2013).

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Question No. 18

Witness: Edwin R. Staton

Q-18. Would the company agree to strict limits and/or caps on ratepayer costs? If not, why not?

A-18. No. With traditional cost-of-service regulation, the Regulatory Compact provides each utility the opportunity to earn a rate of return and to recover costs that were prudently incurred for the provision of safe and reliable utility service in return for accepting an obligation to serve customers located within its service territory. The Public Service Commission is charged with making the determination of whether costs were prudently incurred and whether those costs are fair, just, and reasonable. The imposition of strict limits or caps on ratepayer costs can interfere with a utility's ability to invest appropriately for the continued provision of safe and reliable electric service.

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Question No. 19

Witness: Edwin R. Staton

Q-19. Would the company agree to allow ratepayers to opt-out of smart meter deployment? If not, why not?

A-19. Please see the Companies' Joint Response to the Commission Staff's Initial Request for Information Question No. 116.

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Question No. 20

Witness: David E. Huff

Q-20. Can the company quantify measureable and significant benefits that the ratepayers will realize, including a monetary quantification of net savings (if any) to ratepayers?

A-20. The Companies could answer this question with specificity only if they had actually proposed or implemented a large-scale smart-technology deployment; however, the Companies have neither proposed nor implemented such a deployment. Because the Companies do not have a specific, well-defined smart-technology proposal or program to evaluate in the context of this question, the Companies are unable to quantify ratepayer benefits. A general discussion of ratepayer benefits and possible quantification of benefits was discussed in *Case Participants Joint Response to the Kentucky Public Service Commission Case No. 2008-00408,* Figure 2.

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Question No. 21

Witness: David E. Huff

Q-21. Please explain in detail what detriments, if any, the company expects its ratepayers to realize because of Smart Grid? Include in the explanation both new costs as well as stranded costs.

A-21. The Companies could answer this question with specificity only if they had actually proposed or implemented a large-scale smart-technology deployment; however, the Companies have neither proposed nor implemented such a deployment. Because the Companies do not have a specific, well-defined smart-technology proposal or program to evaluate in the context of this question, the Companies do not have any expected detriments, new costs, or stranded costs that might affect customers.

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Question No. 22

Witness: David E. Huff

Q-22. What are the company's estimated costs which the company expects the ratepayers to realize?

A-22 The Companies could answer this question with specificity only if they had actually proposed or implemented a large-scale smart-technology deployment; however, the Companies have neither proposed nor implemented such a deployment. Because the Companies do not have a specific, well-defined smart-technology proposal or program to evaluate in the context of this question, the Companies have no estimated costs it expects its ratepayers to realize.

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Question No. 23

Witness: Edwin R. Staton

Q-23. What are the company's estimated costs which the company expects its shareholders, if any, to realize? Include in the explanation both new costs as well as stranded costs.

A-23. The Companies could answer this question with specificity only if they had actually proposed or implemented a large-scale smart-technology deployment; however, the Companies have neither proposed nor implemented such a deployment. Because the Companies do not have a specific, well-defined smart-technology proposal or program to evaluate in the context of this question, the Companies provide below a general response to the extent it is feasible to provide one:

As is true with any prudent utility investment, the Companies would expect over time to recover their shareholders' equity investment and a reasonable return on that investment. Therefore, the Companies would not expect any smart-technology investment to create "stranded costs";[7] rather, the Companies would expect to recover the costs of any plant replaced by smart elements as well as the cost of any smart elements deployed. But the Companies would not propose a smart-technology or any other kind of investment that would not be reasonably likely to produce a lower net present value of revenue requirements than would otherwise be necessary over a multi-year period.

[7] The Edison Electric Institute defines stranded costs to be, "Costs incurred by utilities to serve their customers that potentially may be unrecoverable in a newly-created competitive market." *See* Glossary of Electric Industry Terms at 145 (2005), available at: http://www.eei.org/meetings/Meeting%20Documents/TWMS-26-glossry-electerm.pdf.

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Question No. 24

Witness: David E. Huff

Q-24. Does the company agree that its costs to invest and implement Smart Grid will be different than other utility companies? If not, why not?

A-24. A Smart Grid deployment by the Companies most likely would be different than other utility companies' deployments. In the *Case Participants Joint Response to the Kentucky Public Service Commission Case No. 2008-00408,* pages 1 and 2, the joint participant's state.

> Utilities have implemented infrastructure such as Supervisory Control and Data Acquisition (SCADA) which provides telemetry and remote operation of switches and breakers to control the flow of electricity across Kentucky. Partially, it is the utilities' deployment of technology such as SCADA which has produced economical and reliable energy for the Commonwealth. While some utilities have focused on transmission and distribution automation and control, others have more specifically focused on automated meter reading (AMR) and advanced metering infrastructure (AMI). Each utility has made investment decisions that are aligned with the physical infrastructure, geography of their respective customer service area, and value that the investment brings to their customers. Consequently, different utility approaches to enhancing customer benefits through implementation of technology should be seen as a positive for citizens of the Common wealth regardless of the varying implementation mechanisms.
>
> Smart Grid is not an "all or nothing" opportunity. It is an evolving opportunity that naturally progresses from existing infrastructure into technological capabilities where customer value can be achieved. Accordingly, investments should be incremental and sequential, following measureable value to consumers and demonstrated success in earlier phases of technology deployment. Adaptability is the key, thus avoidance of one technological solution is critical to maintaining adaptability of future technology capabilities. The implementation of Smart Grid will be a protracted evolutionary transformation and not an overnight conversion.

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Question No. 25

Witness: Edwin R. Staton

Q-25. Does the company agree that its ratepayers' benefits, whether financial or otherwise, may differ from one utility to another upon implementation of any Smart Grid technology? If not, why not?

A-25. Yes, the Companies agree that its ratepayers' benefits may differ from other utilities'.

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Question No. 26

Witness: Edwin R. Staton

Q-26. Can the company guarantee that the deployment of Smart Grid will not interfere with the regulatory compact whereby the ratepayers will receive safe, adequate and reliable service at fair, just and reasonable costs? If not, why not? Explain in detail.

A-26. Although the "regulatory compact" does not apply to the deployment of any particular technology, nothing about deploying smart elements or any other technology should interfere with the regulatory compact. As the Commission has explained it, "In return for this benefit [local monopoly], it [a utility] is obligated to provide service at the lowest rates consistent with a fair return. That is the nature of the regulatory compact in its traditional form."[8] In addition, consistent with KRS 278.040, the Commission will continue to have exclusive jurisdiction over the rates and service of utilities.

[8] *In the Matter of: An Investigation into the Reasonableness of the Earnings of Brandenburg Telephone Company, Inc.*, Case No. 92-563, Order at 19 (March 25, 1992).

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Question No. 27

Witness: Edwin R. Staton

Q-27. Answer the above question with the definition of "fair, just and reasonable costs" as being economically feasible for the end-user.

a. Provide any cost-benefit analysis that the company has run or will run to make the determination of economically feasible to the end-user.

A-27. The Companies would not propose a smart-technology program, or any other kind of investment, unless it was reasonably likely to produce a lower net present value of revenue requirements than would otherwise be necessary over a multi-year period. This approach helps ensure the Companies' customers continue to pay the lowest reasonable rates consistent with a fair, just, and reasonable return on equity while receiving safe and reliable service.

a. The Companies cannot answer this question because it is not clear what "economically feasible to the end-user" means, and because an answer would require a specific smart-technology proposal or proposals to evaluate.

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Question No. 28

Witness: David E. Huff

Q-28. Regarding time of use (TOU) rates, can the company confirm that low-income ratepayers will not be disproportionately affected more than non-low-income customers? If not, why not? (Provide in the answers in any studies, reports, analyses and relevant data.)

A-28. The Companies do not have sufficient data pertaining to low-income customer participation on time-of-use rates to confirm that low-income customers will not be affected more than non-low-income customers.

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Question No. 29

Witness: David E. Huff

Q-29. With regard to TOU rates, does the company have any history with any such programs? If so, explain in detail with particular facts as to:

a. the number of customers who participated;

b. whether they remained on the program;

c. whether they saved money on their bills; and

d. whether the customers ultimately reduced their usage.

A-29. Please refer to the Joint Response to the Commission Staff's First Request for Information Question No. 103. In addition, please refer to the Responsive Pricing and Smart Metering Pilot Program Final Report filed on July 1, 2011 in Case No. 2007-00117.

a. Please refer to the second paragraph on page 8 of the 2011 Final Report. LG&E noted that "The total number of Responsive Pricing participants peaked at 104 by the end of the year 2008. However, at the end of 2009 the participation level slowly began to decline with a total of 80 Responsive Pricing customers still remaining in the program." At program's end, only 68 customers were participating on the Responsive Pricing rate.

b. Please refer to the second paragraph on page 8 of the 2011 Final Report. LG&E explained that "Fifty percent of customers who requested to be removed from the Responsive Pricing program reported very marginal savings, if any, and did not want to continue participating. The remaining contingent of customers who asked to be removed from the Responsive Pricing program reported moving from the residence; purchasing a new HVAC system or a new suite of appliances; or not wanting to continue participating after one year of activity."

c. Please refer to page 9 of the 2011 Final Report filed on July 1, 2011. Section 3.2.1, Usage Reports, states, "The customer reports established that an average Responsive Pricing customer experienced a 1.4% bill decrease for the summer billing period.

d. Please refer to the page 10 of the 2011 Final Report filed on July 1, 2011. Section 4.1, Demand Response Impacts, states, "The analysis of the three summers of data demonstrates participating Pilot customers consistently decreased their energy usage slightly in high and critical peak pricing periods; however, Responsive Pricing customers used more energy overall throughout the summer periods compared to non-Responsive Pricing customers."

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Question No. 30

Witness: David E. Huff

Q-30. What proposals will the company present to deal with technological impediments to the broad use of Smart Grid, including but not limited to the following:

a. low and fixed-income individuals who do not have Internet resources at their home;

b. multiple forms of telecommunications technology used to access information (Le., analog, cellular, VOIP); and

c. multiple and proprietary technology and software options in the market that may lead to issues of compatibility?

A-30. There are many technological considerations to make when developing any Smart Grid plan. Technology issues were discussed throughout the *Case Participants Joint Response to the Kentucky Public Service Commission Case No. 2008-00408* document. The Companies do not have any current Smart Grid plan. Therefore, the Companies do not have specific technology options.

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Question No. 31

Witness: David E. Huff

Q-31. Assume: Full deployment of Smart Grid at the residential ratepayer level consisting of a household with only Energy Star appliances, an HVAC system with at least a 15 SEERS rating, etc. and any smart grid apparatuses/ equipment for interconnectivity with the electricity provider (including generation, transmission and distribution).

a. Does the company agree that if full deployment of the magnitude described in the above question occurs, the average residential ratepayer could experience a significant capital outlay?

b. If so, what are the projected costs?

c. If no costs are anticipated by the electric provider, why not?

A-31.

a. The Companies would not characterize residential Energy Star appliances or HVAC systems as components of a Smart Grid deployment and thus do not agree with the premise of the question.

b. Please see response to part a.

c. Please see response to part a.

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Question No. 32

Witness: David E. Huff

Q-32. In regard to appliances, such as refrigerators or lighting, does the company agree that in the long run, it is cheaper for the end-user himself/herself to make that capital outlay for the purchase of the appliance or lighting than have the company provide the appliance(s) and build the costs into the company's ratebase which would then include a profit component for the company on an-going basis?

A-32. The Companies would not consider refrigerators or lighting as components of a Smart Grid deployment.

The Companies utilize rebates and incentives through their Demand Side Management programs to encourage customers to purchase more energy-efficient appliances and lighting. The rebates currently offered within the Companies' DSM programming cover the incremental cost from a base model appliance to the Energy Star equivalent. These rebates do not address the full price of an appliance.

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Question No. 33

Witness: David E. Huff

Q-33. Confirm that the Smart Grid depends, at least in part, if not exclusively, on telephony (whether landline, fiber optic, wireless or VOIP) at the end-user level for the end-user to participate in his/her altering his/her electricity usage patterns or behavior.

A-33. Some Smart Grid implementations require a meter or other devices that will need telephony or network connectivity enabling the Companies to report the usage. There are also implementations where data over copper or cellular can be beneficial and in some cases these devices may prove better.

Smart Meters may have communication modules to provide communication to in-home devices, controllable thermostats or appliances. The customer or end-user would not need to provide their own telephony to participate in energy conservation activities. Smart Grid also consists of transmission and distribution devices. In these cases there is no need for end-user telephony.

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Question No. 34

Witness: David E. Huff

Q-34. If the answer to the above question is in the affirmative, confirm that limited access or even complete absence of access to telephony will interfere with, if not prevent, the deployment of the Smart Grid at the end-user level.

A-34. Not applicable. As stated in response to Question No. 33, a customer or end-user would not need to provide their own telephony as customer owned telephony is not required for utilization of implementation of Smart Meter technology.

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Question No. 35

Witness: David E. Huff

Q-35. If the company intends to install infrastructure / software allowing for the transmission of Smart Grid / Smart Meter data over its distribution / transmission conductors and networks, provide estimates, or actual numbers, for the costs of doing so.

A-35. The Companies could answer this question with specificity only if they had actually proposed or implemented a large-scale smart-technology deployment; however, the Companies have neither proposed nor implemented such a deployment. Because the Companies do not have a specific, well-defined smart-technology proposal or program to evaluate in the context of this question, they do not have a specific cost estimate for communicating Smart Grid or Smart Meter data over their conductors or networks.

Depending on the vendor and product lines that are chosen in the competitive bidding process, the infrastructure and software can be vastly different, based on the project implementation phases and regions. Some implementations would require devices for monitoring each layer in the topology. Also, many commercial customers have multiple locations and separate metering for buildings for their own monitoring purposes.

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Question No. 36

Witness: David E. Huff / Eric Slavinsky

Q-36. Is there a standard communications protocol that the company will deploy in its Smart Grid that will be interoperable regardless of the communications provider?

a. If not, explain how the company plans on addressing any problems that might arise.

A-36.

a. The Companies could answer this question with specificity only if they had actually proposed or implemented a large-scale smart-technology deployment; however, the Companies have neither proposed nor implemented such a deployment. Because the Companies do not have a specific, well-defined smart-technology proposal or program to evaluate in the context of this question, they do not a specific communications protocol to deploy. However, the Companies are working with the SGIP and the SGIM committee to assure understanding of the various communication protocol issues. Any plans would address communication protocol standards and interoperability as part of plan development.

Internet Engineering Task Force ("IETF") standards [RFC6272] explain in detail the communications and the transport methods used in Smart Grid implementations. This industry standard explains the protocols, network layers and security mechanisms used. Some vendors' Smart Grid implementations may change their particular use of the standards or use proprietary protocols and communications channels. Much of this is subject to the vendor and equipment manufacturers selected.

The Internet Protocol Suite ("IPS") provides options for numerous architectural components. For example, the IPS provides several choices for the traditional transport function between two systems: the Transmission Control Protocol ("TCP") [RFC0793], the Stream Control Transmission Protocol ("SCTP") [RFC4960], and the Datagram Congestion Control

Protocol ("DCCP") [RFC4340]. Another option is to select an encapsulation such as the User Datagram Protocol ("UDP") [RFC0768], which essentially allows an application to implement its own transport service.

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Question No. 37

Witness: Paul Gregory Thomas / David E. Huff

Q-37. If improved reliability is the goal of Smart Grid / Smart Meter, would it not be more cost-effective to invest in infrastructure hardening (for example, utilizing protocols and standards developed and implemented by many utilities in hurricaneprone regions)?

A-37. Proposed replacement response: Increased reliability can be a benefit of smart technologies, but it is not the only possible benefit. That notwithstanding, each system-hardening or smart-technology proposal must be evaluated on its own merits; it may not be true that all system-hardening plans will provide greater reliability benefits than all smart-technology proposals.

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Question No. 38

Witness: Edwin R. Staton

Q-38. Describe the company's plans to avoid obsolescence of Smart Grid / Smart Meter infrastructure (both hardware and software) and any resulting stranded costs. (This question and the subparts should be construed to relate to both the Smart Grid Investment Standard as well as the Smart Grid Information Standard.)

a. Describe who would pay for stranded costs resulting from obsolescence.

b. With regard to the recovery of any obsolete investment, explain the financial accounting that should be used (as in account entry, consideration of depreciation, time period involved, etc.).

A-38.

a. The Companies could answer this question with specificity only if they had actually proposed or implemented a large-scale smart-technology deployment; however, the Companies have neither proposed nor implemented such a deployment. Because the Companies do not have a specific, well-defined smart-technology proposal or program to evaluate in the context of this question, it is not possible to estimate the value of obsolescence or speak to an applicable recovery method at this time.

b. Please see response to part a.

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Question No. 39

Witness: David E. Huff

Q-39. With regard to interoperability standards, does the company agree that Smart Grid equipment and technologies as they currently exist, and are certain to evolve in the future, are not a one size fits all approach to the Commonwealth?

A-39. Yes. The Companies continue to monitor development of industry standards pertaining to smart grid technologies and how that progress might affect future utilization of such infrastructure.

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Question No. 40

Witness: David S. Sinclair

Q-40. Is dynamic pricing strictly defined as TOU?

a. If not, explain why not.

b. Is the company requesting that dynamic pricing be voluntary or involuntary, if at all?

A-40.

a. No. As I explain in my testimony on page 6, lines 12-18 and page 7, lines 1-9, there are many possible definitions for dynamic pricing. It is true that all dynamic pricing schemes contemplate prices changing throughout the course of the day. However, typically time-of-use ("TOU") rates are thought of as known values defined in a tariff for a pre-defined daily on-peak and off-peak period. While some in the industry may consider TOU rates a form of dynamic pricing, they have what I call in my testimony a low degree of dynamism.

b. The Companies have not made a request for a dynamic pricing tariff. However, as Mr. Bellar states in his testimony on page 14, lines 19-22 and page 15, lines 1-2, "No customer should be obligated to be on a dynamic rate, as opposed to a pure time-of-use rate, without the means to know and adjust to the changing rate; however, if a utility provides its customers appropriate metering and other means of adjusting to dynamic prices, the utility should be able to make a dynamic rate mandatory, though perhaps with exceptions for certain situations, e.g., customers with medical equipment that must operate at all times."

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Question No. 41

Witness: David E. Huff

Q-41. Please explain in detail whether the company has any dynamic programs in place in Kentucky.

a. For each program, provide the number of participants.

b. For each program, state whether those participants on aggregate have saved costs on their bills.

c. For each program, state whether those participants on aggregate have saved costs on their bills.

d. For each program, state whether each participant has saved costs on his/her/its bills. (The question is not intended to request any private identifier information.)

A-41. Please refer to the Joint Response to the Commission Staff's First Request for Information Question No. 103.

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Question No. 42

Witness: Edwin R. Staton

Q-42. Does the company recommend the Commission to formally adopt the EISA 2007 Smart Grid Investment Standard? If not, why not?

A-42. No. Please see the Testimony of Lonnie E. Bellar, being adopted today by Edwin R. Staton, at pages 5-7.

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Question No. 43

Witness: Edwin R. Staton

Q-43. Does the company recommend the Commission to formally adopt the EISA 2007 Smart Grid Information Standard? If not, why not?

A-43. No. Please see the Testimony of Lonnie E. Bellar, being adopted today by Edwin R. Staton, at pages 3-5.

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Question No. 44

Witness: Edwin R. Staton

Q-44. Does the company recommend issuing an IRP Standard?
a. If so, what concerns does the company have with a standard, including "priority resource," especially as it relates to cost-effectiveness?

b. What concerns would the company have with a standard as it affects CPCN and rate applications?

A-44. No. The Commission issued the final Kentucky IRP Standard in its July 24, 2012 Order in Administrative Case No. 2008-00408. The Companies are not aware of an IRP Standard at issue in this proceeding.

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Question No. 45

Witness: David E. Huff

Q-45. Does the company agree that any investment in grid modernization infrastructure should be done before deploying TOU rates or dynamic pricing? If not, why not?

A-45. Smart Meter deployment and the collection of interval data provide an opportunity for customers to conduct an economic assessment related to moving to a TOU rate. Absent this technology and information, the data would not exist to compare the effects of fixed to TOU rates. However, the Companies are aware of some customers selecting the LEV rate without the benefit of this prior information. Consequently, while it would be advisable to deploy Smart Meter systems and collect interval data prior to offering TOU rates, it is not a prerequisite.

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Question No. 46

Witness: Edwin R. Staton

Q-46. Regarding the Kentucky Smart Grid Roadmap Initiative (KSGRI), does the company believe that it provides the fundamental basis for the Commonwealth as a whole to proceed with Smart Grid given its lack of incorporating all electric utilities such as municipalities and the TVA, along with its distribution companies? If yes, please explain why. If not, please explain why not.

A-46. As stated in Mr. Bellar's testimony, the Companies participated in the KSGRI collaborative process by providing input and recommendations concerning the future of smart grid in Kentucky and a broad timeline for implementation in Kentucky. Although the KSGRI provided insight, it did not provide specific plans for the Commonwealth to proceed with Smart Grid. The Companies believe initiatives and investments of this nature are within the authority of the Commission and should be evaluated on a utility-by-utility basis. Also, as stated in Mr. Bellar's testimony, the Companies do not believe that development and deployment of smart technologies should be placed on an arbitrary schedule.

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Question No. 47

Witness: Thomas A. Jessee / Paul Gregory Thomas

Q-47. Does the company believe that the Commonwealth's electric industry is, or will become, so interconnected that all electric entities in any way involved or associated with the generation, transmission and/or distribution of electricity should be included and participate to some degree with Smart Grid if it is to come to fruition? If yes, please explain why. If not, please explain why not.

A-47. No. Today, utilities have transmission interconnections to provide operational benefits for their customers. Smart Grid can help operations by providing additional data and remote control capabilities. However, this is within the utility and independent of other utilities' actions within interconnection parameters.

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Question No. 48

Witness: Edwin R. Staton

Q-48. Does the company believe that any Smart Grid Investment will trigger a CPCN case? If not, why not?

A-48. Whether a particular Smart Grid Investment will require a Certificate of Public Convenience and Necessity ("CPCN") depends on the unique facts involved in a particular project and should therefore be determined on a case by case basis.

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Question No. 49

Witness: David S. Sinclair

Q-49. Does the company believe that Dynamic Pricing should be economically feasible for the end-user and be supported by a cost- benefit analysis?

A-49. The primary economic rationale for a dynamic pricing scheme is to send price signals to consumers that more closely reflect the actual cost of providing service during that time period (e.g., hour, day, and season) so that resources (e.g., capacity and energy) might be more efficiently procured or dispatched by the utility. While this should result in lower total revenue requirements over time, there is no guarantee that a customer will save money at any point in time. In particular, customers that do not or cannot alter their consumption to avoid relatively high priced time periods that reflect the scarcity of capacity and energy will likely pay more for power under a dynamic pricing scheme than they would under more traditional rate designs.

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Question No. 50

Witness: David E. Huff

Q-50. If additional education is contemplated with the deployment of the Smart Grid, please explain in detail if known or contemplated.

A-50. Yes, additional educational efforts are being contemplated with the deployment of Smart Grid. The Companies anticipate that customer education will encompass information about what Smart Grid technology is, how Smart Grid technology operates, and the limitations of Smart Grid technology.

The Companies anticipate using a variety of communication techniques and messaging in their educational efforts. For example, these efforts may include direct mail campaigns, telemarketing, personalized customer usage reports, a web site, specialized billing information, and telephone and email support for participants. These educational outreach efforts will further customer understanding to enable them to make decisions about their personal energy consumption.