Kenneth M. Rubin
Senior Counsel
Florida Power & Light Company
700 Universe Boulevard
Juno Beach, FL 33408-0420
(561) 691-2512
(561) 691-7135 (Facsimile)
Ken.Rubin@fpl.com

July 10, 2013

-VIA HAND DELIVERY -

Ms. Ann Cole
Division of the Commission Clerk and
Administrative Services
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

Re: Staff's First Data Request / Docket 130160-EI

Dear Ms. Cole:

Enclosed for filing on behalf of Florida Power & Light Company's ("FPL") are the original and five (5) copies of its response to Staff's First Data Request dated June 27, 2013.

If you should have any questions, please do not hesitate to contact me at (561) 691-2512 or ken.rubin@fpl.com.

Sincerely,

Kenneth M. Rubin

Enclosures
cc: Counsel of Record

COM ____
AFD ____
APA ____
ECO ____
ENG 3
GCL 1+1 CD
IDM 1
TEL ____
CLK ____

QUESTION

Paragraph 13 of the petition states, "FPL will not assert any ownership or other interest in the customer-owned enclosures by virtue of its inspection, repair or replacement of this equipment in connection with the further validation and refinement of the predictive tool." Please explain the phrase "other interest."

RESPONSE

Florida Power & Light Company ("FPL") will not claim ownership or take a position that it holds any proprietary interest in customer owned meter enclosures as a result of any work performed on that equipment during this pilot. After repairs/replacements are completed by FPL or its contractors, responsibility for future repairs, replacement and maintenance lies with the individual customer, as is the case today. Consistent with the concluding phrase of paragraph 14 of the Petition, "customer-owned meter enclosures will remain the property and responsibility of the customer."

QUESTION
Referencing paragraph 14 of the petition, describe the equipment diagnostic data transmitted from the meter to FPL.

RESPONSE
The equipment diagnostic data referred to in paragraph 14 of the Petition includes data on voltage, power loss, power restoration, communication module reboots (power down/up), non-communicating conditions, and indications of potential tampering such as meter inversion and reverse energy. This data regarding smart meter operating conditions and communications helps FPL to monitor the performance and status of the equipment.

QUESTION

Referencing paragraph 14 of the petition, describe the deployment phase for the meters, including the average time from the installation of the smart meter, to the meter becoming fully operational, and to the point when the meter stopped communicating.

RESPONSE

FPL's Smart Meter Deployment Project involved the successful installation of approximately 4.5 million smart meters from September 2009 to February 2013. The meters have been fully operational from the time of installation. Following installation, FPL employed a rigorous and methodical approach to test the performance of the communications network before transitioning areas of installed operational smart meters into remote billing.

The typical time between installation of the first smart meters in an area and transition of that area to remote billing (also sometimes referred to as "activation") was six months. During this time, normal manual meter reading processes remained in place.

The statement in paragraph 14 of the Petition that "a number of installed meters stopped communicating" does not refer to a single incident or event or to any specific time frame. FPL has established processes to monitor and maintain consistent communications with all activated smart meters. Through these processes, FPL saw that some smart meters stopped communicating after activation, though there was no obvious pattern to explain these intermittent and geographically diverse communications failures. The causes for loss of communication with a smart meter vary and include situations such as obstructions around the meter, power outages, customer tampering, network coverage issues, and communications module failure.

The loss of communication with a smart meter is a not a prevalent problem, as evidenced by FPL's 99.9% billing success rate using readings communicated from activated smart meters. In addition, on average on any given day, only 0.14% or approximately 6,300 smart meters lose communication with the network at any given time, for a variety of reasons more fully identified in the preceding paragraph. Not all of these non-communicating conditions require the meter to be removed from the field as many conditions are transient or can be corrected through other means and therefore do not necessarily impact the ability to obtain a billing read. The ability of the meter to accurately record energy use is not affected when these communications failures occur. It is strictly the ability to remotely communicate that is affected.

QUESTION
Referencing paragraph 14 of the petition, how many meters stopped communicating with FPL?

RESPONSE
As outlined in FPL's response to Staff's First Data Request No. 3, there was no single incident or event leading to meters ceasing to communicate. In addition, on any given day, only 0.14% of smart meters or approximately 6,300 meters lose communication with the network at any given time, for a variety of reasons more fully identified below. Not all of these non-communicating conditions require the meter to be removed from the field as many conditions are transient or can be corrected through other means and therefore do not necessarily impact the ability to obtain a billing read. FPL has established processes to monitor and maintain consistent communications with all activated smart meters. However, when individual meters stop communicating, FPL is vigilant in detecting, investigating, and correcting these conditions. The causes for loss of communication with a smart meter vary and include situations such as obstructions around the meter, power outages, customer tampering, network coverage issues, and communications module failure.

QUESTION

Referencing paragraph 14 of the petition, did all communication capabilities of the meters cease? If not, please describe what communications capabilities ceased and what capabilities continued.

RESPONSE

Smart meters have two primary components. The first is an electric meter which registers customer energy use, and the second is an integrated communication module that enables remote communication with the meter. In the situations described in paragraph 14 of the Petition, the meters lost the ability to remotely communicate. This loss of communication had no impact on the accuracy, registration, or performance of the electric meter itself.

QUESTION

Referencing paragraph 14 of the petition, describe the inspection process, including the entity or entities which conducted the inspection, the number of meters inspected, and the general locations in FPL's service area where the meters were inspected.

RESPONSE

In 2011, FPL removed 9,286 smart meters from various service locations across FPL's territory because they were not communicating. The affected meters were sent to FPL's Meter Technology Center in Miami for evaluation. The evaluation included meter accuracy testing, communications module testing, verification of firmware and software settings, and visual inspection of the physical characteristics of the meter. An ad hoc analysis was also performed to evaluate the historical (pre-failure) communications pattern of these meters.

QUESTION
Referencing paragraph 14 of the petition, how many of the meters inspected had experienced heat damage? Please describe the nature of the damage to the meters.

RESPONSE
Of the 9,286 non-communicating meters evaluated in 2011, 693 were identified by FPL's Meter Technology Center as displaying visual evidence of some type of external heat damage to the base of the meter and/or the blades on the back of the meter. Heat damage was identified through malformation or warping of the base material or pitting or discoloration on the blades, indicating potential arcing and/or heat exposure.

QUESTION

Referencing paragraph 14 of the petition, describe the problems within the customer-owned meter enclosure which caused the heat damage to the inspected meters. Has FPL identified any modifications that can be made to existing meter enclosures that will reduce or eliminate the occurrence of overheating or other causes of meter failure?

RESPONSE

The evaluation described in paragraph 14 was performed at FPL's Meter Technology Center in Miami on meters that had been previously removed from the field. Field evaluation of customer-owned meter enclosures was not conducted during this time. The visual evidence of external heat damage to the base and/or blades on the back of these meters, coupled with the fact this is the area of a meter most exposed to customer-owned meter enclosures when installed, led to the initial hypothesis that the damage to the meters was potentially being caused by conditions within customer-owned meter enclosures.

Problems with meter enclosures generally stem from the poor condition of the meter enclosure components and connections. This can occur as a result of age, environmental conditions such as heat and rain which may cause rapid aging, wear and tear, and tampering, and includes such items as the condition of connections (corroded, contaminated, loose or damaged), fatigue or degradation of components, and stresses on components and connections that occur over time. These conditions are normally addressed by maintenance, repair and/or replacement of meter enclosures by licensed electricians hired by individual customers.

FPL has not identified (and has not investigated) any modifications that might be made to existing customer-owned meter enclosures that might reduce or eliminate the occurrence of overheating or other causes of meter enclosure failures. Per Commission precedent, the responsibility to maintain, repair and/or replace meter enclosures resides with individual customers and the conditions described are normally addressed by licensed electricians hired by customers.

QUESTION
Referencing paragraph 14 of the petition, please identify the members of the smart meter team, including any non-FPL members.

RESPONSE
The primary team members that conducted the initial ad hoc evaluation are Danielle Weishaar (FPL Smart Meter Operations), Carlos Rodriguez (FPL Meter Technology Center), Jim Demars (FPL Meter Technology Center), Nelson Abreu (Formally FPL Meter Technology Center), and Mike Blumberg (DataRaker, Inc., now owned by Oracle).

QUESTION

Referencing paragraph 14 of the petition, how many of the meters which stopped communicating experienced the identified data pattern? Please describe the data pattern that was observed.

RESPONSE

Based on data analysis completed by DataRaker, approximately 46% of non-communicating meters that show evidence of heat damage to the base or blades display a common data pattern before losing communication. This data pattern consists of the communication module powering down and up (re-booting) at a level of regularity and persistence that is not normally seen in smart meter communications.

QUESTION
Paragraph 15 of the petition states, "FPL identified a small number of FPL smart meters in the field displaying the communications data pattern. . ." How many smart meters were identified?

RESPONSE
In contrast to the ad hoc evaluation of meters described in paragraph 14, the small sample of communicating meters addressed in paragraph 15 was identified for the specific purpose of conducting a field evaluation to identify the potential cause of the data pattern that was being seen. To perform the analysis described in paragraph 15 of the Petition, FPL randomly identified 46 communicating meters that were displaying the same data pattern that had been identified in the meter population described in paragraph 14.

QUESTION
Referencing paragraph 15 of the petition, describe the inspection, including the entity or entities which conducted the inspection, the criteria used to select the meters inspected, the number of meters inspected, and the general locations in FPL's service area of the meters inspected.

RESPONSE
In contrast to the ad hoc evaluation of meters described in paragraph 14, the small sample of communicating meters addressed in paragraph 15 was identified for the specific purpose of conducting a field evaluation to identify the potential cause of the data pattern that was being seen. FPL randomly identified 46 communicating meters in Broward and Miami-Dade Counties that were displaying the same pre-failure communication data pattern that had been identified in the meter population referenced in paragraph 14.

The field evaluation of these meters was conducted by Danielle Weishaar (FPL Smart Meter Operations), Carlos Rodriguez (FPL Meter Technology Center), and Andy Calandra (FPL Field Meters Operations). This evaluation consisted of: (1) visual inspection of the meter while still installed and meter enclosure lid closed for any external signs of damage or tampering; (2) visual inspection and, when possible, digital/thermal imaging of the meter and meter enclosure with the meter still installed and meter enclosure lid open; (3) visual inspection of the base and blades of the meter after it was removed from the meter enclosure; and (4) visual inspection and, when possible, digital/thermal imaging of the meter enclosure and its components with the meter removed.

QUESTION

Paragraph 15 of the petition states, " in 70% of the cases studied, damage within the customer-owned meter enclosure was causing overheating. . .". Please describe and explain the damage within the meter enclosure, and explain how the damage within the meter enclosure caused the meter to overheat.

RESPONSE

Problems with meter enclosures, including thermal build up, generally stem from the poor condition of the meter enclosure components and connections. This can occur as a result of age, wear and tear, and tampering. These problems can arise because of the condition of connections (corroded, contaminated, loose or damaged), fatigue or degradation of components, and stresses on components and connections that occur over time. The most common cause of thermal build up is degraded or poor electrical connections and components in the meter enclosure, causing electrical resistance to increase and generate heat with electrical load. These conditions are normally addressed by maintenance, repair and/or replacement of meter enclosures by licensed electricians hired by individual customers.

Meters do not cause damage to the meter enclosures in which they are installed. On the contrary, the meters are directly subjected to the operating conditions of the meter enclosure. As a result, poor conditions within customer owned meter enclosures that cause heat to be generated exposes the meters to those elevated temperature conditions. In some cases, these conditions can be consistent and elevated enough to cause damage to the communications module in a smart meter.

QUESTION

Paragraph 15 of the petition states, "overheating that in turn was causing the communications failure and the probable ultimate failure of the meter itself." Please explain what caused the meter to overheat. Explain whether meters, which have experienced the communications failure, have failed. If so, how many meters have failed? If meters have failed, explain how the failure of the meters impacts the ability of FPL to accurately measure customer electric consumption. Please explain if the overheating meters are a safety concern.

RESPONSE

The poor condition of meter enclosure components and connections can cause heat to be generated. If left unaddressed, these conditions, including elevated temperatures within the meter enclosure, can cause increasing damage to other components within the customer's enclosure. Because meters are directly installed in customer owned meter enclosures, exposure to these elevated temperatures for extended periods of time can also cause the smart meter communications module to stop working.

The smart meters in this sample that were exposed to elevated temperatures lost the capability to remotely communicate. However, this loss of communication had no impact on the accuracy, registration, or performance of the electric meter itself. Therefore, notwithstanding the communications failures, the conditions addressed in paragraph 15 of the Petition did not adversely impact the performance of the meters to accurately register customer energy use.

Meters do not cause damage to the meter enclosures in which they are installed. On the contrary, the meters are directly subjected to the operating conditions of the meter enclosure. As a result, poor conditions within customer owned meter enclosures that cause heat to be generated exposes the meters to those elevated temperature conditions. In some cases, these conditions can be consistent and elevated enough to cause damage to the communications module in a smart meter. The goal of the program that forms the basis of FPL's Petition for Declaratory Statement is to provide customers with the information necessary to potentially prevent or at least mitigate the impact associated with the failure of their individually owned meter enclosures.

QUESTION

Paragraph 16 of the petition states that, "FPL proposes to study a statistically significant random population of approximately 400 deployed smart meters displaying the data patterns that precede the communications failure, along with the enclosures housing those meters." Please explain how many meters, in total, are displaying the data pattern that precedes the communication failure.

RESPONSE

The number of meters which display the communications data pattern varies at any given time. Currently, there are approximately 4,000 smart meters in the field which have displayed the identified pattern at least once. Of the 4,000 meters that have displayed the data pattern, we expect approximately 30% of these to be false positives based on the limited field trial described in paragraph 15 of FPL's petition. Many meters display the data pattern on only a single occasion and continue to communicate without any further issues. The intent of the pilot is to better understand the validity of the model and explore potential improvements to the predictive tool, including the reduction of false positives.

QUESTION
Referencing paragraphs 16 and 17 of the petition, describe the scope of the study/project to be conducted. Provide the timeline for the study/project, including milestones. Explain how and when the results of the study/project will be communicated to the Florida Public Service Commission.

RESPONSE
The scope of the project includes the random selection of approximately 400 communicating meters which display the previously discussed data pattern. These meters are geographically dispersed across FPL's entire service territory.

Once a meter and meter enclosure have been selected, a licensed electrician will contact the customer to schedule an appointment to conduct an inspection of the condition of the meter enclosure and meter. The inspection process will include the following:

(1) Visual inspection and digital image of the meter while still installed and meter enclosure lid closed for any external signs of damage or tampering.
(2) Visual inspection and digital image of the meter and meter enclosure with the meter still installed and meter enclosure lid open.
(3) Visual inspection and digital image of the base and blades of the meter after it was removed from the meter enclosure.
(4) Visual inspection and digital image of the meter enclosure and its components with the meter removed.

If there is damage to the meter enclosure, the electrician will work with the customer and the local permitting authorities in order to conduct the required repairs. Each electrician is required to provide findings including damage found in and around the enclosure and the status of all components. All meters will be removed and sent to the Meter Technology Center for testing, regardless of whether damage is found. All data will be analyzed to determine the validity of the model and identify any possible improvement opportunities based on the data collected.

All repairs will be limited to the meter enclosure and its components, not to extend to the customer's internal electrical system. When the project has been completed, FPL will provide a written report of the results to the PSC, along with the plan for future use of the model.

Project Milestones:

Milestone	Date Start	Date Finish
Staff Recommendation	8/1/2013	8/1/2013
Agenda	8/13/2013	8/13/2013
Standard Order	9/3/2013	9/3/2013
Begin Inspections (two-three weeks from PSC Approval)	9/17/2013	9/23/2013
Complete 1st 80-100 Inspections	10/17/2013	10/17/2013
Complete 1st assessment of model success	10/25/2013	10/25/2013
Complete 2nd 80-100 inspections	11/15/2013	11/15/2013
Complete 2nd assessment of model success	11/29/2013	11/29/2013
Complete 3rd 80-100 of inspections	12/16/2013	12/16/2013
Complete 3rd assessment of model success	1/2/2014	1/2/2014
Complete final inspections	1/30/2014	1/30/2014
Complete final analysis	2/1/2014	2/14/2014
Provide Recommendations on future use of the model	3/3/2014	3/3/2014

QUESTION
Referencing paragraphs 16 and 17 of the petition, provide a breakdown of the cost components of the study/project, including the cost components to repair, if necessary, the 400 smart meters.

RESPONSE

Activity	2013	2014
Inspection and repair/replacement of meter enclosures (assuming 70% repair rate)	$ [redacted]	$ [redacted]
Materials	$ [redacted]	$ [redacted]
Model development and validation	$ [redacted]	$ [redacted]
Project resources	$ [redacted]	$ [redacted]
Total	$ [redacted]	$ [redacted]

Summary of Average Costs used to calculate project cost:

- Average Inspection: $ [redacted] per inspection
- Average Replacement Cost: $ [redacted] (Single Phase Electric service only)
- Average Repair Cost: $ [redacted]

QUESTION
Referencing paragraph 17 of the petition, has FPL determined how it will notify the customer once the diagnostic tool identifies a problem? Has FPL determined the probable range of costs that a customer may incur to repair their equipment? Does FPL anticipate that it will achieve cost savings by early identification of a meter failure?

RESPONSE
The goal of the project is to determine the viability of the predictive tool and identify the conditions surrounding the cause of the displayed data pattern. Once the project is complete and FPL has determined the capability of the model, FPL will consider the most appropriate communications strategy to notify customers of any potential conditions within their meter enclosures.

The cost for the customer to repair or replace their equipment varies depending on multiple factors such as type and extent of the condition found, type of enclosure required, local permitting policies, and local costs of goods and services, to name a few. Customers should contact a licensed electrician for information regarding the cost of repair or replacement in their specific situation.

It is too early for FPL to determine what, if any, system cost savings may result from use of the model in the future. However, the primary goal of this project is to refine the predictive tool in order to provide customers with the opportunity to address potential meter enclosure conditions before problems develop.