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VIA OVERNIGHT DELIVERY

March 29, 2012

Mr. Jeff Derouen
Executive Director
Kentucky Public Service Commission
211 Sower Blvd
Frankfort, KY 40601

RECEIVED
MAR 30 2012
PUBLIC SERVICE
COMMISSION

**Re: Case No. 2011-450
An Investigation of the Reliability Measures of Kentucky's Jurisdictional
Electric Distribution Utilities**

Dear Mr. Derouen:

Enclosed please find an original and twelve copies of the Responses of Duke Energy Kentucky, Inc. to Commission Staff's Second Set of Data Requests in the above captioned case.

Please date-stamp the two copies of the letter and return to me in the enclosed envelope.

Sincerely,

Kristen Cocanougher

cc: Counsel of Record (w/enclosures)

VERIFICATION

State of North Carolina)
)
County of Mecklenburg) SS:

RECEIVED
MAR 30 2012
PUBLIC SERVICE
COMMISSION

The undersigned, Bob Dollar, being duly sworn, deposes and says that he is the Director, R&I Planning, that he has supervised the preparation of the responses to the foregoing information requests; and that the matters set forth in the foregoing responses to information requests are true and accurate to the best of his knowledge, information and belief, after reasonable inquiry.

Bob Dollar
Bob Dollar, Affiant

Subscribed and sworn to before me by Bob Dollar on this 22nd day of March 2012.

Patricia W. Townsend
NOTARY PUBLIC

My Commission Expires: 6/24/2014

VERIFICATION

State of North Carolina)
)
County of Mecklenburg) SS:

The undersigned, AR Mullinax, being duly sworn, deposes and says that he is the Senior Vice President & Chief Information Officer, Duke Energy Business Services, LLC, that he has supervised the preparation of the supplemental response to the foregoing information request; and that the matters set forth in the foregoing response to information request are true and accurate to the best of his knowledge, information and belief, after reasonable inquiry.

AR Mullinax
AR Mullinax, Affiant

Subscribed and sworn to before me by A.R. Mullinax on this 38th day of March 2012.

Joyce W Taylor
NOTARY PUBLIC

My Commission Expires: 10/6/2014

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STAFF-DR-02-001

REQUEST:

The following questions relate to the use of a five-year average of System Average Interruption Duration index (“SAIDI”), System Average interruption Frequency Index (“SAIFI) and Customer Average Interruption Duration Index (“CAIDI”) on a circuit basis as a benchmark to determine the relative reliability of an individual circuit.

- a. In your opinion, is it reasonable for the Commission to require each utility to develop and report a five-year average SAIDI on a circuit-by-circuit basis as a benchmark for comparison purposes?
Explain your answer.
- b. In your opinion, is it reasonable for the Commission to require each utility to explain why a particular circuit has a higher SAIDI than the utility’s five-year average SAIDI for that circuit?
Explain your answer.
- c. In your opinion, is it reasonable for the Commission to require each utility to explain the planned corrective measures for the circuit with a higher SAIDI than the five-year average?
Explain your answer.
- d. In your opinion, is it reasonable for the Commission to require each utility to develop and report a five-year average SAIFI on a circuit-by-circuit basis as a benchmark for comparison purposes?
Explain your answer.
- e. In your opinion, is it reasonable for the Commission to require each utility to explain why a particular circuit has a higher SAIFI than the utility’s five-year average SAIDI for that circuit?
Explain your answer.
- f. In your opinion, is it reasonable for the Commission to require each utility to explain the planned corrective measures for the circuit with a higher SAIFI than the five-year average?
Explain your answer.

- g. In your opinion, is it reasonable for the Commission to require each utility to develop and report a five-year average CAIDI on a circuit-by-circuit basis as a benchmark for comparison purposes?
Explain your answer.
- h. In your opinion, is it reasonable for the Commission to require each utility to explain why a particular circuit has a higher CAIDI than the utility's five-year average CAIDI for that circuit?
Explain your answer.
- i. In your opinion, is it reasonable for the Commission to require each utility to explain the planned corrective measures for the circuit with a higher CAIDI than the five-year average?
Explain your answer.

RESPONSE:

- a) SAIDI is an appropriate measure to use for long-term trending of a large system. SAIDI is not useful for evaluating the performance of small systems such as circuits because of the excessive annual variability of SAIDI at the circuit level. Another issue with calculating SAIDI at the circuit level is capturing the year-to-year changes to the number of customers per circuit and any reconfigurations of the circuits. These changes can significantly impact the SAIDI values at the circuit level from year to year.
- b) Explaining why a particular circuit has a higher SAIDI than the 5-year average SAIDI is not reasonable due to the excessive variability of SAIDI at the circuit level. Variability can be defined as the standard deviation divided by the mean with the higher value be more variable. Using the annual values of 2007-2011 customer minutes of interruption (numerator of SAIDI) as an example of variability, the Duke Energy Kentucky system has a five year variability of 12%. By comparison, Duke Energy Kentucky circuits have a variability ranging from 28% to 203%.
- c) Requiring a utility to take corrective measures for each circuit with a current SAIDI above its 5-year average is not reasonable because of the excessive annual variability issues described above. Duke Energy does not approach reliability improvement or corrective measures on a circuit by circuit basis. Duke Energy makes reliability improvements and takes corrective measures based on fixing known reliability issues on all circuits, regardless of total circuit performance and prioritizes based upon actions that will produce the most significant impact. Duke Energy uses programs and processes designed to reduce the maximum number of customer interruptions and faults.

- d) Answer is the same as for (a) above.
- e) Answer is the same as for (b) above except that Duke Energy Kentucky circuits have a variability using customers interrupted (numerator of SAIFI) that ranges from 22% to 199%.
- f) Answer is the same as for (c) above.
- g) It is not reasonable for the Commission to require each utility to develop and report a five-year average CAIDI on a circuit-by-circuit basis as a benchmark for comparison purposes. CAIDI is not a good reliability measure when used for any reason because it does not accurately measure customer outage duration changes when outage frequency is being improved. In some cases CAIDI will increase, while at the same time, customer outage frequency and duration is decreasing. The elimination of shorter duration outages causes CAIDI to increase, even if the customers still having outages are experiencing shorter durations. However, when measuring circuit performance, CAIDI has an additional disadvantage. A circuit can have almost zero customer interruptions, but still have a high CAIDI because of a very small number of customers that do have outages. In fact, if just one customer has a three hour outage due to a secondary cable failure, the “circuit CAIDI” becomes what that one customer experienced.
- h) It is not reasonable for the Commission to require each utility to explain why a particular circuit has a higher CAIDI than the utility’s five-year average CAIDI for that circuit. CAIDI is not a good reliability measure because it does not accurately measure customer outage duration changes when outage frequency is being improved.
- i) It is not reasonable for the Commission to require each utility to explain the planned corrective measures for the circuit with a higher CAIDI than the five-year average. CAIDI is not a good reliability measures because it does not accurately measure customer outage duration changes when outage frequency is being improved.

PERSON RESPONSIBLE: Bob Dollar

**Duke Energy Kentucky
Case No. 2011-450
Staff Second Set Data Requests
Date Received: March 15, 2012**

STAFF-DR-02-002

REQUEST:

KRS 61.870 through KRS 62.884 address open records of public agencies and 807 KAR 5:001, Section 7, pertains to confidential material submitted to the Commission. Do you anticipate that some information submitted concerning the utility's circuits, whether with regard to SAIDI, SAIFI, CAIDI, or other reporting, could contain confidential, proprietary, or critical infrastructure information for which a petition for confidential information may also be submitted?

Explain your answer. In your answer, provide examples of the type of information for which you may seek confidential protection.

RESPONSE:

Duke Energy Kentucky does not consider SAIDI, SAIFI, or CAIDI to be confidential, proprietary, or critical infrastructure information for which a petition for confidential information may also be submitted. It is possible that some other reporting requirements may include confidential, proprietary, or critical infrastructure information that would require protection. Such information may include, but is not limited to, detailed system maps, future construction plans for corrective actions, and cost estimates.

PERSON RESPONSIBLE: Bob Dollar

Duke Energy Kentucky
Case No. 2011-450
Staff Second Set Data Requests
Date Received: March 15, 2012

STAFF-DR-02-003

REQUEST:

Please describe your utility's current capacity to compose electronic documents.

- a. Is the utility familiar with or currently using Microsoft Office products such as MS Word or Excel? If so, include the name and version(s) of the software currently used.
- b. Describe your utility's current internet connectivity status, including connection speed.
- c. Is the utility familiar with the Commission's website?
- d. Has your utility registered on the PSC website and does it have a valid username and password? (This registration would currently be used for Electronic Case Filing, Annual Reports, and Tariff Filings).
- e. If recommended, would your utility have technical staff available to interface with the PSC Information Services Team to assist in the design and implementation of an automated process for uploading data to the commission?

RESPONSE:

- a. Yes, Duke Energy uses the 2007 version of Microsoft Office which includes Outlook, Word, Excel and Powerpoint.
- b. Our primary internet connection is in Charlotte and it operates at 155 Megabits/second and it is backed up by an internet connection in Huntersville, NC which operates at 50 Megabits/second.
- c. Yes.
- d. Yes.
- e. Yes.

PERSON RESPONSIBLE: a,b,e - AR Mullinax
c,d - N/A

Duke Energy Kentucky
Case No. 2011-450
Staff Second Set Data Requests
Date Received: March 15, 2012

STAFF-DR-02-004

REQUEST:

The following questions relate to the manner by which the utility tracks SAIDI, SAIFI, and CAIDI as stated in response to Items 2. (a) and (b) of the Commission's Order of January 11, 2012.

- a. This question applies to Kentucky Power Company ("Kentucky Power"), Big Sandy Rural Electric Cooperative Corporation, Blue Grass Energy Cooperative Corporation, Clark Energy Cooperative, Inc., Duke Energy Kentucky, Inc. ("Duke"), Farmers Rural Electric Cooperative Corporation, Fleming-Mason Energy Cooperative, Inc., Grayson Rural Electric Cooperative Corporation, Inter-County Energy Cooperative Corporation, Jackson Energy Cooperative Corporation, Jackson Purchase Energy Corporation, Kenegy Corp. , Kentucky Utilities Company ("KU"), Louisville Gas and Electric Company ("LG&E"), Meade County Rural Electric Cooperative Corporation, Nolin Rural Electric Cooperative Corporation, Owen Electric Cooperative, Inc., Salt River Electric Cooperative Corporation, Shelby Energy Cooperative, Inc., South Kentucky Rural Electric Cooperative Corporation, and Taylor County Rural Electric Cooperative Corporation all of which reported that they tracked SAIDI, SAIFI, and CAIDI using an outage management system or an outage management system in conjunction with an Excel spreadsheet.
 - (1) Does your utility have the ability to export (or upload) the data to another data base or data system (including an Excel spreadsheet) maintained by the Commission? If not, explain why.
 - (2) If not identified elsewhere, identify the file formats to which your utility has the ability to export data.

- b. This question applies to Cumberland Valley Electric, Inc. and Licking Valley Rural Electric Cooperative Corporation, who reported that they tracked SAIDI, SAIFI, and CAIDI manually. Does your utility have the ability to export (or upload) the data to another data base or data system (including an Excel spreadsheet) maintained by the Commission? If not, explain why.

RESPONSE:

- a. (1) Duke Energy Kentucky has the ability to export (or upload) the data to another data base or data system (including an Excel spreadsheet) maintained by the Commission.
(2) Duke Energy Kentucky has the ability to export the data in most commonly used formats.
- b. N/A

PERSON RESPONSIBLE:

Bob Dollar
Director R&I Planning

**Duke Energy Kentucky
Case No. 2011-450
Staff Second Set Data Requests
Date Received: March 15, 2012**

STAFF-DR-02-008

REQUEST:

Explain how the SAIDI, SAIFI, and CAIDI indices influence the allocation of capital for system improvement projects within the utility. For the Investor-Owned Utilities Kentucky Power, Duke, KU, and LG&E, explain the manner in which the parent company influences the amount and allocation of capital for system reliability improvements.

RESPONSE:

SAIDI, SAIFI, & CAIDI indices do not influence the allocation of capital for system reliability improvement projects within Duke Energy. Capital for system reliability improvement projects is allocated based on how many customer interruptions can be prevented or eliminated, how much such prevention or elimination will cost, and the specific types of reliability issues that exist in the region. Spending for reliability programs and processes in Kentucky and all other Duke Energy regions is allocated in a fair, proportional, and rigorous manner based on the most current reliability research and experience available. Each program addresses specific reliability issues wherever they occur on the system. Some programs are unique to Kentucky due to certain legacy issues, but many programs are common across all Duke Energy regions including Kentucky.

PERSON RESPONSIBLE:

Bob Dollar
Director R&I Planning

**Duke Energy Kentucky
Case No. 2011-450
Staff Second Set Data Requests
Date Received: March 15, 2012**

STAFF-DR-02-009

REQUEST:

Does the utility currently share other types of data with entities outside your organization? If yes, describe those other sharing systems and data, and with whom your utility shares the information.

RESPONSE:

Duke Energy shares various types of information with many different entities (Industry Groups, Regulators, other Utilities, etc.). For example Duke Energy participates in the annual Southern Companies Benchmarking effort (reliability information along with other statistics/data) and the annual SEE Reliability Benchmark (reliability statistics/data). The information from these benchmarking efforts is only available to participants and the SEE Reliability Benchmark results are anonymous.

PERSON RESPONSIBLE:

Bob Dollar
Director R&I Planning

STAFF-DR-02-010

REQUEST:

Identify any disadvantages to making the reliability index numbers available on the Commission's website.

RESPONSE:

- The vast majority of customers don't understand what reliability indices mean nor do they have a point of reference to determine what are "good" or "bad" numbers.
- Unless the criteria of what to report (what outages are included/excluded, use of IEEE 1366, etc) and what time slice to report on (annual, 12-month roll, etc.) is well defined by the PSC then the numbers for each utility may not be comparable.
- The Kentucky indices could be compared to indices from other jurisdictions where the reporting criteria is not the same and therefore lead to an invalid comparison.
- If a utility does not have an automated OMS system with customer connectivity then there is a possibility that their outage information is under-reported.
- Individual annual numbers do not provide sufficient information on reliability. Long-term trends (the more years of data the better) of reliability indices provide a more complete picture of reliability performance.

PERSON RESPONSIBLE:

Bob Dollar
Director R&I Planning

**Duke Energy Kentucky
Case No. 2011-450
Staff Second Set Data Requests
Date Received: March 15, 2012**

STAFF-DR-02-011

REQUEST:

Identify any advantages to making the reliability index numbers available on the Commission's website.

RESPONSE:

Duke Energy does not see any advantages to making the reliability index numbers available on the Commission's website.

PERSON RESPONSIBLE:

Bob Dollar
Director R&I Planning

**Duke Energy Kentucky
Case No. 2011-450
Staff Second Set Data Requests
Date Received: March 15, 2012**

STAFF-DR-02-012

REQUEST:

In your opinion, what information would the utility's customers be most interested in having easily accessible? In your opinion, is it more appropriate to have this information available by circuit or system averages? How does your utility relay reliability information to your customers? Explain your answers.

RESPONSE:

From a reliability standpoint our customers are most interested in:

- When will my service be restored (ETOR – estimated time of restoration)?
- What caused the outage or what caused repeated outages?

Reliability information is given to customers who call our customer service center. Most customers are not interested in circuit or system level measures they are interested in the 2 items listed above.

PERSON RESPONSIBLE:

Bob Dollar
Director of R&I Planning

**Duke Energy Kentucky
Case No. 2011-450
Staff Second Set Data Requests
Date Received: March 15, 2012**

STAFF-DR-02-013

REQUEST:

If not identified elsewhere, describe the reliability information available for public review on your utility's website.

RESPONSE:

Given that our customers are most concerned about outage information like ETORs and outage causes, our website <http://www.duke-energy.com/kentucky/outages/current.asp#outagedata> (Duke Energy Kentucky Outage & Storm Information) is geared to those issues. The website contains information including, but not limited to:

- Current outage information by county and on a map
- Common outage causes
- Storm Tips

PERSON RESPONSIBLE: Bob Dollar

**Duke Energy Kentucky
Case No. 2011-450
Staff Second Set Data Requests
Date Received: March 15, 2012**

STAFF-DR-02-014

REQUEST:

If the utility's customer requests information from the utility on reliability measures, do you provide it? Explain your answer.

RESPONSE:

Duke Energy Kentucky's customers typically request outage histories when they have questions about reliability and we provide an outage history with causes. Customers rarely ask for reliability indices but if they do we will provide them.

PERSON RESPONSIBLE:

Bob Dollar
Director R&I Planning

STAFF-DR-02-015

REQUEST:

Does the utility have a suggestion for a better or more efficient method or manner for reporting or providing reliability information to the public?

RESPONSE:

- Long-term trends (10+ years) for system level SAIFI & SAIDI are the best indicators of a utilities reliability performance.
- Because there is no standard for what to include/exclude in reliability indices, other than IEEE 1366 for major event day exclusions, comparisons between utilities are problematic at best and invalid at worst.
- Most customers do not understand and are not interested in reliability indices.
- Most customers are concerned about when they can expect their power to be restored and what caused the outage or repeated outages.

PERSON RESPONSIBLE:

Bob Dollar
Director R&I Planning