Duke Energy®

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Senior Paralegal

VIA OVERNIGHT DELIVERY

February 7, 2012

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

Re: Case No. 2011-00450
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 First Set of Data Requests in the above captioned case.

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

Sincerely,

Dianne Kuhnell

Dianne Kuhnell
Senior Paralegal

cc: Counsel of record (w/enclosures)

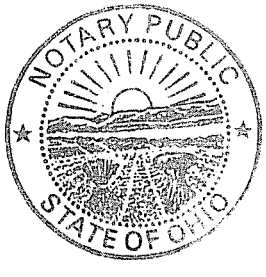
VERIFICATION

State of Ohio)
) **SS:**
County of Hamilton)

The undersigned, Ken Smith, being duly sworn, deposes and says that he is Senior Engineer, 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.

Ken Smith, Affiant

Subscribed and sworn to before me by January on this 18th day of January 2012.



E. MINNA ROLFES
Notary Public, State of Ohio
My Commission Expires
June 10, 2012

E. Minna Rolfes
NOTARY PUBLIC

My Commission Expires: 6/10/12

VERIFICATION

State of Ohio)
)
County of Hamilton)

SS:

The undersigned, Tony Platz, being duly sworn, deposes and says that he is Director, Distribution 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.

Tony Platz, Affiant

Subscribed and sworn to before me by Tony Platz on this 26th day of January 2012.

NOTARY PUBLIC

E. MINNA ROLFES
Notary Public, State of Ohio
My Commission Expires
June 10, 2012

My Commission Expires: 6/10/12

TABLE OF CONTENTS

Duke Energy Kentucky
Case No. 2011-450
Staff First Set Data Requests
Date Received: January 11, 2012

STAFF-DR-01-001

REQUEST:

The following questions relate to the data maintained by each utility.

a. Identify the number of circuits currently maintained by the electric utility.

b. Does the utility calculate separate SAIDI, SAIFI and CAIDI indices for each circuit? If no, explain why not and explain the degree to which the utility tracks the following:

(1) SAIDI;

(2) SAIFI; and

(3) CAIDI.

c. Identify any other reliability indicator or measure the utility uses to assess reliability. Explain the significance of each indicator or measure used. Does the utility maintain these indicators or measures for each circuit?

RESPONSE:

a. Duke Energy Kentucky has 128 distribution circuits.

b. Yes. However, Duke Energy Kentucky does not use the CAIDI metric. Many reliability improvements reduce both customer interruptions (CI) and customer minutes interrupted (CMI), but at the same time CAIDI increases. No single customer may be experiencing longer duration outages, but CAIDI increases because shorter duration outages are being eliminated. Furthermore, CAIDI is an especially poor metric by which to measure a distribution circuit. Circuits that are "high in CAIDI" may have very few customer interruptions and very few customer minutes interrupted. SAIFI and SAIDI are legitimate reliability measures because lower numerical values indicate improved performance and higher numerical values represent worsening performance. But higher or lower numerical values for CAIDI mean nothing at all. Worse, higher or lower numerical values for CAIDI often mislead observers to think that things are

getting better, when they are actually getting worse; or that things are getting worse when they are actually getting better. Therefore, CAIDI should not be used as a reliability metric, especially considering that metrics such as SAIFI and SAIDI are available.

c. Duke Energy Kentucky maintains a listing of Root Cause Categories ranked by SAIFI. This list is compiled for the service territory as a whole and not compiled by circuit. The Root Cause Categories are used to help identify line and equipment designs that perform poorly. Duke Energy Kentucky targets poorly performing designs using various programs and processes. Various poorly performing designs may be present on many, and sometimes all, circuits. The reliability strategy of Duke Energy Kentucky is to consistently and strategically replace or retrofit these poorly performing designs wherever they are. Therefore, *circuits* are not poor performers per se. Instead, circuits are composed of both good and poor designs. It is necessary to target the poor *designs*, not the poor *circuits*. Even well performing circuits may have poor designs that could cause a well performing circuit to perform poorly in the future.

"Fix the worst problems on all the circuits,
not all the problems on the worst circuits."

PERSON RESPONSIBLE: Ken Smith

Duke Energy Kentucky
Case No. 2011-450
Staff First Set Data Requests
Date Received: January 11, 2012

STAFF-DR-01-002

REQUEST:

The following questions refer to the manner in which each utility calculates and tracks the SAIDI, SAIFI and CAIDI indices.

a. Identify the manner in which the indices are calculated and tracked; i.e., manually (Excel spread sheet), or an electronic or mechanized (outage reporting) system.

b. If the response to Item 2.a. above is electronic or mechanized, provide a description of the system and explain whether it was developed purchased from a third-party vendor. If purchased from a third-party vendor, provide the name of the vendor and an estimate of the original cost of the system.

c. If the response in Item 2.a. above is manually, provide a description of the elements tracked. Discuss in detail any inquiry made into the internal development of an electronic or mechanized system or any consideration of the purchase of a system from a third-party vendor.

RESPONSE:

a. Reliability indices are calculated using data obtained from an electronic Outage Management System. The data is entered into Excel spreadsheets to calculate the actual indices.

b. Duke Energy uses an Outage Management System (OMS) supplied by Oracle. The initial cost was $2,000,000.

c. N/A

PERSON RESPONSIBLE: Ken Smith

Duke Energy Kentucky
Case No. 2011-450
Staff First Set Data Requests
Date Received: January 11, 2012

STAFF-DR-01-003

REQUEST:

Concerning SAIDI, SAIFI and CAIDI reporting: the Commission directed that the reporting be based on the criteria and definitions set forth in the IEEE Standard.

a. If the utility does not follow the IEEE standard, explain why not. Explain what standard(s) the utility does follow in its calculation of SAIDI, SAIFI and CAIDI.

b. Does the utility track and review SAIDI, SAIFI and CAIDI monthly, quarterly or annually?

c. Are SAIDI, SAIFI and CAIDI tracked on a rolling 12-month period or for a more discrete period of time; i.e., monthly, quarterly, or annually?

d. Currently, in each annual report submitted pursuant to the Final Order in Case No. 2006-00494, each utility provides system-wide SAIDI, SAIFI and CAIDI calculated for a calendar year. Identify any other preferred 12-month reporting parameter; i.e., calendar year, fiscal year, or some other 12-month method.

e. Does the utility review SAIDI, SAIFI, and CAIDI by any discrete fashion such as by division, district, region or some other method?

RESPONSE:

a. Duke Energy calculates SAIDI, SAIFI, and CAIDI according to IEEE standard 1366.

b. SAIDI and SAIFI are tracked and reviewed monthly.

c. SAIDI and SAIFI are calculated monthly using a 12-month rolling average.

d. Duke Energy Kentucky prefers to continue reporting on a calendar-year basis.

e. Duke Energy Kentucky reviews SAIDI and SAIFI for the entire Kentucky region as a unit.

PERSON RESPONSIBLE: Ken Smith

Duke Energy Kentucky
Case No. 2011-450
Staff First Set Data Requests
Date Received: January 11, 2012

STAFF-DR-01-004

REQUEST:

The following questions relate to the requirement that each utility report the ten worst-performing circuits for each index in the annual report submitted pursuant to the Final Order in Case No. 2006-00494.

a. If the utility does not track SAIDI, SAIFI and CAIDI for each circuit, explain how the ten worst-performing circuits are identified.

b. Does the utility see benefit in expanding the reporting of the worst-performing circuits to the 15 or 20 worst-performing circuits for each index?

c. Identify any alternative to reporting the ten worst-performing circuits that the utility utilizes to determine system reliability.

RESPONSE:

a. Duke Energy Kentucky does track SAIDI and SAIFI for each circuit.

b. No. Duke Energy Kentucky does not see benefit in reporting *any* worst performing circuits. The concept of "worst performing circuits" is actually a poor reliability strategy. It ignores poorly performing line and equipment designs on the other circuits. Duke Energy Kentucky concentrates its efforts in improving reliability on *all* the circuits, not just 10 or 20 of them. Duke Energy Kentucky has a wide variety of programs and processes that target poorly-performing designs on the entire system. Various poorly-performing designs may be present on many, and sometimes all, circuits. The reliability strategy of Duke Energy Kentucky is to consistently and strategically replace or retrofit these poorly performing designs as a system rather than a circuit. Therefore, *circuits* are not poor performers per se. Instead, circuits are composed of both good and poor designs. It is necessary to target the poor *designs*, not the poor *circuits*. Even well-performing circuits may have poor designs that could cause a well-performing circuit to perform poorly in the future.

"Fix the worst problems on all the circuits,
not all the problems on the worst circuits."

c. Duke Energy Kentucky can provide a breakdown by SAIFI for the ten cause categories shown below.

These cause categories are specified in the new IEEE Guide for Interruption Reporting Practices for Distribution – P1782. [Note: P-1782 is an unapproved IEEE Guide to be balloted in 2012. The cause categories given in the guide are likely to be approved, but approval is not completely certain. Nevertheless, Duke Energy in 2010 implemented use of these cause categories in a new enterprise-wide outage management system. This decision was based on advantages derived from using a future industry standard, especially for regulatory reporting and benchmarking.]

Vegetation - Caused by falling trees or limbs, growth of trees, vines, and roots. If any part of a tree is involved in the outage, this cause should be used. This concept is important in regards to wind storms. It may not be possible to determine that a feeder may have a forestry issue if Weather is listed as the cause when actually a tree was involved.

Equipment - Any equipment that is defective or fails and causes an interruption. Examples are controls, conductors, insulators, clearing devices, arresters, structures, supports, switches and transformers.

Public - Interruptions resulting from an act of the public at large. Examples: customer trouble, non-utility employee or contractor dig-in, fire/police requests, foreign contact (e.g. Mylar balloons, crane boom, aluminum ladder), traffic accidents, vandalism, and fires and explosions not originating with the utility.

Wildlife - Includes mammals, birds, reptiles, and insects or any other non-human member of the animal kingdom. Wildlife can cause interruptions by direct contact or indirectly such as nests and bird excrement.

Lightning - Caused by lightning including both direct strokes contacting the wires or equipment, and indirect strokes by lightning-induced flashover.

Power Supply - Caused by failure of the transmission system or generating unit including distributed generation. Does not include loss of a substation component or equipment or other cause in the substation.

Unknown - Interruptions where a definitive cause cannot be determined after investigation.

Weather - Directly due to weather phenomenon including: wind, snow, ice, hail, and rain where the weather itself caused the interruption AND EXCEEDED THE SYSTEM DESIGN LIMITS. Note that if any part of a tree was involved, the cause would be Vegetation. Conductors slapping together in wind would be under Equipment. Ice forming on conductors and tearing them down or flooding of power facilities would be included in Weather.

Planned - Including, but not limited to, road construction, maintenance and repairs, load swaps, replacing equipment, and house moves. Typically those interruptions that can be safely delayed and performed only after appropriate or required customer notification.

Other - Any interruptions that do not fall into any of the other categories. Examples include human error, errors in construction, design or operation, overload, and contamination.

PERSON RESPONSIBLE: Ken Smith

Duke Energy Kentucky
Case No. 2011-450
Staff First Set Data Requests
Date Received: January 11, 2012

STAFF-DR-01-005

REQUEST:

The following questions relate to the identification of the ten worst-performing circuits for each index.

a. Provide an explanation of the actions taken by the utility once the ten worst-performing circuits for each index have been identified. Include the typical steps taken to correct the reliability issues relating to the ten worst-performing circuits for each index.

b. Provide a timeline of the typical steps taken to correct reliability issues relating to the ten worst-performing circuits for each index.

RESPONSE:

a. When the worst-performing circuits have been identified, each circuit is analyzed for failure mode and researched for repairs/solutions that were implemented at the time of failure. Based on analysis, additional repairs and/or additional equipment/protective devices may be specified.

b. After a worst-performing circuit has been presented to Distribution:
   - 30 Days to respond with analysis and solutions
   - 30 Days to initiate any need corrective action
   - 180 Days to complete simple projects
   - 18 Months to complete major projects

PERSON RESPONSIBLE: Tony Platz