

BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of Empire District Electric)
Company, Liberty Sub Corp. and Liberty)
Utilities (Central) Co. Compliance Filing as) Docket No. 17-EPDE-393-CPL
Required by Commission Order in Docket 16-)
EPDE-410-ACQ)

NOTICE OF FILING OF STAFF'S REPORT AND RECOMMENDATION

The Staff of the Kansas Corporation Commission (Staff) hereby files its Report and Recommendation dated November 1, 2018. Per the Settlement Agreement in Docket No. 16-EPDE-410-ACQ, Staff recommends that Empire District Electric Company (Empire) be required to refund \$105,000 to its Kansas customers because its Customer Average Interruption Duration Index (CAIDI) for 2017 deteriorated greater than 15% from the 2013-2015 normalized averages. Staff also recommends that Empire be instructed to inspect all remaining 1996 ABB model 72PM transmission breakers, if they have not done so already.

WHEREFORE, Staff respectfully requests that the Commission approve the recommendations made by Staff in its Report and Recommendation.

Respectfully Submitted,



Michael Neeley, S. Ct. #25027
Senior Litigation Counsel
Kansas Corporation Commission
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STATE OF KANSAS)
) ss.
COUNTY OF SHAWNEE)

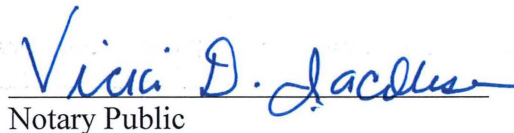
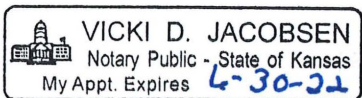
VERIFICATION

Michael Neeley, being duly sworn upon his oath deposes and states that he is Litigation Counsel for the State Corporation Commission of the State of Kansas, that he has read and is familiar with the foregoing *Notice of Filing of Staff's Report and Recommendation* and that the statements contained therein are true and correct to the best of his knowledge, information and belief.



Michael Neeley # 25027
Kansas Corporation Commission of the
State of Kansas

Subscribed and sworn to before me this 8th day of November, 2018.



Notary Public

My Appointment Expires: June 30, 2022

STATE OF KANSAS



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SHARI FEIST ALBRECHT, CHAIR | JAY SCOTT EMLER, COMMISSIONER | DWIGHT D. KEEN, COMMISSIONER

TO: Chair Shari Feist Albrecht
Commissioner Jay Scott Emler
Commissioner Dwight D. Keen

FROM: Tim Stringer, Energy Engineer
Leo Haynos, Chief Engineer
Jeff McClanahan, Director of Utilities

DATE: November 1, 2018

SUBJECT: Docket Number: 17-EPDE-393-CPL
In the Matter of Empire District Electric Company, Liberty Sub Corp. and Liberty Utilities (Central) Co. Compliance Filing as Required by Commission Order in Docket 16-EPDE-410-ACQ

EXECUTIVE SUMMARY:

As required by Docket 16-EPDE-410-ACQ (16-410), Empire District Electric Company (Empire) filed its Electric Distribution 2017 Reliability Performance Study and its answered call rate study. The data was compared with the 2013-2015 averages and the 2017 data was found to exceed the reliability thresholds set by the Commission. As per the Agreement reached in the 16-410 Docket, if the previous year's reliability performance or its answered call rate performance deteriorate below the threshold, Empire is required to refund \$105,000 to its Kansas customers.

Staff has reviewed Empire's 2017 performance studies and concludes that Empire met the threshold values for two reliability standards and the 2017 answered call rate, but did not meet the performance threshold for the third reliability standard. Therefore, Staff recommends the Commission order Empire to refund \$105,000 to its ratepayers per the terms of the Settlement Agreement.

BACKGROUND:

16-EPDE-410-AQC states:¹

"LU Central and EDE agree to maintain or improve EDE's current quality of service, consistent with the requirements of Commission rules. In addition, EDE agrees to the following quality of service parameters and penalties for non-compliance in the event of failure to maintain these parameters. Using the methodology established in the Annual Reliability Benchmarking Report of the Institute of Electronic and Electrical Engineers (IEEE), EDE's normalized reliability statistics (SAIDI, SAIFI, CAIDI) for its Kansas

¹ 16-EPDE-410-ACQ Unanimous Settlement Agreement, Page 12.

operations (area 212) shall be calculated for years 2013 through 2015. EDE shall pay a refund to its Kansas Customers for any year the Kansas Service area normalized annual statistics decrease in reliability below the 2013-2015 averages according to the following schedule:

- a. 5%%-10%: \$35,000
- b. 10%-15%: \$70,000
- c. >15%: \$105,000”

The Settlement Agreement approved by the Commission in the 16-410 Docket requires Empire to pay a refund to its customers if its reliability performance or its answered call rate fall below threshold values set out in the Agreement. In order to evaluate the performance data, Empire is required to file annual reliability reports with the past four years’ data for the following performance parameters:

- System Average Interruption Frequency Index (SAIFI);
- System Average Interruption Duration Index (SAIDI);
- Customer Average Interruption Duration Index (CAIDI);
- Customer answered call rate.

A discussion of the reliability indices calculation methodology is included as Appendix 1 to this Report and Recommendation.

Based on the agreement approved by the Commission in the 16-410 Docket, Empire has agreed to pay a refund to its customers if the calendar year averages for the performance metrics deteriorate below the average of the three calendar years preceding the merger. The threshold values are as follows: SAIDI – 103.5; SAIFI – 1.5; CAIDI – 69.8; and Answered call rate -96%.

For the reliability metrics, an increasing value indicates deteriorating performance.

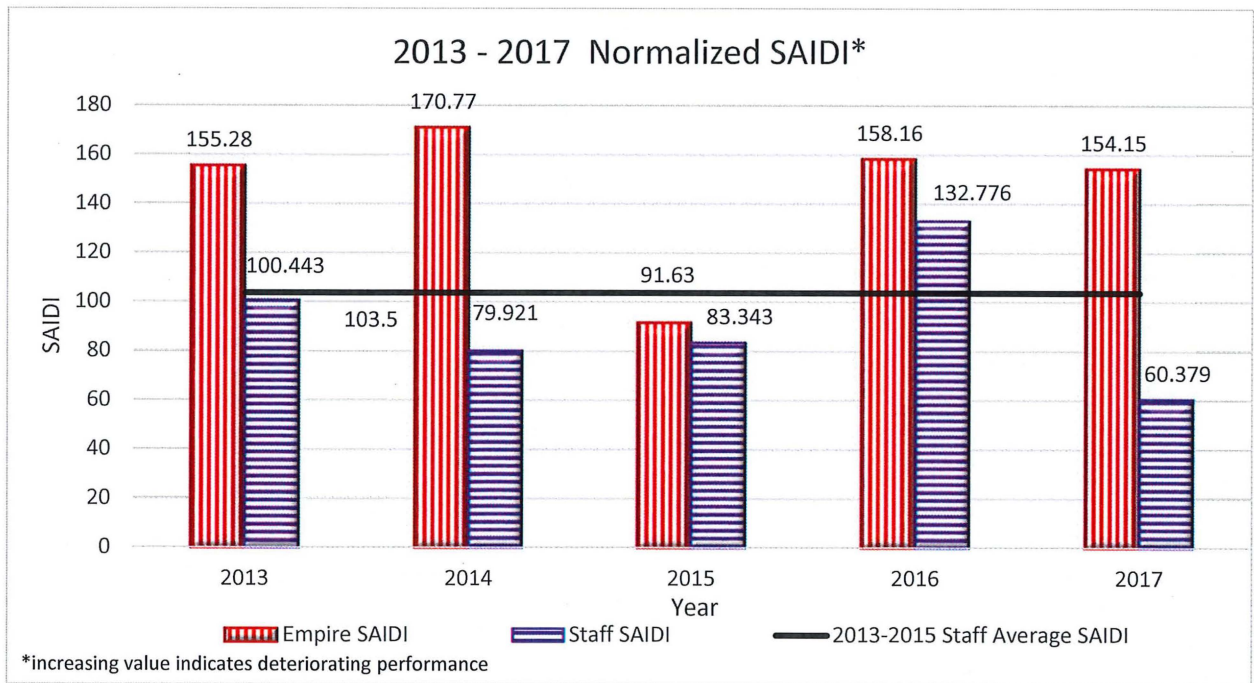
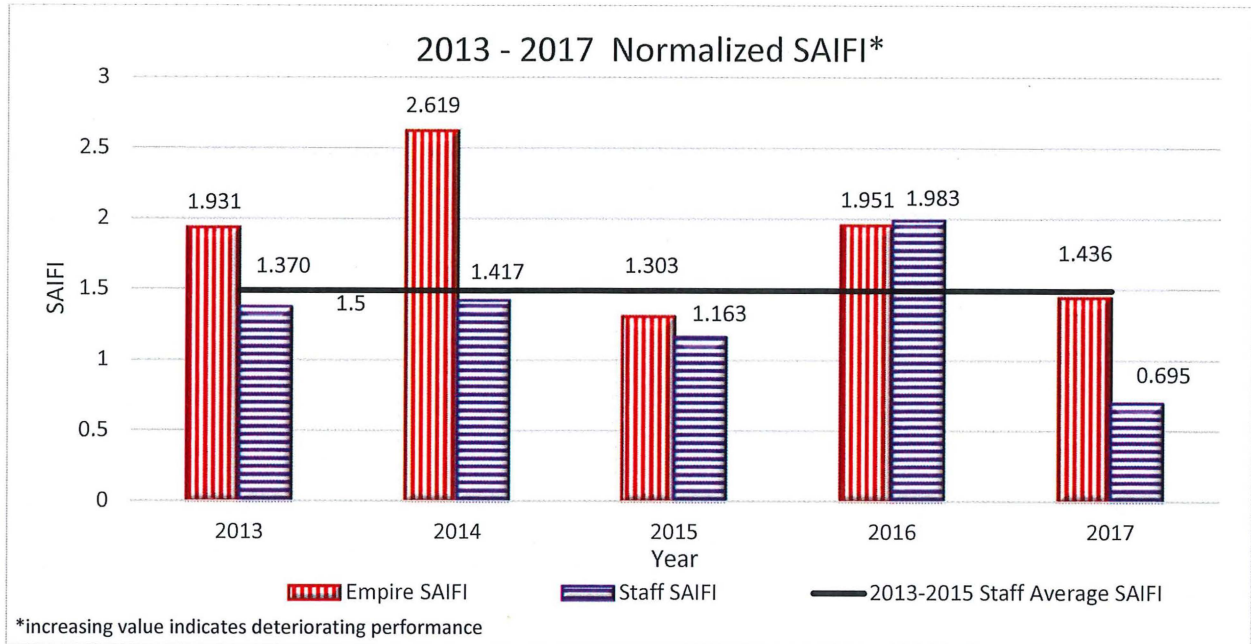
Docket 16-EPDE-410-CPL also requires the impact of certain extraordinary events on Empire’s call center or electric service performance be documented. Should Empire’s service performance become inferior to service standards of any of the performance indicators specified, Empire will have the opportunity to present evidence of an extraordinary event in its written report.

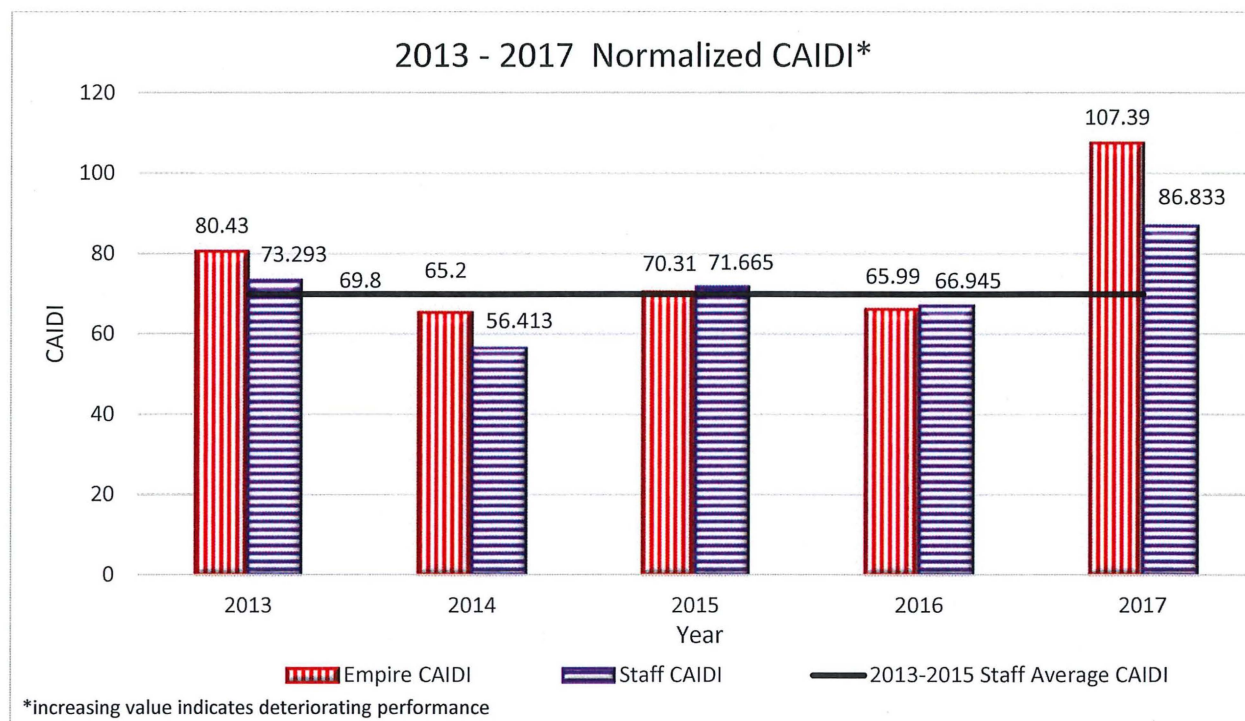
The Docket also requires Empire to calculate the annual answered call rate and pay a refund to its Kansas customers when the normalized annual operations falls below 95% of the 2013-2015 average.

ANALYSIS:

Reliability Performance Report Statistics:

Staff used Empire’s data to verify 2017 SAIFI, SAIDI, and CAIDI. Unfortunately, Staff’s calculations do not agree with Empire’s Annualized SAIFI, SAIDI, and CAIDI. The following charts depict the differences.





Comparing Staff's calculated 2013 – 2015 normalized averages for the reliability metrics, with the Staff-calculated 2017 normalized values finds the 2017 CAIDI exceeds the 2013 – 2015 normalized average threshold by 29.4%. CAIDI represents the ratio of SAIDI to SAIFI, which indicates the average outage duration per customer outage. The reason the 2017 CAIDI value exceeds the baseline threshold appears to be that it took Empire a longer amount of time to restore service for the average outage. Because the 2017 CAIDI value exceeds the threshold CAIDI value, Staff recommends the Commission order Empire to refund \$105,000 to its customers as prescribed by the schedule established in the Settlement Agreement. Staff further recommends this refund be allocated to customer classes based on the revenue allocation calculated from the upcoming rate case test year billing determinants and rates.

$$\text{Each Class Refund} = \frac{\text{Test Year Revenue using current rates for Each Class}}{\text{Total Test Year Revenue}} \times \$105,000$$

In addition, Staff recommends the per-customer refund for the residential class be calculated by dividing the refund allocated to the residential class by customer count.

$$\text{Refund Per Residential Customer} = \frac{\text{Residential Class Refund}}{\text{Customer Count}}$$

And the per-customer refund for all other classes be calculated by dividing each customer's revenue by the class revenue and multiplying that share times the refund allocated to the class.

$$\text{Refund Per Each Other Class Customer} = \frac{\text{Test Year Revenue for Each Customer Within Class}}{\text{Test Year Revenue for the Class}} \times \text{Class Refund}$$

Call Center Statistics:

The Docket requires the 2013 – 2015 average answered call rate to be determined. The performance reference for the answered call rate statistic is based on the average of the call rate for the years 2013, 2014, and 2015. If the current year's answered call rate falls below 95% of the 2013 – 2015 average, then the Settlement Agreement prescribes a performance penalty.

Empire stated their Call Center statistics contain calls from all their service territories, not just their Kansas operations.² Because the Settlement Agreement does not limit this metric to only Kansas data, Staff is agreeable to using the system-wide call center performance metric. Staff calculated Empire's 2013 – 2015 answered call rate as 96%.³ Therefore, as per the Settlement Agreement, no performance penalty is prescribed for this metric.

Major Event Analysis:

Normalized reliability metrics exclude Major Event Days (MEDs) in order to more accurately reflect the utility's day-to-day performance that is not influenced by outside factors such as weather related events. The IEEE 1366 methodology discusses that MED activities should be separately analyzed and reported in order to obtain an accurate portrayal of the utility's performance. Although no refund is associated with MED data, Staff reviewed Empire's MED operations as recommended by IEEE. For the year 2017, Empire provided an analysis for two events that occurred on May 22 and June 17.

The May 22 event involved lightning striking insulators on a transmission line serving the Galena substation.⁴ When the upstream transmission breaker tried to open, it could not due to internal tank failure, which required other breakers to open resulting in 3,336 customers losing power.⁵ Based on Empire's description of this event, Staff agrees it was a valid MED and should be excluded from the reliability calculations.

Empire also report a MED that occurred on June 17, 2017. Staff believes the root cause of this event was the fact that Empire delayed maintenance to a transmission structure. Staff's recommendation regarding this equipment failure is discussed in a separate R&R recommending Empire Show Cause Whether it is in Violation of 1997 NESC Rule 214 A.5.

CONCLUSION:

Based on Staff's calculations, Empire's 2017 CAIDI exceeded the 2013 – 2015 normalized averages by 29.4%. According to the agreement in Docket 16-410, when the normalized metric exceeds the 2013 – 2015 averages by 15% or more, a refund of \$105,000 is due to its Kansas customers.

² Response to Staff Data Request 14.

³ Response to Staff Data Request 14.

⁴ Response to Staff Data Request 4.

⁵ Docket 17-EPDE-393-CPL 2017 Kansas Reliability Performance Report.

RECOMMENDATION:

Staff recommends that the Commission require Empire to refund \$105,000 to its customers as a result of the 2017 CAIDI performance metric exceeding the reference value. Regarding the transmission breaker that suffered an internal tank failure, Staff recommends that the Commission instruct Empire to inspect all the remaining 1996 ABB model 72PM transmission breakers,⁶ if they have not done so already.

⁶ Response to Staff Data Request 4.

APPENDIX 1

Reliability Calculation Method

The Docket requires Empire to use the methodology provided in The Institute of Electrical and Electronics Engineers, Inc. (IEEE) Standard 1366, *IEEE Guide for Electric Power Distribution Reliability Indices* to calculate the SAIDI, SAIFI, and CAIDI indices.

The SAIDI index is used as the basis of this definition since it leads to consistent results regardless of utility size, and because SAIDI is a good indicator of operational and design stress.⁷

IEEE 1366 defines “Major Event” as an event that exceeds reasonable design and or operational limits of the electric power system, thus a Major Event includes at least one Major Event Day (MED). The definition of MED in IEEE 1366 states that the MED is a day in which the daily system SAIDI exceeds T_{MED} . T_{MED} is recalculated every year with the previous 5 year’s data.

The calculation for T_{MED} begins with calculating the natural logarithm of the daily SAIDI values for the previous five sequential years. The exponential of the log-average (α) and log-standard deviation (β) is then used to calculate the T_{MED} value. The equation to calculate T_{MED} is below.

$$T_{MED} = e^{(\alpha - 2.5\beta)}$$

The calculated T_{MED} is used as the threshold for the upcoming year. IEEE 1366 requires MEDs be eliminated from the daily performance data in calculating SAIFI, SAIDI, and CAIDI. An MED is classified as an MED day if the daily SAIDI is greater than the threshold value T_{MED} that occurs and is excluded from the SAIFI, SAIDI, and CAIDI calculations. IEEE calls the daily SAIDI below the T_{MED} threshold “normalized”, Staff and Empire also call the days “excluding” when the MED days are excluded and “including” when the MED days are included. The data used for the SAIDI, SAIFI, and CAIDI for reporting purposes, as called for in the Docket, is normalized data.

Answered Call Rate Calculation

The calculation for answered call rate is defined in Docket 16-EPDE-410-ACQ as the ratio of calls answered to calls received for its normalized operation. Normalized operation is referring to the Reliability Calculation Methodology in which the major event days are excluded from the calculations.

⁷ IEEE 1366-2012, Pg 10.

CERTIFICATE OF SERVICE

17-EPDE-393-CPL

I, the undersigned, certify that a true and correct copy of the above and foregoing Notice of Filing of Staff's Report and Recommendation was served via electronic service this 8th day of November, 2018, to the following:

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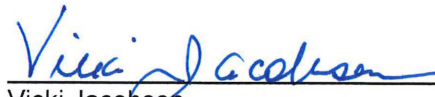
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