

LAW OFFICES OF

# ANDERSON & BYRD

*A Limited Liability Partnership*

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ROBERT A. ANDERSON  
(1920-1994)

RICHARD C. BYRD  
(1920-2008)

May 1, 2018

*via e-filing EXPRESS*

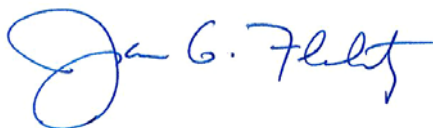
Ms. Lynn M. Retz, Secretary  
Kansas Corporation Commission  
1500 S. W. Arrowhead Road  
Topeka, Kansas 66604-4027

Re: Docket No. 17-EPDE-393-CPL

Dear Ms. Retz:

Enclosed for filing is the 2017 Kansas Reliability Performance Report dated May 1, 2018 ("Report"), of The Empire District Electric Company ("Empire"). The Report is being filed pursuant to (1) Section II.A.vi. (paragraphs 50-56) and Appendix A of the Settlement Agreement approved by the Kansas Corporation Commission ("Commission") in its Order dated December 22, 2016, in Docket No. 16-EPDE-410-ACQ.

Sincerely,



James G. Flaherty  
[jflaherty@andersonbyrd.com](mailto:jflaherty@andersonbyrd.com)

JGF:rr

Enclosure

cc: Thomas J. Connors  
David W. Nickel  
Della Smith  
Dustin L. Kirk  
Amber Smith  
Christopher D. Krygier  
Bethany Aborn



**Liberty Utilities®**  
EMPIRE DISTRICT

**2017 Reliability Performance Report  
16-EPDE-410-ACQ  
17-EPDE-393-CPL**

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Director, System Performance  
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Empire District performs routine reliability activities for all customers. Transmission and distribution assets are inspected on a scheduled basis. Defects identified during inspections are scheduled for remediation. Vegetation clearing is also performed on a routine, scheduled basis.

Empire also identifies distribution circuits each year for reliability improvements. Each identified circuit is assessed by performing a “walk-through” of the circuit identifying visible defects and collecting engineering data to evaluate additional sectionalization and protective device coordination. Empire has made reliability improvements to 8 of the 21 Kansas circuits since the inception of the program in 2010.

Empire has also implemented Operation Toughen Up as a 10-year plan for system enhancements to improve electric service reliability. Empire has completed 6 years of the program to date with Kansas customers benefitting by additional transmission line construction, substation protection upgrades, and distribution rebuilds totaling over \$9.1M.

## **2017 Reliability Indices for Kansas Facilities**

### Kansas Indices Including Major Events

	<b>SAIDI</b>	<b>SAIFI</b>	<b>CAIDI</b>
<b>January</b>	3.48	0.040	85.85
<b>February</b>	2.94	0.033	89.61
<b>March</b>	29.10	0.314	92.77
<b>April</b>	14.73	0.128	115.20
<b>May</b>	45.14	0.410	110.02
<b>June</b>	28.44	0.123	232.13
<b>July</b>	2.18	0.032	67.70
<b>August</b>	18.13	0.184	98.63
<b>September</b>	2.12	0.026	80.58
<b>October</b>	2.82	0.042	67.45
<b>November</b>	2.81	0.051	55.32
<b>December</b>	4.44	0.071	62.42

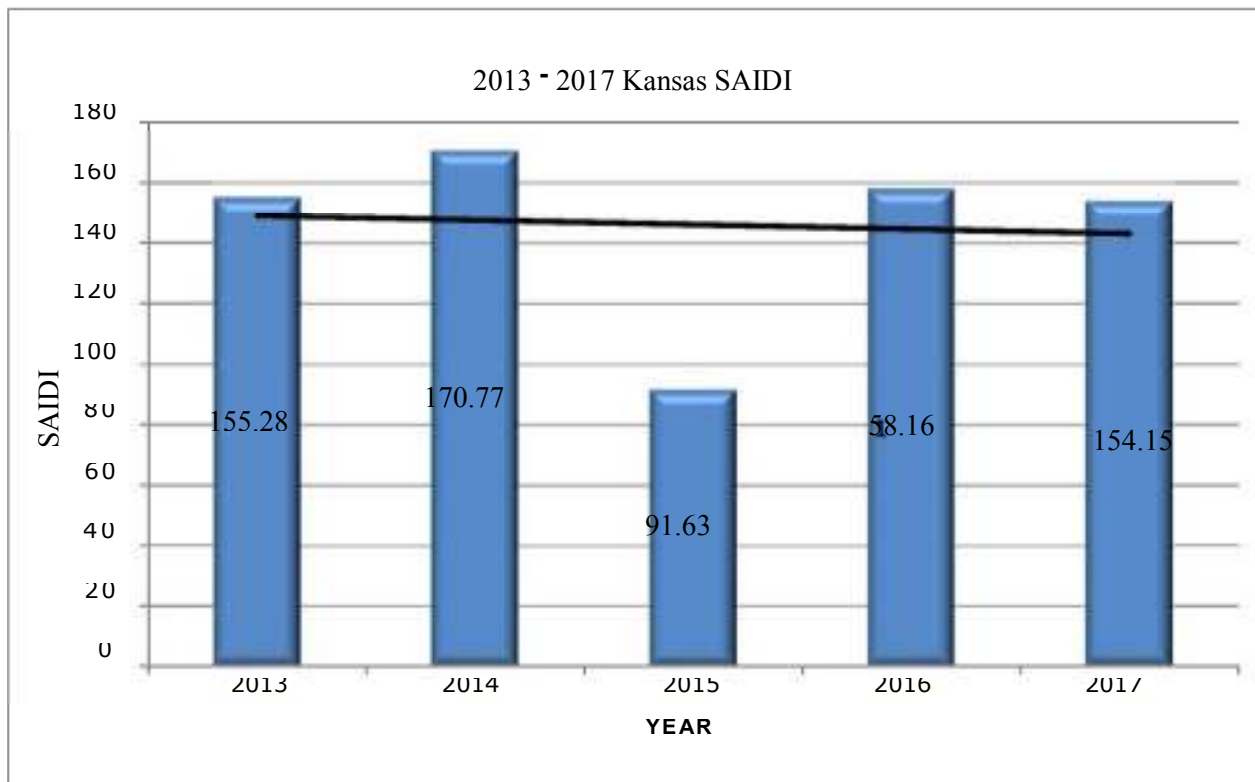
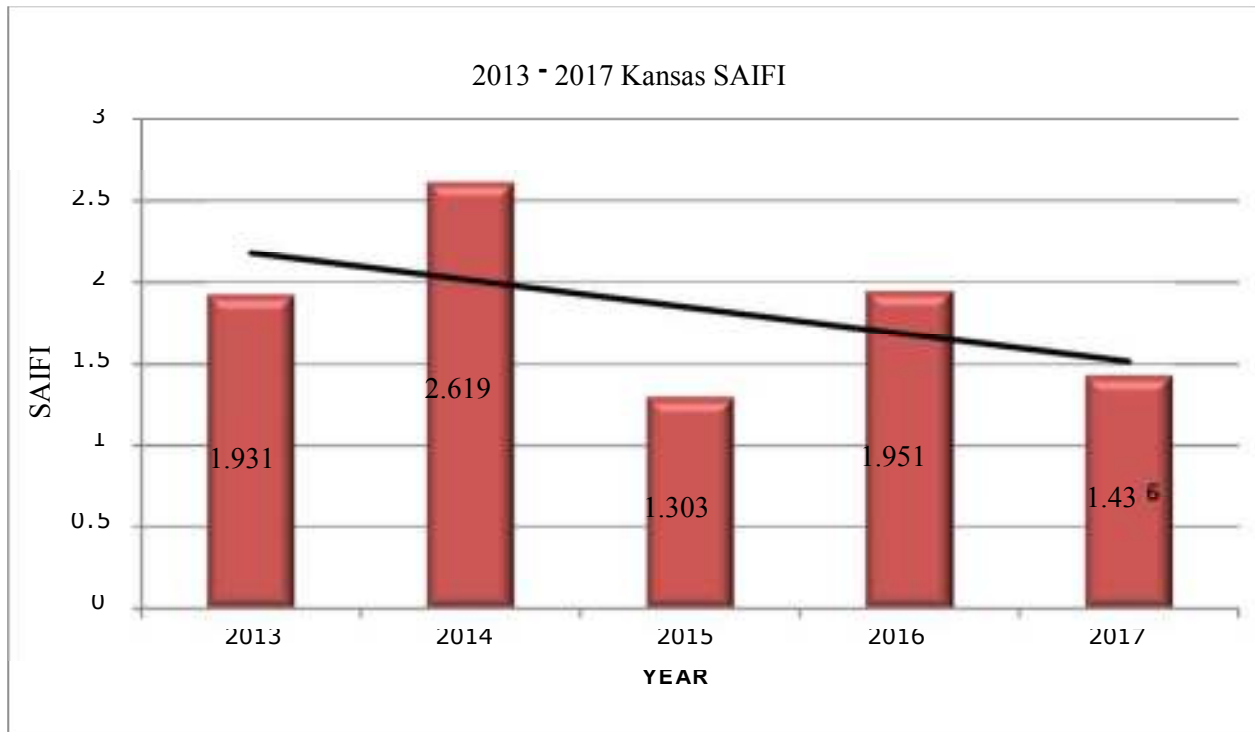
### Kansas Indices Excluding Major Events

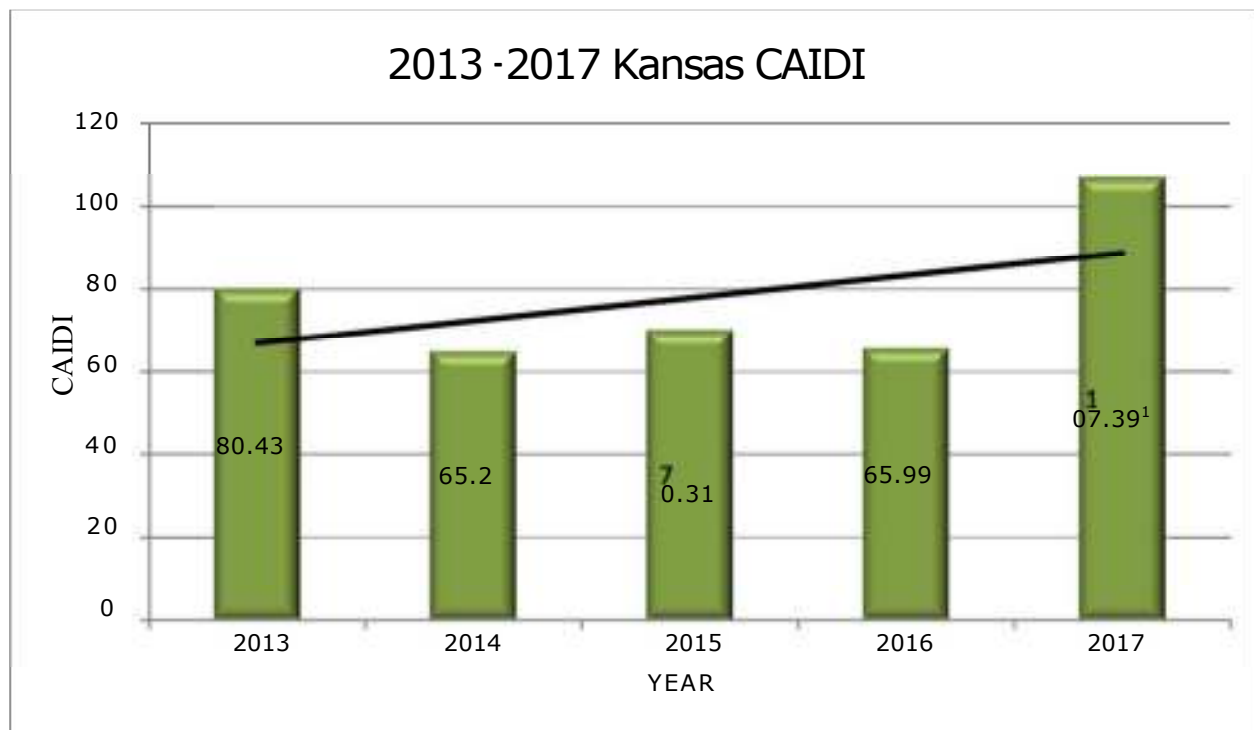
	<b>SAIDI</b>	<b>SAIFI</b>	<b>CAIDI</b>
<b>January</b>	3.48	0.040	85.85
<b>February</b>	2.94	0.033	89.61
<b>March</b>	29.10	0.314	92.77
<b>April</b>	14.73	0.128	115.20
<b>May</b>	19.14	0.269	71.22
<b>June</b>	5.47	0.028	193.19
<b>July</b>	2.18	0.032	67.70
<b>August</b>	18.13	0.184	98.63
<b>September</b>	2.12	0.026	80.58
<b>October</b>	2.82	0.042	67.45
<b>November</b>	2.81	0.051	55.32
<b>December</b>	4.44	0.071	62.42

THE EMPIRE DISTRICT ELECTRIC COMPANY									
CUSTOMER OUTAGE STATISTICS AND INDICES FOR KANSAS									
1/1/2017 to 12/31/2017									
INCLUDING MAJOR EVENT DAYS									
CIRCUIT NUMBER	NUMBER OF OUTAGES	OUTAGE HOURS REPORTED	CUSTOMERS AFFECTED	CUSTOMER OUTAGE MINUTES	TOTAL CUST. ON AFFECTED CIRCUIT	SAIFI	CAIDI	SAIDI	ASAI
2711	2	25.86	170 3	14,443	256	0.665	84.96	56.53	0.99989
2781	0	4.11	3,841	246	1	3	82	246	0.99953
2782	3	37.22	1,339	396,103	811	4.734	103.12	488.23	0.99907
2783	2	10.05	2,304	150,192	161	8.304	112.17	931.42	0.99823
2784	5	8.43	1,221	261,970	744	3.097	113.7	352.11	0.99933
2821	7	41.7	299	201,017	459	2.66	164.63	437.95	0.99917
2822	6	13.45	173	25,369	253	1.182	84.85	100.27	0.99981
2823	19	42.15	191	19,122	527	0.328	110.53	36.28	0.99993
2824	12	16.29	616	7,831	1,096	0.174	41	7.15	0.99999
2911	25	37.93	573	37,785	999	0.617	61.34	37.82	0.99993
2913	15	38.57	961	73,853	890	0.644	128.89	83.03	0.99984
2914	26	28.6	978	39,731	571	1.682	41.34	69.53	0.99987
3391	28	48.3	506	85,908	523	1.87	87.84	164.26	0.99969
4061	20	86.22	721	95,714	790	0.641	189.16	121.19	0.99977
4062	31	23.68	617	101,646	490	1.472	140.98	207.56	0.99961
4251	30	28.86	532	101,228	195	3.164	164.06	519.12	0.99901
4772	20	50.25	662	37,995	986	0.539	71.42	38.53	0.99993
6601	17	30.61	311	39,444	829	0.799	59.58	47.6	0.99991
6602	39	13.74		30,508	517	0.602	98.1	59.01	0.99989
	NUMBER OF OUTAGES	OUTAGE HOURS REPORTED	CUSTOMERS AFFECTED	CUSTOMER OUTAGE MINUTES	TOTAL CUSTOMERS SERVED	SAIFI	CAIDI	SAIDI	ASAI
Total:	387	586.02	16,018	1,720,105	11,158	1.436	107.39	154.15	0.99971

THE EMPIRE DISTRICT ELECTRIC COMPANY									
CUSTOMER OUTAGE STATISTICS AND INDICES FOR KANSAS									
1/1/2017 to 12/31/2017									
EXCLUDING MAJOR EVENT DAYS									
CIRCUIT NUMBER	NUMBER OF OUTAGES	OUTAGE HOURS REPORTED	CUSTOMERS AFFECTED	CUSTOMER OUTAGE MINUTES	TOTAL CUST. ON AFFECTED CIRCUIT	SAIFI	CAIDI	SAIDI	ASAI
2711	2	25.86	170	14,443	256	0.665	84.96	56.53	0.99989
2781	0	1.34	2	80	1	2	40	80	0.99985
2782	2	34.15	3,399	314,702	811	4.19	92.59	387.9	0.99926
2783	2	7.02	889	67,993	161	5.513	76.48	421.66	0.99919
2784	4	5.35	1,658	142,412	744	2.228	85.89	191.41	0.99963
2821	6	37.87	1,219	200,787	459	2.656	164.71	437.44	0.99916
2822	5	11.08	298	25,227	253	1.178	84.65	99.71	0.99981
2823	1	40.75	172	19,038	527	0.326	110.69	36.13	0.99993
2824	7	16.29	191	7,831	1,096	0.174	41	7.15	0.99999
2911	1	37.93	616	37,785	999	0.617	61.34	37.82	0.99993
2913	1	31.02	457	31,001	890	0.514	67.84	34.85	0.99993
2914	2	28.6	961	39,731	571	1.682	41.34	69.53	0.99987
3391	4	48.3	978	85,908	523	1.87	87.84	164.26	0.99969
4061	1	23.88	267	20,262	790	0.338	75.89	25.65	0.99995
4062	5	20.71	244	16,327	490	0.498	66.91	33.34	0.99994
4251	2	14.95	419	54,237	195	2.149	129.44	278.14	0.99947
4772	6	50.25	532	37,995	986	0.539	71.42	38.53	0.99993
6601	2	30.61	662	39,444	829	0.799	59.58	47.6	0.99991
6602	6	13.74	311	30,508	517	0.602	98.1	59.01	0.99989
	NUMBER OF OUTAGES	OUTAGE HOURS REPORTED	CUSTOMERS AFFECTED	CUSTOMER OUTAGE MINUTES	TOTAL CUSTOMERS SERVED	SAIFI	CAIDI	SAIDI	ASAI
Total:	363	479.7	13,445	1,185,711	11,158	1.205	88.19	106.26	0.9998

## **2013-2017 Reliability Indices for Kansas Facilities**





<sup>1</sup>The increase in CAIDI was due to the fact that the decrease in SAIDI was not as pronounced as the decrease in SAIFI for 2017; therefore, since CAIDI is SAIDI divided by SAIFI, the value for CAIDI increased.



## **Major Event Report**

### **May 22, 2017**

Insulators failed on the transmission line serving the #278 - Galena substation due to damage from a previous storm. The equipment failure resulted in an interruption for all four of the distribution circuits serving Galena and the surrounding vicinity. A transmission breaker failure occurred at one of the adjacent substations while attempting to isolate the original fault. This resulted in both segments of the transmission lines serving the #278 – Galena substation to be in a faulted condition. The complication extended the outage duration as the #278 – Galena substation could not be restored until the repairs were made to the faulted transmission breaker at the adjacent substation.

Interruption Cause:	Substation Equipment
Date of Interruption:	5/22/17
Regional Location:	Area 212 – Galena, Kansas
Customer % without power:	29.8% (3,336 out of 11,158)
Outage Start:	5/22/17 8:49 PM
Last Outage Restored:	5/22/17 10:55 PM

### **June 17, 2017**

Storm related wind damage interrupted service to portions of Baxter Springs, Riverton, Hallowell, Sherman City and surrounding rural areas. Included among the damage was a toppled transmission structure supporting two transmission lines; a 161 kV interconnection to Westar and a radial 69 kV line serving Sherman City, Sherwin, Hallowell and a SEKAN Electric Co-Op substation. The structure was damaged prior to the storm by agricultural machinery and had been identified during a routine inspection. The structure was scheduled for replacement, but failed before the replacement could occur. The radial transmission line and additional interconnection transmission line caused the interrupted customers to be off an extended period of time.

Interruption Cause:	Wind
Date of Interruption:	6/17/17
Regional Location:	Area 212 – Columbus
Customer % without power:	12.7% (1,028 out of 11,158)
Outage Start:	6/17/17 6:43 AM
Last Outage Restored:	6/18/17 2:45 AM

## **Total Kansas System Outages**

<b>Outage Cause Description</b>	<b>Customer Minutes Interrupted</b>	<b>Customers Interrupted</b>
<b>ACTS OF MAN</b>	<b>8554</b>	<b>147</b>
<b>BIRDS</b>	<b>27227</b>	<b>290</b>
<b>CONDUCTOR TROUBLE</b>	<b>861</b>	<b>21</b>
<b>CONNECTOR TROUBLE</b>	<b>5904</b>	<b>74</b>
<b>CUTOUT FAILURE</b>	<b>61</b>	<b>1</b>
<b>FIRE CALL</b>	<b>59</b>	<b>1</b>
<b>LIGHTNING</b>	<b>194520</b>	<b>2126</b>
<b>METER DAMAGED</b>	<b>67</b>	<b>1</b>
<b>OTHER ANIMALS</b>	<b>1918</b>	<b>48</b>
<b>POLES HIT</b>	<b>187</b>	<b>5</b>
<b>RECLOSER FAILURE</b>	<b>260</b>	<b>1</b>
<b>SNOW OR ICE</b>	<b>1492</b>	<b>22</b>
<b>SPLICE FAILURE</b>	<b>120</b>	<b>2</b>
<b>SQUIRRELS</b>	<b>56410</b>	<b>1108</b>
<b>STRUCTURE FAILURE</b>	<b>2502</b>	<b>45</b>
<b>SUBSTATION - ACTS OF MAN</b>	<b>153</b>	<b>1</b>
<b>SUBSTATION EQUIPMENT</b>	<b>283324</b>	<b>1539</b>
<b>TRANSFORMER FAILURE</b>	<b>15070</b>	<b>118</b>
<b>TRANSMISSION – EQUIPMENT FAILURE</b>	<b>169664</b>	<b>1687</b>
<b>TRANSMISSION – UNKNOWN</b>	<b>138555</b>	<b>2081</b>
<b>TRANSMISSION – WIND</b>	<b>46393</b>	<b>195</b>
<b>TREES IN SERVICE LINES</b>	<b>3696</b>	<b>38</b>
<b>UNKNOWN</b>	<b>448352</b>	<b>4216</b>
<b>VEGETATION – FALL IN PRIMARY</b>	<b>58651</b>	<b>177</b>
<b>VEGETATION – FALL IN SECONDARY</b>	<b>44</b>	<b>1</b>
<b>VEGETATION – GROW IN PRIMARY</b>	<b>895</b>	<b>20</b>
<b>VEGETATION - GROW IN SECONDARY</b>	<b>283</b>	<b>3</b>
<b>WIND</b>	<b>254883</b>	<b>2050</b>

## **2017 Worst Performing Circuits**

Worst Performing Circuits - System 2017 Measured by SAIFI									
Circuit Number	Substation	Location	Customer Outage Minutes	Customers Affected	Total Cust. On Affected Circuits	SAIFI	SAIDI	CAIDI	Previous Year Worst Performing Circuit?
2782	278	Galena – Northeast	314,702	3,399	811	4.190	387.90	92.59	No

## **Worst Performing Circuit Assessment**

No multi-year worst performing circuits identified.

## Contact Center Stats 2017

Year	Incoming Calls	Calls Answered at Contact Center and IVR	Percent of calls Answered	Percent Abandoned	Staffing Per Shift	
2017	704,362	678,440	96%	4%	<b>Shift</b>	<b>Reps</b>
					7:00a-3:30p	2
					7:00a-4:00p	3
					8:00a-4:30p	1
					8:00a-5:00p	10
					8:30a-5:30p	2
					9:00a-6:00p	3
					10:00a-7:00p	1
					8:30a-7:00p	6
					7:00p-7:00a (Nights)	4
					7:00a-7:00p (Weekends)	2
					7:00a-7:00p (Radio Room)	2