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May 1, 2025

Ms. Celeste Chaney Tucker, Executive Director  
Kansas Corporation Commission  
1500 SW Arrowhead Road  
Topeka, KS 66604-4027

**RE: Reliability Performance Report Docket No. 17-EPDE-393-CPL**

The Empire District Electric Company ("Liberty") respectfully submits its annual reliability performance report for calendar year 2024. The Kansas Corporation Commission ordered in Docket No. 16-EPDE-410-ACQ Appendix A-1 Item 1.3, relating to the merger between The Empire District Electric Company and Liberty Utilities, the production of an "annual reliability performance report" including performance metrics for both including and excluding major event days, a detailed report for each major event, interruption root cause statistics, and a description of the Company's worst performing circuit program. The report was further amended in Docket No. 17-EPDE-393-CPL to include a detailed report of the Company's worst performing device program.

Pursuant to Docket 16-EPDE-410-ACQ, Liberty's annual Reliability Performance Report discusses the 2024 performance and planned 2025 reliability activities to maintain or improve service reliability for Liberty's electric customers. Please note this is a working document, and the planned activities are subject to change.

Respectfully submitted,

Sam McGarrah  
Director of Planning and Asset Management



# 2024 Kansas Corporation Commission Reliability Performance Report

The Empire District Electric Company  
d/b/a Liberty

May 1, 2025



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## Section 1: Overall Reliability Assessment

Liberty serves electric customers in the southeast corner of Kansas, within Cherokee and Labette counties. The region is predominately comprised of rural communities and small towns.

### 2024 Kansas Reliability Indices including Major Event Days

Month	SAIDI	SAIFI	CAIDI
January	1.31	0.020	65.41
February	4.78	0.045	106.34
March	9.72	0.098	98.70
April	8.07	0.051	156.82
May	20.25	0.115	176.02
June	12.81	0.234	54.69
July	23.08	0.088	262.88
August	37.23	0.042	896.35
September	4.32	0.043	101.03
October	8.98	0.105	85.34
November	35.23	0.136	259.71
December	2.54	0.052	49.23

### 2024 Kansas Reliability Indices excluding Major Event Days

Month	SAIDI	SAIFI	CAIDI
January	1.31	0.020	65.41
February	4.78	0.045	106.34
March	9.72	0.098	98.70
April	8.07	0.051	156.82
May	20.25	0.115	176.02
June	12.81	0.234	54.69
July	6.30	0.036	173.68
August	4.74	0.025	192.68
September	4.32	0.043	101.03
October	8.98	0.105	85.34
November	6.51	0.058	112.70
December	2.54	0.052	49.23



**Under paragraph 50 of the Settlement Agreement approved by the Commission in Docket No.16-EPDE-410-ACQ, Liberty agreed to benchmark its normalized reliability statistics (SAIDI, SAIFI, CAIDI), which excluded major event days for its Kansas operations (area 212) based upon the utility's average for years 2013-2015. In 2019, the Commission approved an amendment to the Settlement Agreement that replaced the CAIDI metric with the Worst Performing Devices (WPD) metric. The metrics for SAIDI and SAIFI respectively are as follows: SAIDI: 139.23; SAIFI: 1.951.**



Section 2:

**THE EMPIRE DISTRICT ELECTRIC COMPANY  
CUSTOMER OUTAGE STATISTICS AND INDICES FOR KANSAS  
1/1/2024 to 12/31/2024  
EXCLUDING MAJOR EVENT DAYS**

<b>CIRCUIT NUMBER</b>	<b>NUMBER OF OUTAGES</b>	<b>OUTAGE HOURS REPORTED</b>	<b>CUSTOMERS AFFECTED</b>	<b>CUSTOMER OUTAGE MINUTES</b>	<b>TOTAL CUST. ON AFFECTED CIRCUITS</b>	<b>SAIFI</b>	<b>CAIDI</b>	<b>SAIDI</b>	<b>ASAI</b>
<b>2782</b>	25	46.32	219	24,701	406	0.503	112.79	60.47	0.99989
<b>2783</b>	1	1.03	1	62	94	0.011	62.03	0.70	0.99999
<b>2784</b>	16	27.97	1,207	120,174	911	1.172	99.56	116.95	0.99978
<b>2821</b>	19	22.65	499	26,308	423	1.247	52.72	65.77	0.99988
<b>2822</b>	12	17.72	38	4,271	231	0.175	112.38	19.68	0.99996
<b>2823</b>	14	17.72	605	28,420	429	1.518	46.97	70.93	0.99987
<b>2824</b>	13	15.68	1,061	48,481	1,026	1.097	45.69	50.13	0.99990
<b>3391</b>	24	59.30	104	12,709	500	0.223	122.20	27.31	0.99995
<b>4061</b>	22	29.32	214	17,538	697	0.323	81.95	26.50	0.99995
<b>4062</b>	24	64.32	637	95,115	477	1.449	149.32	216.32	0.99959
<b>4251</b>	19	39.68	541	108,465	165	3.038	200.49	629.59	0.99881
<b>4772</b>	19	146.67	795	106,576	894	0.832	134.06	114.98	0.99978
<b>4881</b>	32	108.67	403	35,196	582	0.741	87.33	64.77	0.99988
<b>4882</b>	35	99.70	597	54,765	839	0.748	91.73	64.59	0.99988
<b>4883</b>	32	87.08	302	26,169	1,219	0.254	86.65	22.13	0.99996
<b>4884</b>	29	214.63	327	84,406	227	1.561	258.12	403.46	0.99923
<b>6601</b>	45	89.58	449	45,936	700	0.655	102.31	69.27	0.99987
<b>6602</b>	21	62.22	820	66,682	426	2.163	81.32	175.88	0.99967
<b>Total:</b>	<b>402</b>	<b>1,150.25</b>	<b>8,819</b>	<b>905,974</b>	<b>10,232</b>	<b>0.876</b>	<b>102.73</b>	<b>89.51</b>	<b>0.99983</b>



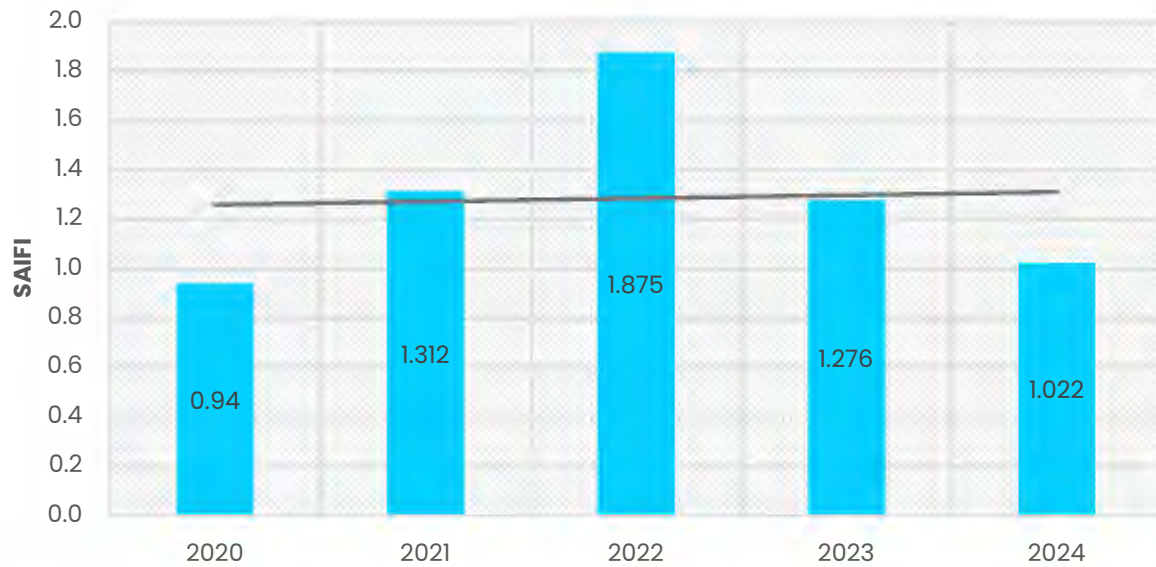
**THE EMPIRE DISTRICT ELECTRIC COMPANY  
CUSTOMER OUTAGE STATISTICS AND INDICES FOR KANSAS  
1/1/2024 to 12/31/2024  
INCLUDING MAJOR EVENT DAYS**

<b>CIRCUIT NUMBER</b>	<b>NUMBER OF OUTAGES</b>	<b>OUTAGE HOURS REPORTED</b>	<b>CUSTOMERS AFFECTED</b>	<b>CUSTOMER OUTAGE MINUTES</b>	<b>TOTAL CUST. ON AFFECTED CIRCUITS</b>	<b>SAIFI</b>	<b>CAIDI</b>	<b>SAIDI</b>	<b>ASAI</b>
<b>2782</b>	27	59.67	238	31,904	406	0.554	134.05	79.78	0.99985
<b>2783</b>	1	1.03	1	62	94	0.011	62.03	0.70	0.99999
<b>2784</b>	19	41.17	1,620	247,786	911	1.663	152.95	268.51	0.99949
<b>2821</b>	19	22.65	499	26,308	423	1.247	52.72	65.77	0.99988
<b>2822</b>	13	18.27	39	4,304	231	0.180	110.35	19.83	0.99996
<b>2823</b>	14	17.72	605	28,420	429	1.518	46.97	70.93	0.99987
<b>2824</b>	17	25.88	1,444	136,291	1,026	1.493	94.38	140.93	0.99973
<b>3391</b>	26	69.70	364	146,241	500	0.782	401.76	314.47	0.99940
<b>4061</b>	23	31.28	232	19,667	697	0.351	84.77	29.72	0.99994
<b>4062</b>	27	72.63	640	95,614	477	1.456	149.40	217.46	0.99959
<b>4251</b>	20	41.92	545	109,002	165	3.065	200.00	633.24	0.99880
<b>4772</b>	20	157.38	907	178,536	894	0.967	196.84	201.68	0.99962
<b>4881</b>	35	174.25	421	50,977	582	0.774	121.08	93.83	0.99982
<b>4882</b>	36	101.28	598	54,860	839	0.749	91.74	64.72	0.99988
<b>4883</b>	39	324.40	393	236,060	1,219	0.333	600.66	203.07	0.99961
<b>4884</b>	34	364.37	394	168,962	227	1.881	428.84	808.04	0.99847
<b>6601</b>	47	90.92	451	46,017	700	0.658	102.03	69.40	0.99987
<b>6602</b>	21	62.22	820	66,682	426	2.163	81.32	175.88	0.99967
<b>Total:</b>	<b>438</b>	<b>1,676.73</b>	<b>10,211</b>	<b>1,647,693</b>	<b>10,232</b>	<b>1.022</b>	<b>161.36</b>	<b>167.50</b>	<b>0.99968</b>



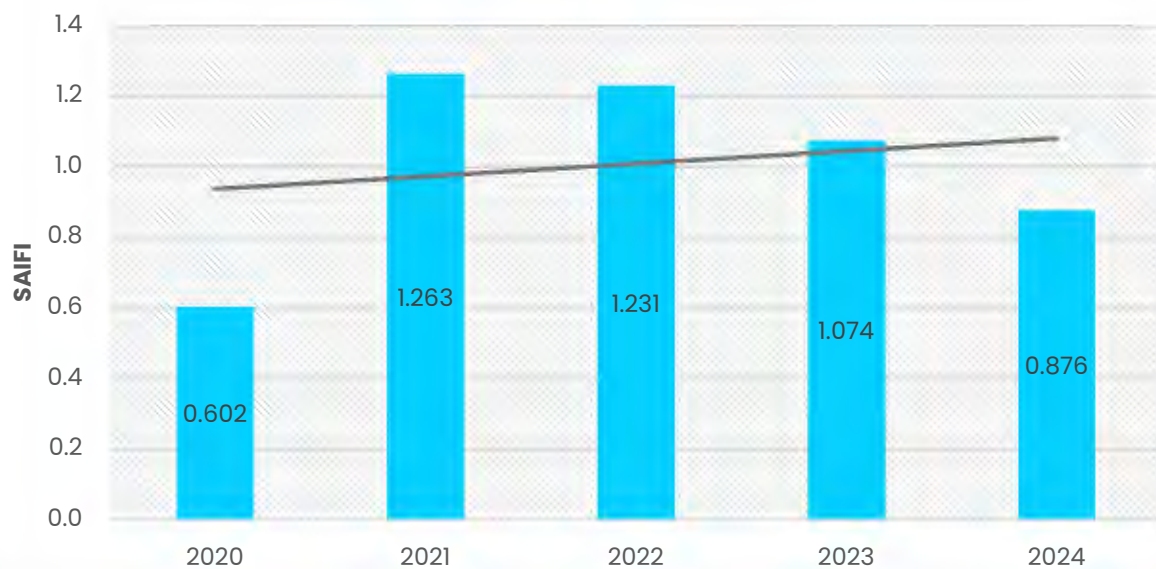
## 5-Year Kansas SAIFI

Including Major Events



## 5-Year Kansas SAIFI

Excluding Major Events

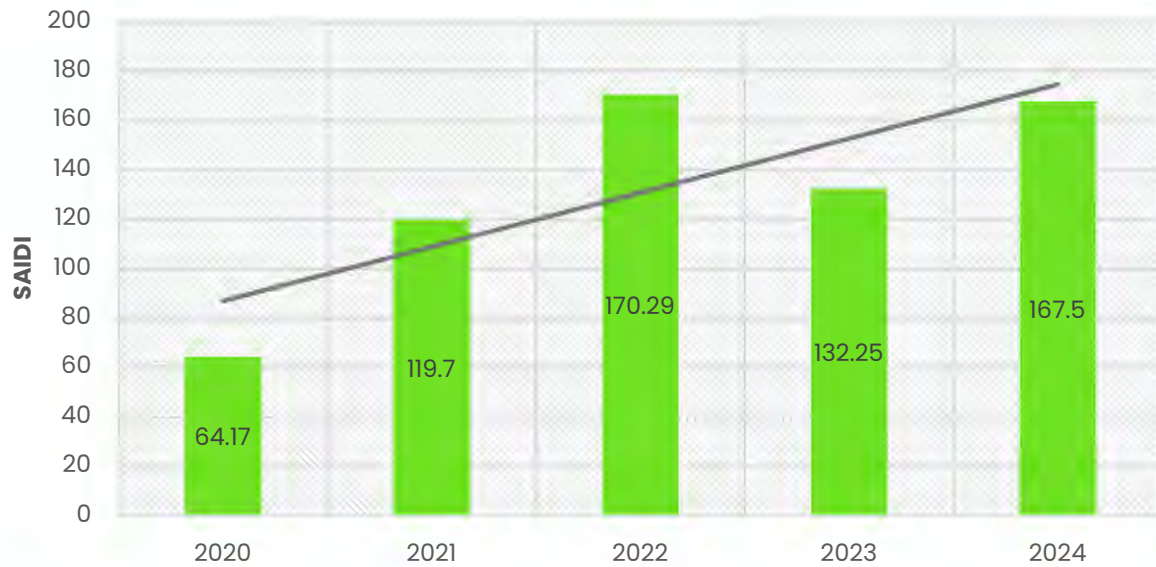






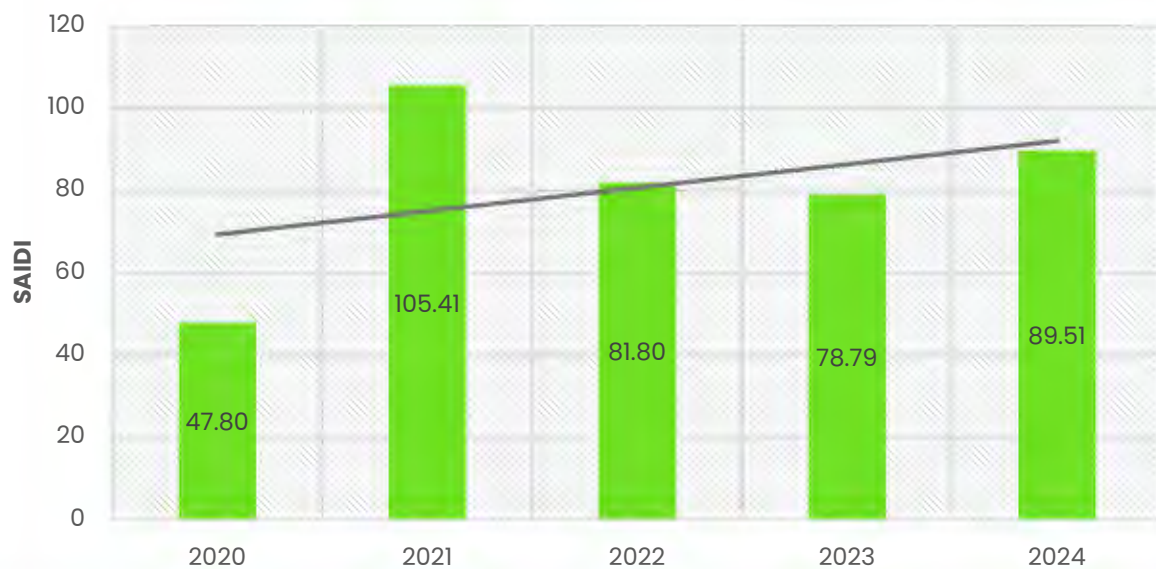
### 5-Year Kansas SAIDI

Including Major Events



### 5-Year Kansas SAIDI

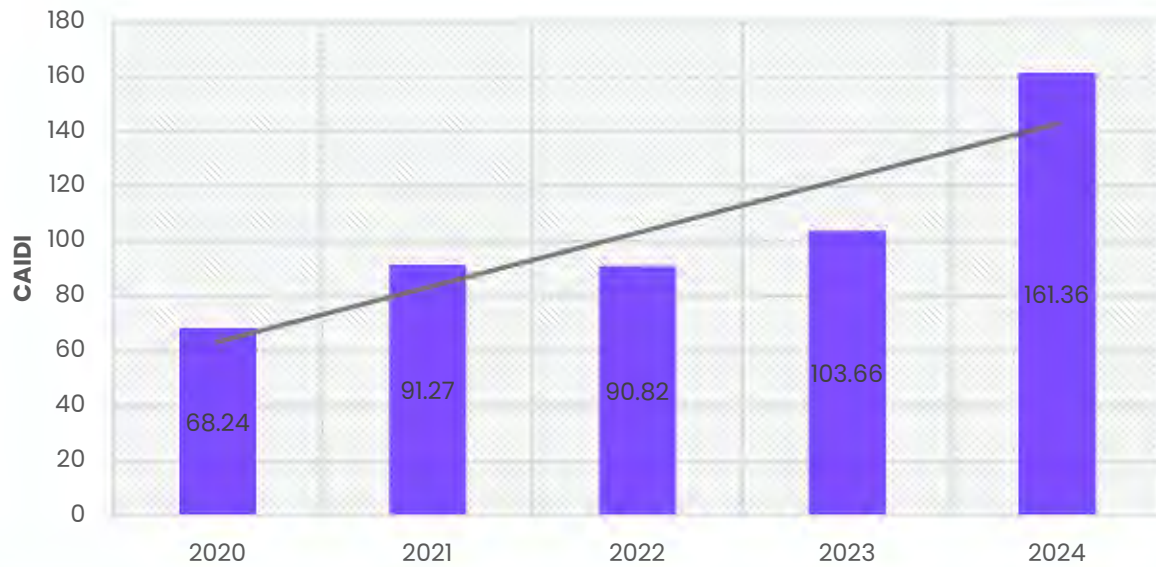
Excluding Major Events





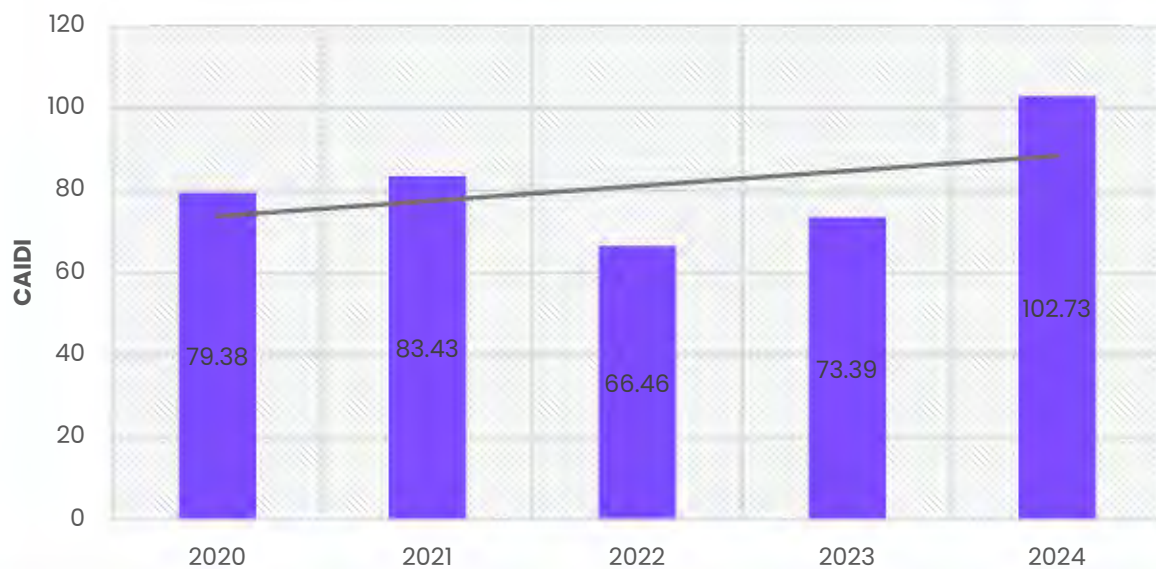
## 5-Year Kansas CAIDI

Including Major Events



## 5-Year Kansas CAIDI

Excluding Major Events





### Section 3:

#### Major Event Report

On July 17<sup>th</sup>, Liberty experienced severe weather that created multiple instances of sustained outages. However, Liberty's sectionalizing equipment performed properly and managed to reduce the number of customers impacted by this event. There were no substation or transmission equipment outages during this event.

Interruption Cause:	Wind and Lightning
Date of Interruption:	July 17 <sup>th</sup> , 2023
Regional Location:	Area 212 – Baxter Springs and Columbus, Kansas
Customer % without Power:	4.79% (490 of 10,232)
Outage Start:	7/17/2024 4:48 AM
Last Outage Restored:	7/17/2024 6:52 PM

On August 16<sup>th</sup>, Liberty experienced severe weather that produced multiple instances of sustained outages. However, Liberty's sectionalizing equipment performed properly and managed to reduce the number of customers impacted by this event. There were no substation or transmission equipment outages during this event. This event occurred concurrently with Major Event Days in Liberty's Oklahoma and Missouri territories. This factor extended the outages and lengthened the restoration process.

Interruption Cause:	Wind and Lightning
Date of Interruption:	August 16, 2024
Regional Location:	Area 212 – Columbus, Kansas
Customer % without Power:	1.57% (161 of 10,232)
Outage Start:	8/16/2024 7:34 PM
Last Outage Restored:	8/18/2024 5:55 PM



On November 3<sup>rd</sup>, Liberty experienced severe weather that produced multiple instances of sustained outages. However, Liberty’s sectionalizing equipment performed properly and managed to reduce the number of customers impacted by this event. There were no substation or transmission equipment outages during this event.

Interruption Cause:	Wind and Lightning
Date of Interruption:	November 3, 2024
Regional Location:	Area 212 – Baxter Springs and Columbus, Kansas
Customer % without Power:	7.24% (741 of 10,232)
Outage Start:	11/3/2024 2:56 AM
Last Outage Restored:	11/3/2024 11:02 PM



## Root Cause Interruption Statistics

Outage Cause Description	Customer Minutes Interrupted	Customers Interrupted	Number of Outages
Act Of Man – Misoperation	402	4	4
Act Of Man – Null	112	2	2
Act Of Man – Vehicle Strike	43,211	320	8
Animal – Bird	20,319	240	17
Animal – Other Animal	4,729	48	4
Animal – Squirrel	167,451	2,681	91
Equipment – Corrosion/Decay	161,427	1,569	9
Equipment – Fire	59	2	1
Equipment – Other	47,224	452	14
Equipment – Vibration/Loose connection	1,216	45	6
Equipment – Wire Movement	135	1	1
Other – Debris / Balloon	196	1	1
Other – Unknown	177,763	1,187	82
Unknown – None	6,511	36	8
Vegetation – Fall In Limb	79,055	551	14
Vegetation – Fall In Tree	29,980	605	15
Vegetation – Grow In	18,736	89	9
Weather – Lightning	448,655	1,506	92
Weather – Tornado	6,458	2	1
Weather – Wind	434,050	870	59

On April 22, 2024, Liberty transitioned from an Outage Management System (OMS) to an Advanced Distribution Management System (ADMS). As part of this migration, Liberty restructured its incident cause codes, replacing the existing single-cause format with a more detailed Cause –Sub cause structure. This modification can be seen in the cause codes reported above, which varies from previous reporting.



**Section 4:**

**Worst Performing Circuit Analysis/Improvement Program**

Liberty's top 5% worst performing circuits for 2024 are provided in the table below.

**2024 Worst Performing Circuits**

Circuit Number	Substation	Location	Customer Outage Minutes	Customers Affected	Total Cust. on Affected Circuits	SAIFI	SAIDI	CAIDI	Previous Year Worst Performing Circuit?
4251	425	Sherman City Southeast	108,465	541	165	3.038	629.59	200.49	No

**Worst Performing Circuit Assessment**

Circuit 4251 serving Sherman and Hallowell was Liberty's Kansas 2024 worst performing circuit.

This circuit received an overhead patrol inspection in 2023. Liberty will perform an intrusive overhead inspection in 2025 and underground and overhead patrol inspections in 2029. Liberty performed vegetation maintenance inspection and vegetation maintenance activities in 2023. Liberty will perform vegetation maintenance inspections in 2025 and 2028.

This circuit had three separate circuit-wide outages. The first outage occurred on April 28<sup>th</sup>. This outage occurred because of broken wire. The second outage occurred because of a broken crossarm as a result of high wind. The last outage occurred during a tornadoic storm system event where 6 transmission poles fell. This circuit is currently being analyzed as a potential location for asset replacement.

**Worst Performing Circuit Assessment**

No multi-year worst performing circuits identified.





**Worst Performing Device Assessment**

As defined in Exhibit A of Docket No. 17-EPDE-393-CPL, the first provided table below displays the Kansas Worst Performing Device Metric Standard for Liberty. The second table displays Liberty's Worst Performing Device performance metrics for the past five years. The chart provides this information in graphical form by comparing the past five years to the calculated base service. Worst Performing Devices (WPDs) are limited to any device, excluding breakers, which experience three or more outages during a reporting period.

In 2024, Liberty experienced 40 total interruptions among Worst Performing Devices. The 2024 worst performing device total is less than (better than) the base service reliability of 85 total interruptions. Liberty continuously addresses worst performing devices as part of its ongoing program.

**Kansas Worst Performing Device Base Service Reliability**

Year	Interruptions By Interruption Count						Total
	3	4	5	6	7	8	
2013	54	8	5				67
2014	57	8	10	12		24	111
2015	39	12	5			8	64
Base Service (2013-2015 Avg. + 5%)	52.5	9.8	7	4.2	0	16.8	84.7

**Kansas 5-Year Worst Performing Device**

Year	Interruptions By Interruption Count						Total
	3	4	5	6	7	8	
2020	24	4	5				33
2021	30		5				35
2022	9	8					17
2023	12	8					20
2024	36	4					40

