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April 23, 2024

Ms. Lynn M. Retz, Secretary
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 2023. 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 2023 performance and planned 2024 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



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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.

2023 Kansas Reliability Indices including Major Event Days

Month	SAIDI	SAIFI	CAIDI
January	10.09	0.109	92.95
February	2.76	0.037	74.61
March	26.72	0.438	61.02
April	4.28	0.047	90.57
May	1.69	0.025	67.38
June	3.12	0.029	106.67
July	20.24	0.126	161.08
August	43.44	0.201	216.42
September	11.99	0.143	83.88
October	0.52	0.009	57.42
November	6.93	0.106	65.26
December	0.42	0.006	66.53

2023 Kansas Reliability Indices excluding Major Event Days

Month	SAIDI	SAIFI	CAIDI
January	10.09	0.109	92.95
February	2.76	0.037	74.61
March	26.72	0.438	61.02
April	4.28	0.047	90.57
May	1.69	0.025	67.38
June	3.12	0.029	106.67
July	2.38	0.019	126.08
August	7.90	0.105	74.97
September	11.99	0.143	83.88
October	0.52	0.009	57.42
November	6.93	0.106	65.26
December	0.42	0.006	66.53



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
1/1/2023 to 12/31/2023
EXCLUDING MAJOR EVENT DAYS

CIRCUIT NUMBER	NUMBER OF OUTAGES	OUTAGE HOURS REPORTED	CUSTOMERS AFFECTED	CUSTOMER OUTAGE MINUTES	TOTAL CUST. ON AFFECTED CIRCUITS	SAIFI	CAIDI	SAIDI	ASAI
2782	17	25.64	745	51,041	471	1.582	68.51	108.37	0.99979
2783	2	2.10	108	6,086	107	1.009	56.35	56.88	0.99989
2784	8	10.46	128	9,962	1,048	0.122	77.83	9.50	0.99998
2821	6	7.30	638	34,568	468	1.363	54.18	73.86	0.99986
2822	7	6.36	276	15,328	258	1.070	55.54	59.41	0.99989
2823	15	22.23	171	16,294	507	0.337	95.29	32.14	0.99994
2824	33	48.43	2,671	178,582	1,148	2.327	66.86	155.59	0.99970
3391	17	27.14	56	5,513	567	0.099	98.45	9.72	0.99998
4061	18	41.62	1,055	69,801	772	1.366	66.16	90.36	0.99983
4062	17	20.09	89	6,979	559	0.159	78.42	12.48	0.99998
4251	5	5.28	254	17,492	200	1.270	68.87	87.46	0.99983
4772	24	32.03	1,658	150,234	1,026	1.615	90.61	146.37	0.99972
4881	21	27.63	785	79,762	662	1.186	101.61	120.55	0.99977
4882	18	44.83	172	15,266	969	0.178	88.76	15.76	0.99997
4883	19	31.96	1,647	86,798	1,336	1.233	52.70	64.99	0.99988
4884	10	12.28	103	9,948	262	0.393	96.58	37.97	0.99993
6601	29	42.60	393	35,718	854	0.460	90.89	41.80	0.99992
6602	16	27.19	1,660	136,030	522	3.177	81.95	260.38	0.99950
Total:	282	435.17	12,609	925,402	11,745	1.074	73.39	78.79	0.99985

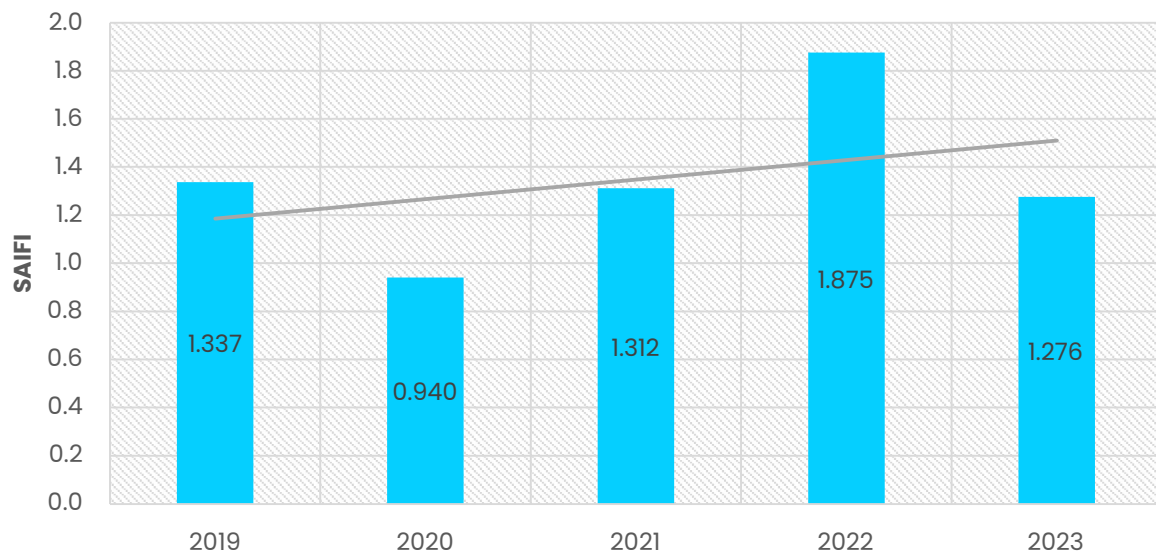


THE EMPIRE DISTRICT ELECTRIC COMPANY
CUSTOMER OUTAGE STATISTICS AND INDICES FOR KANSAS
1/1/2023 to 12/31/2023
INCLUDING MAJOR EVENT DAYS

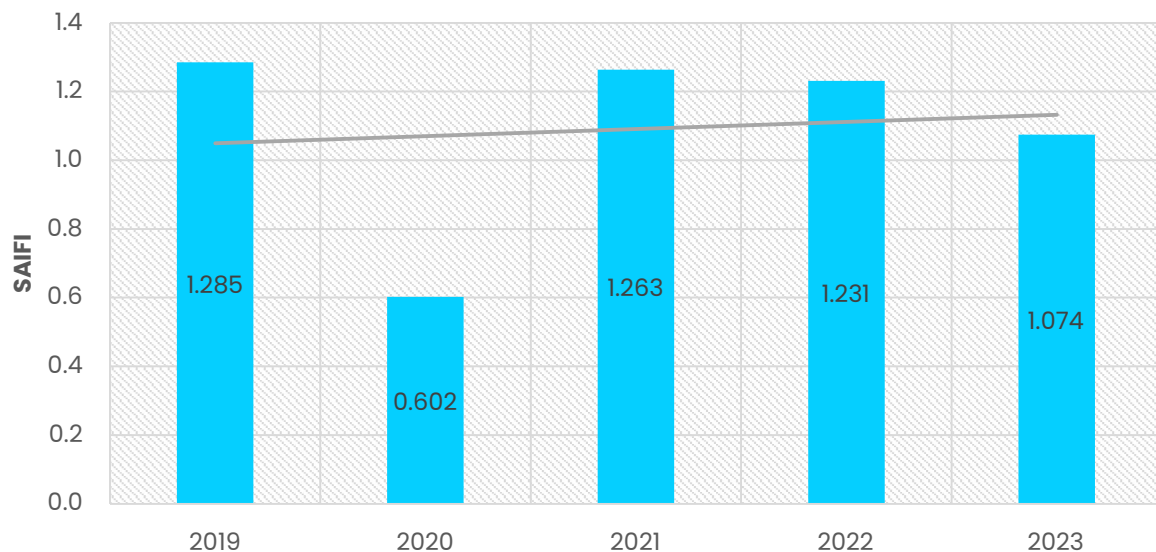
CIRCUIT NUMBER	NUMBER OF OUTAGES	OUTAGE HOURS REPORTED	CUSTOMERS AFFECTED	CUSTOMER OUTAGE MINUTES	TOTAL CUST. ON AFFECTED CIRCUITS	SAIFI	CAIDI	SAIDI	ASAI
2782	17	25.64	745	51,041	471	1.582	68.51	108.37	0.99979
2783	2	2.10	108	6,086	107	1.009	56.35	56.88	0.99989
2784	8	10.46	128	9,962	1,048	0.122	77.83	9.50	0.99998
2821	6	7.30	638	34,568	468	1.363	54.18	73.86	0.99986
2822	8	13.66	534	128,516	258	2.070	240.67	498.12	0.99905
2823	23	44.68	797	261,464	507	1.572	328.06	515.71	0.99902
2824	36	50.81	2,779	186,847	1,148	2.421	67.24	162.79	0.99969
3391	20	42.13	394	67,229	567	0.694	170.63	118.48	0.99977
4061	24	67.85	1,133	90,747	772	1.467	80.09	117.48	0.99978
4062	19	29.79	91	7,561	559	0.163	83.09	13.52	0.99997
4251	6	14.58	287	35,906	200	1.435	125.11	179.53	0.99966
4772	27	47.93	1,686	161,881	1,026	1.643	96.01	157.72	0.99970
4881	22	28.23	786	79,798	662	1.188	101.52	120.61	0.99977
4882	19	46.91	173	15,391	969	0.179	88.97	15.89	0.99997
4883	19	31.96	1,647	86,798	1,336	1.233	52.70	64.99	0.99988
4884	14	29.13	405	25,872	262	1.546	63.88	98.75	0.99981
6601	29	42.60	393	35,718	854	0.460	90.89	41.80	0.99992
6602	20	34.16	2,260	267,786	522	4.326	118.49	512.63	0.99902
Total:	319	569.92	14,984	1,553,171	11,745	1.276	103.66	132.25	0.99975



5-Year Kansas SAIFI Including Major Events

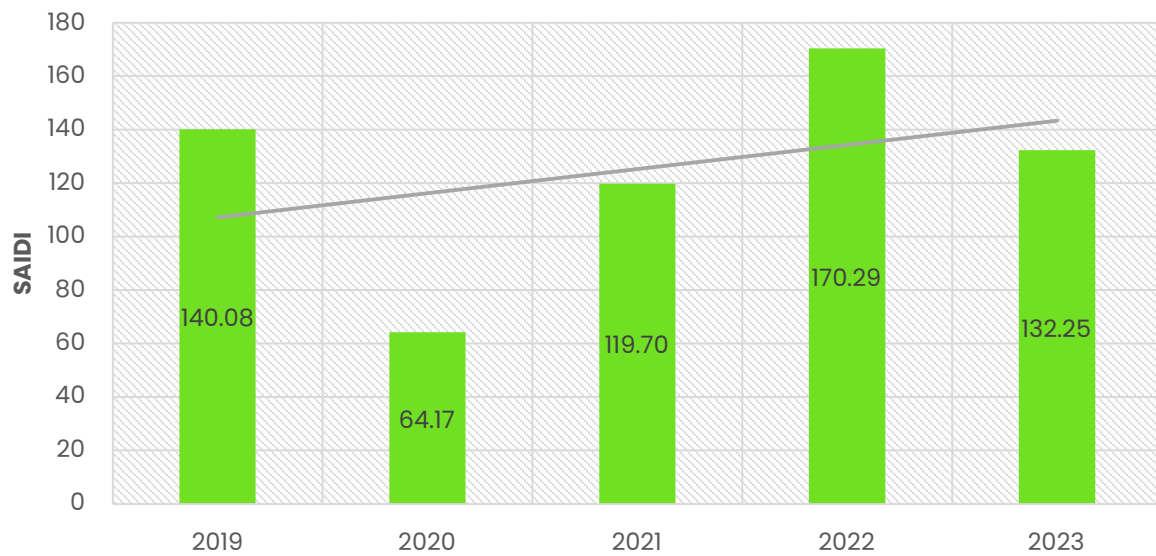


5-Year Kansas SAIFI Excluding Major Events

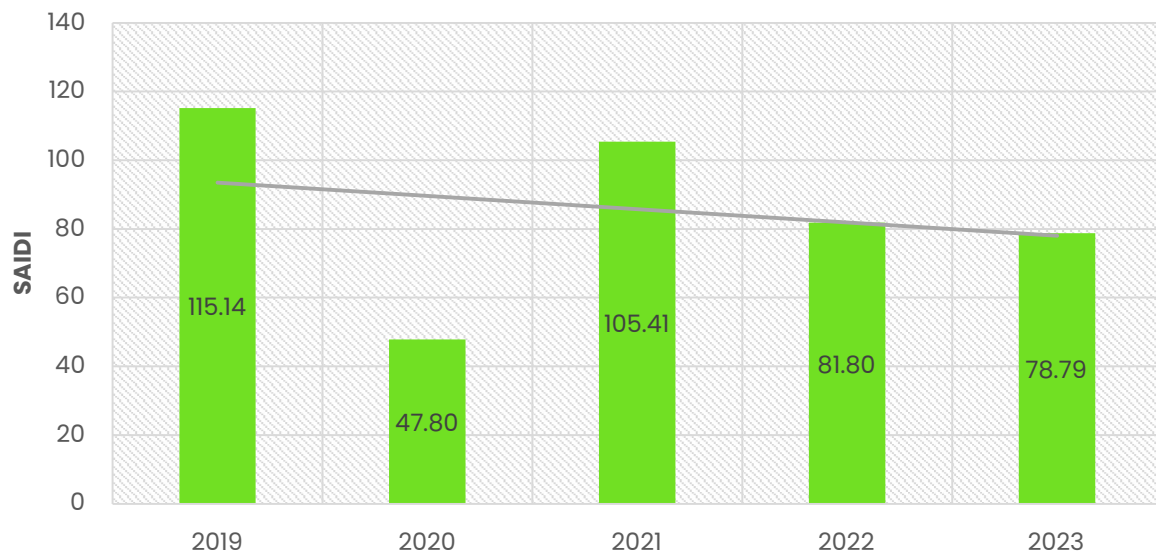




5-Year Kansas SAIDI Including Major Events



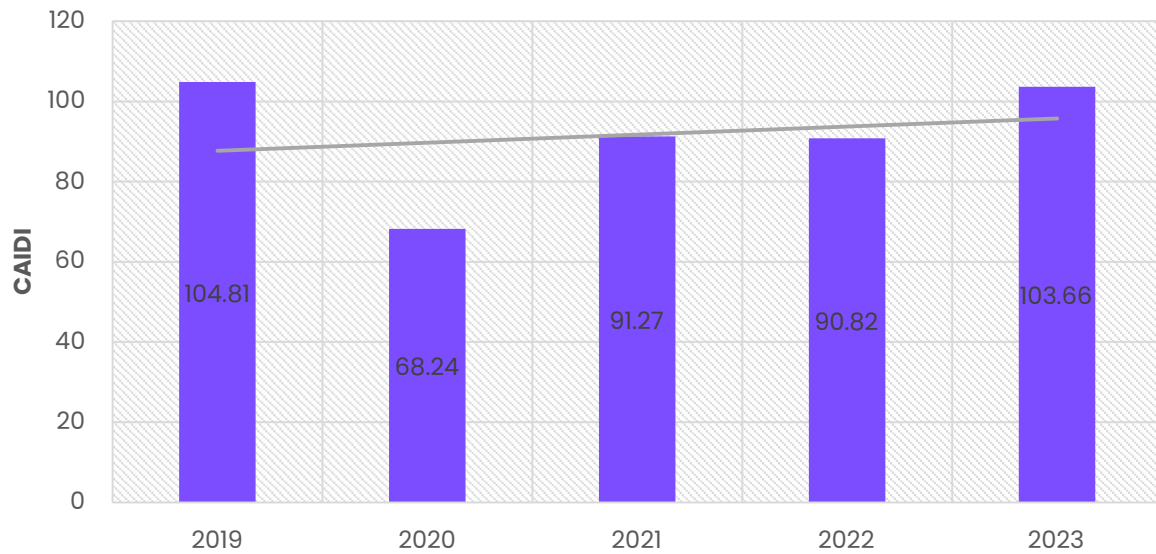
5-Year Kansas SAIDI Excluding Major Events





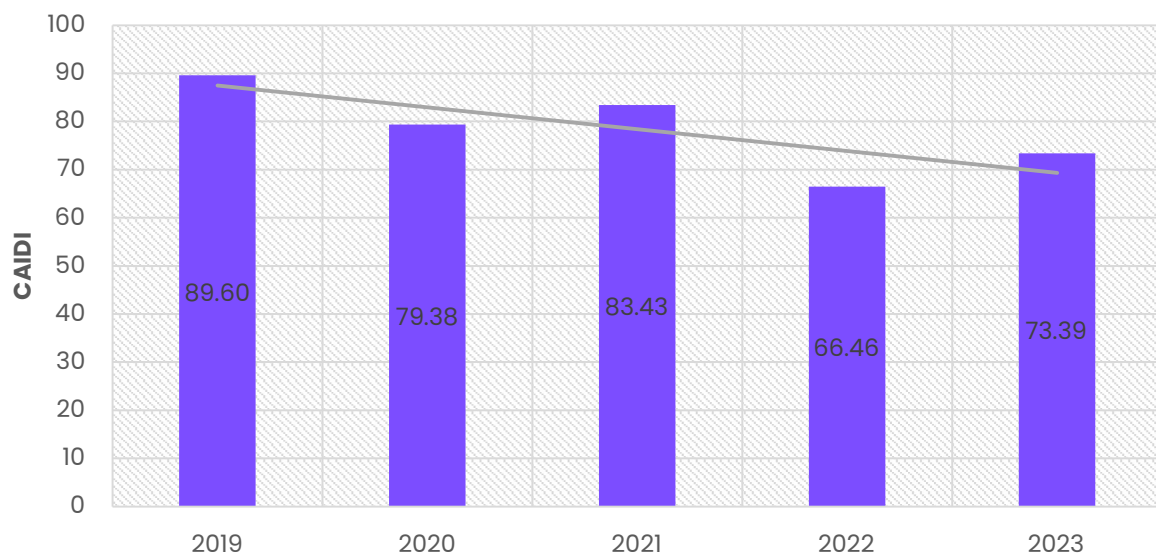
5-Year Kansas CAIDI

Including Major Events



5-Year Kansas CAIDI

Excluding Major Events





Section 3:

Major Event Report

On July 13th, Liberty witnessed widespread storms impacting customers in the Columbus, Kansas area. The winds from these storms surpassed 60 MPH and resulted in several poles down and vegetation fall-ins. Liberty restored power to a majority of the customers by 6:00 AM.

Interruption Cause:	Wind
Date of Interruption:	July 13, 2023
Regional Location:	Area 212 – Columbus, Kansas
Customer % without Power:	10% (1,121 of 11,745)
Outage Start:	7/13/2023 12:58 AM
Last Outage Restored:	7/13/2023 11:38 PM

On August 5th, Liberty experienced widespread severe storms that impacted a large number of Kansas customers. Liberty responded to an instance of a vegetation transmission fall-in that caused two circuits to lose power. Liberty responded swiftly and had restored power to a majority of the customers prior to 10 AM.

Interruption Cause:	Wind and Lightning
Date of Interruption:	August 5, 2023
Regional Location:	Area 212 – Galena, Kansas and Columbus, Kansas
Customer % without Power:	11% (1,254 of 11,745)
Outage Start:	8/5/2023 2:00 AM
Last Outage Restored:	8/5/2023 9:14 PM



Root Cause Interruption Statistics

Outage Cause Description	Customer Minutes Interrupted	Customers Interrupted	Number of Outages
ACTS OF MAN	102,717	1,158	7
BIRDS	63,299	760	32
CABLE TROUBLE	1,528	4	2
CONDUCTOR TROUBLE	29,237	281	11
CONNECTOR TROUBLE	3,148	32	8
CUTOUT FAILURE	44,314	1,233	5
IMPROPERLY SAGGED WIRES	60,452	1,334	2
LIGHTNING	327,143	1,514	52
MAINTENANCE	85	2	2
OTHER ANIMALS	2,619	45	11
OVERLOAD	4,021	56	2
POLES HIT	74,503	681	3
SPICE FAILURE	11	1	1
SQUIRRELS	120,695	1,775	67
STRUCTURE FAILURE	53,507	392	8
SUBSTATION - ANIMAL	75,190	1,307	6
SUBSTATION - OTHER	5,996	200	1
TRANSFORMER FAILURE	6,013	50	13
TRANSMISSION - STRUCTURE FAILURE	105,968	1,026	1
TREES IN SERVICE LINES	2,968	19	13
UNKNOWN	49,937	881	22
VEGETATION - FALL IN PRIMARY	340,524	1,609	26
VEGETATION - FALL IN SECONDARY	172	3	3
VEGETATION - GROW IN PRIMARY	1,120	15	3
VEGETATION - GROW IN SECONDARY	78	2	2
WIND	84,007	806	19



Section 4:

Worst Performing Circuit Analysis/Improvement Program

Liberty's top 5% worst performing circuits for 2023 are provided in the table below.

2023 Worst Performing Circuits

Circuit Number	Substation	Location	Customer Outage Minutes	Customers Affected	Total Cust. on Circuits	SAIFI	SAIDI	CAIDI	Previous Year Worst Performing Circuit?
6602	66	Scammon South	136,030	1,660	522	3,180	260,59	81.95	No

Worst Performing Circuit Assessment

Circuit 6602 serving Weir was Liberty's Kansas 2023 worst performing circuit.

This circuit received an overhead patrol inspection in 2019. Liberty will perform underground and overhead patrol inspections in 2025 and an intrusive overhead inspection in 2026. Liberty performed vegetation maintenance inspection and vegetation maintenance activities in 2022. Liberty will perform vegetation maintenance inspections in 2025 and 2028.

This circuit had three independent outages. Liberty has determined that no action is currently required. Liberty will continue to monitor this circuit.

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 2023, Liberty experienced twenty total interruptions among Worst Performing Devices. The 2023 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					
	3	4	5	6	7	8
2013	54	8	5			
2014	57	8	10	12		
2015	39	12	5			8
Base Service (2013-2015 Avg. + 5%)		52.5	9.8	7	4.2	0
						16.8
Total						84.7

Kansas 5 Year Worst Performing Device						
Year	Interruptions By Interruption Count					
	3	4	5	6	7	8
2019	18	4				
2020	24	4	5			
2021	30		5			
2022	9	8				
2023	12	8				
Total						20

