BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of The Empire District Electric Company's 2019 Triennial Compliance Filing Pursuant to 4 CSR 240-22	)))	**File No. EO-2019-0049**

THE DIVISION OF ENERGY'S COMMENTS IN RESPONSE TO THE EMPIRE DISTRICT ELECTRIC COMPANY'S 2019 TRIENNIAL COMPLIANCE FILING

COMES NOW the Division of Energy ("DE") of the Missouri Department of Natural Resources before the Missouri Public Service Commission, and for its comments in response ("Comments") to the above-captioned matter states:

1. DE appreciates the opportunity to review Liberty-Empire's ("Liberty-Empire" or "Company") integrated resource plan ("IRP") and provides these Comments. The resolutions to the concerns identified could strengthen Liberty-Empire's plan by creating additional benefits.

2. **Concern 1: Selection of Weather Data.** The largest share of Liberty-Empire's load and peak demand are attributed to the residential sector and the residential sector tends to be more sensitive to weather than other sectors identified in the Company's IRP. The Demand-Side Resource Analysis estimates that the residential sector accounts for approximately 49% of annual energy use, yet represents 59% of the summer coincident peak due to the saturation of air conditioning equipment and the sensitivity of Liberty-Empire's system and the residential sector to weather.[1] Air conditioning is the largest contributor to summer peak demand, followed by appliances.[2]

3. Liberty-Empire is unique since the Company may be considered a dual-peaking utility. However, as shown in Tables 3-75 and 3-76 of the IRP, Liberty-Empire's recent average

[1] EO-2019-0049, Vol. 5, pp. 55
[2] EO-2019-0049, Vol. 5, pp. 57

total energy use and average peak demand have been higher during the summer than during the winter season.[3]

4. Under normal conditions, Joplin is warmer than Springfield during all months of the year. Liberty-Empire modeled weather scenarios using historical weather data from the National Oceanic and Atmospheric Administration ("NOAA") at the Springfield, Missouri airport ("SGF") rather than at the Joplin Regional Airport ("JLN").[4] Liberty-Empire's base forecast uses normal monthly Heating Degree Days ("HDDs") and Cooling Degree Days ("CDDs") based on a 30-year average (1988 to 2017) of Springfield, Missouri's daily average temperatures.[5] By contrast, economic data included in the IRP assigned a 66% weight to the Joplin Metropolitan Statistical Area ("MSA") and a 34% weight to the Springfield MSA to more accurately represent the population distribution of Liberty-Empire's territory.[6]

5. DE notes that NOAA also maintains historical daily weather data for Joplin Regional Airport, located in the region where the majority of Liberty-Empire's customers are concentrated. The data is available online from NOAA's National Centers for Environmental Information ("NCEI").[7] Table 1 compares the SGF HDD and CDD data from Table 3-42 of Empire's IRP[8] with the corresponding annual and normal values (1988 to 2017) from the JLN NOAA weather data.

[3] EO-2019-0049, Vol. 3, pp. 174-177
[4] EO-2019-0049, Vol. 3, pp. 23
[5] EO-2019-0049, Vol. 3, pp. 161
[6] EO-2019-0049, Vol. 3, pp. 28
[7] NOAA National Centers for Environmental Information. Daily Summaries Station Details. Retrieved from https://www.ncdc.noaa.gov/cdo-web/datasets/GHCND/stations/GHCND:USW00013987/detail
[8] EO-2019-0049, Vol. 3, pp. 95

Table 1. Historical and normal HDDs and CDDs for JLN and SGF, base 65 degrees Fahrenheit.

JLN	**Year**	**HDD65**	**CDD65**	*SGF*	**Year**	**HDD65**	**CDD65**
	2001	3896	1831		2001	4407	1294
	2002	4108	1816		2002	4650	1369
	2003	4048	1636		2003	4575	1231
	2004	3789	1481		2004	4219	1095
	2005	3964	1948		2005	4316	1616
	2006	3473	1932		2006	3889	1609
	2007	3963	1872		2007	4229	1612
	2008	4310	1517		2008	4889	1145
	2009	4343	1329		2009	4673	1036
	2010	4329	1934		2010	4788	1612
	2011	4282	2147		2011	4693	1716
	2012	3332	2065		2012	3736	1695
	2013	4685	1538		2013	4899	1319
	2014	4749	1547		2014	4900	1360
	2015	3913	1664		2015	4142	1434
	2016	3548	1839		2016	3768	1666
	2017	3010	1718		2017	3566	1365
	Avg(88-17)	**4052**	**1676**		**2019 IRP**	**4458**	**1345**

5. Table 2 shows the difference in annual CDD and HDD values between the SGF and JLN data sets. On average, Joplin experiences 25% more CDDs and 9% fewer HDDs than Springfield.

Table 2. Difference in historical and normal HDDs and CDDs for JLN and SGF.

J - S	Year	HDD65	CDD65	% HDD	% CDD
	2001	-512	537	-11.6%	41.5%
	2002	-542	447	-11.7%	32.7%
	2003	-528	405	-11.5%	32.9%
	2004	-431	386	-10.2%	35.2%
	2005	-352	332	-8.2%	20.5%
	2006	-417	323	-10.7%	20.0%
	2007	-266	260	-6.3%	16.1%
	2008	-580	372	-11.9%	32.5%
	2009	-331	293	-7.1%	28.3%
	2010	-460	322	-9.6%	20.0%
	2011	-412	431	-8.8%	25.1%
	2012	-405	370	-10.8%	21.8%
	2013	-214	219	-4.4%	16.6%
	2014	-152	187	-3.1%	13.7%
	2015	-230	230	-5.5%	16.0%
	2016	-221	173	-5.9%	10.4%
	2017	-556	353	-15.6%	25.8%
	Normal	-406	331	-9.1%	24.6%

6. Liberty-Empire modeled base, mild, and extreme weather scenarios for SGF, which are shown in IRP Table 3-69[9] and are compared to the JLN base values (the 1988 to 2017 normal) in Table 3. The historical normal (JLN Base) for CDDs for Joplin is greater than the extreme scenario modeled in the IRP, i.e., the average CDDs historically experienced by Liberty-Empire customers in the Joplin area are more extreme than the hypothetical extreme scenario modeled in Liberty-Empire's load forecast. Additionally, JLN base HDDs are closer to the mild scenario than the base scenario modeled in the IRP.

[9] EO-2019-0049, Vol. 3, pp. 163

Table 3. JLN base compared to SGF base, mild, and extreme weather scenarios.

Scenario	HDD65	CDD65
Base	4458	1345
Mild	3736	1035
Extreme	4901	1616
JLN Base	4052	1676

7. By relying on SGF NOAA weather data and not using energy sales-weighted weather data to account for differences between Springfield and Joplin weather normals, the model does not as accurately as feasible represent the historical conditions experienced by the Company's customers, given customers' geographic distribution. Consequently, Liberty-Empire's weather-normalization model may be over-responsive to CDDs and under-responsive to HDDs, meaning that Liberty-Empire's weather normalized peak may be too low during CDD events and too high during HDD events. As a result, the current modeling of extreme weather scenarios may underestimate the impact on Liberty-Empire's system summer peak. Use of a weighted combination of the JLN and SGF data would increase the accuracy of the Load Forecast Sensitivity Analysis in Liberty-Empire's IRP and better align with resource planning objectives by mitigating weather-related risks.

8. Additionally, DE notes that Liberty-Empire expects winter and summer seasonal energy and peak loads to increase and converge over the IRP planning horizon (See IRP Figures 3-76 and 3-78).[10] Were Liberty-Empire to incorporate Joplin weather data as suggested, this convergence may be greater and could result in a projected increase in summer peak beyond that of the projected winter peak, perhaps to an extent which could influence transmission, generation, and demand-side management ("DSM") planning.

[10] EO-2019-0049, Vol. 3, pp. 177 and 179

9. Finally, Liberty-Empire's Normal Weather Load Forecast creates the possibility that the value of DSM programs with peak summer coincidence, namely residential central air conditioning programs, is understated in this IRP.

11. **Concern 2: Advanced Metering Infrastructure ("AMI") Opportunities and Value.** Grid modernization and the use of AMI could increase Liberty-Empire's flexibility and resilience; improve meter accuracy; enhance Liberty-Empire's capability of making adjustments for distributed energy resources, demand-side rates ("DSR"), demand response, efficiency programs, conservation voltage reduction measures, electric vehicles ("EVs"), and energy storage technologies; deepen Liberty-Empire's understanding of customer behaviors and preferences; and, enable Liberty-Empire to have a more granular and holistic understanding of load variability. Sub-hourly energy information can enhance DSR and DSM programs and enable customers to save energy and shift load through behavioral changes and make better informed choices about energy use. DE emphasizes the importance of making individual customer energy usage information readily accessible for the customer to interpret and access. With remote communications capabilities, the applications of AMI systems include, but are not limited to, synchronizing smart thermostats with in-home appliance controllers, establishing a variety of pricing and efficiency programs, and load control and monitoring. Liberty-Empire notes the potential of AMI to support the design of DSM programs and the measurement of the effects of these programs on consumption.[11] DE expresses the value of early and proactive identification of opportunities and investment into leveraging these functions to ensure AMI investments provide maximum benefits to customers. One such potential opportunity could be

[11] EO-2019-0049, Vol. 4.5, pp. 89

incorporating weather data capabilities within its AMI network to use for its DSM and generation planning purposes.

12. **Concern 3: Development of Demand-Side Management Programs.** Certain DSM programs and measures not deemed cost-effective in the Demand-Side Resource Analysis, particularly residential central air conditioning measures, may be cost-effective at some point over the planning horizon if different assumptions are used for weather. As noted above, incorporating JLN weather data into Liberty-Empire's analyses could better reflect the summer-peaking characteristics of the utility system. This is important because, despite increases in efficiency standards and trends, Liberty-Empire's residential sector customer growth is projected to result in a net increase in heating and cooling intensity.[12] Reevaluation of DSM potential based on the inclusion of JLN weather data may provide increased energy efficiency opportunities.

13. **Closing Remarks.** DE encourages Liberty-Empire to evaluate all viable program designs to improve energy efficiency for the residential sector. Additionally, successfully deployed AMI technology coupled with a robust customer education component may enhance efficiency and load responsiveness of residential customers' demand for heating and cooling. Continued consideration of leveraging DSR, DR, and direct load control programs to modify the consumption of electricity may provide further efficiency benefits. Proactively shaping the load impact of changing customer characteristics and behaviors, including possible transitions occurring in the transportation sector, could be of long-term value to Liberty-Empire and its customers. Ongoing monitoring and evaluation of EV adoption rates and projects that may influence local EV adoption could improve Liberty-Empire's ability to reduce increases in

[12] EO-2019-0049, Vol. 3, pp. 91

potential future operating expenses attributed to EV charging, allowing charging to occur in a manner that benefits the utility system and ratepayers by spreading cost recovery over a greater amount of usage.

WHEREFORE, the Division of Energy provides these Comments for consideration.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing have been served electronically on all counsel of record this 28th day of February, 2020.

*/s/ Jacob Westen*_____
Jacob Westen