Exhibit No.: 23
Issue: Weather Normalization Witness: Eric Fox
Type of Exhibit: Rebuttal Testimony
Sponsoring Party: The Empire District Electric Company
Case No.: ER-2019-0374
Date Testimony Prepared: February 2020

Before the Public Service Commission
of the State of Missouri

Rebuttal Testimony

of

Eric Fox

on behalf of

The Empire District Electric Company
a Liberty Utilities Company

February 2020

REBUTTAL TESTIMONY
OF
ERIC FOX
THE EMPIRE DISTRICT ELECTRIC COMPANY
BEFORE THE
MISSOURI PUBLIC SERVICE COMMISSION
CASE NO. ER-2019-0374

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Eric Fox. My business address is 20 Park Plaza, Suite 428, Boston, Massachusetts, 02116.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am submitting this Rebuttal Testimony on behalf of The Empire District Electric Company ("Liberty-Empire" or "Company").

Q. ARE YOU THE SAME ERIC FOX WHO FILED DIRECT TESTIMONY IN THIS DOCKET ON BEHALF OF LIBERTY-EMPIRE?

A. Yes, I am.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of this testimony is to provide weather normal sales estimates for the update-period August 2018 through September 2019 and to comment on Missouri Public Service Commission ("Commission") Staff's calculation of weather normal sales, as set forth in Staff's direct testimony.

Q. ARE YOU SPONSORING ANY SCHEDULES WITH YOUR REBUTTAL TESTIMONY?

A. Yes. I am sponsoring Rebuttal Schedule EF-1 which shows calculated weather normalized sales for the update-period.

Q. WAS THE INFORMATION CONTAINED IN REBUTTAL SCHEDULE EF-1 OBTAINED OR DERIVED FROM THE BOOKS AND RECORDS OF THE COMPANY?

A. Yes. Normalized rate-class sales are based on historical load research data and billed sales, customer data, and updated weather data provided by the Company. Normalized weather data was provided by Staff.

II. SUMMARY

Q. WHAT IS THE PURPOSE OF WEATHER NORMALIZATION IN THIS PROCEEDING?

A. The purpose of weather normalization is to adjust sales used in determining revenue requirements for abnormal weather conditions. Weather normal sales were submitted as part of the rate case test-year: April 2018 to March 2019. The test-year period has been updated through September 2019 to provide a more current snapshot of Company customer counts, sales, and costs. The update-period includes the twelve-month period October 2018 through September 2019.

Q. PLEASE DESCRIBE THE UPDATE PERIOD CALCULATIONS.

A. Weather-normal sales for the update-period are calculated in the same manner as that for calculating test-year weather-normal sales described in my direct testimony. Daily weather impacts are calculated from the same set of daily weather response models used in calculating test-year weather-normal sales. The daily normal degree-day data series are also the same as that used in calculating test-year weather-normal sales. While actual heating and cooling degree-days exceed normal, the update-period has

less extreme weather conditions as compared to the test-year. As a result, weather related sales for the update-period are lower than that for the test-year period. Table 1 compares test-year and update-period heating degree-days (HDD 55 degree temperature base) and cooling degree days (CDD 65 degree temperature base). Table 2 compares associated weather impacts.

Table 1: Degree-Day Comparison

Test Year (April 2018 - March 2019)				
	Actual	Normal	Difference	Percent
HDD65	2,732	2,496	236	9.5%
CDD65	1,826	1,392	433	31.1%

Update Period (October 2018 - September 2019)				
	Actual	Normal	Difference	Percent
HDD65	2,603	2,496	107	4.3%
CDD65	1,584	1,392	191	13.7%

Table 2: Weather-Impact Comparison (MWh)

Rate Class	Test Year	Update Period
Residential	110,967	32,447
Commercial	11,113	2,873
General Power	19,653	7,097
Small Heating	3,446	1,380
Total Electric Building	11,098	3,968
Total	156,277	47,765

Weather normal sales are derived by subtracting weather impacts in Table 2 from actual sales. Table 3 compares weather normal sales for the test year and update-period.

Table 3: Test Year and Update Period Weather Normal Sales (MWh)

Rate Class	Test Year	Update Period
Residential	1,662,883	1,666,319
Commercial	315,700	315,826
General Power	843,781	841,703
Small Heating	84,685	84,433
Total Electric Building	357,553	352,966
Total	3,264,602	3,261,245

In total, normalized sales in the update-period are slightly lower than the test-year period, reflecting differences in actual sales between these two periods as well as weather-related sales.

Q. PLEASE EXPLAIN YOUR OPINION OF STAFF'S WEATHER NORMALIZATION MODELS, PROCESS, AND RESULTS.

A. Staff estimated weather-normal sales for the period April 2018 to March 2019. Staff's weather-normalized sales for this period are reasonable. Staff has developed an approach for weather normalizing sales utilizing daily rate class weather response models and daily two-day weighted actual and normal temperature data. The approach and associated models generate reasonable normal sales estimates and have been used and approved in past Missouri rate cases. The Company adopted Staff's approach in its own weather normalization work. Staff also provided the normal weather data set used in normalizing test-year and update-period sales. There are small differences in Staff's estimated models that result in only small differences in normalized sales. For model estimation, Staff used two years of historical data – August 2017 to July 2019, and the Company used three years – March 2016 to March 2019. There are also small differences in the weather response model specifications that involved slightly different degree-day variable specifications. For example, our residential model used HDD with 55 and 60 degree-day basis and CDD with 65 and 75 degree temperature basis; Staff's

model used HDD with 42 and 56 degree basis, and CDD with 65 and 72 degree basis. Staff's differences in the estimation period and constructed weather variables results in only small differences in estimated weather impacts and resulting normalized sales. The Company used the same approach for estimating normalized sales for the update-period. Staff's models and sales adjustment process will generate similar weather normalized sales for the update-period.

III. CONCLUSION

Q. DO YOU RECOMMEND USING THE NORMALIZED UPDATE PERIOD SALES FOR DETERMINING THE COMPANY'S REVENUE REQUIREMENTS?

A. Yes. The update-period weather-normalized sales provide reasonable estimates of expected class sales for determining the Company's revenue requirements. Normalized sales are based on the Staff's weather normalization approach and Staff's calculated daily normal temperatures. The approach is well thought-out and results in reasonable test-year weather impacts.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes, it does.

The Empire District Electric Company (Missouri) - Weather Normalized Sales Estimates

	2018			2019									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Residential													
Sales (MWh)	117,424	122,975	159,231	169,750	182,365	177,861	113,341	89,516	107,206	146,265	157,356	155,476	**1,698,765**
WN Sales (MWh)	**103,216**	**105,650**	**151,013**	**177,827**	**187,838**	**169,751**	**111,665**	**91,992**	**108,079**	**154,056**	**163,563**	**141,668**	**1,666,319**
Custs	129,782	130,374	130,643	130,773	130,849	130,887	130,759	130,718	130,903	130,896	131,173	131,203	**130,747**
kWh per Cust	905	943	1,219	1,298	1,394	1,359	867	685	819	1,117	1,200	1,185	**12,990**
WN kWh per Cust	795	810	1,156	1,360	1,436	1,297	854	704	826	1,177	1,247	1,080	**12,741**
Commercial (CB)													
Sales (MWh)	26,958	24,309	25,315	27,068	27,018	27,596	22,889	21,199	22,725	31,014	31,488	31,119	**318,698**
WN Sales (MWh)	**25,249**	**23,250**	**24,856**	**27,571**	**27,337**	**27,107**	**22,803**	**21,263**	**22,797**	**31,955**	**32,193**	**29,444**	**315,826**
Custs	18,031	18,074	18,057	18,070	18,069	18,072	18,095	18,088	18,164	18,104	18,145	18,167	**18,095**
kWh per Cust	1,495	1,345	1,402	1,498	1,495	1,527	1,265	1,172	1,251	1,713	1,735	1,713	**17,612**
WN kWh per Cust	1,400	1,286	1,377	1,526	1,513	1,500	1,260	1,176	1,255	1,765	1,774	1,621	**17,453**
General Power													
Sales (MWh)	76,438	65,902	64,949	64,548	65,610	65,240	62,834	65,326	69,181	78,774	82,277	87,722	**848,800**
WN Sales (MWh)	**72,588**	**65,049**	**64,729**	**64,957**	**65,870**	**64,876**	**62,769**	**64,875**	**68,870**	**79,980**	**83,100**	**84,040**	**841,703**
Custs	1,779	1,785	1,782	1,781	1,785	1,786	1,786	1,785	1,783	1,786	1,789	1,790	**1,785**
kWh per Cust	42,967	36,920	36,447	36,243	36,756	36,528	35,182	36,597	38,801	44,106	45,990	49,007	**475,544**
WN kWh per Cust	40,803	36,442	36,324	36,472	36,902	36,325	35,145	36,345	38,626	44,782	46,451	46,949	**471,565**
Small Heating													
Sales (MWh)	6,132	6,448	8,054	8,630	9,292	8,589	6,146	5,134	11,302	1,280	7,257	7,548	**85,812**
WN Sales (MWh)	**5,709**	**5,763**	**7,720**	**8,990**	**9,518**	**8,261**	**6,080**	**5,209**	**11,328**	**1,315**	**7,406**	**7,132**	**84,433**
Custs	3,028	3,031	3,034	3,029	3,027	3,028	3,026	3,032	3,030	3,024	3,021	3,020	**3,028**
kWh per Cust	2,025	2,127	2,655	2,849	3,070	2,836	2,031	1,693	3,730	423	2,402	2,499	**28,342**
WN kWh per Cust	1,885	1,902	2,544	2,968	3,144	2,728	2,009	1,718	3,739	435	2,452	2,362	**27,886**
Total Electric Building													
Sales (MWh)	29,477	28,413	31,631	32,307	32,134	31,399	26,840	24,350	25,932	30,369	32,091	31,992	**356,934**
WN Sales (MWh)	**27,984**	**26,422**	**30,684**	**33,356**	**32,781**	**30,453**	**26,640**	**24,491**	**25,939**	**31,026**	**32,610**	**30,581**	**352,966**
Custs	940	943	946	947	946	946	946	945	943	946	946	945	**945**
kWh per Cust	31,359	30,130	33,436	34,115	33,968	33,191	28,372	25,767	27,499	32,103	33,923	33,854	**377,717**
WN kWh per Cust	29,770	28,019	32,435	35,223	34,652	32,191	28,160	25,916	27,507	32,797	34,471	32,361	**373,503**
Total													
Sales (MWh)	256,428	248,047	289,180	302,304	316,419	310,683	232,051	205,525	236,346	287,702	310,470	313,857	**3,309,011**
WN Sales (MWh)	234,747	226,135	279,002	312,702	323,344	300,448	229,957	207,829	237,014	298,332	318,871	292,864	**3,261,245**
Custs	153,560	154,207	154,462	154,600	154,676	154,719	154,612	154,568	154,823	154,756	155,074	155,125	**154,599**
kWh per Cust	1,670	1,609	1,872	1,955	2,046	2,008	1,501	1,330	1,527	1,859	2,002	2,023	**21,401**
WN kWh per Cust	1,529	1,466	1,806	2,023	2,090	1,942	1,487	1,345	1,531	1,928	2,056	1,888	**21,091**

AFFIDAVIT OF ERIC FOX

STATE OF MASSACHUSETTS)
) ss
COUNTY OF SUFFOLK)

On the 25th day of February, 2020, before me appeared Eric Fox, to me personally known, who, being by me first duly sworn, states that he is Director of Forecast Solutions of Itron and acknowledges that he has read the above and foregoing document and believes that the statements therein are true and correct to the best of his information, knowledge and belief.

Eric Fox

Subscribed and sworn to before me this 25th day of February, 2020

Notary Public

My commission expires: 12/19/2025