Exhibit No.:
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Witness: Todd W. Tarter
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Sponsoring Party: The Empire District Electric Company
Case No.: ER-2019-0374
Date Testimony Prepared: March 2020

**Before the Public Service Commission**
**of the State of Missouri**

# Surrebuttal Testimony

**of**

**Todd W. Tarter**

**on behalf of**

**The Empire District Electric Company**
**a Liberty Utilities Company**

**March 2020**

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## I. INTRODUCTION

**Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

A. Todd W. Tarter. My business address is 602 S. Joplin Avenue, Joplin, Missouri.

**Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

A. I am employed by Liberty Utilities Service Corp. as the Senior Manager, Strategic Planning for Liberty Utilities' Central Region which includes The Empire District Electric Company ("Liberty-Empire" or "Company").

**Q. ARE YOU THE SAME TODD W. TARTER THAT EARLIER PREPARED AND FILED DIRECT AND REBUTTAL TESTIMONY IN THIS RATE CASE BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION ("COMMISSION") ON BEHALF OF LIBERTY-EMPIRE?**

A. Yes.

**Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?**

A. In my surrebuttal testimony, I will respond to the rebuttal testimony of the Commission Staff's ("Staff") witness Charles T. Poston who discussed the Staff's examination of the forced outage rates and market prices used in Liberty-Empire's production cost model, which was utilized by the Company to help determine the base energy cost proposal and associated Fuel Adjustment Clause ("FAC") base factor for this case.

## II. FORCED OUTAGE RATES

**Q. PLEASE SUMMARIZE STAFF'S COMMENTS ABOUT THE FORCED OUTAGE RATES USED IN THE COMPANY'S PRODUCTION COST MODEL?**

A. In his rebuttal testimony, Staff witness Poston mentions that some of the forced outage rates used in the Company's model are "artificially high," and he specifically mentions that the Asbury, Riverton 12 Combined Cycle, and State Line Combined Cycle forced outage rates were significantly higher than the values calculated by Staff. Mr. Poston seems to imply that this is an issue in the Company's modeling since forced outage rates can impact the total amount of generation at a power plant, along with the resulting fuel costs and market revenues from the sale of energy. In other words, a higher forced outage rate may limit the amount of energy produced for these three resources.

**Q. DOES THE GENERATION FROM THE COMPANY'S MODEL FOR THESE THREE RESOURCES APPEAR TO BE UNREASONABLY LOW DUE TO FORCED OUTAGE RATES THAT ARE TOO HIGH?**

A. No. The resource generation results from the Company's model appear to be reasonable and consistent with recent history. In fact, the results are very similar to the corresponding results in the Staff model run. As shown in the table below, the Company and Staff models are within 0.7% for Asbury's generation in megawatt hours ("MWh"), which given the different models and different inputs, is extremely close. As compared to the Staff model, the Company's model is actually showing more generation from the Riverton 12 Combined Cycle unit, not less, with the two models being within 0.3% of one another (the table shows a comparison to the actual

average from 2017-2019 for this unit since this unit's first full year of operation was 2017). Of the three resources that Staff mentioned, State Line Combined Cycle shows the greatest generation variance between the Company and Staff models, but they are still within 3.1% of each other. In total, the generation from the three resources that the Staff witness highlighted as having "higher" forced outage rates in the Company model is within 1.3% of the generation for these same three units in the Staff model.

**Production Cost Model Generation (MWh) By Resource ER-2019-0374**

| Resource | Years in the Actual Average | Actual Average | Company Model | Staff Model | % Difference Company vs. Staff |
|---|---|---|---|---|---|
| Asbury | (2016-2019) | 964,172 | 941,635 | 948,626 | -0.7% |
| Riverton 12 CC | (2017-2019) | 1,161,514 | 1,173,948 | 1,170,917 | 0.3% |
| State Line CC | (2016-2019) | 1,383,448 | 1,319,699 | 1,360,016 | -3.1% |
| Total | | 3,509,134 | 3,435,282 | 3,479,559 | -1.3% |

**Q. CAN YOU PROVIDE THIS SAME COMPARISON FOR ALL OF THE RESOURCES IN BOTH OF THE MODELS?**

A. Yes. The following table shows a generation comparison between the Company and Staff models. The total generation level between the Company and Staff models is within 1.3% of each other. The Company model is actually closer to the historical average. The Company model has 1.4% more generation than the actual historical average, while the Staff model has 2.7% more generation than the actual historical average.

**Production Cost Model Generation (MWh) By Resource ER-2019-0374**

| Resource | Actual Average | Company Model | Staff Model | % Difference Company vs. Staff |
|---|---|---|---|---|
| Asbury | 964,172 | 941,635 | 948,626 | -0.7% |
| Iatan 1 | 445,577 | 473,768 | 537,442 | -13.4% |
| Iatan 2 | 652,059 | 681,444 | 710,831 | -4.3% |
| Plum Point Own | 288,108 | 321,157 | 310,699 | 3.3% |
| Riverton 12 CC | 1,161,514 | 1,173,948 | 1,170,917 | 0.3% |
| Riverton 7-11 | 485 | - | 2,644 | NA |
| EC 1-2 | 22,491 | 20,212 | - | 100.0% |
| EC 3-4 | 105,616 | 98,369 | 93,004 | 5.5% |
| State Line 1 | 43,004 | 12,248 | 18,446 | -50.6% |
| State Line CC | 1,383,448 | 1,319,699 | 1,360,016 | -3.1% |
| Ozark Beach | 45,792 | 55,895 | 51,098 | 8.6% |
| Plum Point PPA | 295,823 | 321,157 | 310,699 | 3.3% |
| Elk River PPA | 464,040 | 523,243 | 512,630 | 2.0% |
| Meridian Way PPA | 311,927 | 327,053 | 322,613 | 1.4% |
| **Total** | 6,184,057 | 6,269,828 | 6,349,664 | -1.3% |

**Q. ARE THERE REASONS WHY DIFFERENT MODEL APPROACHES MIGHT UTILIZE DIFFERENT TYPES OF FORCED OUTAGE RATES?**

A. Yes. The Staff and Company are not using the same production cost model. Even if they did, models may have multiple ways to accomplish the same types of tasks, and different modelers may take different approaches to model the system they are attempting to simulate. For example, a resource may have a rated capacity of 200 megawatts ("MW"). It may have this rating because it tested for a few hours according to specific guidelines to achieve this peak condition rating, but it may not be able to operate at this level for an extended period of time. One approach may be to model this type of resource with a maximum capacity of 185 MW (representing the typical maximum output) and perhaps use 200 MW as an emergency capacity if the production cost model allows such a construct. Under this scenario, a lower forced outage rate could be used. Another approach might be to use 200 MW as the maximum capacity and use a higher forced outage rate to account for the fact that the

unit does not normally operate at that MW level in order to accomplish the same simulation task as the first scenario. Forced outage rates in models may also attempt to take into account full forced outages, partial forced outages and de-rates.

**Q. BASED ON THE MODEL OUTPUT, ARE THE FORCED OUTAGE RATES IN THE COMPANY MODEL CONTRIBUTING TO ANY UNREASONABLE RESULTS?**

A. No.

## III. MARKET PRICES

**Q. PLEASE SUMMARIZE STAFF'S COMMENTS ABOUT THE MARKET PRICES USED IN THE COMPANY'S PRODUCTION COST MODEL?**

A. In his rebuttal testimony, Staff witness Poston discusses two primary concerns he has with the Company's market prices. He refers to these in sections titled (1) "intra-day nodal price differentials" and (2) "negative market prices." Based on my reading of Mr. Poston's rebuttal testimony, I would briefly summarize his first concern about the nodal price differentials as an observed recognizable shape among the different sets of Company market prices, where the relative differences between the market prices at different price nodes remained very consistent. Mr. Poston feels that this uniformity does not appear to account for behavior that is regularly seen in historic market price data. And secondly, based on my understanding of his rebuttal testimony, I would briefly summarize his second concern about negative market prices as the Company's data has an identical, very low number of hours of negative market prices for every price node, which is not consistent with Staff's examination of three years of historic market data.

**Q. PLEASE DESCRIBE THE DEVELOPMENT OF THE COMPANY MARKET PRICES USED IN ITS PRODUCTION COST MODEL FOR THIS CASE.**

A. The Company's market prices were developed by Horizons Energy, a consulting firm that was contracted by the Company to provide input data for the EnCompass production cost model. They were developed specifically for creating an annualized and normalized total company production cost model run appropriate for establishing an FAC base factor or annual budgets. Hourly nodal prices are composed of a zonal price forecast for Southwest Power Pool – Southeast ("SPP-SE") and a locational marginal price ("LMP") differential to the Liberty-Empire load node. Hourly zonal prices are obtained utilizing the Horizons Energy National Database. This database contains resources, hourly demand for electricity and transmission interconnection limits. Horizon Energy then simulates the commitment and dispatch for 8,760 hours per year to simultaneously obtain prices for North American power markets. Variations in many factors, including generation and transmission availability, demand for electricity, and delivered natural gas prices impact the hourly market price. LMP price differentials for the Company's other resource nodes are obtained through statistical evaluation of the historical relationship between the zone and each nodal point. This parameterization includes both time of day and month of the year. In addition, forward looking research is performed to evaluate whether the differential may change due to anticipated changes in transmission or generation.

**Q. HOW DO YOU RESPOND TO STAFF'S FIRST CONCERN ABOUT NODAL PRICE DIFFERENTIALS?**

A. The price curves representing the Company's market prices are based on zonal analysis and historical observations for use in a production cost model for the sole

purpose of allowing the model to cost out the load, dispatch resources, and derive costs and revenues for these resources. Each set of nodal prices in the Company's model do have similar patterns as Staff mentioned; however, this does not impair the production cost simulation. How the various load and generator nodes' shapes are similar or dissimilar does not matter for this purpose, so long as they have the proper basis differentials, are correlated with the same natural gas prices, and yield realistic results. In his rebuttal testimony, Mr. Poston discusses the price spread between nodes. On page 2, lines 5-9 he states:

> *…due to transient market conditions, the price spread between nodes could increase to $50/MWh or more for a limited number of hours before returning to closer agreement. These short term pricing differences can impact dispatching decisions and the revenue earned by power plants. Empire's market price data does not capture this type of market behavior.*

However, within the model, each resource and load source *only responds to the market price at its given location*. Therefore, the pricing differences between nodes, that Mr. Poston describes would not impact dispatch decisions and revenue earned by the resource. For example, a resource would only react to the market price at its given node. Its dispatch and revenue would not be impacted by a different market price (that may have spiked or declined) at another resources' node. This approach is consistent with the SPP market design. For this case, the Company is utilizing consistent market prices developed for the intended purpose of estimating the annualized and normalized fuel and purchased power ("FPP") expense level for setting the base FPP cost and the associated FAC base factor. The Staff is using a three-year average of actual day-ahead market prices for use in its production cost model.

**Q. HOW DO YOU RESPOND TO STAFF'S SECOND CONCERN ABOUT NEGATIVE MARKET PRICES?**

A. The Staff's assertion that a different number of negative prices exist between the Company and Staff market price data seems to be an arbitrary metric and it represents only a very small subset of both the Company and Staff market price data sets. The Company has a consistent number of negatively priced hours between load nodes, which are fewer in number than the Staff's market prices. However, based on the multiple sets of 8,760 hourly prices used by both parties, I calculated that the Company has about 0.06% of those hours with negative prices and the Staff has about 0.10% of those hours with negative prices. Furthermore, according to the SPP Market Monitoring 2018 Annual State of the Market Report[1], the incidence of negative prices in 2018 was about half of the 2017 level. Utilizing historical data (such as Staff averaging three years of historical market prices) may tend to overstate the negative price count. The network topology changes over time, which in this case has led to a decrease in negative pricing intervals.

**Q. BASED ON THE MODEL OUTPUT, ARE THE MARKET PRICES IN THE COMPANY'S MODEL CONTRIBUTING TO ANY UNREASONABLE RESULTS?**

A. No.

**Q. PLEASE SUMMARAIZE YOUR REVIEW OF STAFF WITNESS MR. POSTON'S REBUTTAL TESTIMONY THAT EXAMINES INPUT DATA IN THE COMPANY'S MODEL.**

[1] https://www.spp.org/documents/59861/2018%20annual%20state%20of%20the%20market%20report.pdf

A. Mr. Poston elected to discuss the Staff's analysis of some of the Company's inputs into its production cost model, but he did not explicitly state or quantify that these inputs were contributing to any unreasonable results. The Company does not find that Staff's examination of the forced outage rates and market prices used in the Company's production cost model invalidates the Company model in any way. The Company's model is producing reasonable results for the purposes of this case.

**Q. DOES THIS CONCLUDE YOUR SURREBUTTAL TESTIMONY?**

A. Yes.

**VERIFICATION OF TODD W. TARTER**

Todd W. Tarter, under penalty of perjury, declares that the foregoing surrebuttal testimony is true and correct to the best of her/his knowledge, information, and belief.

/s/*Todd W. Tarter*
Todd W. Tarter
Senior Manager, Strategic Planning