Exhibit No. 3P

Liberty – Exhibit 3P
Aaron J. Doll
Direct Testimony (EO-2022-0193)
File Nos. EO-2022-0040 & EO-2022-0193

Exhibit No.: _____
Issues: Reasons for Retirement; Prudence of Retirement
Witness: Aaron J. Doll
Type of Exhibit: Direct Testimony
Sponsoring Party: The Empire District Electric Company
Case No.: EO-2022-0193
Date Testimony Prepared: March 2022

Before the Public Service Commission
of the State of Missouri

Direct Testimony

of

Aaron J. Doll

on behalf of

The Empire District Electric Company

March 2022

DENOTES CONFIDENTIAL
20 CSR 4240-2.135(2)(A)3,4

PUBLIC VERSION

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THE EMPIRE DISTRICT ELECTRIC COMPANY
BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION
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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Aaron J. Doll. My business address is 602 South Joplin Avenue, Joplin, Missouri.

Q. By whom are you employed and in what capacity?

A. I am employed by Liberty Utilities Service Corp. as Senior Director of Energy Strategy for the Liberty Central Region, which includes The Empire District Electric Company ("Liberty" or the "Company").

Q. On whose behalf are you testifying in this proceeding?

A. I am testifying on behalf of Liberty.

Q. Please describe your educational and professional background.

A. I graduated from Missouri State University in 2003 with a Bachelor of Science degree in Psychology and a minor in Philosophy. I received my Master of Business Administration from Missouri State University in 2008.

I have worked for the Company for approximately 15 years. I worked in the Planning and Regulatory Department for six years as a Planning Analyst and was responsible for load forecasting, weather normalization, and sales and revenue variance analysis. In 2012, I transferred to the Supply Management Department as the Market Risk Manager and eventually the Manager of Market Settlements and Systems. In this capacity, I worked to facilitate the migration of the daily power marketing activities from the Southwest Power Pool, Inc. ("SPP") Energy Imbalance Market ("EIS") to the

SPP Integrated Marketplace ("IM") and oversaw the procurement of the Transmission Congestion Rights ("TCRs"). Additionally, I provided oversight of the meter management, market settlements, and market applications.

In 2020, I was promoted to my current position of Senior Director of Energy Strategy. In this role, I oversee the procurement of fuel for electrical generation, the day-to-day interfacing, systems, and settlements with SPP as it relates to the IM, the long term and short-term load forecasting, and the production cost modeling. I also provide regulatory support relating to those responsibilities.

Q. Have you previously testified before the Missouri Public Service Commission ("Commission") or any other regulatory agency?

A. Yes. I have testified on behalf of the Company before this Commission, the Oklahoma Corporation Commission, the Kansas Corporation Commission, and the Arkansas Public Service Commission.

Q. What is the purpose of your Direct Testimony in this proceeding?

A. In support of Liberty's request for a Financing Order authorizing the issuance of securitized utility tariff bonds to recover costs associated with the Asbury generating plant ("Asbury"), my testimony explains the Company's decision to retire Asbury. Specifically, I describe Asbury's operating characteristics, the manner in which it participated in the SPP generation market and how it became increasingly uncompetitive in the years leading up to the retirement. I also discuss the studies and analyses that the Company undertook and which ultimately supported the retirement decision. My primary conclusion, which is based on the information presented in the remainder of my testimony, is that Liberty's decision to retire Asbury was prudent.

II. PRUDENCY OF THE ASBURY RETIREMENT DECISION

Q. When was Asbury retired?

A. In March 2020.

Q. Had the Company recovered all of its net plant investment in Asbury at that time?

A. No. As set forth in the Direct Testimony of Liberty witness Charlotte T. Emery, there was an outstanding net plant balance of approximately $159.4 million at the time that Asbury was retired.

Q. Why did Liberty retire Asbury before it was fully depreciated?

A. Because doing so was in the best interest of its customers as the plant had become uneconomic. Among the clearest indications that this was the case is the drop in the plant's net capacity factor from 76.42% in 2010 to 46.97% in 2019, evidence that Asbury was increasingly uncompetitive in the generation market. Worse still, had it stayed in operation, Asbury would have required significant environmental upgrades to comply with the Environmental Protection Agency's coal combustion residuals rules ("CCR"). The direct testimonies of Company witnesses Shaen T. Rooney and Drew W. Landoll, respectively, discuss Asbury's obsolescence and the investments that would have been required to keep it in service.

Q. Did the Company undertake any analyses whose results support the decision to retire Asbury?

A. Yes. Liberty undertook an analysis of Asbury's economics in both 2017 and 2019, finding in its 2019 Integrated Resource Plan ("IRP") that retiring Asbury would result in significant savings for Liberty's customers. In other words, retiring the plant would have made sense if even the CCR standard would not have required significant expenses to keep the facility in service. For further discussion on environmental capital

investments and compliance requirements pertaining to the Asbury generating plant refer to Company witness Landoll's direct testimony.

Q. Based on these data and the other factors you discuss throughout your testimony, can you conclude that retiring Asbury was a prudent decision?

A. Yes, it was. In retiring Asbury when it did, the Company was responding to a combination of market signals and required environmental upgrades that it could not prudently ignore. The balance of decisions that led to Asbury's decommissioning are a clear example of good utility practice. The remainder of my testimony focuses on the specific circumstances surrounding Asbury's retirement and the process by which Liberty decided to retire the facility. The prudence of the Company's decisions is discussed at length in the Direct Testimony of Company witness Frank Graves.

III. ASBURY'S INABILITY TO COMPETE IN GENERATION MARKETS

Q. Please describe your involvement with Asbury and the SPP IM over the years.

A. I have been involved with Asbury's participation in the SPP IM since the market went live on March 1, 2014. My position at that time was focused on the new SPP settlements created as a result of the SPP IM construct and the management of congestion derivatives. I worked closely with market settlements and internal reporting to inform Company management of the performance in the market, which included Asbury. As it relates to the management of congestion hedging products, I evaluated the locational marginal pricing ("LMP") between all of the Company's generating units and load to determine whether a Financial Transmission Right ("FTR") was valuable. The evaluation included the basis differential in LMPs between the Asbury power plant and the Company's load settlement location.

As my role expanded in the department, I was involved in management discussions to increase the economics of Asbury as it relates to its performance in the SPP IM which is discussed in more detail in my testimony below.

Q. Please describe Asbury's primary operating characteristics at the beginning of the SPP IM.

A. Asbury was a 200-megawatt (MW) coal plant with a 10,638 average heat rate (Btu/KWh), 16-hour start-up time, 96-hour minimum run-time, and 48 hour minimum down-time.

Q. Explain what is meant by average heat rate, start-up time, minimum run-time, and minimum down-time.

A. Average heat rate is a metric of efficiency that is calculated as the amount of energy used to generate 1 Kilowatt-hour (KWh). Incremental heat rates, or heat rates along an output curve supplied by power plant testing, can be multiplied by fuel costs to provide the fuel-related cost curve of an entity's energy offer into the SPP IM. A higher heat rate implies a less efficient facility, and vice versa.

Start-up Time, as defined by the SPP IM, is the time required to start a resource and reach the Minimum Economic Capacity Operating Limit following receipt of a start-up order from SPP. Asbury began participation in the SPP IM with a 16-hour Start-Up Time.

Minimum Run Time is the length of time a Resource must run from the time the Resource is put online to the time the Resource is shut down. Asbury began participation in the market with a 96-hour Minimum Run Time.

Minimum Down Time is the minimum length of time required following desynchronization that a Resource must remain off-line prior to a subsequent

synchronization. Asbury began participation in the SPP IM with a Minimum Down Time of 48 hours.

Q. Describe Asbury's first few years of participation in the SPP IM.

A. From March 2014 until October 2016, Asbury was offered in the SPP IM with a Day-Ahead ("DA") market status of "Self." The "Self" status communicates to SPP that the Market Participant, Liberty in this case, is committing the Resource and SPP should include it as committed in either the DA Market and/or Reliability Unit Commitment ("RUC") as specified. As a result of Asbury's "Self" status, Liberty could be sure that the unit would be online the following day which prevents unit cycling from an SPP de-commitment instruction and also helps manage fuel inventory. However, as a result of the "Self" status, the unit is considered a "price taker" which means it could not be certain that the LMPs would be greater than the cost of generation during its run.

Q. Describe unit cycling and why the Company was seeking to avoid it at Asbury.

A. Unit cycling is the continual starting up and shutting down of a unit. In the SPP IM, cycling is caused by economic signals that do not support the continuous operation of a generating unit day-to-day and instead signals the unit to start up or shut down. As discussed below, Liberty attempted to avoid cycling out of concern for daily energy pricing to serve load, start-up risk, and fuel inventory management.

Q. Please describe each of the aforementioned risks that Liberty was attempting to mitigate.

A. **Daily Energy Pricing to Serve Load**: If Asbury was de-committed from the IM, the unit would only receive a start-up instruction in instances where DA prices could support both start-up costs (which are not insignificant for baseload coal units) and the energy offer which is comprised of a no-load offer and incremental energy offer. If the

prices didn't justify the start-up and energy offer of the unit, Asbury would not be selected, even if its marginal energy costs were in the money. This creates a situation in which units that may not be as economical as Asbury on an energy-only basis are being called on more frequently, simply due to Asbury's start-up cost, thereby raising the cost of energy and negatively impacting Liberty's customers. Avoiding cycling of the unit mitigated this risk, as it took the start-up costs out of the equation and allowed dispatch of the unit based solely on incremental energy costs.

Start-up Risk: Cycling introduces risk for a facility like Asbury because coal plants are designed for base load generation and are not made for frequent starts and stops and often exhibit problems when asked to cycle. If a unit receives a Day-Ahead commitment instruction in the SPP IM, it has created a financial position relating to the sale of energy to serve a portion of SPP load. If the generating unit is unable to meet its obligation to provide the energy that has already been sold in the Day-Ahead market, then the Market Participant that is offering the unit is forced to purchase back the energy that it was unable to deliver in the Real-Time Balancing Market ("RTBM"). Often, the generation purchased back in the RTBM is at a higher cost than what it was sold for in the DA, because a less efficient unit would need to be called on to replace the generation that failed to make it online. The spread between what the energy was sold for in the DA and what it was purchased back for in the RT, often called the DART spread, creates a financial position for the market participant which can often result in dollars owed for power that was sold but that was not delivered. Keeping Asbury from cycling served to mitigate the risk associated with the failure to provide energy when committed. In his Direct Testimony, Liberty witness Rooney discusses in more detail

the negative impacts on power plants like Asbury when asked to continuously start and stop (cycling).

Fuel Delivery Contract Management: Liberty, like many coal plant owners, had coal delivery contracts that have specific required amounts of delivery. If Asbury was left offline for extended periods of time, the amount of delivered coal on the ground could present both environmental and safety issues. These issues include bulldozer safety, permitted coal pile size, water discharge, required packing to prevent spontaneous combustion, etc. Keeping Asbury from cycling was an effective mitigant to prevent excess coal inventory problems.

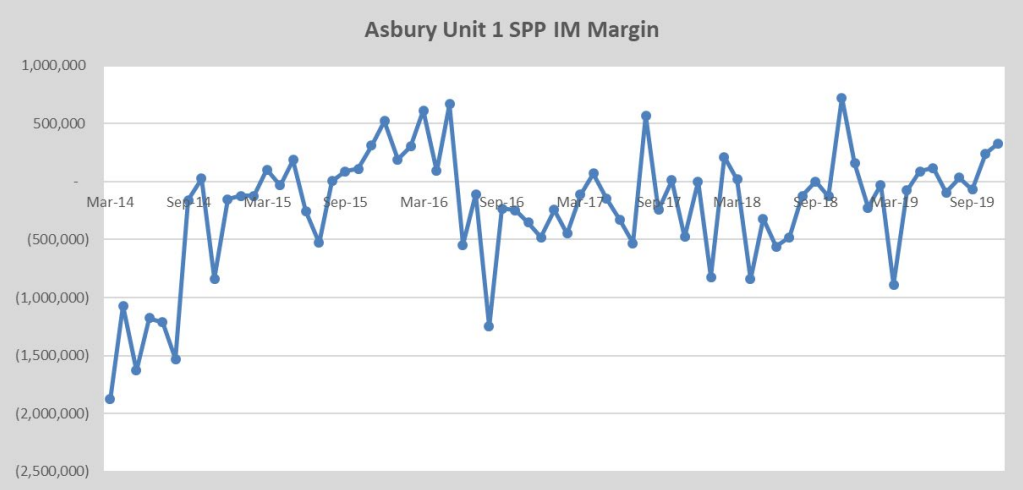
Q. Did Liberty cease self-committing Asbury in October of 2016?

A. Yes, right around that time, Liberty ceased self-committing Asbury for the reasons mentioned below. The only self-commitment of Asbury on a forward-going basis would have been for discrete scenarios similar to other generating units in the Company's fleet such as unit testing.

Q. Why did Liberty not continue self-committing the unit if it avoided costly and damaging cycling, mitigated start/stop risk, and helped manage fuel inventory, as described above?

A. The initial decisions to self-commit Asbury were justified based on the prevailing locational marginal prices ("LMP") which, when netted with fuel costs, resulted in favorable net operating margins. In essence, our customers were still receiving net revenues that were offsetting the cost to purchase generation. However, the margins began to diminish in 2015 and by the summer of 2015, the unit began to exhibit negative net operating margins for 10 consecutive months.

Figure AJD-1



Negative values indicate favorable margins (unit costs – SPP IM revenues) and positive values represent unfavorable margins

Q. Was Asbury's declining profitability atypical of similar generators?

A. No. The SPP market was becoming more competitive around this time and changes in the performance consistent with those observed for Asbury were common in thermal plants that had previously been economic. In the 2015 Annual State of the Market ("ASOM"), the SPP Market Monitoring Unit ("MMU") stated:

> In 2014, coal, combined cycle, and combustion turbine technologies were able to support their ongoing maintenance costs with that year's prices. However…while 2015 prices did support the ongoing maintenance cost of combined cycle and combustion turbine units, they did not support the cost of scrubbed coal units.

The report went on to describe that the "MMU expects the market to signal the retirement of inefficient generation." The MMU provided more details on its long run price signals as included in Table AJD-1 below.

Table AJD-1

Technology	AVG Marginal Cost ($/MWh)	Net Revenue from SPP Market ($/MW Yr)	Annual Revenue Requirement ($/MW Yr)	Able to Recover New Entry Cost	Annual Fixed O & M Cost ($/MW Yr)	Able to Recover Avoidable Cost
Scrubbed Coal	23.74	20,626	421,684	NO	31,160	NO
Gas Combined Cycle	19.22	36,122	151,525	NO	15,370	YES
Combustion Turbine	34.55	9,533	284,437	NO	7,040	YES

The 2016 and 2017 MMU ASOM found consistent results with the 2015 ASOM, in that prices did not support the cost of scrubbed coal units.

Q. Did Liberty stop self-committing Asbury immediately following the reduction in prices?

A. No. Liberty still had must-take coal delivery challenges to navigate. However, in October 2016, the Company was able to renegotiate its coal delivery contract to avoid must-take scenarios, which would allow the Company to manage its coal pile without having to self-commit Asbury to keep inventory levels manageable. From November 2016 forward, Asbury was almost exclusively offered in "market" status in which case SPP would commit the unit based on sufficient pricing.

Q. What was the result of allowing Asbury to be offered in "Market" status?

A. Although the unit was then only committed and dispatched when it was considered "in-the-money," in order to improve its net operating margins, Asbury operated less and less. Refer to Table AJD-2 below which is Asbury's Net Capacity Factor ("NCF"):

Table AJD-2

Asbury Unit 1	
Year	NCF
2010	76.42%
2011	70.72%
2012	70.32%
2013	78.17%
2014	64.05%
2015	63.50%
2016	62.69%
2017	56.92%
2018	48.01%
2019	46.97%

Q. What is a Net Capacity Factor ("NCF")?

A. A Net Capacity Factor is an industry standard used to assess how much a unit generates over a period of time compared with how much it could generate if it ran at the top of its net capacity during that same time. For example, a 200 MW net capacity unit is capable of generating 1,752,000 MWh annually (200 MW * 8,760 hours [assuming a non-leap year]). If the unit actually generates 1,314,000 MWh over the same 8,760 hours, it would have a NCF of 75% (1,314,000 MWh /1,752,000 MWh).

Q. What do the NCF figures in Table AJD-2 above say about the operation of Asbury?

A. The NCF figures show that the unit was running lower and lower annually when compared to what it was capable of running (assuming 100% availability). The NCF is used to make an apples-to-apples comparison of a unit's amount of generation compared to what it is capable of generating over a fixed period of time. Over time, a unit's capacity may fluctuate based on degradation or investment in that unit, but an NCF takes that information into account to isolate its generation performance compared to its respective capabilities.

Q. As Asbury's NCF began to decline, what did the Company do to try and improve its performance in the SPP IM?

A. As Asbury's NCF continued to decline, plant personnel worked on various aspects of its operating characteristics to make it more amenable to market commitments, therefore improving its NCF.

Q. What aspects of Asbury's operating characteristics were modified?

A. During 2018, plant personnel worked on getting the unit to be more flexible with the hope that improvements in its market-operating agility would increase its NCF. Around February 2018, Liberty decreased Asbury's Minimum Run Time from the 96 hours mentioned previously in my testimony to 48 hours. Additionally, plant personnel were able to successfully operate the plant with a new Minimum Down Time of 6 hours compared to its previous Minimum Down Time of 48 hours. Please see the Direct Testimony of Liberty witness Rooney for additional discussion of how these changes were made and the effects they had on the unit.

Q. How did these new operating parameters change Asbury's operation?

A. Asbury could now cycle down for a short period of time, often during low price periods, and come back online as needed by SPP. With the operating parameters of Asbury closer to those of a combined cycle generator, Asbury was able to maximize its ability to offer into the IM unencumbered by its lack of market-operating agility and the result was a record number of starts in its last two years of operation.

Table AJD-3

Asbury Unit 1	
Year	Starts
2010	10
2011	9
2012	7
2013	2
2014	8
2015	11
2016	10
2017	11
2018	34
2019	26

Q. Did this greater number of starts impact the NCF trend?

A. No. As you can see Table AJD-3 above, the NCF continued to fall, even with the greater number of starts.

Q. Does the Commission review the commitment status offering of generators into the SPP IM?

A. Yes. In the Commission Staff ("Staff") Second Supplemental Report, issued on November 8, 2019, in EW-2019-0370 (*In the Matter of an Investigation of Missouri Jurisdictional Generator Self-Commitments into SPP and MISO Day-Ahead Energy Markets*), Staff recommended to "…monitor the number of hours that units are dispatched at their economic minimum under self-scheduled or must-run status in future fuel adjustment clause prudence reviews.[1]"

Q. How does the Staff review the self-commitment prudence in fuel adjustment clause prudence reviews?

A. In Staff Report of the Ninth Prudence Review of The Empire District Electric Company, Staff "conducted a review of commitment status of Liberty-Empire's electric generation facilities into SPP in an effort to determine any negative impacts

[1] EW-2019-0370. Staff's Second Supplemental Report, p. 2.

that might be occurring because of such actions[2]." Staff's review of self-commitments in its prudence reviews include an evaluation of the financial impact of the self-commit units as offered and cleared into the SPP market. Staff acknowledges that there are a variety of reasons for a self-commitment status, and that "Some of these reasons are unavoidable and can require the resource to be offered in self-commitment status."[3]

Q. What did Staff find in its latest fuel prudence review conducted as it relates to the self-commitment of Asbury in the SPP IM?

A. **[redacted]**

Q. Did the Staff recommend a disallowance for the "Out of the Money" transactions of Asbury in EO-2021-0281?

A. No. Staff's Report discussed their findings in Case No. EW-2019-0370 "Many of the units in question were commissioned as base load units well before the day-ahead markets were formed. These base load coal units were not designed to be cycled frequently and doing so would likely increase the likelihood of outages, increase

[2] EO-2021-0281. Staff Report. Ninth Prudence Review of Costs Related to The Fuel Adjustment Clause for The Electric Operations of The Empire District Electric Company, p. 36.
[3] *Id,* p. 37.

operations and maintenance expense, and reduce the reliability of the units. Staff maintains that in order to filly understand the economic impact of self-scheduling on a given unit's profitability, an analysis at the RTO level would need to be conducted.[4]"

Q. What has the RTO said about self-commitments in the SPP IM?

A. In the "Self-committing in SPP markets: Overview, impacts, and recommendations" whitepaper issued by the SPP MMU in December 2019, Recommendation 1.1 stated that "In order to improve price formation and market efficiency, we recommend SPP and stakeholders work to reduce the incidence of self-commitments." [5]

Q. What is the Company's reaction to these external reviews of either Asbury or the self-commitment of uneconomical baseload coal plants?

A. They are not dissimilar from the Company's review of Asbury. As discussed below, the retirement of Asbury rather than continued investment in an uneconomic plant was deemed the prudent course of action.

Q. What was the actual retirement date of Asbury?

A. Liberty notified SPP of Asbury's coming retirement in August 2019, and Asbury was officially de-designated as a network resource on March 1, 2020. That was the earliest possible retirement date for Asbury per the SPP guidelines that were in place at the time, and it was retired as a coal-fired generating facility at that time.

IV. STUDIES AND ANALYSES THAT SUPPORTED THE ASBURY RETIREMENT DECISION

Q. When did the Company begin analyzing whether to keep Asbury in service?

[4] EW-2019-0370. Staff's Second Supplemental Report, pp. 1-2.
[5] Self-committing in SPP markets: Overview, impacts, and recommendations. Section 1.1, p. 2.

A. The evaluation of Asbury's ongoing useful life given market conditions, the lower cost of wind, and the avoidance of additional environmental compliance-related investment in Asbury, was first conducted by Charles River Associates ("CRA") in the Generation Fleet Savings Analysis ("GFSA"). The results of the GFSA indicated that the investments that would be required for compliance with the CCR rules could not be justified because of Asbury's economic obsolescence, as evidenced by its performance in the SPP IM. Instead, the study showed that Asbury should be retired since there were less expensive ways for Liberty to serve its load.

Q. Did the Company's analyses of cost savings relating to the retirement of Asbury take into account Liberty's recovery of a return on the undepreciated Asbury balances?

A. Yes. My understanding is that the savings calculated in the GFSA assumed that customers would pay the remaining outstanding balance, decommissioning costs, and capital costs at Liberty's authorized carrying rate, over thirty-year period.

Q. Was this finding confirmed in Liberty's 2019 IRP filing?

A. Yes. In the course of the 2019 IRP, it was determined that retiring Asbury would result in savings of approximately $93 million on a 20-year expected value basis.[6] Under a stochastic analysis conducted by CRA looking at 54 different scenarios (*see* Case No. EO-2019-0049), retiring Asbury resulted in savings over maintaining Asbury until end of life, 94% of the time, on a probability-weighted basis. Calculated savings ranged from $18 million to $144 million.

Q. Does this conclude your Direct Testimony at this time?

A. Yes.

[6] EO-2019-0049. 2019 Triennial Integrated Resource Plan. Volume 7, p. 17.

VERIFICATION

I, Aaron J. Doll, under penalty of perjury, on this 21st day of March, 2022, declare that the foregoing is true and correct to the best of my knowledge and belief.

/s/ Aaron J. Doll