BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

APPLICATION OF THE EMPIRE DISTRICT ELECTRIC COMPANY, A KANSAS CORPORATION, FOR AN ADJUSTMENT IN ITS RATES AND CHARGES FOR ELECTRIC SERVICE IN THE STATE OF OKLAHOMA	)))))	CAUSE NO. PUD 202100163

Direct Testimony

of

Shaen T. Rooney

Submitted on behalf of

The Empire District Electric Company

February 28, 2022

****DENOTES CONFIDENTIAL****

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PUBLIC VERSION

TABLE OF CONTENTS
FOR THE DIRECT TESTIMONY OF SHAEN T. ROONEY
THE EMPIRE DISTRICT ELECTRIC COMPANY
BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA
CAUSE NO. PUD 202100163

SUBJECT **PAGE**

LIST OF EXHIBITS IN SUPPORT OF DIRECT TESTIMONY

1.	SR-1 Wind Project Map
2.	SR-2 Generation Fleet Investments

DIRECT TESTIMONY OF SHAEN T. ROONEY
THE EMPIRE DISTRICT ELECTRIC COMPANY
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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Shaen T. Rooney, and my address is 602 South Joplin Avenue, Joplin, Missouri, 64801.

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

A. I am employed by Liberty Utilities Service Corp. as the Senior Manager of Strategic Projects for the Liberty Central Region. My primary responsibility is managing large capital projects in energy supply for The Empire District Electric Company ("Liberty-Empire" or "Company"). I am also responsible for Liberty-Empire's environmental department, which works to ensure Liberty-Empire's operations remain compliant with state and federal regulations.

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

A. I am testifying on behalf of Liberty-Empire.

Q. Please describe your educational and professional background.

A. I graduated from the University of Missouri-Columbia in 2001 with a Bachelor of Science degree in Chemical Engineering. In February 2002, I was employed by the Missouri Department of Natural Resources' Air Pollution Control Program as an environmental engineer, primarily responsible for air quality planning, especially focused on construction permitting, energy production, and fuels. In November 2004, I joined Liberty-Empire as Environmental Coordinator. In that position, I was

responsible for assisting management with Liberty-Empire's generating fleet operations in order to comply with state and federal air pollution regulations. I was also responsible for obtaining the necessary air permits for construction projects. From October 2006 until June 2008, I was employed as the Local Projects Manager at the Company's Asbury Generating Station. Duties included assisting in power plant construction projects, including the construction of a selective catalytic reduction ("SCR") system, and various operating and maintenance ("O&M") activities. In June 2008, I took a position as a Plant Operations Supervisor at the Asbury Generating Station. My duties included leading a team of plant operators in the operation of the plant, while prioritizing safety, maximizing production, and maintaining compliance with all applicable state and federal regulations. In November 2010, I assumed the position of Manager of Strategic Projects, where I was responsible for generation resource planning, origination of projects, development of project specifications, selection of contractors, and oversight of project progress. During my time as Manager of Strategic Projects, the Company executed the Asbury Air Quality Control System retrofit and Riverton 12 Combined Cycle Conversion. In May 2015, I returned to the Asbury Generating Station, this time as Plant Operations Manager. My responsibilities in this role were to set plant goals that aligned with the Company's goals and to lead all plant operations teams to achieve those goals while remaining focused on safety, maximizing production, and complying with all applicable regulations. In June 2018, I assumed the position of Generation Operations Project Manager, where my responsibilities were the same as when I had been employed as Manager of Strategic Projects. In August 2019, management of the Company's environmental department

was added to my responsibilities, and my title was changed to Senior Manager of Strategic Projects.

Q. Have you previously testified in a proceeding before the Oklahoma Corporation Commission ("Commission") or before any other utility regulatory agency?

A. Yes, I have testified before this Commission in Cause No. PUD 202100127, Cause No. PUD 202000068, and Cause No. PUD 201200170. I have also testified before the Kansas Corporation Commission and the Missouri Public Service Commission.

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

A. The purpose of my testimony is to provide some history of prior regulatory proceedings regarding the wind projects that are a subject of this case. My testimony will provide details on the status of these projects, including how they are being operated. I will also testify on other significant investments in Liberty-Empire's generation facilities that are included in this case. Finally, given my previous roles with the Company, my testimony also supplements that provided by Company witness Aaron J. Doll, by conveying additional technical background on the changes in operations and maintenance practices previously implemented at Asbury to help the plant better compete in the Southwest Power Pool Integrated Marketplace ("SPP IM") ahead of the eventual decision to retire the plant.

II. REGULATORY HISTORY OF THE WIND PROJECTS AND STATUS OF THE WIND PROJECTS

Q. Please provide the regulatory history of the Wind Projects that are important components of this rate case.

A. The primary driver in this case is the cost recovery related to the acquisition of the Kings Point, North Fork Ridge, and Neosho Ridge Wind Projects (the "Wind

Projects"). This effort began in Oklahoma in 2017 when Liberty-Empire proposed its Customer Savings Plan (**"**CSP**")** to the Commission which outlined its plan to acquire up to 800 MW of wind generation in conjunction with the retirement of its Asbury coal fired generation plant thereby avoiding costly environmental compliance obligations required by federal law. This plan was premised on exhaustive planning and scenario analysis which demonstrated significant long-term savings to customers. At the time of the CSP filing, Liberty-Empire was in the process of soliciting proposals and selecting qualified bidders to construct projects in conjunction with tax equity investments in order to take advantage of the Production Tax Credit under the Internal Revenue Code.

The response from the Attorney General and the Public Utility Division ("PUD") was in support of the wind investment plan proposed by Liberty-Empire in the CSP. Attorney General witness Todd F. Bohrmann stated, "the Company has demonstrated that its acquisition of up to 800 MW of new wind resources under the CSP is cost-effective compared with its 2016 IRP preferred plan, including on a risk-adjusted basis . . . I would recommend approval of Empire's request to record its investment in, and the costs to operate and maintain, up to 800 MW for any wind projects acquired as part of the CSP." Additionally, in testimony, PUD recommended approval of the tax equity partnership as part of the CSP.

Following agreement of the Attorney General and PUD, the parties filed a Joint Stipulation and Settlement Agreement which requested an order from the Commission authorizing the Company's request for proposal ("RFP") for the acquisition of up to 800 MW of "strategically located wind generation" using federal tax incentives in conjunction with tax equity partners. Ultimately due to intervening circumstances, Liberty-Empire filed a Motion to Withdraw Application and Dismiss Cause, and a Final

Order was issued addressing only the treatment of the tax savings resulting from the Tax Cuts and Jobs Act.

Q. Please provide an overview of the Wind Projects.

A. The three wind projects are known as Kings Point, North Fork Ridge, and Neosho Ridge. Kings Point has a nameplate capacity of 149.4 MW, North Fork Ridge has a nameplate capacity of 149.4 MW, and Neosho Ridge has a nameplate capacity of 301 MW. The Company acquired the North Fork Ridge wind project on January 27, 2021, and on May 5, 2021, purchased the Kings Point and Neosho Ridge wind projects. All three Wind Projects are currently in operation and in service. As my colleague Kevin Melnyk describes in his testimony, the Company is proud to say that it brought them online in a manner consistent with our initial estimates and well within the industry benchmarks for estimate-to-actual cost variance. Importantly, the Company was able to successfully complete the Wind Projects while resolving multiple logistical challenges posed by the global COVID-19 pandemic. The commissioning of these projects provides a clean and sustainable source of energy for Liberty-Empire's customers for many years to come. In this case, the Company's witnesses provide testimony on the following key elements:

i) The retirement of Asbury and the importance of the recovery of Liberty-Empire's remaining investment in the plant;

ii) The cost of the Wind Projects; and

iii) Demonstration that the savings contemplated in the analysis in support of the Customer Savings Plan are consistent with the acquisition of the Wind Projects.

The direct testimony of Company witnesses Aaron J. Doll, Kevin Melnyk, Frank Graves, Drew Landoll, and Charlotte T. Emery address various aspects of Asbury retirement and Wind Project commissioning in more detail.

Q. Where are the Wind Projects located?

A. Both the Kings Point and North Fork Ridge facilities and associated generation tie lines are located in the state of Missouri, in the general vicinity of Joplin. The Neosho Ridge facility and its associated generation tie line are located in the southeast corner of the state of Kansas, in Neosho County. A map depicting the location of each of the Wind Projects is attached to my testimony as Direct Exhibit SR-1.

Q. Please provide some background on the North Fork Ridge Wind Project.

A. The North Fork Ridge Wind Project, which was constructed by Mortenson Construction, has a nameplate capacity of 149.4 megawatts ("MW") and interconnects at Liberty-Empire's substation at Asbury. The North Fork Ridge Wind Project consists of 69 wind turbine generators and the infrastructure necessary for these generators to operate as an integrated energy production facility delivering energy to the transmission system. Each turbine consists of a foundation, tower, nacelle, rotor hub, and three blades. The nacelle contains a gearbox, generator, and transformer. There is an underground communications network, to allow monitoring and control of each turbine. There is also an underground collection network that takes the energy generated from each turbine to the project substation. The project substation consists of a large transformer, protective relays, electrical bus work, circuit breakers, disconnect switches, and capacitor banks. An approximately 6.5-mile long 161 kilovolt ("kV") generation tie line carries energy from the project substation to the point of interconnection at Liberty-Empire's Asbury substation. There is a satellite maintenance

facility to supplement the existing Asbury maintenance shop, which serves all three wind facilities. Access roads were also constructed to allow for maintenance.

Q. Please describe the Kings Point Wind Project.

A. The Kings Point Wind Project, also constructed by Mortenson Construction and with a nameplate capacity of 149.4 MW, interconnects at Liberty-Empire's La Russell Energy Center. The Kings Point Wind Project consists of 69 wind turbine generators and the infrastructure necessary for these generators to operate as an integrated energy production facility delivering energy to the transmission system. Each turbine consists of a foundation, tower, nacelle, rotor hub, and three blades. The nacelle contains a gearbox, generator, and transformer. There is an underground communications network, to allow monitoring and control of each turbine. There is also an underground collection network that takes the energy generated from each turbine to the project substation. The project substation consists of a large transformer, protective relays, electrical bus work, circuit breakers, disconnect switches, and capacitor banks. An approximately 15-mile long 161 kV generation tie line was constructed to carry energy from the project substation to the point of interconnection at Liberty-Empire's La Russell Energy Center. There is also a satellite maintenance facility at Kings Point. This maintenance facility includes additional warehouse space due to the distance from the primary maintenance facility at the Asbury maintenance shop.

Q. Please describe the Neosho Ridge Wind Project.

A. Neosho Ridge, constructed by IEA Constructors, has a nameplate capacity of 301 MW and interconnects to a new substation on Evergy Kansas Central's ("Evergy") Neosho-to-Caney River 345 kV transmission line. Neosho Ridge consists of 139 wind turbine generators and the infrastructure necessary for these generators to operate as an

integrated energy production facility delivering energy to the transmission system. Each turbine consists of a foundation, tower, nacelle, rotor hub, and three blades. The nacelle contains a gearbox, generator, and transformer. There is an underground communications network, to allow monitoring and control of each turbine. There is also an underground collection network that takes the energy generated from each turbine to the project substation. The project substation consists of two large transformers, protective relays, electrical bus work, circuit breakers, disconnect switches, and reactive compensation devices. An approximately 8-mile long 345 kV generation tie line was constructed to carry energy from the project substation to the point of interconnection on Evergy's Neosho-to-Caney River 345 kV transmission line. On November 17, 2020, Liberty-Empire was granted a Transmission Rights Only Certificate of Public Convenience and Authority from the Kansas Corporation Commission (Docket NO. 20-EPDE-503-COC) for this transmission line. Infrastructure to allow maintenance of the turbines was also constructed, consisting mainly of roads for ease of access and a maintenance building.

Q. How is Liberty-Empire operating and maintaining the Wind Projects?

A. Liberty-Empire monitors and operates the Wind Projects from an operations center located in the former Asbury Power Plant office building. This subject is covered in more detail in the Direct Testimony of Company witness Drew Landoll. The employees that monitor and maintain the Wind Projects were selected from among Liberty-Empire's employees, including those that were previously employed at the Asbury Generating Station. Liberty-Empire maintains the balance of plant equipment for the Wind Projects, that is, everything other than the turbines. Due to warranty provisions, turbine maintenance is performed by the turbine original equipment manufacturer

("OEM") under a Service and Maintenance Agreement ("SMA"). **[redacted]**

Q. Have the Wind Projects achieved the in-service criteria established by the Missouri Public Service Commission's report and order granting the Certificate of Convenience and Necessity authorizing the Company's acquisition of the Wind Projects?

A. Yes, in case ER-2021-0312, witness's[1] for the Missouri Public Commission Staff testified that all three Wind Projects had achieved the in-service criteria. Furthermore, no other parties in the case challenged the respective witness's assessment that the in-service criteria had been met for each of the projects.

Q. Since the Wind Projects were first synchronized to the transmission system, how much energy have they generated?

A. The first turbine was synchronized to the grid in September 2020 at the North Fork Ridge project. Neosho Ridge was first synchronized in November 2020, followed by Kings Point in January 2021. To the end of January 2022, the projects have generated 586,755 MWh; 978,406 MWh; and 456,132 MWh, respectively.

Q. How reliable have the Wind Projects been since they have been placed in service?

[1] ER-2021-0312 MPSC witness J Luebbert Rebuttal Testimony Page 2 (Neosho Ridge Wind Project); Staff Report - Cost of Service Report Page 30 (North Fork Ridge); MPSC witness Charles T. Poston, PE Rebuttal Testimony Page 8 (Kings Point).

A. Liberty-Empire has been tracking turbine availability since the time that each project declared commercial operation. To date, the Wind Projects have exceeded their budgeted technical availability by a substantial margin, and for 2021, all three Wind Projects demonstrated Turbine Manufacturer's Warranty Availability of greater than 90%.

Q. What are the Company's plans for the continuation or restoration of safe and adequate service if there are significant unplanned outages associated with the Wind Projects?

A. Because Liberty-Empire participates in the Southwest Power Pool ("SPP") Integrated Marketplace ("IM"), an outage at one or even all three of the Wind Projects would not typically result in service interruption for the Company's customers. In fact, these projects are capable of providing energy when other generators are not. This was demonstrated during Winter Storm Uri when all three wind farms, which are equipped for cold weather operation, continued to generate electricity, while other generators paid record high prices for fuel, and fuel supply fell short of demand. Moreover, Liberty-Empire has more than a century of experience in operating and maintaining electric generating facilities. This experience has been employed when outages occurred to diagnose outage causes, implement safe and effective restoration measures, and identify root causes to increase reliability. If Liberty-Empire determines that an outage is caused by a manufacturing or construction defect, it will use all remedies available under the purchase and sale agreements for the Wind Projects or the Turbine Supply Agreements to resolve the problem.

III. OTHER GENERATION CAPITAL INVESTMENTS

Q. What other capital investments has the Company made to its generation fleet since the last rate case that it seeks to include in rate base?

A. The Company continually seeks to reinvest in its infrastructure to ensure that its generation facilities are capable of providing reliable and efficient service to customers. To this end, Liberty-Empire makes capital investments to all its facilities every year. Since the last rate case, which began on April 1, 2019 and continues through December 31, 2021, Liberty-Empire has invested nearly $106 million in its existing generation facilities.

Q. Does this investment consist of only minor improvements and replacements at Liberty-Empire's generation facilities?

A. No. While there are some small items that are included, there are several material projects that account for a significant portion of the total investment. Approximately $6.5 million was invested in two spare power turbines for the aeroderivative combustion turbine units at the La Russell Energy Center. $15.9 million and $11.4 million were invested in upgrades to State Line Combined Cycle's combustion turbines 2-1 and 2-2, respectively. The upgrades were implemented at the end of each turbine's major inspection interval. The centerpiece of these upgrades is a new combustion turbine rotor, which promises to increase the maximum capacity of the units while improving fuel efficiency. A list of all generation fleet investments is attached to my testimony as Direct Exhibit SR-2.

IV. ASBURY MARKET PERFORMANCE IMPROVEMENT

Q. Are you familiar with efforts to improve the Asbury Power Plant's market performance prior to the decision to retire the plant?

A. Yes, as I described in my professional background, I was employed in operations management at the Asbury Power Plant twice. In my most recent employment at Asbury, I led the operations department at the plant. It was during this time that Liberty-Empire and Asbury Power Plant management looked to improve Asbury's performance in the SPP IM.

Q. Why was it necessary to improve Asbury's market performance?

A. In short, because Liberty-Empire ceased to self-commit Asbury and instead dispatched the unit as required by the SPP IM. As a result, Asbury's capacity factor decreased as Asbury was outperformed by units with lower heat rates, lower fuel costs, shorter start up durations, shorter minimum downtimes, and faster ramp rates. If the Company had not taken measures to improve Asbury's market performance, the units capacity factor and market revenues would likely have continued to decline. Company witness Aaron J. Doll further discusses Asbury and its participation in the SPP IM.

Q. Can you describe the changes made to improve the unit's market performance?

A. As stated previously, there are several factors that influence a unit's market performance. Liberty-Empire continually seeks to improve unit heat rates, and so to avoid duplication of those ongoing activities, this effort would instead focus on shortening startup duration, decreasing minimum downtime, and decreasing minimum run time. In early 2018, Liberty-Empire changed Asbury's Minimum Run Time from 96 hours to 48 hours. Additionally, plant personnel were able to successfully operate the plant with a new Minimum Down Time of six hours compared to its previous Minimum Down Time of 48 Hours. These changes on Asbury's performance in the SPP IM is further explained in Company witness Aaron J. Doll's Direct Testimony.

Q. How were these changes implemented?

A. Asbury's steam turbine was more flexible and capable of shorter start up times than were initially offered into the SPP IM: however, the turbine was limited by the capabilities of the boiler. By performing boiler tuning and programming changes to the plant controls, especially the burner management system, Liberty-Empire was able to remove or reduce the boiler limitations. Of course, human performance would also be a major factor in the success of this program, so the changes were accompanied by additional operator training and the introduction of new standard operating procedures, especially for startup, shutdown, and layup.

Q. What was the effect on Asbury of these changes?

A. In its final two years of operation, Asbury experienced a record number of starts. During part of the year, Asbury would operate as it had historically, with longer runtimes at higher capacity. During periods of lower demand, rather than simply remain in reserve shutdown status as it had in recent years, the unit was now called upon to run for shorter durations, sometimes performing daily cycling duty. Unfortunately, the additional starts were not accompanied by an increase in net capacity factor. In fact, net capacity factor continued to decline. The increased number of starts also raised the risk of damage, especially to steam-bearing components, due to cycling.

Q. What is cycling?

A. Cycling of a thermal power plant refers to the transition from online status to offline status and back online, or vice versa. It can also refer to transitioning across a unit's load range, especially from minimum load to maximum load.

Q. Why is cycling concerning?

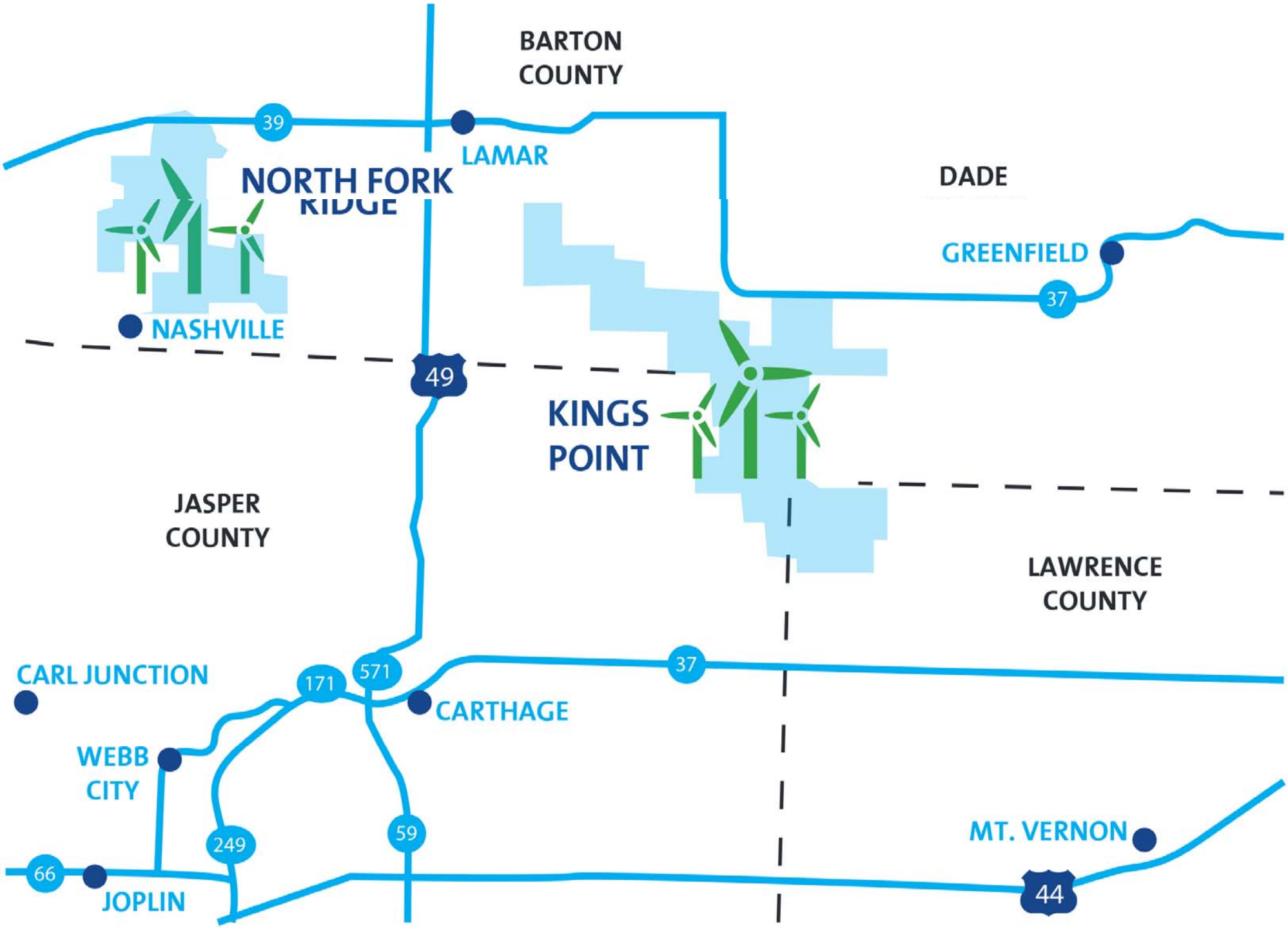
A. Because cycling causes damage. Increased cycling has been demonstrated to reduce mean time between failures in units designed and built for baseload operation, like

Asbury. These impacts can be mitigated, but only through redesign and replacement of certain steam cycle components or through enhanced inspection and maintenance programs. These additional costs become increasingly difficult to justify for a unit with a net capacity factor that is diminishing.

V. CONCLUSION

Q. Does this conclude your direct testimony?

A. Yes.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LAMAR
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NASHVILLE
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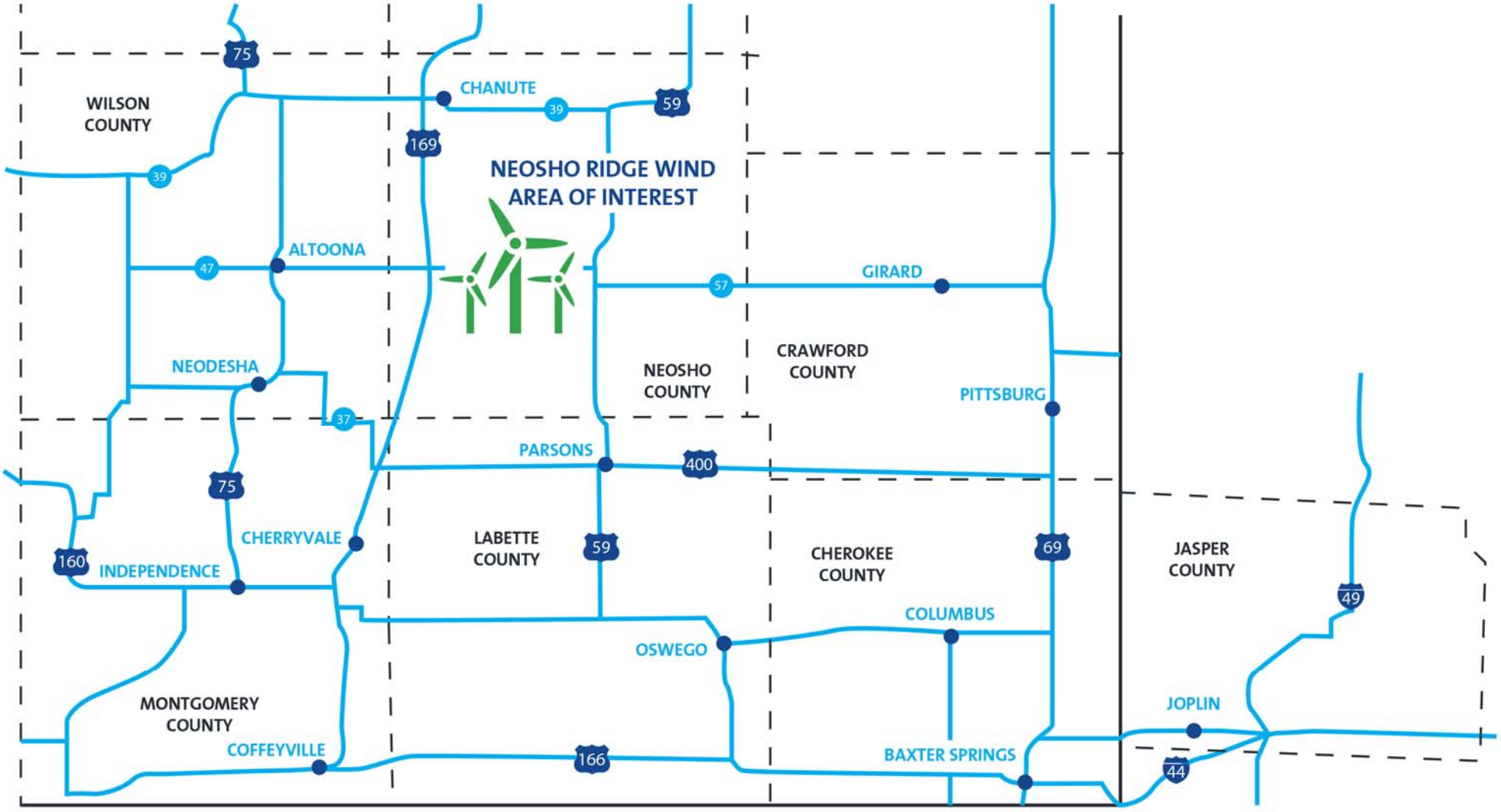
NEOSHO RIDGE WIND
AREA OF INTEREST
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COUNTY
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COUNTY
PITTSBURG
PARSONS
CHERRYVALE
INDEPENDENCE
LABETTE
COUNTY
CHEROKEE
COUNTY
JASPER
COUNTY
COLUMBUS
OSWEGO
MONTGOMERY
COUNTY
COFFEYVILLE
JOPLIN
BAXTER SPRINGS
75
39
59
169
47
57
37
400
160
69
49
166
44

Generation Plant Additions Since Prior Case

Ferc Function	Funding project	Funding Project Description	Sum of Activity Cost
Hydro Generation Plant	PO0006	#7 Generator Rewind	1,767,167
Hydro Generation Plant	PO0010	Improvements to the Dam	1,557,145
Hydro Generation Plant	PO0011	Improvements to Lake/Grounds	1,091,954
Hydro Generation Plant	PO0012	Improvements to Powerhouse	2,288,967
Other Generation Plant	NG0022	Utility Scale Community Solar	3,025,794
Other Generation Plant	PA0003	Plant Replacements & Imprvmts	-
Other Generation Plant	PCC001	Misc Prod Plant Additions	5,189,646
Other Generation Plant	PCC006	TURBINE UPGRADES	35,168,270
Other Generation Plant	PCC007	Valve Additions	2,133,617
Other Generation Plant	PCC009	Deep Well Pump &Column	2,104,899
Other Generation Plant	PE0001	Misc Production Plant Addition	12,176,303
Other Generation Plant	PE0009	Eng Ctr Controls	1,081,742
Other Generation Plant	PE0012	Eng Ctr Unit 2	1,426,343
Other Generation Plant	PE0013	Eng Ctr Unit 3	4,402,667
Other Generation Plant	PE0014	Eng Ctr Unit 4	2,390,653
Other Generation Plant	PR0001	Production Plant Additions	3,192,069
Other Generation Plant	PR0003	Plant Replacements & Imprvmts	4,302,422
Other Generation Plant	PR0009	Lowell & Bypass Replacements	1,761,240
Other Generation Plant	PR0011	Valve Additions	218,035
Other Generation Plant	PR0021	Water System Additions	1,805,570
Other Generation Plant	PR0024	Combustion Turbines	1,834,191
Steam Generation Plant	NG0016	Iatan 2	95,125
Steam Generation Plant	PA0003	Plant Replacements & Imprvmts	(114,744)
Steam Generation Plant	PA0011	Valve Additions	(21,512)
Steam Generation Plant	PI0001	Iatan Plant	8,554,907
Steam Generation Plant	PIC001	Iatan Common Facilities	5,195,463
Steam Generation Plant	PII001	Iatan 2	3,375,771
			$ 106,003,703.16

CERTIFICATION

The undersigned, Shaen Rooney, deposes and states that he is Senior Manager, Strategic Projects, that he has personal knowledge of the matters set forth in the foregoing responses and the information contained therein is true and accurate to the best of his information, knowledge and belief after reasonable inquiry.

/s/ Shaen T. Rooney
Shaen T. Rooney