BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of Rocky Mountain Power for Approval of a Significant Energy Resource Decision and Voluntary Request for Approval of Resource Decision	)	**Docket No. 17-035-40** **DPU Exhibit 3.0 DIR**

CONFIDENTIAL - SUBJECT TO UTAH PUBLIC SERVICE COMMISSION RULES R746-1-602 and 603

DIRECT TESTIMONY

OF

ROBERT A. DAVIS

ON BEHALF OF THE

UTAH DIVISION OF PUBLIC UTILITIES

December 5, 2017

Q: Please state your name and occupation.

A: My name is Robert A. Davis. I am employed by the Division of Public Utilities (Division) at the Utah Department of Commerce as a Utility Analyst in the Energy Section. My business address is 160 East 300 South, Heber Wells Building - 4th Floor, Salt Lake City, Utah, 84111.

Q: On whose behalf are you testifying?

A: The Division.

Q: Please summarize your educational and professional experience.

A: I received a Master's Degree in Business Administration with Master's Certificates in Finance and Economics from Westminster College in May of 2005. I am a Certified Valuation Analyst (CVA) by the National Association of Certified Valuators and Analysts (NACVA). I've completed the NARUC Utility Rate School, IPU Advanced Regulatory Studies Program, and attended other conferences and seminars relating to regulated energy utilities. I have been employed by the Division since May of 2012 working on various telecommunications and energy related assignments.

Prior to my current position, I was a Utility Analyst at the Utah State Tax Commission-Centrally Assessed Property Tax Division, where I valued telecommunication, energy,

and airline companies for property tax purposes. Prior to working at the Property Tax Division, I was an Electronic Engineering Technician at Fairchild Semiconductor.

Q: Have you testified before the Commission on prior occasions?

A: Yes, I have.

Q: What is the purpose of your testimony in this proceeding?

A: My testimony, along with that of other Division witnesses, presents the Division's conclusions on the transmission projects identified by Rocky Mountain Power (Company) in its Application for Approval of a Significant Energy Resource Decision and Voluntary Request for Approval of Resource Decision, Docket No. 17-035-40. Lack of response to any particular topic relating to the transmission projects does not preclude the Division from providing further testimony as evidence appears.

Q: Will you summarize your conclusions?

A: The transmission projects are an economic decision needed to support the proposed wind projects. However, should the new wind projects proposed in this docket not be approved, the Company has not persuaded the Division that the transmission projects are needed at this time.

Q: What transmission projects is the Company requesting approval for?

A: The Company is requesting approval of [redacted] to construct the following transmission projects:[1]

Aeolus to Bridger/Anticline Line

- A 140-mile, 500 kilovolt (kV) transmission line (Aeolus-to-Anticline Line), including construction of the new Aeolus (500/230 kV) and Anticline (500/345 kV) substations.
- A five-mile, 345 kV transmission line, that will extend from the proposed Anticline substation to the Jim Bridger substation along with associated interconnection facilities at the Jim Bridger substation to accommodate the interconnection of the 345 kV line from the proposed Anticline substation.
- A voltage control device at the existing Latham substation.

230 kV Network Upgrades

- A new 16-mile, 230 kV transmission line parallel to an existing 230 kV line, from the Shirley Basin substation to the proposed Aeolus substation including modifications to the Shirley Basin substation to accommodate the new line.
- The reconstruction of four miles of an existing 230 kV transmission line between the proposed Aeolus substation and the Freezeout substation including modifications of the Freezeout substation to accommodate the new line.
- The reconstruction of 14-miles of an existing 230 kV transmission line between the Freezeout substation and the Standpipe substation including modification to the Freezeout and Standpipe substations to accommodate the transmission lines.

The Company claims the network upgrades are needed to support interconnection of the new wind projects requested in this docket. The Company claims the transmission upgrades will increase capacity, effectively lower system impedance, and other benefits

[1] Company witness, Rick A. Vail, Direct Testimony, at lines 29-48.

that will improve reliability and resiliency.

Q: Please describe the benefits the Company claims customers might receive should the Commission approve the Transmission Projects.

A: The Company claims that congestion on the current transmission system in Eastern Wyoming limits its ability to deliver energy from Eastern Wyoming to the Jim Bridger energy hub. The Company claims its proposed Aeolus-to-Bridger/Anticline Line addition will relieve this congestion and will increase the transmission capacity in Eastern Wyoming by 750 megawatts (MW). Further, the Company claims its transmission projects will allow the Company to interconnect approximately 1,180 MW of wind resources (860 MW of Company New Wind and 320 MW of QF wind currently in the queue). The Company claims the transmission projects will provide substantial benefits, not only for Utah customers, but all customers throughout the Company's service area.[2]

Q: Does the Division agree with the Company's assessment of the benefits it is claiming?

A: Not entirely. During the technical conference held October 11, 2017, Company witness, Rick Vail, alluded to the fact that if not for the integration of variable renewable energy (VRE), existing and proposed, there would not likely be a need for transmission upgrades at this time.[3]

[2] Id., at lines 74-79.
[3] Company witness, Rick A. Vail, Technical Conference - Significant Energy Resource Decision, Docket No. 17-035-40, 10-11-17, YouTube at 2:44:36 to 2:46:05. https://www.youtube.com/watch?v=Hi2qM7uflmM.

However, Mr. Vail further explained that even though the system is meeting NERC reliability standards, the current system is at capacity. In his testimony, Mr. Vail, attests the Company's system in Eastern Wyoming has limited fault current and transfer capability.[4] The Division understands these constraints might lead to a weak grid and reliability will be difficult to maintain if additional variable resources are interconnected to the system in its current condition.

The Northern Tier Transmission Group's (NTTG) Final Regional Transmission Plan, supports Mr. Vail's statements:[5]

<u>High Wyoming Wind Case</u>

> Without significant reinforcements, the transmission system in Wyoming could not handle both existing and future planned wind resources while maintaining all other Wyoming area generating resources at their typical high capability in an export scenario.

The Division acknowledges some benefits as claimed by the Company in its application. However, the cost to gain these benefits is substantial. The Division is not convinced the transmission projects and associated benefits are currently needed or prudent.

[4] Company witness, Rick A. Vail, Direct Testimony, at lines 324-328.
[5] NTTG 2016-2017 Revised Draft Final Regional Transmission Plan, Version 3.2, September 1, 2017, at page 24.

Concurrently to its Utah filing, the Company is seeking approval from the Wyoming Public Service Commission for a Certificate of Public Convenience and Necessity (CPCN) in this matter. Wyoming Office of Consumer Advocate (OCA) witness, Bryce J. Freeman testified about the necessity of the Company's proposed transmission projects. Mr. Freeman stated:

> No, at least not in the traditional sense. Traditionally, transmission system investments are necessary to address failing components that have reached the end of their useful lives, to expand system capacity to accommodate new generation that is needed for native load service, or to resolve reliability issues that threaten the stability of the system. While RMP does have some concerns regarding the dynamic stability of the transmission system in eastern [sic] Wyoming [sic] which I will address in a moment, reliability issues are not the primary driver for the transmission system investments RMP is proposing in this proceeding.[6]

Q: Is the Department of Energy (DOE) concerned about the reliability and resiliency of the National Grid, which the Company's proposed transmission projects will be a part of?

A: No. The DOE's Staff Report to the Secretary on Electricity Markets and Reliability, concludes that the National Grid is in the best shape it has been in since 2002.[7] The Staff points out that going forward, grid reliability and resiliency will depend on transmission upgrades as VRE is added. The Staff offered its conclusions looking forward on reliability and resiliency:

[6] Wyoming Docket No. 20000-520-EA-17, Office of Consumer Advocate, Bryce J. Freeman, Direct Testimony, November 20, 2017, page 13, at lines 3-11.
[7] Staff Report to the Secretary on Electricity Markets & Reliability, U.S. Department of Energy, August 2017, Chapter 4, at page 63.

> Although the Bulk Power System (BPS) is performing reliably today with the current mix of resources, technologies, and loads, the entire system remains volatile. Low customer demands and a flatter supply curve mean that many generators face continuing economic stress, retirements may continue, and utility-scale and customer-side Variable Resource Energy (VRE) additions (enabled by subsidies and mandates) will continue. These factors and the uncertainty about future conditions are making it harder for grid planners and operators to maintain today's level of reliability.
>
> Any successful strategy to address BPS reliability and resilience going forward should include developing portfolios of resources that deliver both resource adequacy and Essential Reliability Services (ERS) to advance reliable grid operations. Resource portfolios could be complemented with wholesale market and product designs that recognize and complement resource diversity by compensating providers for the value of ERS on a technology-neutral basis. More work is needed to define, quantify, and value resilience.[8]

Q: Does the Division agree with the DOE?

A: Yes. The Division concludes that future changes to the Company's transmission system may be needed to maintain a reliable and resilient grid as resources are added, or removed. The DOE Staff offers guidelines outlining three characteristics of building transmission:

1) Demonstrating a need for the transmission project, also known as transmission planning;
2) determining who pays for the transmission project, also called cost allocation, and;
3) State and Federal agency siting and permitting.[9]

[8] Id., at page 100.
[9] Id., at page 75.

The Division understands the Company's responsibility, as part of the BPS, to design its transmission and distribution systems to be reliable and resilient for transportation of electric energy. The Division also understands the complexity and time required to build transmission infrastructure and is committed to supporting that effort when in the public interest. The Company's decisions, however, have to be prudent and in the public interest to effectively accomplish these objectives.

Q: Does the Company's proposal follow the DOE's guidelines?

A: Yes, at least partially. The Division's review of the Company's proposed transmission projects, in light of the DOE Staff's guidelines mentioned above, concludes that the Company planned the transmission projects not necessarily for general reliability or resiliency as explained above, but for reliability and resiliency to support the new wind generation. That is, with the new wind generation, the proposal fits the guidelines. Without the new wind generation, the need for the transmission projects at this time is much less clear.

The Commission is tasked with reviewing proposed projects in the public interest. The Company has not persuaded the Division that the transmission and wind projects (other Division witnesses address the New Wind Projects) are in the public interest to Utah customers. The Company has not convinced the Division that the benefits of the transmission projects out-weigh the costs to Utah customers. The Division understands

the length of time required to obtain Federal and State siting permits, as well as other permits needed for projects of this magnitude. The proposed transmission upgrades may be needed in the future to facilitate system reliability and resiliency. However, the Division is not persuaded that the proposed transmission upgrades and buildouts are needed now. Further, actual projects needed in the future may not mirror the proposal in this docket.

Q: Does the Company's recent Integrated Resource Plan (IRP) identify a need for the transmission project?

A: No. The Company's 2017 IRP does not forecast a significant increase in load over the study period. The Company can meet forecasted loads with Front Office Transactions (FOTs) and existing generation. The IRP did not identify a resource deficiency so much as it identified a potential economic opportunity for cheaper resources, if certain long-range assumptions prove true. The Division is not persuaded that the transmission projects are in the public interest even when considering the offsetting benefits of the Production Tax Credits (PTCs) to the costs of the transmission projects.

Q: If the Commission approves the transmission project, will constraints on the system be resolved?

A: Not entirely, because there will always be constraints. Constraints happen in any system. Management of constraints is what matters. The Company's 2017 IRP lists

several projects that have been completed and several projects that will need to be completed to ensure system reliability and resiliency.[10] These projects are in addition to the projects the Company is proposing in this docket.

Q: Do witnesses in the parallel Wyoming proceeding have concerns about constraints?

A: Yes. Wyoming OCA witness Mr. Freeman testified about constraints on other paths of the system. Mr. Freeman stated:

> Yes, the system will still be constrained west of Bridger and RMP has not proposed any transmission upgrades or expansions on that path that will relieve that constraint. It is possible that with additional capacity on path 19 [sic] RMP could displace even higher cost resources than Bridger with the new wind generation. However, the economic viability of additional transmission upgrades would have to be measured against the cost of those upgrades and account for the savings that would result from displacing higher costs [sic] resources elsewhere on the system.[11]

Q: Could the New Wind Project add to the constraints on the transmission system?

A: Yes. The Company claims the transmission system in Eastern Wyoming is already constrained as explained above and claims the new wind, re-powered wind proposed in Docket No. 17-035-39, and generation in the queue cannot be interconnected to the current transmission system without reliability issues. The Company currently manages constraints in the area by redispatching thermal resources.[12] Managing constraints in

[10] PacifiCorp's 2017 Integrated Resource Plan, Volume I, Transmission Planning, pages 72-74.
[11] Wyoming Docket No. 20000-520-EA-17, Office of Consumer Advocate, Bryce J. Freeman, Direct Testimony, November 20, 2017, page 11, at lines 15-24.
[12] Company witness, Rick A. Vail, Direct Testimony, at lines 336-339.

this way will likely make thermal resources less economic, potentially leading to stranded costs. The Division is skeptical that additional curtailments of existing thermal resources is wise. The value of the proposed projects is speculative and highly dependent on a number of future price, load, and other assumptions. The thermal assets currently being curtailed were economic when the Commission approved them. Diminishing those plants' value in the hope new projects will prove beneficial is not fully understood at this time.

Wyoming OCA witness Mr. Freeman explains in his testimony that the system is dynamic. Meaning, the Company manages the constraints and other attributes of the system to provide least cost energy to its customers. Mr. Freeman stated:

> The addition of up to 1,270 MWs of new wind in Wyoming will almost certainly create the need for further ramping and redispatch at Bridger. However, after discussing this issue with Mr. Teply of the Company, I am confident that this will actually be a benefit to customers for a couple of reasons. First, by constructing the transmission system upgrades, RMP will essentially be moving the existing transmission constraint in eastern [sic] Wyoming to Bridger. Currently, the transmission system is constrained in eastern [sic] Wyoming which means that RMP is limited to balancing its current Wyoming wind resources with resources behind that constraint.[13]

The energy produced by the current wind generation in Eastern Wyoming (including the

[13] Wyoming Docket No. 20000-520-EA-17, Office of Consumer Advocate, Bryce J. Freeman, Direct Testimony, November 20, 2017, page 10, at lines 28-29 and page 11, at lines 1-6.

re-powered wind if approved), along with energy produced by the Dave Johnston and Wyodak generation facilities, can exceed the transmission capacity in the area. The three (230 kV lines) along the TOT 4A path are part of the current constraints prohibiting additional energy export from Eastern Wyoming to the West and South. The proposed transmission will not provide enough capacity to reliably export the potential generation from the area during high-wind days. Any additional generation proposed in the future will exacerbate this condition, potentially necessitating additional projects.

Q: Could the new wind generation aid in the reliability and resiliency of the grid?

A: I am not an Engineer and therefore cannot answer with specificity. However, in general, yes. It has the potential to do so. Based on comments during the technical conference and the Company's filing, it appears that the Company is planning that the new wind generation will eventually replace thermal generation in the area as thermal facilities are retired or curtailed for wind generation.[14] The Dave Johnston and Wyodak facilities are currently being curtailed to allow wind generation capacity on the system. This creates a loss of synchronous generation and possibly loss of reliability and resiliency.

Thermal generation, e.g., the Dave Johnston and Wyodak facilities, offers synchronous inertia through the rotating mass of the generators. Synchronous inertia provides

[14]Dave Johnston is scheduled to be retired at the end of 2027. PacifiCorp 2017 IRP, Executive Summary, Existing Coal Resources, at page 7. Wyodak is anticipated to retire sometime after the current 20-year study period.

frequency and voltage control to keep the grid reliable and resilient. Synchronous inertia gives generators the capability to provide automatic generator control (AGC) to balance system voltage and frequency. Wind generation provides a small measure of this same capability (synthetic inertia). Technologies[15] available for the proposed new wind generation have some degree of AGC. However, for this technology to work, wind generators will have to be operated at less than full available capacity at given times. Reduced output is necessary so the wind generators have enough "wind head-room" or reserve energy available to provide the variable voltage support and frequency control necessary to meet variable load. In other words, wind facilities must run at lower than full capacity to preserve the remaining capacity for ramping up when needed to provide ancillary voltage and frequency services. Thus, for the new wind to supplement or replace AGC currently provided by Dave Johnston and Wyodak facilities, the wind generation will not be producing at its full capacity during times when wind generation may be needed to standby to provide ancillary services.[16] The PTCs are calculated based on energy delivered, but offer no credit for reserve capacity. This scenario could have a profound impact on PTC credits, which are a major economic driver of these projects.

Q: Can you draw conclusions from your analysis of the transmission projects?

[15] Company witness, Timothy J. Hemstreet, Docket No. 17-035-39, lines 392-424. For example, GE WindFREE™, WindCONTROL™, and WindINERTIA™.
[16] F. Diaz-Gonzalez, A. Sumper, O. Gomis-Bellmunt, (2016). Energy Storage in Power Systems. Section 3.2.2, Synthetic Inertia, pages 87-90. John Wiley & Sons, Ltd. United Kingdom.

A: Yes. The Division has sought answers to two main questions in this matter: (1) is the proposed transmission project prudent given grid reliability and resiliency considerations; or (2) is the proposed transmission project needed primarily to support the Company's economic decision to add new wind generation for PTC credits?

The Division concludes that the answer to the first question is no and the second is yes. The Division's answer to the prudency question is driven by the public interest, primarily surrounding the overall risks to customers. According to the Company, the transmission projects may improve system reliability and resilience. However, the Company has not persuaded the Division that the transmission projects are needed now in the absence of its speculative wind projects.

The Division understands that some transmission projects will likely be needed in the future to provide for a strong, resilient grid. As Dave Johnston, and other thermal resources are retired, and variable generation replaces them, upgrades to the transmission system will have to be made. What these resources might be, and when and where these resources will be needed, and their associated transmission needs, cannot yet be known with certainty.

The Division is not opposed to transmission upgrades needed to meet reliability and resiliency standards to assure a robust grid in the future. However, those upgrades have

to be in the public interest, timely, and needed for reliability and resiliency. The proposed transmission projects are not in the public interest, though necessary if the new wind projects are approved.

Q: Does this conclude your direct testimony?

A: Yes, it does.