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Opening Statement

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**Technical Conference, Managing Transmission Line Ratings, Docket No. AD19-15-000
Panel 3: Discussion of a Possible Requirement for
Transmission Owners to Implement AARs**

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Good afternoon Chairman Chatterjee, Commissioners and FERC Staff. PacifiCorp appreciates the opportunity to participate in the Commission's Technical Conference on Managing Transmission Line Ratings. PacifiCorp concurs with FERC's initiative to discuss the issues related to different methods of transmission line ratings (static, seasonal, ambient adjusted, dynamic) being used in the industry and how the use of Dynamic Line Ratings (DLR) and Ambient Adjusted Ratings (AAR) could be enhanced. Appropriately evaluated and applied DLR and AAR may be useful in alleviating congestion, increasing transfer capability and addressing reliability concerns. Particularly, with integration of renewable resources such as wind where the resource is not in the near vicinity of load, DLR or AAR could be used to address reliability concerns or congestion issues under outage conditions.

PacifiCorp has used the DLR technology in order to alleviate congestion and address reliability issues under outage conditions which in turn has increased the available transfer capability on a transmission path. This DLR system is implemented in eastern Wyoming on the Standpipe to Platte 230 kV Line, approximately 32 miles long. This DLR system measures the ambient conditions on the transmission line at three different locations, communicates the data to a central master unit, which then communicates the data to PacifiCorp's Energy Management System. Along with the ambient temperature and wind speed, the DLR system also measures tension on the line segments as well as ice loading and thickness. Based on these measurements, the DLR system calculates the dynamic line rating approximately every 10 seconds and update

the EMS system with the new ratings. Some of the potential benefits and challenges of using DLR are listed below:

Benefits:

- (1) Potential to eliminate or delay capital investment requirements by optimizing the transmission line rating and transfer capability without requiring the construction of new transmission lines.
- (2) Potential to mitigate reliability concerns (thermal overloads) under outage conditions.
- (3) Awareness of the real time conditions and true transmission line capability that could impact the reliability of the transmission system.

Challenges:

- (1) Regular maintenance of the AAR/DLR equipment
- (2) Other limiting elements such as breakers and jumpers connecting the transmission line to the substation.
- (3) Recurring costs due to technology changes and replacement of existing AAR/DLR equipment.
- (4) Malfunctioning of the AAR/DLR equipment affecting the data quality and loss of communication

Because the AAR and DLR technology bring both benefits and challenges, the benefits are best realized when specific applications are identified and the systems are evaluated and designed to maximize the benefits of the specific use case. Accordingly, transmission owners should not be required to implement AARs on all transmission lines. Transmission lines in the western interconnection in particular may go through a variety of terrain due to line lengths (several hundred miles) and the varying geography of the western United States and hence experience a variety of ambient conditions (ambient temperature, wind speed, altitude, etc.) on which the rating would be dependent. This would require ambient condition measurements across the entire line lengths at certain intervals. Also requiring transmission owners to implement AARs on

every transmission line may not be an effective use of the technology as the ratings established on some transmission lines may already be adequate either due to minimal changes in the ambient conditions throughout the year or the loading observed historically along with a future forecast.

Individual transmission owners should be given an opportunity to determine whether implementing the AAR on a particular transmission line would be beneficial to the transmission system in either alleviating congestion or enhancing the reliability of the transmission system. Requiring the transmission owners to implement AARs on every single transmission lines may result in unnecessary capital investment without the return that was expected and put additional burden on consumer rates.

The transmission owners should be allowed to determine the subset of transmission lines on which the AAR should be applied as they have access to and are in the best position to make this assessment. The planning/operational reliability analysis, historical information on congestion, causes of congestion, limiting element information, LiDAR survey results etc. could be used as criteria for determining the subset of transmission lines best suited for the AAR/ DLR application.

PacifiCorp does not operate under an RTO or ISO, but believes that there would be both benefits as well as challenges for RTO/ISO's to incorporating the AARs into their energy management systems. Widespread implementation of AARs, whether implemented under an RTO, ISO or non-RTO entity has the potential for significant communication network upgrades necessary to communicate the real time ambient conditions to the energy management system as well as the new line rating and the changes to the ATC and share that real time information to all participants and affected systems. This would be an added cost to installation and maintenance of the communication network.

Currently the tools/software used to conduct power flow analysis incorporate static ratings provided by the transmission owner. These tools currently do not have the capability of handling ambient adjusted ratings to determine varying total transfer capability (TTC) under varying ambient conditions. The seasonal TTC of a transmission system is established using these static ratings. If the TTC of a transmission system is based on a single transmission element and is limited due to thermal constraints, then the increase/decrease in the ATC of that transmission element could be proportionally used in the markets. But if the SOL of a transmission system is based on a transmission flow gate then a full TTC analysis needs to be conducted in order to determine the increase/decrease in the ATC. This is due to the fact that the impact of change in rating of one or multiple transmission elements due to AAR on the transmission flow gate is unknown until the full TTC evaluation is done.

Network transmission service and point-to-point transmission service irrespective of the bilateral markets or the RTOs/ISOs utilize the same transmission system hence both should be impacted pro-rata for the changes to ATC based on the AARs.

Due to the intermittent nature of the ambient conditions which could change significantly within an hour time frame and potentially increase or decrease the ATC in the market, AAR should only be used in markets that are operating in hourly or less time frame. Also the positive changes to the ATC should be available as a non-firm products that could be easily curtailed if necessary in light of changes to the ATC. Keeping it within an hourly or shorter market will not only help test the technology and process but also minimize the changes in the ATC due to unexpected changes in ambient conditions.

Many transmission owners currently do not have the communication network and the tools in place to accept and use an AAR data stream and automatically calculate AARs and change ratings in the real time EMS system. Significant communication networks to capture ambient conditions and calculate AARs would be required along with tools that would automatically

update the ratings in the EMS. Also expanded communication networks will be necessary to ensure that all data gathered to calculate the AARs by transmission owners is communicated to the RTO/ISO respectively. Data quality check requirements would also be needed by the RTO/ISO in order to ensure that the quality of the data received by the RTO/ISO is useable.

PacifiCorp believes that current FERC regulations/NERC standards adequately address the distribution of the transmission line rating methodology by transmission owners to entities concerned with the reliability of the interconnection and transmission system such as the Reliability Coordinators, Transmission Operators, Planning Coordinators, and Transmission Planners upon request. Through its transmission planning process, PacifiCorp continues to consider possible applications of DLR and/or AAR on its system for reliability enhancements and transmission customer needs. PacifiCorp does not see a need to revise the existing FERC regulations and NERC standards covering distribution and coordination of facilities ratings methodology as part of any effort to advance more widespread adoption of AAR and DLR.

Consideration should be given to how the protection of the thermally protected transmission lines will be handled in light of AAR/DLR (real time setting changes). Also consideration should be given to how the interconnection procedures could be modified such that a transmission provider could identify an AAR/DLR as a mitigation to a thermal constraint as part of the interconnection cost. Additional outreach with regards to the benefits and challenges of implementing AARs/DLRs involving a wide variety of stakeholders throughout the interconnection is warranted.

Thank you for the opportunity to provide comments on this important issue of Managing Transmission Line Ratings. I would be happy to answer any questions that you may have.