**Federal Energy Regulatory Commission**

**Technical Conference: Managing Transmission Line Ratings**

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**Remarks of Brett Wangen, GridSME,**

**on behalf of the**

**Western Interconnection Regional Advisory Body (WIRAB)**

## Introduction

My name is Brett Wangen. I am Vice President of Power System Services for Grid Subject Matter Experts, but I am here today on behalf of the Western Interconnection Regional Advisory Body (WIRAB). WIRAB has been very active in this space because the West has historically operated in a very conservative manner, using planning and outage coordination processes to determine static limits that may or may not be accurate for use in real-time operations. WIRAB sponsored a report in 2015 that presented a path forward to improve how the transmission system is utilized by maximizing the use of real-time data in the calculation of Total Transfer Capabilities (TTC) and System Operating Limits (SOL). Similar to this effort to improve the use of Facility Ratings, the objective of the 2015 report was to improve the quality of TTC and SOL calculations by maximizing the use of the most recent information available – topology, scheduled outages, generation and load levels, PMUs, etc. Having real-time Facility Ratings based on expected or actual real-time conditions is a valuable input whether it be for TTC calculations, operations planning studies, or real-time operations.

## Western Interconnection Experience with AARs and DLRs

The Reliability Coordinators (RC) in the West look to the Transmission Owner (TO) and the Transmission Operators (TOP) to communicate both Facility Ratings (as required by FAC-008-3) and System Operating Limits (as required by FAC-014-2). Those Facility Ratings and SOLs are then applied to reliability models and used as part of the RCs Outage Coordination, Operations Planning, and Real-time Assessment activities. If a pre- or post-Contingency exceedance is detected during any of those study processes, only then will the limit(s) being used be reviewed and validated by the operations personnel reviewing the exceedance. Figure 1 depicts the process used by the TO to determine and communicate AARs and DLRs in real-time to their RC/RTO/ISO.

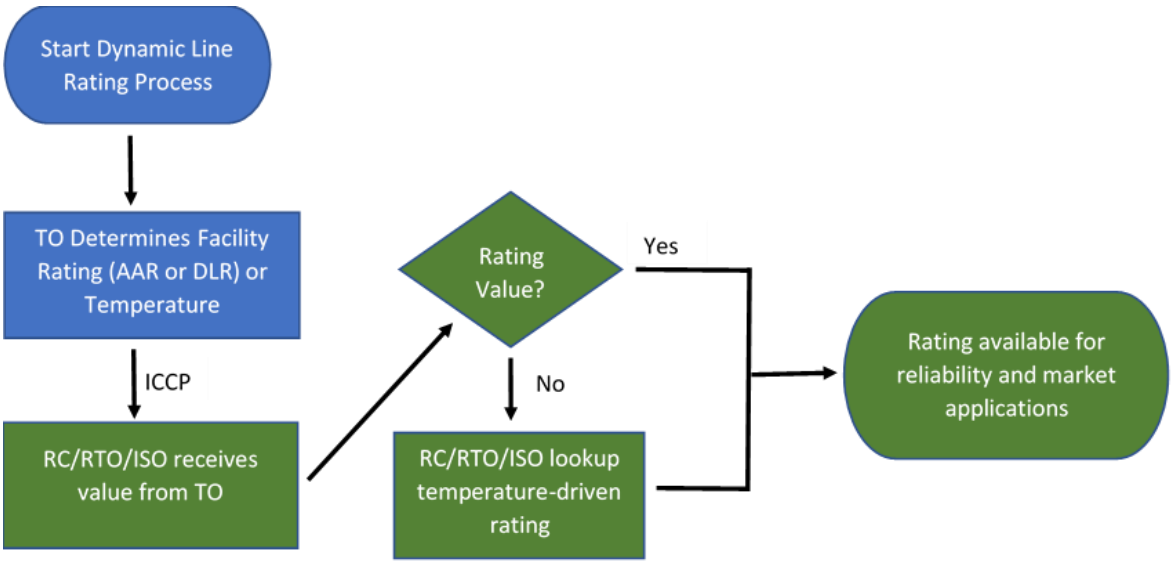


Figure 1. DLR and AAR Communication to the RC/RTO/ISO

The integration of Ambient-Adjusted Ratings (AAR) and Dynamic Line Ratings (DLR) calculated ratings are commonly supported by Energy Management Systems (EMS) and their advanced applications. The integration of those ratings into the EMS does typically require a special application to interpret the values provided by the TOP. The DLRs and AARs can be wholly calculated on the TO or TOP end and sent as an analog value via Inter-Control Center Communications Protocol (ICCP), or in the case of AARs can include the implementation of a temperature-driven rating lookup table along with the appropriate real-time temperature value(s) sent via ICCP.

In the Western Interconnection, there are roughly 14,000 transmission line segments that are monitored by Reliability Coordinators (based on Peak Reliability's network model). With the large number of transmission lines, only a small percentage – 1,300 or just over 9% - have AARs available for use in RC real-time applications. Western Interconnection RCs are focused on the reliability of the BES and use the available AARs for the purpose of reliability monitoring. Having the TOP provide the limits essentially in real-time is a great value to the RCs and ensures that the most accurate limit possible is being used. Having and using the same Facility Ratings aids significantly in RC to TOP conversations when problems are being addressed on the BES in real-time operations.

A related and equally important component of utilizing dynamic ratings is to ensure that the provided ratings represent the most limiting element within the Facility. For example, if a ring bus is opened and now a transmission line is limited by a single breaker rather than the transmission line itself, that topology driven limitation now becomes the transmission line rating. Recognizing the topology change and adjusting the ratings appropriately is critical to maintaining BES reliability.

## Remaining Western Issues

As previously described, there are some uses of primarily AARs in the Western Interconnection. Unfortunately, the vast majority of TOs still use outdated and inefficient Facility rating practices that leaves it to real-time operations personnel to sort out issues as they are observed in real-time. Many TOs still provide to the TOP and RC the most conservative seasonally adjusted ratings possible that are designed for a traditional maximum temperature, low wind type of conditions. If pre- or post-

Contingency thermal issues are then observed, it is up to the Reliability Coordinators and the Transmission Operators to discuss the situation and review the current ratings. Normally, this situation is resolved by the TO providing a more accurate transmission line rating for the current system and ambient conditions. All of the real-time coordination to adjust transmission line limits may result in human errors and delays, all that have the potential to negatively impact reliability and market costs.

## Summary and Next Steps

Having accurate and timely data is critical to improving grid reliability and energy market quality. DLR and AAR implementation are very achievable goals for the industry and would help improve both reliability and market processes.

WIRAB believes that it is important to take incremental next steps to move in the direction of further AAR and DLR implementation and adoption in the West. WIRAB urges FERC to direct NERC and the regions, WECC specifically, to conduct reliability assessments, in 2020, evaluating the reliability benefits, barriers, and direct costs to implementing ARR/DLR processes in real-time operations to improve reliability. WIRAB further encourages Western RCs to consider fee structures and other available options to incent the adoption of AARs and DLRs in the Western Interconnection.