

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Managing Transmission Line Ratings

Docket No. AD19-15-000

**COMMENTS OF
THE NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION**

The National Rural Electric Cooperative Association (NRECA) appreciates this opportunity to submit comments addressing issues discussed at the technical conference in this proceeding and what Commission action on transmission line ratings and related practices may be appropriate.¹ NRECA submits these comments to provide the broad perspective of its member cooperatives on these issues. Individual cooperatives may file comments reflecting their specific views and experiences.

INTEREST OF NRECA

NRECA represents nearly 900 local electric cooperatives operating in 48 states. America's electric cooperatives power over 20 million businesses, homes, schools, and farms across 56 percent of the nation's landmass and serve one in eight (42 million) consumers. In total, cooperatives generate about five percent of the nation's electricity and sell about 13% of the electricity delivered to the nation's consumers.²

NRECA's member cooperatives include 62 generation and transmission (G&T) cooperatives and 831 distribution cooperatives. The G&T cooperatives generate,

¹ See Notice Inviting Post-Technical Conference Comments (Oct. 2, 2019).

² See <https://www.electric.coop/electric-co-op-facts-figures-2019/>. With the addition of Block Island Utility District to NRECA membership in 2019, NRECA's members are in 48 states. See <https://www.electric.coop/block-island-utility-district-nreca-rhode-island-electric-cooperative/>

purchase, and transmit power to distribution cooperatives that provide it to the end-of-the-line cooperative consumer-members. Collectively, G&T cooperatives provide power to nearly 80 percent of the nation's distribution cooperatives. The remaining distribution cooperatives receive power from other generation sources within the electric sector. Both distribution and G&T cooperatives share an obligation to serve their members by providing safe, reliable, and affordable electric service.

Cooperatives own and maintain 2.6 million miles, or 42 percent, of the nation's electric transmission and distribution lines (including over 44,000 miles of transmission lines). Cooperatives serve an average of eight consumers per mile of line and collect annual revenue of approximately \$19,000 per mile. Other utility sectors combined average 32 customers and \$79,000 in annual revenue per mile.³

The interest of NRECA in this proceeding arises from its member cooperatives' status as transmission owners, transmission operators, and transmission customers, both in regions served by Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs) and in other regions.

COMMENTS

A. The Commission should maintain a focus on benefits to consumers and reliability of service.

Improvements in the management of transmission line ratings is a means to an end: better electric service at lower costs for consumers. Therefore, Commission action in this area will be appropriate if it will reduce the cost of delivered power to load-serving

³ <https://www.cooperative.com/programs-services/bts/Documents/Data/Electric-Co-op-Factsheet-Update-February-2019.pdf>

entities and end-use consumers while maintaining or improving the reliability of the Bulk Electric System (BES).

The Commission should consider all the ramifications of more aggressively rating transmission facilities with ambient-adjusted ratings (AARs) or dynamic line ratings (DLRs). At a minimum, transmission line ratings must be established and implemented in ways that are consistent with public safety and that ensure the BES is planned and operated in compliance with North American Electric Reliability Corporation (NERC) Reliability Standards, including the Critical Infrastructure Protection Standards.⁴ Steps to lower congestion costs in the wholesale electricity markets should not be done to the detriment of BES reliability. As history has shown, inaccurate facility ratings can create reliability problems.⁵ Transmission engineers should continue to rate facilities conservatively to provide a safety and reliability margin to account for unanticipated conditions and all the physics that is not considered due to simplifications that must be made in the design process.⁶ Cooperatives are not opposed to the use of AAR and DLRs in operations where there are consumer benefits to be gained, but safety and reliability should remain the foremost considerations.

Accordingly, NRECA supports a reasoned approach to implementing changes in the management of transmission line ratings. Before taking any action in this area, the Commission should carefully investigate and assess all aspects of how transmission line

⁴ See Statement of Dennis D. Kramer on Behalf of MISO Transmission Owners at 1 (Sept. 10, 2019) (line ratings must “Maintain public and employee safety” and “Ensure the [BES] is operated and designed in compliance with NERC standards”); Tr. 145 (Kramer).

⁵ Prepared Remarks of Howard L. Gugel on Behalf of NERC (Sept. 10, 2019); Tr. 91 (Gugel).

⁶ Prepared Remarks of Howard L. Gugel at 3 (“An adequate capacity safety margin is essential to ensuring that the bulk power system does operate in an unknown state. This was a key finding in the investigation of the 2003 blackout”); Tr. 95 (Gugel).

ratings are established and used in planning and operations. The technical conference in this proceeding is a good first step. NRECA and its members appreciate the measured approach to Commission action that this proceeding represents.

B. The Commission should not mandate the use of AARs or DLRs.

NRECA does not support new, blanket requirements for all transmission owners to adopt new transmission line ratings and rating methodologies for all transmission lines. Participants at the technical conference recommended against one-size-fits-all requirements for transmission line ratings and ratings methodologies.⁷ Similarly, technical conference participants explained why it would be wasteful and not cost-effective to require AARs or DLRs on all transmission lines.⁸ In general, cooperatives support using AARs and DLRs only on facilities that are congested, and where their use makes sense based on the circuit in question.

Cooperative transmission owners have used this reasonable approach in implementing forms of AAR or DLR today to help them provide safe, affordable, reliable

⁷ Statement of Dennis D. Kramer at 2 (Sept. 10, 2019) (“There is no one-size-fits-all path forward, and the Commission should recognize that the differences in how the transmission system has developed over time because of unique topology, specific system requirements, and differing environmental conditions.”); Opening Statement of Michelle Bourg at 3 (Sept. 10, 2019) (“Entergy believes there is no one-size-fits all approach to the calculation of transmission facility ratings.”); Prepared Remarks of J.T. Smith on behalf of Midcontinent Independent System Operator, Inc., at 3 (Sept. 11, 2019) (“It is not likely that a one size fits all approach to the use of AARs and DLRs would serve customers best, but rather MISO suggests the continued study of opportunities to use AAR[s] and DLRs, as is happening in the MISO region already.”); Tr. 148, 215, 291 (Kramer); Tr. 160, 213, 294 (Bourg); Tr. (216) (Rikin Shah).

⁸ Opening Statement of Rikin Shah on Behalf of PacifiCorp at 2, 3 (Sept. 10, 2019) (“[T]ransmission owners should not be required to implement AARs on all transmission lines... 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 through the year or the loading historically along with a future forecast. ... Requiring the transmission owners to implement AARs on every single transmission line[] may result in unnecessary capital investment ... and put additional burden on consumer rates.”); Opening Statement of Dennis D. Kramer at 2 (“[I]t is important that any implementation of AAR be focused on transmission lines where it can provide the most benefit. For AARs to be cost-effectively implemented, methods must be developed to identify candidate transmission lines and evaluate the benefit that AARs may provide compared to the implementation cost.”); Tr. 147 (Kramer); Tr. 163–65 (Shah).

service to their member-consumers. Thus, one NRECA member G&T cooperative reports that it has implemented dynamic line ratings based on established IEEE criteria for ambient temperature. But it has chosen not to use other criteria that could affect ratings, such as wind speed or cloud cover, because they are not as easily implemented and not as stable or predictable as ambient temperature adjustments.⁹ After years of using temperature-adjusted limits, the cooperative has found the process to be efficient and economical, without posing risk to equipment, safety, or reliability.

Another G&T cooperative reports that it uses criteria akin to DLR on wind farm outlet lines of moderate length, where high loading on the line is coincident with high output from the wind farm, indicating high winds and therefore effective cooling of the conductor. The cooperative does not adjust the ratings in real time, but rather assumes a higher wind level when establishing ratings.¹⁰

The key point is that transmission-owning cooperatives have had the flexibility to balance the costs and benefits of implementing these rating methods and employing new technologies in their own planning and operations and to adopt the measures that work best for their member-consumers. With expected technological progress in sensors and communications technologies, this cost/benefit analysis can be expected to change, and NRECA expects the use of these technologies by cooperatives will continue to grow.¹¹

⁹ For a similar view, see Opening Statement of Michelle Bourg at 1 (“Entergy has found that ambient temperature rating adjustments are the most predictable and efficient to implement. Entergy does not adjust any transmission facility ratings based on projected or actual wind conditions.”)

¹⁰ See also Tr. 14 (T. Bruce Tsuchida) (“Now, as an example of the benefit of dynamic line rating is that the high wind can actually lead to a higher cooling effect which means you can potentially send more power to a given overhead line. This is very beneficial, especially in the Midwest when there’s a lot – where there’s a lot of wind being developed, because when there’s strong wind the wind turbines are producing more power, and you want more transfer capability on the line.”).

¹¹ The Commission could consider approving limited, voluntary pilot projects to obtain better information on the implementation costs and operational benefits of AARs and DLRs.

A one-size-fits-all approach to AARs and DLRs poses a distinct risk to cooperatives (both as transmission owners or operators and as transmission customers) given their rural service areas and the long distances of the transmission lines serving rural distribution cooperatives, especially in Western states. It can be expensive to implement AARs or DLRs on a long transmission line, since ambient conditions (wind, temperature, precipitation, solar irradiation) will vary by location. With many varying conditions occurring over a long transmission line, implementation may be challenging, particularly on days when weather fronts are moving through. The discussion at the technical conference noted these implementation difficulties.¹² An across-the-board requirement for transmission owners to use AARs or DLRs likely would increase transmission costs disproportionately for rural consumers. Accordingly, NRECA strongly urges against such nationwide standards.

C. The Commission should not preempt industry discussions with overly prescriptive rules on the transparency of transmission line rating methodologies.

In general, cooperatives are not opposed to industry discussion of reasonable measures to improve the transparency of transmission line rating methodologies, recognizing that any such measures must be consistent with CIP Standards and Critical Electric/Energy Infrastructure Information (CEII) requirements. But NRECA does not

¹² Opening Statement of Rikin Shah at 2 (“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.”); Tr. 180 (Kramer) (“Some areas have better monitoring facilities and better forecasting capabilities than others, some of those are better and like I said just because you're near a zone of urban area, as opposed to very remote, and very rural where [there] may not be the temperature sensors.”); Tr. (Brett Wangen) (“In the West, in particular, you'll have wind in Wyoming that's going to end up in California. And in some of these transmission lines are extremely long and so, to try to equate an amount of wind at the source to a facility rating on that transmission line or segments of lines, would be difficult just because of the length of the lines.”).

believe that the Commission should require all RTOs and ISOs to develop and maintain comprehensive databases to document the limiting element of all transmission circuits and facilities in their regions.¹³ The benefit to consumers, in the form of improved line ratings and improved transmission planning and operations, from maintaining such centralized databases of all limiting elements is unclear. Cooperative and other transmission owners and operators are held accountable for their ratings methodology and transmission ratings through compliance with NERC Reliability Standard FAC-008-3. Any changes to that regime should be addressed through the NERC standards development process.

CONCLUSION

NRECA requests that the Commission take account of cooperatives' perspectives as discussed above in deciding what Commission action in this area is appropriate.

Respectfully submitted,

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¹³ Notice Inviting Post-Technical Conference Comments, Question 4.b.