

**UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION**

Managing Transmission Line Ratings

)

Docket No. RM20-16-000

**JOINT COMMENTS OF  
THE AMERICAN FOREST & PAPER ASSOCIATION,  
THE COALITION OF MISO TRANSMISSION CUSTOMERS,  
THE ELECTRICITY CONSUMERS RESOURCE COUNCIL,  
THE INDUSTRIAL ENERGY CONSUMERS OF AMERICA, AND  
THE PJM INDUSTRIAL CUSTOMER COALITION**

March 22, 2021

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The American Forest & Paper Association (“AF&PA”), the Coalition of MISO Transmission Customers (“CMTC”), the Electricity Consumers Resource Council (“ELCON”), the Industrial Energy Consumers of America (“IECA”), and the PJM Industrial Customer Coalition (“PJMICC”) (collectively, “Industrial Customer Organizations”) welcome the opportunity to submit these Comments in response to the Federal Energy Regulatory Commission’s (“Commission” or “FERC”) Notice of Proposed Rulemaking (“NOPR”) on managing transmission line ratings in the above-referenced docket.<sup>1</sup> The Industrial Customer Organizations strongly support the use of ambient-adjusted ratings (“AAR”) and dynamic line ratings (“DLR”) as a requirement for transmission owners in FERC-regulated Regional Transmission Organizations (“RTOs”) and Independent System Operators (“ISOs”), and urge the

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<sup>1</sup> *Managing Transmission Line Ratings, Notice of Proposed Rulemaking*, 173 FERC ¶ 61,165 (2020) (“NOPR”). See also *Notice of Proposed Rulemaking, Managing Transmission Line Ratings*, Docket No. RM20-15-000, 86 Fed. Reg. 6420 (Jan. 21, 2021) (setting March 22, 2021 as the due date for comments).

Commission in a Final Rule to expand the applicability of such requirements to all public utilities in all areas of the nation. Requiring the use of AARs and DLRs is a positive step toward enabling grid operators to measure and to make transparent the optimal physical capacity of electric transmission circuits so that grid operators, market participants, and other stakeholders may make informed decisions about planning and system operations. Additionally, the Final Rule should require greater transparency and openness with the methodologies that are used to calculate AARs, DLRs, and all other types of transmission line ratings.

## **I. DESCRIPTION OF THE INDUSTRIAL CUSTOMER ORGANIZATIONS**

AF&PA serves to advance a sustainable U.S. pulp, paper, packaging, tissue, and wood products manufacturing industry through fact-based public policy and marketplace advocacy. AF&PA member companies make products essential for everyday life from renewable and recyclable resources and are committed to continuous improvement through the industry's sustainability initiative – *Better Practices, Better Planet 2020*. The forest products industry accounts for approximately 4% of the total U.S. manufacturing GDP, manufactures over \$200 billion in products annually, and employs approximately 900,000 men and women. The industry meets a payroll of approximately \$50 billion annually and is among the top 10 manufacturing sector employers in 45 states. AF&PA member companies purchase a significant amount of electricity in Commission-regulated markets, and have observed transmission charges as a growing portion of their total charges for electricity.

CMTC is a continuing *ad hoc* association of large industrial and commercial end-users of electricity in the Midwest operated to represent the interests of industrial energy consumers before regulatory and legislative bodies. CMTC has participated in the Midcontinent Independent System Operator, Inc. (“MISO”) market/transmission issues since the inception of CMTC more than 20

years ago. CMTC member companies pay transmission rates that are assessed by MISO transmission owners. Some CMTC member facilities are assessed transmission charges as a separate, stand-alone charge on invoices assessed by market suppliers. Other CMTC facilities pay for transmission charges on a bundled basis, as a component of retail electricity charges that also included charges for generation and distribution service.

ELCON is the national association representing large industrial consumers of electricity. ELCON member companies create a wide range of products from virtually every segment of the manufacturing community— ELCON members own and operate hundreds of major facilities and are significant consumers of electricity in the footprints of all organized markets and other regions throughout the United States. Reliable electricity supply at just and reasonable rates is essential to our members' operations. ELCON members' business operations rely upon the transmission of electricity by FERC-jurisdictional utilities. Accordingly, any changes to the Commission's transmission line ratings policy will have a direct financial impact on ELCON members.

IECA is a nonpartisan association of leading manufacturing companies with \$1.1 trillion in annual sales, over 4,400 facilities nationwide, and more than 1.8 million employees. IECA is an organization created to promote the interests of manufacturing companies through advocacy and collaboration for which the availability, use and cost of energy, power or feedstock play a significant role in IECA members' ability to compete in domestic and world markets. IECA members represent a diverse set of industries including chemical, plastics, steel, iron ore, aluminum, paper, food processing, fertilizer, insulation, glass, industrial gases, pharmaceutical, building products, automotive, independent oil refining, and cement. Like AF&PA, IECA member companies purchase a significant amount of electricity in Commission-regulated markets, and have observed transmission charges as a growing portion of their total charges for electricity.

PJMICC is a continuing *ad hoc* association of large industrial and commercial end-users of electricity in the PJM Interconnection, L.L.C. (“PJM”) region operated for the purposes of representing the interests of large energy consumers. PJMICC member companies pay transmission rates that are assessed by PJM transmission owners, and have observed transmission charges as a growing portion of their total charges for electricity.

## **II. EXECUTIVE SUMMARY**

The Industrial Customer Organizations support and applaud the Commission’s NOPR as a critical first step to ensuring more accurate transmission line ratings and preventing unjust and unreasonable rates caused by the sub-optimization of FERC-jurisdictional transmission facilities. An accurate assessment of the full functional range of transmission facilities is required for planning as well as safe and reliable operation. Inaccurate and understated transmission line ratings may result in unjust and unreasonable rates in several ways, including:

- Understated transmission line ratings increase transmission congestion, which increases costs to consumers and, in some areas of the country, may lead to transmission line-loading relief events (*i.e.*, service curtailments).
- In regions where transmission owners also own generation, transmission owners have a profit incentive to understate transmission line ratings to benefit their affiliated generation. While documenting actual occurrences is particularly difficult for consumers (due to the lack of transparency of line ratings methodologies and the lack of accountable auditability of line ratings), overly conservative transmission line ratings could benefit local generation by imposing an unnecessary limit on power flows into the area where the generation is located, thus increasing energy, capacity, and ancillary service prices. Requiring optimization of transmission ratings, and transparency in methods used to calculate such ratings, would help align utility practice with the interests of consumers.
- Understated transmission line ratings create an illusory need for transmission upgrades, which, in turn, “justifies” transmission owners’ additions to rate base. Under a static analysis of line capacity, a facility rating deficit of just one megavolt ampere (“MVA”) could trigger substantial transmission investment.

While the NOPR seeks enhanced transparency and greater accuracy for transmission line ratings, the Industrial Customer Organizations respectfully submit that the NOPR does not go nearly far enough toward ensuring just and reasonable rates and efficient transmission planning. The NOPR proposes to require transmission owners to implement AARs under a scheduled timeframe and would require RTO/ISOs to establish procedures necessary to allow transmission owners to electronically update transmission line ratings at least hourly. Notably, however, the NOPR stops short of requiring implementation of DLRs. As recognized in the NOPR, DLRs may be more accurate than AARs because DLRs are based not only on ambient air temperature but also on other weather conditions such as wind, cloud cover, solar irradiance intensity, precipitation, and transmission line conditions such as tension or sag.<sup>2</sup> A Final Rule should require the implementation of DLRs unless transmission owners can establish that the cost of implementing DLRs would exceed DLR-related benefits to consumers (via lower transmission rates and energy, capacity, and ancillary service prices). In almost all cases, the cost of installing DLRs pales in comparison to the benefits of reducing congestion, minimizing energy and capacity costs, and reducing the need for investment in new transmission system capability.

Importantly, the NOPR proposes greater transparency for transmission line ratings and methodologies by requiring transmission owners to make such information available to RTO/ISOs and market monitors. However, transmission line ratings and associated methodologies should be publicly available or, at a minimum, easily accessible by customers and other stakeholders (such as state commissions and reliability organizations) to allow interested parties to review and audit transmission line rating methodologies, assumptions, and values. Publishing line rating methodologies would improve accountability; reduce transmission owners' incentives to minimize

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<sup>2</sup> See NOPR at ¶ 100.

or understate transmission line ratings; and enable customers, state regulators, and other stakeholders to monitor for and challenge inaccurate, understated ratings.

Finally, the Commission's proposed enhancements to line ratings and their associated methodologies should not be limited to RTO/ISO regions, but should extend to all areas of the country to ensure the optimization of the capability of the nation's existing transmission facilities and infrastructure. Transmission line ratings are calculated for all transmission facilities under the Commission's jurisdiction; they are not limited to transmission facilities in RTO/ISO regions. Any Final Rule should not unduly discriminate against, or disadvantage, consumers located outside of RTO/ISO regions by limiting enhancements to transmission line ratings approaches just to RTO/ISO regions. Moreover, by applying additional requirements only on transmission owners that participate in RTOs/ISOs, the Commission is creating a marked regulatory disparity between RTO/ISO regions and non-RTO/ISO regions that results in a disincentive for transmission owners to join an RTO/ISO. The Final Rule should apply to all regions, not just to RTO/ISO regions.

### **III. INTRODUCTION AND BACKGROUND**

#### **1. The FERC Technical Conference in Docket No. AD19-15-000**

On September 10-11, 2019, FERC held a Technical Conference to discuss issues related to transmission line ratings, focusing on DLRs and AARs. In a whitepaper published in August 2019,<sup>3</sup> FERC Staff explained that transmission line ratings, as determined by transmission owners, directly affect the volumes of permissible flows on electric power systems, the price of electric power, and the reliability of the electric grid. FERC Staff also explained that improving

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<sup>3</sup> See "Managing Transmission Line Ratings," Docket No. AD19-15-000 (Aug. 23, 2019) ("FERC Staff Paper").

methodologies and practices for determining line ratings “could reduce costs, increase efficiency, and provide reliability.”<sup>4</sup>

In late 2019, parties filed initial comments and reply comments to questions raised by FERC Staff at the September 10-11, 2019 Technical Conference. Many commenters – including consumer-oriented groups, certain independent market monitors, certain RTOs/ISOs, and stakeholders with a vested interest in deploying new transmission ratings and associated technologies – stressed the importance of requiring transmission owners to use dynamic and ambient-adjusted ratings, and to be more transparent with their transmission line ratings and associated methodologies. Many incumbent transmission owners largely opposed transmission line ratings reforms, especially the use of DLRs and the public disclosure of their line ratings methodologies and assumptions.

## **2. The Notice of Proposed Rulemaking in Docket No. RM20-16-000**

On November 19, 2020, FERC issued the NOPR, seeking to improve the accuracy and transparency of transmission line ratings by requiring transmission providers to implement AARs on their transmission lines. The NOPR proposes to require RTOs and ISOs to establish procedures to allow transmission owners to electronically update transmission line ratings at least hourly. The NOPR proposes to require transmission owners to share transmission line ratings and associated methodologies with transmission providers (*i.e.*, RTOs/ISOs) and market monitors (if applicable).

Currently, line ratings are often calculated for normal and emergency periods using assumptions about ambient or seasonal conditions that do not accurately reflect the near-term conditions impacting transfer capability of the transmission system. Therefore, FERC proposes

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<sup>4</sup> FERC Staff Paper at 1.

two requirements to increase the use of AARs that incorporate near-term forecasted ambient air temperatures. FERC proposes that transmission providers use AARs as the basis for:

- 1) evaluating transmission service requests that will end within 10 days of the request; and
- 2) determining certain curtailment, interruption, or redispatch of transmission service that is anticipated to occur within those 10 days.

In contrast to those short-term requests, FERC proposes that transmission providers use seasonal line ratings as the basis for evaluating longer-term requests for transmission service and for determining the need for certain curtailment, interruption, or redispatch of transmission service that is anticipated to occur more than 10 days in the future.

In proposing the use of AARs, FERC proposed defining transmission line ratings as the maximum transfer capability of a transmission line, computed in accordance with a written line rating methodology and consistent with Good Utility Practice, in light of technical limitations (*e.g.*, thermal flow limits) on conductors and relevant transmission equipment (*e.g.*, circuit breakers, line traps, and transformers) and Transmission System limitations (*e.g.*, system voltage and stability limits). FERC proposed prioritizing the use of AARs on historically congested transmission lines within one year from the date of the compliance filing for implementation to any final rule, and proposed requiring implementation of AARs on all other lines within two years from the date of the compliance filing for implementation of any final rule.

In the NOPR, FERC also explained that DLRs may be more accurate than AARs because DLRs are based not only on ambient air temperature but also on other weather conditions such as wind, cloud cover, solar irradiance intensity, precipitation, and transmission line conditions such as tension or sag. In light of the limited existing use of DLRs by RTOs/ISOs, FERC proposed requiring RTOs/ISOs to implement the systems and procedures necessary to allow transmission owners to electronically update transmission line ratings on an hourly basis.

FERC explained that its proposed line ratings reforms apply to normal (pre-contingency) operations; however, FERC seeks comments from stakeholders on whether RTOs/ISOs should implement unique emergency ratings for use during post-contingency operations.

FERC preliminarily found that the present lack of transparency into transmission line ratings and associated methodologies may result in unjust and unreasonable rates. Therefore, FERC proposed requiring transmission owners to share their line ratings methodologies with their respective RTO/ISO and market monitor (but not with other entities). FERC sought comment on whether such methodologies should be shared with other transmission providers and interested stakeholders, upon request.

### **3. MISO Transmission Line Ratings Workshop – January 15, 2021**

On January 15, 2021, MISO conducted a transmission line ratings workshop to: explain how transmission line ratings are implemented in MISO; discuss industry standards, best practices, and considerations; and discuss policy developments, including the NOPR.<sup>5</sup> During the workshop, MISO explained that its Energy Management System currently supports multiple ratings with a superseding hierarchy and that ratings refresh every ten minutes.<sup>6</sup>

### **4. Recent PJM Actions and Planned Implementation of DLRs**

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<sup>5</sup> See “Transmission Line Ratings Workshop – January 15, 2021,” MISO, available at [Transmission Line Ratings Workshop - January 15, 2021 \(misoenergy.org\)](https://www.misoenergy.org/Transmission-Line-Ratings-Workshop-January-15-2021) last accessed Mar. 22, 2021). Presentation materials and a recording of the workshop is available on MISO’s website.

<sup>6</sup> See “Review of MISO’s Rating Process,” MISO, at Slide 11, available at [Review of MISO’s Rating Process \(misoenergy.org\)](https://www.misoenergy.org/Review-of-MISOs-Rating-Process) (last accessed Mar. 22, 2021) (“January 2021 Presentation on MISO’s Rating Process”). MISO did explain that it is “agnostic” as to the source of the rating and will defer to the rating determinations of the MISO transmission owners. *Id.* at Slides 7, 11

During its Emerging Technologies Forum on November 13, 2020, PJM staff explained that DLRs are an existing feature in PJM’s Energy Management System, and that DLR Supervisory Control and Data Acquisition (“SCADA”) points may be transmitted to PJM.<sup>7</sup>

In January 2020, PPL Electric Utilities (“PPL”) presented at a number of PJM stakeholder meetings about placing DLRs in service on two 230 kV transmission lines: the Susquehanna-Harwood and Juniata-Cumberland lines.<sup>8</sup> The Susquehanna-Harwood and Juniata-Cumberland lines are in the 2020 Top 10 Congested Facilities in PJM (#8 and #10, respectively) and together were responsible for approximately \$30 million in congestion costs.<sup>9</sup> As a result of implementing DLRs on those lines, PPL expects an average increase of almost 30% in the capacity of those lines.<sup>10</sup> PJM is targeting a go-live implementation date of June 1, 2021 for those DLRs.<sup>11</sup>

PJM Planning staff also presented on the consideration of ratings in the Market Efficiency process.<sup>12</sup> As contrasted with the more typical planning process that provides for upgrades based only on projected violations to established reliability criteria, the market efficiency process would

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<sup>7</sup> See “Dynamic Line Ratings – Impacts to PJM”, PJM, Slide 4, *available at* [20201113-item-03c-dlr-impacts.ashx \(pjm.com\)](https://www.pjm.com/20201113-item-03c-dlr-impacts.ashx) (last accessed Mar. 22, 2021) (“PJM November 2020 DLR Presentation”). PJM plans to develop a DLR desk reference guide for use by control room staff. *Id.* at Slide 8.

<sup>8</sup> See “Dynamic Line Ratings Strategy,” PPL Electric Utilities, *available at* [20210113-item-12-ppl-dynamic-line-ratings.ashx \(pjm.com\)](https://www.pjm.com/20210113-item-12-ppl-dynamic-line-ratings.ashx) (last accessed Mar. 22, 2021) (“PPL January 2020 Presentation”).

<sup>9</sup> 2020 Top 10 Congested Facilities - PJM Presentation: Markets Report, Slide 52, PJM Members Committee Webinar, January 2021, *available at* [20210125-item-07a-markets-report.ashx \(pjm.com\)](https://www.pjm.com/20210125-item-07a-markets-report.ashx) (last accessed Mar. 22, 2021) (“PJM 2020 Top 10 Congested Facilities”). The \$30 million amount is approximate amount based on viewing the chart on Slide 52.

<sup>10</sup> PPL January 2020 Presentation at Slide 6.

<sup>11</sup> PJM November 2020 DLR Presentation at Slide 7.

<sup>12</sup> See “Market Efficiency Planning Process: Modeling Dynamic Line Ratings,” PJM Emerging Technologies Forum, *available at* [20210111-item-03-dlr-market-efficiency.ashx \(pjm.com\)](https://www.pjm.com/20210111-item-03-dlr-market-efficiency.ashx) (last accessed Mar. 22, 2021).

address congestion issues on the transmission grid and remove economic bottlenecks that cause congestion in the PJM-administered energy market.<sup>13</sup>

Finally, PJM has scheduled a Special Education Session in the PJM Operating Committee on DLRs for March 30, 2021.<sup>14</sup>

#### IV. COMMENTS

##### 1. **Inaccurate Transmission Line Ratings and a Lack of Transparency Result in Unjust And Unreasonable Rates.**

The NOPR correctly found that transmission line ratings and associated rules directly affect the cost of wholesale energy, capacity, and ancillary services, and the cost of delivering wholesale energy to transmission customers.<sup>15</sup> The NOPR explained that most transmission owners use seasonal or static transmission line ratings/methodologies that are based on conservative, worst-case assumptions about long-term conditions, such as the expected high temperatures that could occur over the longer term.<sup>16</sup> The NOPR further explained that transmission providers and planning authorities “utilize conservative long-term assumptions in the long-term transmission planning horizon and the near-term transmission planning horizon.”<sup>17</sup> The NOPR concluded that while such conservative assumptions may be appropriate in the planning context, the line ratings “often do not reflect the true near-term transfer capability of transmission facilities as relevant to the availability of, and arrangement for, point-to-point transmission service” and thereby “fail to

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<sup>13</sup> See *id.*

<sup>14</sup> See “Dynamic Line Ratings Update,” PJM Operating Committees, available at [20210211-item-12-dynamic-line-ratings-update.ashx \(pjm.com\)](https://www.pjm.com/20210211-item-12-dynamic-line-ratings-update.ashx) (last accessed Mar. 22, 2021) (“Dynamic Line Ratings Update”).

<sup>15</sup> NOPR at ¶ 38.

<sup>16</sup> NOPR at ¶ 39.

<sup>17</sup> NOPR at ¶ 39, fn. 55.

reflect the true cost of delivering wholesale energy to transmission customers.”<sup>18</sup> The NOPR further found that, in RTO/ISO markets, line ratings determine the physical capacity and power flow over the lines, affect the dispatch and unit commitment computations by grid operators by constraining power flows on individual transmission facilities, and impact congestion costs that are reflected in locational marginal prices (“LMPs”).<sup>19</sup> There should be no dispute that transmission line ratings are a “practice” that directly impacts FERC-jurisdictional rates under the Federal Power Act (“FPA”). Under the FPA, the Commission is required to oversee all FERC-jurisdictional rates and all rules and practices affecting such rates. FERC’s decision to institute requirements for transmission line ratings is fully consistent with FERC’s authority and obligations under the FPA.

As to the use of AARs, the NOPR rightly found that using near-term forecasts of ambient air temperatures in line ratings “would result in more accurately reflecting the actual cost of delivering wholesale energy to transmission customers.”<sup>20</sup> Reflecting actual ambient temperatures in line ratings, rather than reflecting static temperature assumptions, tends to increase the transfer capability of transmission circuits and, therefore, reduces congestion costs by enabling grid operators to import less expensive power into previously “constrained” areas.<sup>21</sup> Potomac Economics, MISO’s market monitor, found that the implementation of AARs by those not already doing so would have produced approximately \$78 million and \$94 million in reduced congestion

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<sup>18</sup> NOPR at ¶ 39.

<sup>19</sup> NOPR at ¶ 40; *see* Speaker Comments of T.B. Tsuchida, The Brattle Group, Docket AD19-15 (Sep. 10-11).

<sup>20</sup> NOPR at ¶ 41.

<sup>21</sup> NOPR at ¶ 41.

costs in 2017 and in 2018, respectively, in MISO alone.<sup>22</sup> MISO agrees that significant savings are available if AARs and DLRS are more broadly deployed.<sup>23</sup>

Monitoring Analytics, PJM's market monitor, explains that, "[w]hen higher cost local generation is needed to meet part of the local load because of transmission limits, 100 percent of the local load pays the higher price while only the local generation receives the higher price," and that difference between what load pays and what generators receive is congestion.<sup>24</sup> Since 2008, congestion costs in PJM have ranged from \$0.5 billion to \$2.05 billion per year.<sup>25</sup> Transmission line ratings can result in short-term significant price increases when grid operators like PJM implement transmission penalty factors.<sup>26</sup>

Although concluding that "current line ratings practices usually understate transmission capability" (and therefore result in unnecessary congestion costs), the NOPR explained that line ratings can also overstate transmission capability and that actual ambient temperatures can exceed assumed temperatures.<sup>27</sup> The Industrial Customer Organizations recognize that overstating transmission capability could damage equipment and create reliability issues. Industrial Customer Organizations also recognize that actual loading of a particular transmission facility should not exceed the AAR or DLR for that facility.<sup>28</sup> The key is to make sure that the methodology (the

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<sup>22</sup> NOPR at ¶ 41 (citing Potomac Economics Comments at 2).

<sup>23</sup> Speaker Comments of J.T. Smith, MISO, Docket No. AD19-15-000, at 3 (Sep. 10-11, 2019).

<sup>24</sup> Speaker Comments of Joe Bowring, Monitoring Analytics, Docket No. AD19-15-000, at 1 (Sep. 10-11, 2019).

<sup>25</sup> Speaker Comments of Joe Bowring, Monitoring Analytics, Docket No. AD19-15-000, at 1. During extreme weather conditions, such as January 2014, congestion costs in PJM were \$825.1 million for a single month. *Id.*; *see also* Post-Technical Conference Comments of Monitoring Analytics at 2.

<sup>26</sup> Post-Technical Conference Comments of Monitoring Analytics at 2-3.

<sup>27</sup> NOPR at ¶ 42.

<sup>28</sup> *See* "Transmission Line Ratings Workshop: Typical Industry Practices," MISO, at Slides 30, 39 *available at* [PowerPoint Presentation \(misoenergy.org\)](https://www.misoenergy.org) (last accessed Mar. 22, 2021) ("MISO Presentation on Typical Industry Practices").

“math”) underlying AAR and DLR calculations by each transmission owner accurately reflects the technical specifications of the conductors or other limiting elements of a transmission circuit. Subjecting the methodology to greater transparency and scrutiny, as discussed below, should enhance the accuracy of the methodology and the calculations and, thus, make great strides in ameliorating concerns about facility rating overstatement.

The NOPR also made the critical finding that the level of transparency into transmission line ratings and their associated methodologies is insufficient and contributes to rates that may be unjust and unreasonable.<sup>29</sup> Such inadequate transparency prevents not just grid operators and market monitors but other interested stakeholders, including consumers, from having an opportunity to review and validate the accuracy and reasonableness of particular line ratings values and the application of a transmission owner’s line ratings methodology.<sup>30</sup> Because NERC and RTO/ISO-managed processes only examine ratings relative to reliability criteria, there is inadequate oversight authority to review and audit facility ratings data and verify that data for accuracy. While NERC Standard FAC-008-3 may be an appropriate standard for reliability, it does not ensure just and reasonable rates by making sufficient capacity available by using DLRs, nor does the reliability standard ensure sufficient transparency for line rating values, inputs, and assumptions.<sup>31</sup> Implementing adequate oversight authority and publishing line ratings methodologies promotes accountability and reduces incentives and opportunities to understate ratings.

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<sup>29</sup> NOPR at ¶ 47. As summarized by PJM’s market monitor, “[t]he actions of RTO/ISOs with respect to line ratings are generally nontransparent, not rule driven, and have a significant impact on prices.” Post-Technical Conference Comments of Monitoring Analytics at 5.

<sup>30</sup> See NOPR at ¶ 47.

<sup>31</sup> See Post-Technical Conference Comments of American Wind Energy Association (“AWEA”) at 7.

One of the Commission’s primary responsibilities is protecting consumers.<sup>32</sup> The very purpose of the FPA is “to protect customers against excessive prices.”<sup>33</sup> Consistent with its obligation under the FPA, the Commission has steadfastly sought, and must continue to consistently seek to protect consumers against the effects of unjust and unreasonable rates, including the understatement (or overstatement) of transmission system capacity. The Industrial Customer Organizations applaud the Commission’s initiative in this NOPR and submit that getting the ratings right is one of the best opportunities to optimize the nation’s transmission system and make substantial improvements to the efficiency of wholesale electricity markets.<sup>34</sup> Accordingly, the Industrial Customer Organizations ask the Commission to confirm and finalize the NOPR’s initial findings and preliminary determinations regarding the strong likelihood for inaccurate and non-transparent transmission line ratings to result in rates that are unjust and unreasonable under the Federal Power Act.

**2. The Commission Should Require the Implementation of AARs as Soon as Practicable.**

As noted by the NOPR, numerous entities at the Technical Conference supported the implementation of an AAR requirement as “a cost-effective industry best practice that would achieve significant savings to ratepayers.”<sup>35</sup> While some transmission owners opposed an AAR requirement, other utilities such as Exelon agreed that AARs can represent a best practice and a

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<sup>32</sup> *NAACP v. FERC*, 425 U.S. 662, 666-667 (1976).

<sup>33</sup> *Pa. Water & Power Co. v. FPC*, 343 U.S. 414, 418 (1952); accord *FERC v. Elec. Power Supply Ass'n, U.S.*, 136 S. Ct. 760, 781 (2016); see also *Pub. Sys. v. FERC*, 606 F.2d 973, 979 (D.C. Cir. 1979) (“[T]he Federal Power Act aim[s] to protect consumers from exorbitant prices and unfair business practices.”).

<sup>34</sup> See Post-Technical Conference Comments of Potomac Economics, Docket No. AD19-15, at 2; Post-Technical Reply Conference Comments of the WATT Coalition at 1; see also Post-Technical Conference Comments of Exelon Corporation at 1 (explaining that “the efficient utilization of existing transmission infrastructure...can provide benefits to customer at little additional cost”), 7.

<sup>35</sup> NOPR at ¶ 51.

cost-effective way to enhance transmission use to benefit customers.<sup>36</sup> DTE Electric Company (“DTE”) states that AARs can be implemented without causing any undue burden and that transmission owners are obligated to implement the most cost-effective solution.<sup>37</sup> In supporting the NOPR’s AAR proposal, the PJM Operating Committee explained that AARs create additional capability on the system, thereby adding operational flexibility, reliability, and market efficiencies.<sup>38</sup>

The Independent Market Monitors for PJM and MISO both support a requirement for transmission owners to update AARs hourly.<sup>39</sup> As mentioned above, MISO’s market monitor found that the implementation of AARs by those not already doing so in MISO alone would have produced approximately \$78 million and \$94 million in reduced congestion costs in 2017 and in 2018, respectively.<sup>40</sup> An AAR requirement not only increases the accuracy of line ratings, but also increases operational awareness by providing grid operators with a better understanding of the capabilities of the transmission facilities.<sup>41</sup> Monitoring Analytics, PJM’s market monitor, concludes that the Commission should require all transmission owners to use AARs, and that the failure to require AARs means that “line ratings in actual use are wrong much of the time.”<sup>42</sup>

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<sup>36</sup> NOPR at ¶ 53; *see* Speaker Comments of Michael Kormos, Exelon, Docket No. AD19-15 (Sep. 10-11, 2019); *see also* Post-Technical Conference Comments of AEP at 1-3 (AARs benefit the transmission system); *see also* Post-Technical Reply Comments of the Organization of MISO States (“OMS”) at 1 (because there are an array of line ratings approaches available that can provide benefits to customers, the Commission “should find and encourage benefits to customers wherever they may exist”).

<sup>37</sup> NOPR at ¶ 56 (citing DTE Post-Technical Conference Comments at 2).

<sup>38</sup> “Dynamic Line Ratings Update,” PJM Operating Committee, at Slide 4, *available at* [20210311-item-14-ferc-aar-nopr-discussion.ashx \(pjm.com\)](https://www.ferc.gov/20210311-item-14-ferc-aar-nopr-discussion.ashx) (last accessed Mar. 22, 2021).

<sup>39</sup> NOPR at ¶ 55; *see* Speaker Comments of Michael Wander, Potomac Economics, Docket No. AD19-15 (Sep. 10-11, 2019); Monitoring Analytics Post-Technical Conference Comments at 5.

<sup>40</sup> NOPR at ¶ 55.

<sup>41</sup> NOPR at ¶ 55 (citing Potomac Economics Comments at 6-7).

<sup>42</sup> NOPR at ¶ 55 (quoting Monitoring Analytics Comments at 5).

Given the direct impact of line ratings on congestion and other consumer costs, such an outcome does not comport with the FPA’s just and reasonable rates mandate.

The NOPR proposes to require all RTOs/ISOs to implement AARs on transmission lines that they operate and provide service.<sup>43</sup> The NOPR proposes to define AAR as “a transmission line rating that applies to a time period of not greater than one hour and reflects an up-to-date forecast of ambient air temperature across the time period to which the rating applies.”<sup>44</sup>

To implement AARs, the NOPR proposes to require every RTO/ISO to “establish and maintain systems and procedures necessary to allow transmission owners to electronically update transmission line ratings (for each period for which transmission line ratings are calculated) at least hourly” and require transmission owners to submit that data directly into the RTO/ISO’s Energy Management System.<sup>45</sup> The Industrial Customer Organizations generally support the proposed rules with respect to AARs but submit that these rules should be implemented as soon as practicable.

### **3. The Commission Should Apply The Final Rule To All Regions Of The Country, Not Just To RTO/ISO Regions.**

The Commission sought comment on whether that requirement should be applied to transmission owners located outside RTO/ISO markets.<sup>46</sup> The Industrial Customer Organizations firmly support a requirement that all transmission providers, including transmission providers located outside of RTO/ISO markets, must electronically update transmission line ratings at least hourly. Importantly, the Commission found that the use of transmission line ratings based on long-

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<sup>43</sup> NOPR at ¶ 81.

<sup>44</sup> NOPR at Regulatory Text, Proposed Section 35.28(b)(10).

<sup>45</sup> NOPR at ¶ 82, Regulatory Text, Proposed Section 35.28(g)(12)(i).

<sup>46</sup> See NOPR at ¶ 82.

term assumptions is not just and reasonable, and therefore invoked its authority under Section 206 of the FPA to propose to require all transmission providers to implement AARs and seasonal line ratings on the transmission lines over which they provide transmission service.<sup>47</sup> The Commission did not limit its Section 206 finding only to the existing use of line ratings in RTO/ISO markets. No evidence has been presented to indicate that the accuracy and transparency issues surrounding line ratings are somehow absent in regions outside of RTO/ISO markets. Therefore, the Commission's reforms in this rulemaking should apply with equal force to all transmission-owning and transmission-operating entities that are subject to the Commission's jurisdiction. If anything, the need for line ratings reforms may be greater in regions outside of RTO/ISO markets because the functional separation of transmission operation and transmission ownership has not occurred, and no independent operator or independent monitor is involved with reviewing or administering transmission facility ratings. No basis exists to impose additional regulatory oversight in RTO/ISO regions and not impose the same or greater additional regulatory oversight in non-RTO/ISO regions.<sup>48</sup>

#### **4. If Prioritization Is Necessary, Congested Circuits Should Be Prioritized.**

As to the implementation timeframe, the NOPR proposes to require AARs and seasonal line ratings on all lines, but seeks to prioritize implementation of AARs and seasonal line ratings on historically congested transmission lines. Prioritizing historically congested lines makes sense for reliability and economic reasons. Re-rating congested lines will allow transmission providers to better understand the transmission facilities they operate, and if the facilities are under-rated,

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<sup>47</sup> See NOPR at ¶ 125.

<sup>48</sup> See Post-Technical Conference Comments of Potomac Economics at 14 (AARs should be used to determine available transfer capacity in non-RTO areas).

provide for more physical capacity and power flow over the lines in a timely manner, which should help relieve congestion costs and lead to better and more accurate energy price formation in LMPs and other wholesale market prices.<sup>49</sup>

The NOPR proposes to require that “AARs and seasonal line ratings be implemented on historically congested lines within one year from the date of the compliance filing for implementation of any final rule, and on all other lines within two years from the date of the compliance filing for implementation of any final rule.”<sup>50</sup> The Industrial Customer Organizations appreciate the NOPR’s implementation of required reforms and understand the need for a staggered implementation (by prioritizing congested lines first), but submit that the proposed timeframe will unnecessarily delay reforms that are needed now. Presently, many transmission lines throughout the country are not subject to AARs. MISO recently estimated that only 7% of all lines in MISO (or 12% under MISO’s functional control) use AARs.<sup>51</sup> Given the period of time that is typically involved in the NOPR process, and the time involved with development, filing, and acceptance of compliance filings, the earliest that AAR reforms could reduce congestion on congested lines would be late 2022, and all other lines would be addressed in 2023 or later. Yet, many transmission lines throughout the country are not even subject to AARs, let alone DLRs. MISO recently estimated that 7% of all lines in MISO (or 12% under MISO’s functional control) participate in AARs.<sup>52</sup>

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<sup>49</sup> See NOPR at ¶ 40; see “Managing Transmission Lines,” by T.B. Tsuchida of the Brattle Group, Docket AD19-15 (Sep. 10-11).

<sup>50</sup> NOPR at ¶ 92.

<sup>51</sup> NOPR at ¶ 92.

<sup>52</sup> January 2021 Presentation on MISO’s Rating Process at Slide 14. AAR usage across MISO differs drastically by region, with a few regions and sub-regions deploying AARs on more than 40% of their lines while most of the regions deploy AARs on less than 10% of their lines. See *id.* at Slide 18. MISO agrees that AARs have potential benefits.

The NOPR does not provide any rationale for the proposed lengthy implementation timeframe. The need for transmission line ratings reforms has been on the radar of transmission owners and transmission providers since at least June 28, 2019 (if not much earlier) when FERC issued a Notice of Technical Conference in Docket No. AD19-15-000. Transmission owners, transmission providers, and industry stakeholders should begin taking steps now to prepare for the eventual full-scale implementation of AARs and seasonal ratings.

To that end, the Industrial Customer Organizations propose the following adjustments to the NOPR's proposed timeline:

That AARs and seasonal line ratings be implemented on historically congested lines within six months ~~one year~~ from the date of the compliance filing for implementation of any final rule, and on all other lines within one year ~~two years~~ from the date of the compliance filing for implementation of any final rule.

Importantly, without requiring a stricter deadline,<sup>53</sup> it is unlikely that any significant actions and steps toward the implementation of AARs will occur before 2022. In rare cases and for good cause shown, the Commission could accommodate any well-documented need for additional time by granting extensions. However, allowing a relaxed timeline only perpetuates incorrect line ratings and could cause the unnecessary construction of costly transmission facilities.

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*See* "MISO Update on Integrated Roadmap Issue 54, MISO (Oct. 1, 2020), at Slides 2, 5, *available at* [MISO Update on IR-054 \(misoenergy.org\)](https://www.misoenergy.org/MISO-Update-on-IR-054) (last accessed Mar. 22, 2021).

<sup>53</sup> *See* Post-Technical Conference Comments of Potomac Economics at 8 (very few transmission owners provide AARs voluntarily and transmission owner agreements do not require AARs).

## **5. The Commission Should Require the Implementation of DLRs Where Doing So is Economical, Reliable, and Safe.**

In the NOPR, the Commission found that in many circumstances, DLRs may be more accurate than AARs because DLRs “are based not only on forecasted ambient air temperature, but also on other weather conditions such as wind, cloud cover, solar irradiance intensity, precipitation, and/or on transmission line conditions such as tension or sag.”<sup>54</sup> Additionally, DLRs could incorporate measurements from sensors installed on or near the transmission line that would measure wind speed, line tension, conductor temperatures, or line sag through the use of photo-spatial sensors and 3-D laser scanning.<sup>55</sup> Many organizations that are invested in advanced line ratings technologies asserted that DLR systems are ready for deployment now.<sup>56</sup> Advanced technologies that enable DLRs can more accurately reflect transfer capability<sup>57</sup> and “can increase the utilization and efficiency of the existing transmission network while also supporting system reliability.”<sup>58</sup> During a November 13, 2020 forum at PJM, LineVision and Lindsey Systems further presented on the capabilities of DLRs.<sup>59</sup> The practical value that DLRs can deliver was noted above in an example where PPL expects an average increase of almost 30% capacity due to

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<sup>54</sup> NOPR at ¶ 5.

<sup>55</sup> NOPR at ¶ 25.

<sup>56</sup> Working for Advanced Transmission Technologies (“WATT”) Post-Technical Conference Comments at 1; *see generally* Speaker Comments of Joey Alexander, Ampacimon SA and Elia System Operator, Docket No. AD19-15 (Sep. 10-11, 2019); *see also* Speaker Comments of Brett Wangan, Western Interconnection Regional Advisory Board, Docket No. AD19-15 (Sep. 10-11, 2019) (“DLR and AAR implementation are very achievable goals for the industry and would help improve both reliability and market processes”); *see also* Post-Technical Conference Comments of Potomac Economics at 13 (“DLR technologies and the resulting data streams could be received and used by the RTOs to calculate ratings”).

<sup>57</sup> *See* NOPR at ¶ 25.

<sup>58</sup> WATT Comments at 1.

<sup>59</sup> *See* “Lindsey Systems: PJM Emerging Technologies Forum,” available at [CORPORATE PRESENTATION \(pjm.com\)](https://www.pjm.com) (last accessed Mar. 22, 2021) (“Lindsey Systems November 2020 PJM Presentation”); *see also* “LineVision”, available at [20201113-item-03a-linevision-presentation.ashx \(pjm.com\)](https://www.pjm.com) (last accessed Mar. 22, 2021) (“LineVision November 2020 PJM Presentation”).

the planned implementation of DLRs<sup>60</sup> on the Susquehanna-Harwood and Juniata-Cumberland lines, which are in the 2020 Top 10 Congested Facilities in PJM and together were responsible for approximately \$30 million in congestion costs.<sup>61</sup> In a February 1, 2021 case study, the Brattle Group concluded that DLRs are one of three key technologies that can help integrate more renewables into the grid by quickly and cost-effectively helping to maximize the capability of the existing transmission system.<sup>62</sup>

Despite the benefits<sup>63</sup> and longstanding known capabilities of DLRs, the NOPR found that DLRs have unique implementation challenges due to the additional data and communication needs that increase costs and system complexity; present added physical/cybersecurity risk; and require more knowledge training.<sup>64</sup> The NOPR found that DLRs are not widely deployed in the United States, although transmission owners have tested DLRs on select transmissions lines.<sup>65</sup> The NOPR found that the inability of certain RTO/ISOs to accept and use a DLR “may prevent the market from benefiting from the more accurate representation of current system conditions” and therefore “result in rates that do not reflect the actual costs of delivering wholesale energy to transmission customers.”<sup>66</sup>

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<sup>60</sup> PPL January 2020 Presentation at Slide 6.

<sup>61</sup> PJM 2020 Top 10 Congested Facilities at Slide 52.

<sup>62</sup> “Unlocking the Queue with Grid-Enhancing Technologies,” The Brattle Group, at p. 3-4, *available at* [Unlocking the Queue with Grid Enhancing Technologies \(watt-transmission.org\)](https://www.brattle.com/wp-content/uploads/2021/03/Unlocking-the-Queue-with-Grid-Enhancing-Technologies-watt-transmission.org) (last accessed Mar. 22, 2021). Brattle explained that high winds can lead to higher cooler and allows for increased flows, as evidenced by European studies finding that DRLs contribute to approximately 15% reduction in wind curtailment in some areas. *Id.* at p. 18. Similarly, MISO explained that traditional time of day ratings may no longer be appropriate because wind generation at night may currently be curtailed based on ratings that were designed around day-time conditions. MISO Presentation on Typical Industry Practices at Slide 80.

<sup>63</sup> *See, e.g.*, Speaker Comments of Jake Gentle, Idaho National Laboratory, Docket No. AD19-15 (Sep. 10-11, 2019); Post-Technical Conference Comments of AWEA at 1-5.

<sup>64</sup> *See* NOPR at ¶ 27.

<sup>65</sup> NOPR at ¶ 28.

<sup>66</sup> NOPR at ¶ 42.

Industrial Customer Organizations urge the Commission to require implementation of DLRs on a more accelerated timeframe. Importantly, the Commission in 2007 – nearly 15 years ago – recognized that DLRs “are an innovative” application that should be considered in future revisions to NERC Reliability Standard FAC-008-1.<sup>67</sup> NERC has explained that research and pilot projects were initiated to implement DLRs as early as the 1990s.<sup>68</sup> In seeking to accelerate DLR deployment, the Industrial Customer Organizations agree with the Working for Advanced Transmission Technologies’ (“WATT”) recommendation that transmission owners should be required to perform a cost-benefit study on the deployment of DLRs and other congestion mitigating technologies and equipment upgrades.<sup>69</sup> Other commenters suggest pilot programs or a staggered implementation of DLRs.<sup>70</sup> MISO and PJM caution against the immediate, full-scale deployment of DLRs because it is a relatively new technology, but ultimately recommend DLR pilot programs.<sup>71</sup> While the NOPR found that the ability to incorporate DLRs varies among RTO/ISOs and transmission owners,<sup>72</sup> such variance should not serve as an absolute barrier to DLR deployment or cause a more protracted implementation. PJM and MISO have indicated their

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<sup>67</sup> 18 CFR Part 40 Mandatory Reliability Standards for the Bulk-Power System, Order No. 693, 118 FERC ¶ 61,218 at P 768 (2007).

<sup>68</sup> Speaker Comments of Howard Gugel, NERC, Docket No. AD19-15 (Sep. 10-11, 2019).

<sup>69</sup> NOPR at ¶ 69; WATT Comments at 5, 7.

<sup>70</sup> See NOPR at ¶ 70.

<sup>71</sup> NOPR at ¶ 73. At the technical conference, PJM explained that it initiated a successful pilot program with AEP and LineVision in 2016 and a second pilot program with AEP and Lindsey Systems and 2018. Speaker Comments of Shawn Murphy, PJM, Docket No. AD19-15 (Sep. 10-11, 2019). Vistra Energy also explained that Oncor Electric Delivery Company undertook a successful pilot project in ERCOT in 2013, leading Oncor to invest in DLRs for most of their transmission facilities, many of which are connected to Vistra’s generation plants. Speaker Comments of Amanda Frazier, Vistra Energy, Docket No. AD19-15 (Sep. 10-11, 2019). MISO’s market monitor has worked with MISO and Entergy on a program to provide AARs and short-term emergency ratings. Post-Technical Conference Comments of Potomac Economics at 3, 6-7.

<sup>72</sup> NOPR at ¶¶ 73-74.

Energy Management Systems can incorporate DLRs.<sup>73</sup> Further, PJM already goes one step beyond AARs by allowing transmission owners to submit different day and night ratings for each temperature rating, given the lack of solar irradiance at night.

The Final Rule should require transmission providers and transmission owners to begin the DLR roll-out in the very near future. Importantly, while certain parties during the Technical Conference in Docket No. AD19-15 suggested that transmission owners should have an opportunity to receive incentive-based rate treatment for the deployment of DLRs and the reduction of any transmission congestion,<sup>74</sup> the NOPR correctly does not propose such incentives, and the Commission should continue to reject any attempts that seek incentives for DLR deployment. Unless transmission owners can show that DLR deployment is not cost-effective, DLR deployment should be required to enhance reliability and grid-optimization, and as a function of Good Utility Practice and prudent transmission operation. The Commission should require transmission providers and transmission owners to optimize existing transmission facilities to ensure rates are just and reasonable; no incentives are necessary.<sup>75</sup>

The Industrial Customer Organizations contend that the Commission should seize the opportunity to accelerate the implementation of DLRs in all circumstances, except in those rare instances when a transmission owner demonstrates that DLR implementation would not be cost-

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<sup>73</sup> See January 2021 Presentation on MISO's Rating Process at Slide 11; PJM November 2020 DLR Presentation at Slide 4.

<sup>74</sup> See, e.g., Speaker Comments of Rob Gramlich, Grid Strategies, Docket No. AD19-15 (Sep. 10-11, 2019).

<sup>75</sup> Industrial Customer Organizations note that the Commission currently has pending before it a NOPR regarding transmission rate incentives. See *Electric Transmission Incentives Policy Under Section 219 of the Federal Power Act*, 170 FERC ¶ 61,204 (2020); see generally FERC Docket No. RM20-10-000. Section 219 of the FPA already requires the Commission to provide incentive-based rate treatment for continued investments in transmission projects. 16 U.S.C. § 824s(b)(3). Importantly, all rates adopted under Section 219 must still be just, reasonable, and not unduly discriminatory consistent with Sections 205 and 206 of the FPA. See 16 U.S.C. § 824s(d).

effective.<sup>76</sup> The Commission should, at a minimum, require the implementation of staggered pilot programs that require grid operators and transmission owners to implement DLRs on the most thermally limited, congested lines.<sup>77</sup> DLR technologies are readily available and stakeholders can work to ensure that any physical and/or cybersecurity concerns are addressed.<sup>78</sup> Without taking a more meaningful step forward on the implementation of DLRs, the NOPR’s findings that DLRs can serve as a powerful tool to prevent unjust and unreasonable rates will remain mere findings without any practical import (and any further progress on DLR implementation may be impeded for years to come as other issues take centerstage). Critically, the NOPR found that the inability of certain RTO/ISOs to accept and use a DLR “may prevent the market from benefiting from the more accurate representation of current system conditions” and therefore “result in rates that do not reflect the actual costs of delivering wholesale energy to transmission customers.”<sup>79</sup> Thus, the NOPR’s findings on the need for reform and the ability of DLRs to be more accurate than AARs should translate into a firm requirement in the Final Rule that transmission providers and transmission owners immediately begin DLR implementation as necessary to produce just and reasonable Commission-jurisdictional rates.<sup>80</sup>

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<sup>76</sup> Grid operators and market monitors often maintain the top congested facilities in their region. *See generally* PJM 2020 Top 10 Congested Facilities; *see also* MTEP19 Market Congestion Planning Study, MISO (May 2019), *available at* [PowerPoint Presentation \(misoenergy.org\)](https://www.misoenergy.org/PowerPoint-Presentation) (last accessed Mar. 22, 2021). For a more in depth discussion on congestion in MISO, see 2019 MISO State of Market Report,” Potomac Economics (June 2020), *available at* [2019 STATE OF THE MARKET REPORT \(potomaceconomics.com\)](https://www.potomaceconomics.com/STATE-OF-THE-MARKET-REPORT) (last accessed Mar. 22, 2021).

<sup>77</sup> NOPR at ¶ 74 (citing WATT Comments at 7, Industrial Customers Comments at 16 (asking the Commission to require RTOs/ISOs to study the benefits and effectiveness of DLRs on the most congested, thermally limited transmission lines); *see also* Speaker Comments of Michael Chiasson, Potomac Economics, Docket No. AD19-15-000, at Presentation Slide 6 (Sep. 10-11, 2019).

<sup>78</sup> *See* Post-Technical Conference Comments of AWEA (explaining that NERC Critical Infrastructure Protection (“CIP”) 005 and CIP-006 Standards should address any security concerns involving the communication of line ratings and field measurements).

<sup>79</sup> NOPR at ¶ 42.

<sup>80</sup> *See* NOPR at ¶ 100.

The NOPR’s proposed regulatory text proposes a definition of *dynamic line rating*,<sup>81</sup> but does not apply that definition elsewhere in the proposed regulatory text. Industrial Customer Organizations recommend the proposed definition of *dynamic line rating* be expanded to include additional inputs, such as: conductor temperature, the thermal age of the line, and the cumulative number and frequency of faults. Those aforementioned criteria collect data necessary to show how the maximum capacity of the line is reduced over time due to aging line components.<sup>82</sup> Because design margins shrink over time, there should be a difference between a one-year old conductor system and a conductor system that has been in operation for decades. While “calendar age” of a line can serve as a useful proxy if faults and actual conductor temperature are not measured, “thermal aging” (*i.e.*, increasing the temperature causes annealing of a conductor, which decreases its future carrying capability) can more accurately capture and assess the line’s physical capacity.<sup>83</sup>

Furthermore, the NOPR itself does not suggest taking any concrete steps in the Final Rule with respect to DLR requirements. The Industrial Customer Organizations urge the Commission to, in its Final Rule, require the implementation of DLRs, even if the required implementation must be carried out initially through pilot programs.

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<sup>81</sup> See NOPR, Regulatory Text, Proposed Section 35.28(b)(11) (defining *dynamic line rating* as “a transmission line rating that applies to a time period of not greater than one hour and reflects up-to-date forecasts of inputs such as (but not limited to) ambient air temperature, wind, solar irradiance intensity, transmission line tension, or transmission line sag.”

<sup>82</sup> Given that design margins shrink over time, there should be a difference between a one-year old conductor system and a conductor system has been in operation for decades.

<sup>83</sup> See, *e.g.*, “Critical Aging Segments of Power Transmission Line,” Goh, H.H., et al. American Journal of Engineering and Applied Sciences, 6 (4): 340-351 (2013) (*available at*: <http://www.thescipub.com/ajeas.toc>) (last accessed March 22, 2021); *see also* “Review of Thermal Stress and Condition Monitoring Technologies for Overhead Transmission Lines: Issues and Challenges,” IEEE Access, published June 24, 2020 (*available at*: <https://ieeexplore.ieee.org/iel7/6287639/8948470/09123900.pdf>) (last accessed March 22, 2021).

## **6. FERC's Proposed Line Ratings Reforms for Emergency Ratings**

FERC explained that its proposed line ratings reforms apply to normal (pre-contingency) operations; however, FERC seeks comments from stakeholders on whether RTOs/ISOs should implement unique emergency ratings for use during post-contingency operations. Industrial Customer Organizations urge the Commission to require AARs and, consistent with the discussion above, DLRs in all situations. The need for accuracy in transmission facility ratings does not exist only during normal operations; the need also exists, and perhaps even more so, during emergency operations. Without review, verification, and oversight by RTOs/ISOs of transmission owner line ratings and methods and without requirements that ratings directly reflect operating condition temperatures, transmission owners retain substantial discretion in determining emergency ratings values.<sup>84</sup> System operators need to know, in real-time and as accurately as possible, the actual operating capability of all transmission facilities under their purview. As MISO's market monitor observes, short term emergency ratings may enable operating at higher levels for longer periods of time while the grid operator undertakes redispatch or other post-contingent actions.<sup>85</sup> Optimizing the system through emergency ratings can provide significant cost savings for consumers. AARs and, in due course, DLRs should be required for both normal and emergency ratings.

## **7. The Commission Should Require Transmission Line Ratings and Associated Methodologies to Be Publicly Available.**

The NOPR makes the important finding that the level of transparency into transmission line ratings and their associated methodologies is insufficient and contributes to rates that may be

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<sup>84</sup> Speaker Comments of Joe Bowring, Monitoring Analytics, Docket No. AD19-15-000, at 2-3.

<sup>85</sup> Post-Technical Conference Comments of Potomac Economics at 4.

unjust and unreasonable.<sup>86</sup> Such inadequate transparency prevents not just grid operators and market monitors but other interested stakeholders, including consumers, from having an opportunity to review and validate the accuracy and reasonableness of particular line ratings values and the application of a transmission owner’s line ratings methodology.<sup>87</sup> Because NERC and RTO/ISO-managed processes only examine ratings relative to reliability criteria, there is a lack of oversight authority to review and audit facility ratings methodologies and outputs from the perspective of optimizing transmission capacity. Certain transmission owners contend that no additional transparency is needed because there is no reliability benefit to increasing the transparency of transmission line ratings.<sup>88</sup> We disagree. In fact, transparency is a prerequisite for stakeholders to independently evaluate the potential reliability benefits of more accurate line ratings. However, even if reliability benefits are minimal, additional transparency is still needed to ensure just and reasonable rates through accurate ratings and transmission system optimization.<sup>89</sup> Ensuring independent oversight authority<sup>90</sup> and publishing line ratings and rating methodologies better ensures accountability and reduces incentives and opportunities to understate

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<sup>86</sup> NOPR at ¶¶ 47, 125.

<sup>87</sup> See NOPR at ¶ 47.

<sup>88</sup> See Post-Technical Reply Comments of the MISO Transmission Owners at 9.

<sup>89</sup> See NOPR at ¶ 47. While the Commission has authority over reliability, the Commission has separate authority over rates under Sections 205 of 206 of the FPA. See Post-Technical Reply Conference Comments of the WATT Coalition at 4 (citing TAPS Post-Technical Conference Comments at 12). Importantly, the Industrial Customer Organizations do not seek to elevate economics and the maximum transfer capability of a transmission line above reliability; instead, the Industrial Customer Organizations submit that the existing transmission system may be better optimized for economics and efficiency while also maintaining reliability. As recognized during the January 2021 MISO Transmission Line Ratings Workshop, “[t]here must be an appropriate balance in considering economics vs. reliability when developing Transmission Line Ratings.” See “Transmission Line Ratings Workshop: Typical Industry Best Practices,” at Slide 2 (Jan. 15, 2021), available at [PowerPoint Presentation \(misoenergy.org\)](https://www.misoenergy.org/PowerPointPresentation) (last accessed Mar. 22, 2021).

<sup>90</sup> See Industrial Customer Comments at 10-14; Monitoring Analytics Comments at 4-5; TAPS Comments at 12-13; DTE Comments at 5-8; Potomac Economics Comments at 15-18; WATT Comments at 9.

or manipulate ratings.<sup>91</sup> Additionally, increased transparency helps identify more cost-effective congestion management solutions.<sup>92</sup>

Transparency is highly valued by the Commission and is essential for proper functioning of an organized and competitive electricity market.<sup>93</sup> The Commission’s nine planning principles, articulated in Order No. 890, include openness, transparency, and information exchange.<sup>94</sup> The Commission’s regulations impose requirements of non-discrimination, independent functioning, and transparency on transmission owners.<sup>95</sup> Without transparency, opportunities exist for parties to engage in unjust enrichment or other self-dealing behavior.<sup>96</sup> A lack of transparent and accessible information elevates the probability of material line ratings errors (understated or overstated) that remain uncorrected due to a lack of accountability, oversight, review, and verification.

Systemic incentives and widespread opportunities exist for the understatement of line ratings and the understatement of transmission system capacity, resulting in unjustified and

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<sup>91</sup> See NOPR at ¶ 34 (explaining that increased transparency around ratings methodologies may reduce transmission owners’ incentive to be overly conservative with their line ratings methodologies) (citing WATT comments from September 2019 Technical Conference, Day 1 Tr. at 23); see also WATT Comments at 8-9, Speaker Comments of Rob Gramlich, Grid Strategies, Docket No. AD19-15 (Sep. 10-11, 2019); Speaker Comments of Devin Hartman, Electricity Consumers Resource Council, Docket No. AD19-15 (Sep. 10-11, 2019); Post-Technical Conference Comments of Transmission Access Policy Study Group (“TAPS”) at 6-8 (allowing transmission owners to set ratings facilitates the potential for market manipulation).

<sup>92</sup> NOPR at ¶ 121 (citing DTE Post-Technical Conference Comments at 4).

<sup>93</sup> See, e.g., *Wholesale Competition in Regions with Organized Electric Markets*, 119 FERC ¶ 61,306 at P26 (June 22, 2007) (discussing competition issues and Commission actions to further transparency in the transmission planning process).

<sup>94</sup> See generally *Preventing Undue Discrimination and Preference in Transmission Service*, Order No. 890, FERC Stats. & Regs. ¶ 31,241, *order on reh’g*, Order No. 890-A, FERC Stats. & Regs. ¶ 31,261 (2007), *order on reh’g*, Order No. 890-B, 123 FERC ¶ 61,299 (2008), *order on reh’g*, Order No. 890-C, 126 FERC ¶ 61,228, *order on clarification*, Order No. 890-D, 129 FERC ¶ 61,126 (2009) (“Order No. 890”).

<sup>95</sup> 18 CFR §§ 358.4, 358.7.

<sup>96</sup> The Commission has explained that “a lack of transparency both increases the potential for undue discrimination and makes it more difficult to detect.” *18 CFR Parts 35 and 37 Preventing Undue Discrimination and Preference in Transmission Service*, 115 FERC ¶ 61,211 at P 30 (Proposed Rulemaking May 19, 2006).

unnecessary construction and additions to transmission rate base, which contribute to the escalation of transmission rates. Optimization of existing transmission facilities, through AARs, DLRs, and transparent rating methodologies, provides a necessary check on imprudent and unnecessary investment. Because transmission owners earn a rate of return based on the transmission assets they own, they have a financial incentive to construct additional transmission facilities and a disincentive to optimize existing facilities to relieve congestion or to upgrade their systems as efficiently as possible. Furthermore, transmission owners that own generation have an incentive to understate system capacity to achieve additional energy and capacity revenues for their affiliated generation resources. Without sufficient oversight and transparency, these generation-owning transmission owners have “greater control and discretion to enhance the competitive advantage of their own generation and disadvantage the generation of others.”<sup>97</sup> As a result of these long-standing incentives, and with minimal oversight of transmission line ratings, customers – such as the Industrial Customer Organizations that are large energy users – are exposed to paying higher transmission rates and higher energy, capacity, and ancillary service prices.<sup>98</sup> We agree with the Commission’s finding in the NOPR that such rate outcomes are inconsistent with the Federal Power Act’s mandate that rates be just, reasonable, and not unduly discriminatory.

Customers are not alone in pleading for greater transparency. The market monitors for PJM and MISO stress the importance of increased transparency and accountability for transmission owner line ratings and practices. PJM’s market monitor explains that PJM

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<sup>97</sup> Post-Technical Conference Comments of TAPS at 6, Docket No. AD19-15.

<sup>98</sup> See Post-Technical Conference Comments of Monitoring Analytics at 1 (transmission line ratings have “significant and frequently underappreciated impacts on competitive wholesale power markets”).

transmission owners “have substantial discretion” in establishing line ratings and that “PJM does not review or verify the accuracy of transmission owners’ methods to compute line ratings.”<sup>99</sup> Because PJM real time prices are calculated every five minutes and are “extremely sensitive to transmission line ratings” and significantly impact “all aspects of wholesale power markets,” PJM’s market monitor concludes that “ensuring and improving the accuracy and transparency of line ratings is essential.”<sup>100</sup> Similarly, MISO’s market monitor has concluded that additional transparency around rating methodologies “is essential for administering an AAR requirement.”<sup>101</sup> Making DLR information available to market participants will increase awareness of the additional capacity on the system and “help market participants make more informed financial decisions with respect to perceived transmission congestion.”<sup>102</sup>

The NOPR proposes greater transparency for transmission line ratings and methodologies by requiring transmission owners to make such information available to RTO/ISOs and market monitors. However, transmission line ratings and associated methodologies should be publicly available or, at a minimum, easily accessible by customers and other stakeholders<sup>103</sup> (such as state

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<sup>99</sup> Speaker Comments of Joe Bowring, Monitoring Analytics, Docket No. AD19-15-000, at 3. MISO has explained that widespread differences in MISO exist with respect to line ratings approaches due to different historical system designs and vendors as well as the different methodologies of the transmission owners. January 2021 Presentation on MISO’s Rating Process at Slide 22.

<sup>100</sup> Speaker Comments of Joe Bowring, Monitoring Analytics, Docket No. AD19-15-000, at 3; *see also* Post-Technical Conference Comments of TAPS at 8, Docket No. AD19-15.

<sup>101</sup> Post-Technical Conference Comments of Potomac Economics Comments at 14. *See also* Speaker Comments of Michael Chiasson, Potomac Economics, Docket No. AD19-15-000, at Presentation Slide 3 (Sep. 10-11, 2019) (contending that ratings methodologies should be “broadly available”).

<sup>102</sup> Speaker Comments of Chad Thompson, ERCOT, Docket No. AD19-15 (Sep. 10-11, 2019).

<sup>103</sup> *See* Post-Technical Conference Comments of Organization of MISO States (“OMS”) at 3 (submitting that line ratings methodologies should be as transparent as possible); DTE Comments at 5 (asking FERC to “require and enforce more transparency into the overall Transmission Line Ratings Process”); *see also* Post-Technical Conference Comments of AWEA at 8 (asking FERC to “require that line ratings methodologies be transparent and fully reproducible by market participants”); *see also* Post-Technical Reply Conference Comments of the WATT Coalition at 3 (DLRs should be available at a customer’s request and will be a cost effective solution for increasing transmission capacity).

commissions and consumer advocates) to allow interested parties to review and audit transmission line rating methodologies, assumptions, and values.<sup>104</sup> When data pertaining to the capacity of the transmission system is inaccessible or cannot be verified, market participants and stakeholders are forced to rely exclusively on the inside knowledge and internal databases of transmission providers and the transmission owners.<sup>105</sup> The proverbial fox is guarding the proverbial henhouse.

Pursuant to its regulations governing FERC Form No. 715, the Commission has determined that potential transmission customers must be able to reasonably anticipate the outcome of technical studies that a transmission owner or RTO performs when assessing the availability of transmission capacity to satisfy a customer's request for transmission service.<sup>106</sup> However, ambiguity exists in the facility rating reporting obligations under Form No. 715 requirements, and the Commission should take steps to eliminate such ambiguity.<sup>107</sup> In short, customers should have broad access to facility ratings values and the methodologies and assumptions underlying those values to allow customers to challenge and assess the transmission rates they must pay.<sup>108</sup> In a similar vein, the Commission should require transmission owners to identify each facility's limiting element and make that information available to potential competitors (*i.e.*, merchant

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<sup>104</sup> In the NOPR, the Commission does not propose any new auditing requirements, but emphasized that it would “continue to conduct review of line ratings as a component of broader tariff compliance audits.” NOPR at ¶ 130.

<sup>105</sup> See Post-Technical Conference Comments of Potomac Economics at 17 (arguing that a universal database is needed that is available to all RTOs, other Transmission Providers, and Transmission Planners to understand the limiting element on the facility/circuit and to assess whether a facility needs to be upgraded).

<sup>106</sup> 18 CFR § 141.300; see <https://www.pjm.com/library/request-access/ferc-form-715.aspx> (explaining PJM's interpretation of the FERC Form 715) (last accessed Mar. 22, 2021). FERC Form 715 requires transmission owners (or their RTO/ISO acting on their behalf) to report accurate, actual facility ratings.

<sup>107</sup> In a fully litigated proceeding that involved, among other issues, the transparency, accuracy, and accessibility of transmission line ratings in PJM, the Commission determined that Form 715 ratings merely provide a “snapshot in time” as of April each year and therefore do not provide sufficient information on which customers may rely on to accurately determine transmission system capability. *TranSource, LLC v. PJM Interconnection, L.L.C.*, 168 FERC ¶ 61,119 at PP 154-155 (2019).

<sup>108</sup> See WATT Reply Comments at 3 (DLRs should be made available at a customer's request); Monitoring Analytics Comments at 5 (recommending that FERC).

transmission developers) subject to any Critical Energy Infrastructure Information (“CEII”) and confidentiality rules to the extent necessary for system security.<sup>109</sup> Enabling competitive transmission developers to access line ratings methodologies, inputs, assumptions, and values could enable the competitive developers to propose solutions that may be more efficient and more cost-effective than solutions proposed by the incumbent transmission owners.<sup>110</sup>

To that end, the Industrial Customer Organization propose the following adjustments to Section 35.28(c)(5):

Every public utility that owns, controls, or operates facilities must have on file a joint pool-wide or system-wide open access transmission tariff, ~~which that~~ provides for the following to be shared with its transmission provider(s), ~~(and its Market Monitoring Unit(s), if applicable), and interested stakeholders such as consumers and state utility commissions~~:

In the NOPR, the Commission was persuaded by certain comments that public availability of transmission line ratings and transmission line ratings methodologies raises confidentiality concerns, litigation risk, and compliance burdens.<sup>111</sup> However, the NOPR does not provide substantial evidence to support that finding,<sup>112</sup> and such a finding is inconsistent with the following facts: 1) some transmission owners do make their line rating methodologies publicly

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<sup>109</sup> Potomac Economics Comments at 5. MISO’s market monitor noted that while the MISO Transmission Owner agreement includes a provision that the transmission owners will provide the method they use to calculate equipment ratings, that provision is rarely used. *Id.* at 18; *see* MISO Transmission Owners Agreement at Appendix B, Section V.

<sup>110</sup> *See id.*

<sup>111</sup> NOPR at ¶ 126.

<sup>112</sup> Importantly, the NOPR does not explain at all how making ratings information publicly available creates a litigation risk. Instead, the NOPR appears to accept at face value generic statements by transmission industry advocates that “[g]reater public dissemination of line ratings in the name of transparency gives rise to security risks and the potential for burdensome litigation.” *See* Post-Technical Conference Comments of the Edison Electric Institute at 12. The NOPR should have engaged contrary statements in the record that asserted that ratings that are subject to more public accountability will be more accurate and therefore decrease litigation risk, especially given that transmission owners will have AARs or DLRs that provide “more demonstrable information on line clearances and thermal performance.” *See* Post-Technical Conference Reply Comments of the WATT Coalition at 3.

available,<sup>113</sup> and 2) PJM publicly posts its updated line ratings data.<sup>114</sup> The NOPR found that some transmission owners and providers make their ratings methodologies publicly available while others do not.<sup>115</sup> Critically, access to the numeric transmission line ratings, limiting elements, and line ratings methodologies is often problematic because transmission owners routinely and unnecessarily mark such information as confidential, highly sensitive/confidential, and/or CEII.<sup>116</sup>

Transmission owners have failed to demonstrate why their facility ratings methodologies constitute competitive or sensitive information that should not be made available to the public. The Commission should investigate whether any information pertaining to transmission line ratings, including methodologies, numeric values, underlying calculations, and limiting elements should be confidential or marked as CEII, with a presumption that neither classification is necessary. The Industrial Customer Organizations submit that public access and transparency should outweigh any confidential/security concerns unless demonstrated otherwise.<sup>117</sup>

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<sup>113</sup> For example, PPL Electric Utilities has used the PJM 2000 Ratings Methodology, a publicly available methodology, for its line ratings. See *TranSource, LLC Answer to Motions of FirstEnergy Service Company and Public Service Electric and Gas Company for Protection to Retain Document Designations for Highly Sensitive Protected Materials Document Designations* (hereinafter, “PSE&G Motion for Protection”), at p. 9, Docket EL15-79 (filed Oct. 24, 2016). In that dispute, PSE&G and FirstEnergy were ordered to remove the highly sensitive designations for their facility ratings methodologies.

<sup>114</sup> See [https://edart.pjm.com/reports/PJM\\_Line\\_ratings.txt](https://edart.pjm.com/reports/PJM_Line_ratings.txt).

<sup>115</sup> See NOPR at ¶ 114.

<sup>116</sup> See, e.g., Motion of FirstEnergy Service Company for an Order Determining that Certain Documents Marked Highly Sensitive Protected Materials are Entitled to Stay So Marked under EL15-79, Dckt. No. EL15-79 (Oct. 14, 2016); Motion of Public Service Electric and Gas Company to Retain Highly Sensitive Protected Materials Document Designation under EL15-79, Dckt. No. EL15-79 (Oct. 17, 2016). The Presiding Judge denied the requests of PSE&G and FirstEnergy to keep their facility ratings methodologies marked as highly sensitive, which would have prevented the Complainant’s lead witness from reviewing that content. See *TranSource, LLC v. PJM Interconnection, L.L.C.*, Prehearing Conference Transcript, Docket No. EL15-79, at 164:3-165:22 (Oct. 26, 2016).

<sup>117</sup> The Industrial Customer Organizations agree that a safe, secure, and resilient grid is of paramount concern. However, generic, unsubstantiated assertions about cyber/physical concerns should not be used to thwart efforts at creating a more efficient and economic grid. The burden to demonstrate that a security issue takes precedence over optimizing the grid should be on the transmission owner or transmission provider making that claim. See *Cal. Indep. Sys. Operator Corp.*, 128 FERC ¶ 61,072, at P 27 (Jul. 21, 2009) (“[U]nder section 205 of the FPA, the

Importantly, many DLR providers have made significant investments to ensure that their technologies and systems have sufficient physical and cyber protections.<sup>118</sup>

Further, any sensitive or CEII information could be provided pursuant to existing procedures, which allow such information to be provided upon request after a requester signs the necessary non-disclosure agreement. The requester should not be required to demonstrate a need to access facility and transmission line ratings information. As recommended by PJM's market monitor, transmission owner discretion regarding line ratings "should be minimized or eliminated" and the "line rating methods should be public and fully transparent."<sup>119</sup>

Accordingly, the Commission should require transmission line ratings and associated methodologies to be publicly available, or at a minimum, accessible to stakeholders, including consumers whose electric transmission rates are directly impacted by inaccurate and chronically understated transmission line ratings.

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proponent of a rate change has the burden of demonstrating that the proposal is just and reasonable and not unduly discriminatory or preferential.")

<sup>118</sup> See Watt Reply Comments at 4 ("security should not be used as red herring to avoid improvements to the grid's reliability and efficiency"); Lindsey Systems November 2020 PJM Presentation at Slide 8 (explaining the cyber security aspects of DLR technologies, such as span mounted sensors that are not accessible for a physical attack).

<sup>119</sup> Speaker Comments of Joe Bowring, Monitoring Analytics, Docket No. AD19-15-000, at 3.

V. **CONCLUSION**

**WHEREFORE**, the Industrial Customer Organizations respectfully request that the Commission consider these Comments when promulgating a Final Rule in this proceeding.

Respectfully submitted,

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Dated: March 22, 2021

**CERTIFICATE OF SERVICE**

I hereby certify that I have this day served, via first-class mail, electronic transmission, or hand-delivery the foregoing upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Washington, DC this 22nd day of March 2021.

*/s/ Robert A. Weishaar, Jr.*

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