

136 FERC ¶ 61,185  
UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Jon Wellinghoff, Chairman;  
Marc Spitzer, Philip D. Moeller,  
John R. Norris, and Cheryl A. LaFleur.

Transmission Relay Loadability Reliability Standard      Docket No. RM08-13-004

ORDER NO. 733-B

ORDER DENYING RECONSIDERATION AND GRANTING CLARIFICATION IN  
PART AND DENYING CLARIFICATION IN PART

(Issued September 15, 2011)

1. In this order, the Commission addresses requests for clarification or reconsideration of Order No. 733-A, which addressed requests for rehearing and clarification of our Final Rule on the North American Electric Reliability Corporation's (NERC) Reliability Standard PRC-023-1 regarding "relay loadability."<sup>1</sup> The petitioners seek further clarification of several matters that were clarified in Order No. 733-A. We address these requests substantively and, in part, grant clarification and, in part, deny requests for clarification.
2. In addition, the petitioners seek clarification or reconsideration regarding certain issues arising from the Final Rule, Order No. 733 that should have been raised at an earlier stage of this proceeding, on rehearing. These arguments are rejected as untimely requests for rehearing of Order No. 733. The petitioners also seek to augment the record by submitting expert affidavits and request that the Commission clarify or reconsider Order No. 733-A in light of the supplemented record. As discussed below, we reject the attempt to expand the record at this late stage of the proceeding. While we reject the untimely arguments and affidavits on procedural grounds, we nonetheless review these matters in a summary manner and deny the requests on substantive grounds.

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<sup>1</sup> *Transmission Relay Loadability Reliability Standard*, Order No. 733, 130 FERC ¶ 61,221 (2010), *order on reh'g and clarification*, Order No. 733-A, 134 FERC ¶ 61,127 (2011).

## I. Background

3. On March 18, 2010, the Commission issued Order No. 733, which approved Reliability Standard PRC-023-1 (Transmission Relay Loadability) submitted to the Commission by NERC, the Commission-certified Electric Reliability Organization (ERO) for the United States. The Reliability Standard requires transmission owners, generator owners, and distribution providers to set load-responsive phase protection relays<sup>2</sup> according to specific criteria in order to ensure that the relays reliably detect and protect the electric network from all fault conditions but do not limit transmission loadability<sup>3</sup> or inhibit system operators' ability to protect system reliability. Pursuant to section 215(d)(5) of the Federal Power Act (FPA),<sup>4</sup> the Commission directed the ERO to develop certain modifications to PRC-023-1 and to develop a new Reliability Standard that requires the use of protective relay systems that can differentiate between faults and stable power swings and, when necessary, phase-out relays that cannot meet this requirement.

4. On February 17, 2011, the Commission issued Order No. 733-A providing clarifications and granting rehearing, in part, and denying rehearing, in part. Among other matters addressed in the order, the Commission clarified its directives to modify PRC-023-1 to include a mandatory test for planning coordinators to use to identify which facilities below 200 kV are critical to the reliability of the bulk electric system (and therefore subject to the Standard) and to revise Attachment A to make the Standard applicable to supervisory relays. Additionally, the Commission clarified a directive requiring NERC to develop a new Reliability Standard addressing stable power swings by requiring the use of protective relays that can differentiate between faults and stable power swings and, when necessary, phase-out relays that cannot meet this requirement. The Commission also offered clarification regarding the applicability of the Standard to backup protective relays located at a generator step-up transformer.

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<sup>2</sup> Load-responsive protection relays are a category of protective relays that detect and initiate the removal of faults on an electric system. They are designed to read electrical measurements, such as current, voltage, and frequency, and can be set to recognize certain measurements as indicating a fault. When a protective relay detects a fault on an element of the system that it is protecting, it sends a signal to an interrupting device (such as a circuit breaker) to disconnect the element from the rest of the system.

<sup>3</sup> Loadability refers to the ability of protective relays to refrain from operating under load conditions.

<sup>4</sup> 16 U.S.C. § 824o(d)(5) (2006).

5. In addition, Order No. 733-A articulated the structure established by section 215 of the FPA by which the Commission, and not solely the ERO, has the responsibility and authority to identify reliability gaps. The ERO is authorized to address reliability matters through its Reliability Standards development process, and the Commission through its review of proposed Reliability Standards and authority to direct modifications or new Standards that address specific issues necessary to carry out the purposes of section 215.

## **II. Request for Clarification of Reconsideration**

6. On March 21, 2011, the Edison Electric Institute and the National Rural Electric Cooperative Association (collectively, EEI/NRECA) jointly filed a timely motion and the American Public Power Association and the Transmission Access Policy Study Group (collectively, APPA/TAPS) together filed a motion, in both instances, requesting clarification or reconsideration of Order No. 733-A.<sup>5</sup>

7. In general, both motions assert the Commission based its directives on a faulty understanding of the Blackout Report<sup>6</sup> or an incorrect characterization of relay engineering. Both motions also reprise issues addressed in Order No. 733-A relating to the Commission exceeding its statutory authority by failing to give “due weight” to the technical expertise of the ERO and by giving overly prescriptive directives. Finally, EEI/NRECA seek clarification or reconsideration of language that they characterize as suggesting that the Commission expects 100 percent relay security and of the Commission’s directive regarding generator relays.

## **III. Discussion**

8. Below, we address the following five matters that are appropriately before us as requests for clarification of Order No. 733-A: (1) stable power swings; (2) due weight to the ERO; (3) scope of Commission directives; (4) expected relay performance; and (5) relays located at generators. On these matters, we grant clarification, in part, and deny clarification, in part.

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<sup>5</sup> EEI/NRECA March 21, 2011 Joint Request for Clarification at 1 (EEI/NRECA Request); APPA/TAPS March 21, 2011 Motion at 1 (APPA/TAPS Motion). EEI/NRECA and APPA/TAPS are collectively referred to herein as the Trade Associations.

<sup>6</sup> U.S.-Canada Power System Outage Task Force, *Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations* (Apr. 2004) (Blackout Report), available at <https://reports.energy.gov/BlackoutFinal-Web.pdf>.

9. In addition, certain arguments raised in the requests for clarification and/or reconsideration do not pertain to clarifications made by the Commission in Order No. 733-A. Likewise, EEI/NRECA submit two affidavits to support their pleadings. As discussed below, we reject the untimely pleadings and affidavits on procedural grounds. As we explain, however, even if these pleadings and affidavits were properly before us, they would not cause us to revisit our previous decisions.<sup>7</sup>

**A. Stable Power Swings**

10. Reliability Standard PRC-023-1 applies to steady state<sup>8</sup> relay loadability without regard to dynamic conditions or stable power swings.<sup>9</sup> Rather than ordering the ERO to modify PRC-023-1 to address stable power swings, Order No. 733 directed the ERO to develop a new Reliability Standard that requires the use of protective relay systems that can differentiate between faults and stable power swings and, when necessary, phase-out relays that cannot meet this requirement. In Order No. 733-A, the Commission reaffirmed its belief that not addressing stable power swings constitutes a gap in the current Reliability Standards, clarified its expectations regarding phasing-out zone 3 relays,<sup>10</sup> and affirmed that the ERO has flexibility in how it addresses the directive.

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<sup>7</sup> We address the arguments in these pleadings and affidavits on the merits below, in a section titled “Untimely Arguments.”

<sup>8</sup> The steady state of a power system is an operating condition assumed for analysis purposes in which all the operating quantities that characterize the system’s operating condition can be considered to be constant. As stated in the Blackout Report on page 76, “[t]he electric power system constantly experiences small power oscillations that do not lead to system instability.” As a practical matter, therefore, the power system never achieves a steady state condition because there are always movements or changes in power flows, voltages or frequencies simply due to load ramping, generation dispatches, planned or unplanned removal of facilities, and tripping or inadvertent tripping of facilities due to system disturbances.

<sup>9</sup> Stable power swings are oscillations in power flow(s) on an electric system that do not result in instability and arise from an event or disturbance such as changes in load, scheduled or unscheduled removal of transmission or generation facilities, or a fault.

<sup>10</sup> Reliability Standard PRC-023-1 addresses Recommendation 21A of the Blackout Report, which pertains to zone 3 relays. The most common system protective device for transmission lines is the impedance relay, also known as a distance relay. A protective system using distance relays consists of two or three relays, each of which looks at a particular “zone” of the transmission line. Zone 3 relays, and zone 2 relays set

(continued...)

11. EEI/NRECA assert the Blackout Report does not support the need for a Reliability Standard addressing stable power swings. They believe the Blackout Report neither recommends that such a Standard be created, nor does its analysis support such a Standard. According to EEI/NRECA, relays tripped during the August 2003 Blackout not because of the inability of relays to distinguish faults from stable power swings, but because of faults and severe over-loading conditions without faults. In response to the Commission's statement regarding protection system applications currently used to block tripping of relay elements during stable power swings,<sup>11</sup> EEI/NRECA identify technical limitations of certain protection schemes mentioned by the Commission in Order No. 733-A. They claim that a Reliability Standard that requires relays to distinguish between stable power swings and faults threatens to decrease Bulk-Power System reliability.<sup>12</sup> Finally, they assert that the Commission has inserted "dynamic loadability" conditions into PRC-023-1 thus introducing "a concept unknown in the industry" and contradicting the intent of the Reliability Standard. For these reasons, the Trade Associations seek clarification of the rationale supporting the directives.

### **Commission Determination**

12. The Commission addressed this issue in both Order Nos. 733 and 733-A<sup>13</sup> and is not persuaded that further clarification is necessary. The Blackout Report summarizes

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to operate like zone 3 relays (zone 3/zone 2 relays), can provide remote circuit breaker failure and backup protection for remote distance faults on a transmission line. These relays are typically set to reach 100 percent of the protected transmission line with a margin of more than 100 percent of the longest line (including any series elements such as transformers) that emanates from the remote buses. The zone 3/zone 2 relay trips when the apparent impedance (measured by the current and voltage seen by the relay) falls within a designated zone for a specified length of time. In tripping, it causes circuit breakers to operate and thereby isolates the protected elements. Blackout Report at 74; Order No. 733, 130 FERC ¶ 61,221 at P 4 n.8.

<sup>11</sup> "We also believe that [the] claim that relays cannot distinguish between actual faults and stable power swings appears to ignore the fact that there are protection system applications currently in use for such purposes, i.e., 'power swing block' applications that are applied to block tripping of distance relay elements during stable power swings." Order No. 733-A, 134 FERC ¶ 61,127 at P 112 (footnote omitted).

<sup>12</sup> EEI/NRECA Request at 13-14.

<sup>13</sup> Order No. 733, 130 FERC ¶ 61,221 at P 130-173; Order No. 733-A, 134 FERC ¶ 61,127 at P 100-113.

how the August 2003 Blackout cascade was triggered, identifies the role played by zone 3/zone 2 relays operating unnecessarily when faults did not exist,<sup>14</sup> and recommends addressing the problem of such relays tripping unnecessarily.<sup>15</sup> It takes no position, however, on whether to address the problem based on either a steady-state loading approach or a stable power swings approach. Had the Blackout Report taken a position as to how to address the problem of relays tripping unnecessarily, the Commission would nevertheless be authorized by section 215(d)(5) of the FPA to identify gaps in reliability and direct the ERO to submit a new Reliability Standard or a modification to an existing Standard to address such gaps. The ERO designed Reliability Standard PRC-023-1 to address the steady-state aspects of relay loadability,<sup>16</sup> but did not address the aspects of the problem associated with stable power swings. The Commission identified the failure to address stable power swings as a gap in the current Reliability Standards that must be addressed and directed that it be addressed in a separate Reliability Standard.<sup>17</sup>

13. As we explained in Order No. 733, the Commission's concern that stable power swings should not cause unnecessary relay operations is consistent with good planning practices and considerations as documented by the NERC's predecessor, the North American Electric Reliability Council.<sup>18</sup> According to its published *NERC Planning Standards* approved by the ERO's predecessor's Board of Trustees in 1997, good planning practice dictates that protection design systems are to be designed to have generation and transmission protection systems avoid tripping for stable power swings on the interconnected transmission system.<sup>19</sup>

14. EEI/NRECA assert that the August 2003 Blackout was the result of severe overloading conditions and not the result of an inability on the part of relays to distinguish faults from stable power swings. The general nature of their assertion suggests that lines tripped because the current exceeded the lines' ratings just as a household circuit breaker, which is sensitive only to current, trips to prevent thermal damage. But, in fact,

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<sup>14</sup> Blackout Report at 73.

<sup>15</sup> *Id.* at 158.

<sup>16</sup> *See* Order No. 733, 130 FERC ¶ 61,221 at P 132, 173.

<sup>17</sup> *Id.* P 150–153; Order No. 733-A, 134 FERC ¶ 61,127 at P 104.

<sup>18</sup> Order No. 733, 130 FERC ¶ 61,221 at P 151.

<sup>19</sup> North American Electric Reliability Council, *NERC Planning Standards* 49 (1997).

transmission lines can tolerate thermal heating for limited periods without experiencing problems.<sup>20</sup> Moreover, based on steady-state load flow analysis, the Blackout Report indicates the Sammis-Star line, loss of which marked the turning point at which system problems initiated a cascade, only encountered loading above 120 percent of its normal rating<sup>21</sup> but tripped because its protective relays registered low apparent impedance.<sup>22</sup>

15. The Blackout Report details how, upon the initial tripping of FirstEnergy's lines, the redistributed power flows increased the current flowing over the remaining operational lines, thus, aggravating voltage declines.<sup>23</sup> Because current increases in inverse proportion to the decrease in voltage for a given amount of power, as the current rose, the voltage on the lines fell. Zone 3/zone 2 relays, looking for line faults, operated when the apparent impedance (voltage divided by current) seen by the relays fell within one of the relays' operating zones for the appropriate amount of time delay.<sup>24</sup> Once lines in the Cleveland-Akron area tripped, the disrupted power flow on these tripped lines were redistributed to other lines including critical 345 kV lines in Michigan, in turn causing depressed voltages and increased currents which, when seen by zone 3/zone 2 relays, led to further tripping of lines.<sup>25</sup> Based on these facts, an assertion that the lines tripped simply because of overloading in the absence of stable power swings would represent an incomplete picture. Instead, the Blackout Report states that “[p]ower swings and voltage

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<sup>20</sup> North American Electric Reliability Council, *NERC Actions to Prevent and Mitigate the Impacts of Future Cascading Blackouts* 12 (February 10, 2004) (NERC Actions Report), *reprinted in* Blackout Report, Appendix D, at 204 (“Many of the zone 3 relays that operated during the August 14 cascading outage were not set with adequate margins above their emergency thermal ratings. For the short times involved, thermal heating is not a problem and the lines should not be tripped for overloads.”); *see also* Blackout Report at 82.

<sup>21</sup> Blackout Report at 64 fig. 5.12.

<sup>22</sup> *Id.* at 69 (“Unlike the previous three 345-kV lines, which tripped on short circuits to ground due to tree contacts, Sammis-Star tripped because its protective relays saw low apparent impedance (depressed voltage divided by abnormally high line current)—i.e., the relay reacted as if the high flow was due to a short circuit.”).

<sup>23</sup> *Id.* at 81.

<sup>24</sup> *Id.* at 80.

<sup>25</sup> *Id.* at 75.

fluctuations . . . can cause other lines to detect high currents and low voltage that appear to be faults, even if faults do not actually exist on these other lines.”<sup>26</sup>

16. Moreover, the North American Electric Reliability Council acknowledged the role of power swings in the misoperation of relays during the August 2003 Blackout. In its Recommendation 8 appended to the Blackout Report in Appendix D, it acknowledged the role power swings played in causing zone 3 relays to operate for overload conditions:

First, beginning with the Sammis-Star line trip, most of the remaining line trips during the cascade phase were the result of the operation of a zone 3 relay for a perceived overload (a combination of high amperes and low voltage) on the protected line. If used, zone 3 relays typically act as an overreaching backup to zone 1 and zone 2 relays, and are not intentionally set to operate on a line overload. However, under extreme conditions of low voltages and *large power swings* as seen on August 14, zone 3 relays can operate for overload conditions and propagate the outage to a wider area by essentially causing the system to “break up.”<sup>27</sup>

In response to the Commission’s request for comment on whether the ERO should develop a modification to PRC-023-1 or a separate Reliability Standard to address stable power swings, NERC replied, in part, that “[r]eliability of the power system requires secure protective relay settings to avoid operation during *stable power swings* and dependable tripping for faults and unstable power swings. . . . FERC is appropriately concerned with the effect of stable power swings upon load responsive relays.”<sup>28</sup> And in a document that the ERO described as representing the technical justification for ongoing revisions to the Reliability Standard addressing coordination of system protection among operating entities,<sup>29</sup> NERC’s System Protection and Control Subcommittee states “[t]he

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<sup>26</sup> *Id.* at 73.

<sup>27</sup> NERC Actions Report at 12, *reprinted in* Blackout Report at 204 (emphasis added).

<sup>28</sup> North American Electric Reliability Corp. August 17, 2009 Comments in Response to Notice of Proposed Rulemaking (NERC Comments) Docket No. RM08-13-000, at 24–25 (emphasis added).

<sup>29</sup> *Id.* at 21.

impedance relay *must not operate for stable system swings.*<sup>30</sup> The Commission's directive is, therefore, supported by the record and is not arbitrary and capricious.<sup>31</sup>

17. In response to the Commission's Notice of Proposed Rulemaking,<sup>32</sup> some commenters disputed the value of the protection schemes capable of distinguishing between faults and stable power swings mentioned by the Commission, and argued that the applications identified by the Commission were less reliable than the methods used in distance relays. In Order No. 733, we noted that the protection systems discussed in the NOPR were merely examples of systems that can differentiate between faults and stable power swings. Regarding the Trade Associations' concern that the directive may result in reduced reliability, we repeat what we responded to those NOPR commenters in Order No. 733: "We leave it to the ERO to determine the appropriate protection systems to be discussed in the new Reliability Standard through application of its technical expertise."<sup>33</sup>

18. Our directive does not require the elimination of the currently used impedance (or distance) relays as backup protection. Nor does it mandate use of a particular technology or an absolute obligation to prevent protection relays from operating unnecessarily during power stable swings. Our directive instead requires "the creation of a Reliability Standard that addresses protection systems vulnerable to stable power swings (resulting from Category B and Category C contingencies) that will result in inappropriate

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<sup>30</sup> North American Electric Reliability Corp., *Technical Reference Document, Power Plant and Transmission System Protection Coordination* 26 (2009) (emphasis added) (subsequently revised in July 2010 without alteration to cited material).

<sup>31</sup> The ERO has continued to support the reliability objective associated with developing a Reliability Standard to address operation of protective relays in response to stable power swings. North American Electric Reliability Corporation, Informational Filing in Response to Order No. 733-A on Rehearing, Clarification, and Request for an Extension of Time, Docket No. RM08-13-000 at 7 (filed July 21, 2011) (NERC Informational Filing).

<sup>32</sup> *Transmission Relay Loadability Reliability Standard*, Notice of Proposed Rulemaking, FERC Stats. & Regs. ¶ 32,642 (2009) (NOPR).

<sup>33</sup> Order No. 733, 130 FERC ¶ 61,221 at P 167; *see also* Order No. 733-A, 134 FERC ¶ 61,127 at 108 ("[t]hrough the application of its technical expertise, and the balancing of stakeholder interests, the ERO's Reliability Standard development process is the appropriate forum to discover and address any unintended consequences arising from the use of protective relays systems").

tripping.”<sup>34</sup> A new Reliability Standard addressing stable power swings will interact with existing Facilities Design, Connections and Maintenance (FAC), Interconnection Reliability Operations and Coordination (IRO), Protection and Control (PRC), Transmission Operations (TOP), and Transmission Planning (TPL) Reliability Standards. These Reliability Standards interact to promote Reliable Operations. As we said in Order No. 733:

these interactions require limits to be established for all system elements, interconnected systems to be operated within these limits, operators to take immediate action to mitigate operation outside of these limits, and protective relays to refrain from operating until the observed condition on their protected element exceeds these limits. Protection relays include primary and backup relays. If zone 2/zone 3 relays are used by entities as part of their protection systems designed to achieve the system performance, they can remain as backup protection as long as they do not inadvertently trip non-faulted facilities due to stable power swings.<sup>35</sup>

19. As to EEI/NRECA’s assertion that our directive contradicts the intent of the Reliability Standard by inserting dynamic-related criteria into PRC-023-1, we note that our directive was to fill a gap not intended to be covered by this Reliability Standard by creating a *new* Reliability Standard to address stable power swings. In its response to the NOPR, NERC commented that rather than modifying PRC-023-1, stable power swings should be addressed in a separate Reliability Standard.<sup>36</sup> NERC further requested that we provide the ERO adequate time to undertake the effort to develop requirements that promote the overall reliability of the power system while avoiding unintended consequences. The Commission, accordingly, did not direct that stable power swings be addressed in PRC-023-1. Instead, we agreed with the ERO that this subject could appropriately be handled in a separate Reliability Standard and directed the ERO to submit an action plan and timeline to address this issue.

20. Therefore, based on the rationale provided above, we do not provide the clarification sought by the Trade Associations.

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<sup>34</sup> Order No. 733-A, 134 FERC ¶ 61,127 at 107.

<sup>35</sup> Order No. 733, 130 FERC ¶ 61,221 at P 166.

<sup>36</sup> NERC Comments at 25.

**B. Due Weight****Order No. 733-A**

21. In Order No. 733-A, the Commission reaffirmed that the ERO has discretion in how to comply with a Commission directive.<sup>37</sup> The Commission explained that “[t]he ERO is not required to adopt the Commission’s guidance into the Reliability Standard, but is required to develop its response to the Commission’s concerns through the stakeholder evaluation process contained within the Reliability Standard development process.”<sup>38</sup>

22. In discussing concerns raised on rehearing regarding the Commission’s application of due weight, the Commission explained:

We find no difficulty in reading section 215(d)(2) in harmony with section 215(d)(5). Section 215(d)(2) requires the Commission to give due weight to the technical expertise of the ERO when the Commission reviews a Standard or modification proposed by the ERO. Section 215(d)(5) authorizes the Commission to direct a modification to a Standard if it judges that such a modification is necessary. There is no contradiction in the Commission giving due weight to the technical expertise of the ERO and still finding that there is a “specific matter” that the ERO must address. EEI’s argument tends to diminish the significance of the Commission’s authority to direct modifications under section 215(d)(5) because it fails to recognize that the Commission, and not just the ERO, has the responsibility and authority to identify “specific matters” that it considers appropriate to carry out section 215. Section 215 establishes a paradigm by which both the Commission and the ERO are responsible for identifying reliability gaps—the ERO through its Reliability Standards development process, where it can independently identify areas of concern and develop Standards to address them; and the Commission through its review of proposed Reliability Standards and authority to direct modifications or new Standards that address specific issues necessary to effectuate the purposes of section 215.<sup>39</sup>

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<sup>37</sup> Order No. 733-A, 134 FERC ¶ 61,127 at P 12; *see generally id.* “Authority Under Section 215(d) of the FPA” at P 8–30.

<sup>38</sup> *Id.* P 12.

<sup>39</sup> *Id.* P 25 (citation omitted); *see also id.* P 23–27.

### Requests for Clarification

23. EEI/NRECA state that an essential part of the reliability regime established by section 215 of the FPA is the requirement that the Commission give due weight to the technical expertise of the ERO. They argue that the Commission failed to give due weight to the ERO's technical expertise regarding *how* to address the transmission relay loadability concerns raised in the Blackout Report. EEI/NRECA contend that the Commission's directives in this proceeding necessarily determined that the ERO had not sufficiently addressed the recommendations of the Blackout Report on loadability issues. But, they argue, "where the ERO has proposed a rational technical basis for why the proposed Reliability Standard meets the purpose of the Standard, the obligation to give 'due weight' should act to prevent the Commission from second-guessing the conclusions of the ERO, even if the Commission believes it would have proposed a different Reliability Standard."<sup>40</sup>

24. EEI/NRECA further assert that a directive begins with a determination that the proposed Reliability Standard is technically deficient, thus, overruling the ERO's conclusions on the proper way to protect the Bulk-Power System. EEI/NRECA contend that, the Commission's duty to give due weight to the ERO's expertise requires that "the Commission must respect the technical expertise of the ERO not only in *how* to address the underlying concern, but also with regards [sic] to *whether* there is an additional underlying concern on that issue that needs to be addressed."<sup>41</sup>

25. According to EEI/NRECA, a proposed Reliability Standard is the product of the ERO's technical judgment with respect to both what it contains and what it omits. With this premise, any directive addressing the context of the proposed Standard must overcome the obligation to accord due weight to the ERO's technical judgment. Accordingly, EEI/NRECA argue that Order No. 733-A errs in asserting that the Commission's authority to direct a modification under section 215(d)(5) of the FPA is not constrained by the requirement in section 215(d)(2)<sup>42</sup> that it give due weight to the technical expertise of the ERO.<sup>43</sup>

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<sup>40</sup> EEI/NRECA Request at 22.

<sup>41</sup> *Id.* at 25.

<sup>42</sup> 16 U.S.C. § 824o(d)(2) (2006).

<sup>43</sup> Order No. 733-A, 134 FERC ¶ 61,127 at P 25.

26. In giving guidance with respect to a specific directive, the Commission has stated that it will consider an alternative provided that the ERO can show that its alternative addresses the Commission's underlying reliability concern in an equally efficient and effective manner as the Commission's suggested approach.<sup>44</sup> For the Trade Associations, the requirement that the ERO's alternative approach must be equally effective and efficient as the Commission's proposal is not supported by Section 215, and adds additional and unwarranted restrictions on the ERO's statutory role.<sup>45</sup>

### **Commission Determination**

27. We deny the EEI/NRECA request for clarification on this issue. While EEI/NRECA add some new nuance to the matter, their petition essentially revisits a matter that we have adequately addressed previously in this and other Commission proceedings.<sup>46</sup> However, we address the matter below because of the ongoing concern regarding the Commission's authority to issue directives pursuant to section 215(d)(5) of the FPA and how that dovetails with another statutory provision that the Commission give "due weight" to the ERO's technical expertise.

28. Section 215(d)(5) of the FPA grants the Commission the authority to direct the ERO to develop a Reliability Standard or a modification to a Reliability Standard that addresses a specific matter if the Commission considers such a new or modified Reliability Standard appropriate.<sup>47</sup> While EEI/NRECA are correct in stating that the Commission must give due weight to the technical expertise of the ERO when the Commission reviews a Standard or modification proposed by the ERO, their argument fails to recognize that the Commission, upon its own motion, is authorized to identify matters it considers appropriate to carry out section 215. The Commission has the

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<sup>44</sup> *Id.* P 13; Order No. 733, 130 FERC ¶ 61,221 at P 18.

<sup>45</sup> EEI/NRECA Request at 23; APPA/TAPS Motion at 5.

<sup>46</sup> See Order No. 733-A, 134 FERC ¶ 61,127 at P 8–12, 22–27; see also *Revision to Electric Reliability Organization Definition of Bulk Electric System*, Order No. 743-A, 134 FERC ¶ 61,210, at P 14–16, 26–31 (2011); *North American Electric Reliability Corp.*, 132 FERC ¶ 61,218, at P 30–36, 53 (2010).

<sup>47</sup> Section 215(d)(5) of the FPA states: "The Commission, upon its own motion or upon complaint, may order the Electric Reliability Organization to submit to the Commission a proposed reliability standard or a modification to a reliability standard that addresses a specific matter if the Commission considers such a new or modified reliability standard appropriate to carry out this section."

responsibility and authority to identify specific matters that it considers appropriate to carry out section 215.<sup>48</sup>

29. We are not persuaded by EEI/NRECA's argument that a proposed Reliability Standard is owed due weight both to the matters addressed in the Standard and to related matters that are omitted from the Standard without any explanation in the record. The petitioners' approach is incongruous with the language of section 215(d)(2) of the FPA, which states that "the Commission shall give due weight to the technical expertise of the Electric Reliability Organization with respect to the *content* of a proposed standard or modification to a reliability standard..." (emphasis added). EEI/NRECA argue that an unexplained omission is an exercise of the ERO's technical expertise and thus entitled to due weight. We disagree, and find that it is unreasonable to read the statute as requiring the Commission to give due weight to an omission when there is no evidence in the record to explain that omission. Without such evidence, the Commission would have no basis for evaluating the reasoning behind the omission or for determining whether the omission prevented the proposed Reliability Standard from satisfying the statutory standard of review. Thus, the Commission must give due weight to an omission when the ERO explains the technical basis behind the omission in an initial filing, response to a Commission data request, supplemental filing, comments on a notice of proposed rulemaking, or other filing in the record. We do not read section 215(d)(2) as requiring the Commission to give due weight to an unexplained omission, especially in circumstances where, as here, the Commission identifies the omission as an area of concern and provides the ERO with an opportunity to comment on whether the concern is justified, and if so, whether the Commission's proposed remedy is appropriate. Consequently, we reject EEI/NRECA's argument.

30. Moreover, EEI/NRECA imply that the due weight owed the ERO prevents the Commission from issuing directives to augment or modify a Standard. We disagree with any such implication. We believe it is important to explain the Commission's application of due weight, as well as its section 215(d)(5) authority, in the context of this proceeding. In Order No. 733, the Commission directed the ERO to develop a new or modified Reliability Standard to address several concerns identified by the Commission. For example, Reliability Standard PRC-023 does not address stable power swings. The Commission found that this omission constitutes a reliability gap and directed the ERO to develop a new Standard that addresses this matter.<sup>49</sup> Furthermore, in its comments in response to the reliability gap identified by the Commission in the NOPR, the ERO

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<sup>48</sup> Order No. 733-A, 134 FERC ¶ 61,127 at P 25.

<sup>49</sup> Order No. 733, 130 FERC ¶ 61,221 at P 150; Order No. 733-A, 134 FERC ¶ 61,127 at P 104.

affirmed the need to address stable power swings.<sup>50</sup> In this circumstance, it is reasonable for the Commission to exercise its section 215(d)(5) authority to direct the ERO to develop a new or modified Reliability Standard that addresses the Commission's concern.

31. Similarly, Reliability Standard PRC-023-01 states that the Standard applies to transmission lines operated at 200 kV and above and "transmission lines operated at 100 kV to 200 kV as designated by the Planning Coordinator as critical to the reliability of the Bulk Electric System."<sup>51</sup> The Reliability Standard, however, does not provide any criteria for defining or identifying transmission lines that are "critical" to reliability. In its comments on the NOPR, NERC submitted its guidance for identifying operationally significant 100kV–200kV facilities, but after careful review and giving due weight to the ERO's submission, the Commission concluded that the guidance would identify some, but likely not all, critical sub-200 kV facilities. In particular, the Commission found that while NERC's guidance would identify all critical facilities between regions and sub-regions, it would not necessarily identify the critical facilities within a sub-region or a company.<sup>52</sup> In light of this, the Commission directed the ERO pursuant to section 215(d)(5) of the FPA, to develop a mandatory test to identify which sub-200 kV facilities could trip on relay loadability and contribute to a cascading outage.<sup>53</sup> The Commission's Final Rule also articulated what an appropriate set of criteria would accomplish and a suggested set of criteria for determining "critical" transmission lines in the 100 kV to 200 kV range. The Commission, however, made clear that other approaches would be acceptable provided that they satisfied the underlying reliability concerns. Again we believe that this is an appropriate exercise of the Commission's 215(d)(5) authority, and does not deny due weight to the ERO's technical expertise.<sup>54</sup>

32. In another exercise of its section 215(d)(5) authority, the Commission directed the ERO to modify PRC-023-1 by removing supervisory relays from Attachment A's list of

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<sup>50</sup> See NERC Comments at 24.

<sup>51</sup> PRC-023-1 A.4.1.2.

<sup>52</sup> Order No. 733, 130 FERC ¶ 61,221 at P 75-76.

<sup>53</sup> Order No. 733-A, 134 FERC ¶ 61,127 at P 39, *citing* Order No. 733, 130 FERC ¶ 61,221 at P 69.

<sup>54</sup> The ERO acknowledged the need for some criteria in its comments on the NOPR. See NERC Comments at 12 ("NERC recognizes the need for consistent criteria across North American [sic] for making these determinations regarding 100 kV to 200 kV circuits.").

protection systems excluded from the requirements of the Reliability Standard. The Commission, however, made it clear that it did not prescribe this specific change as an exclusive solution to its reliability concern.<sup>55</sup> The ERO gave no technical rationale for the exclusion in its initial filing, but in response to the NOPR justified the exclusion on the basis that it is preferable to trip one line for loss of communications than not to trip the line at all.<sup>56</sup> In this instance, the Commission, after giving due weight to the ERO's technical expertise, was not persuaded that the ERO had offered a reasonable rationale for the exclusion of supervisory relays.<sup>57</sup> Even with this concern, the Commission determined that the proposed Reliability Standard PRC-023-1 was just and reasonable, not unduly discriminatory or preferential and in the public interest, and approved the Standard. However, as a separate matter, the Commission exercised its authority pursuant to section 215(d)(5) of the FPA and directed the ERO to address the Commission's concern regarding supervisory relays.

33. We disagree with the Trade Associations' argument that the Commission is adding an unwarranted restriction on the ERO by requiring any alternative to its guidance to be "equally effective and efficient" as the Commission's suggested approach. The Commission addressed this same issue raised by NRECA in another docket. Our Order No. 743-A noted that section 215(d)(2) of the FPA establishes the standard of review the Commission is to use in reviewing the content of an ERO proposed Reliability Standard.<sup>58</sup> The statute specifies that the "Commission may approve, by rule or order, a proposed reliability standard or modification to a reliability standard if it determines that the standard is just, reasonable, not unduly discriminatory or preferential, and in the public interest."<sup>59</sup> The Commission then dismissed NRECA's argument by stating:

Certainly, whether a proposed Reliability Standard provides for an adequate level of reliability is included in the factors used in determining whether the proposal is just and reasonable, but it is not the standard of review. The Commission's statement that any alternative proposal must be "as effective

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<sup>55</sup> Order No. 733, 130 FERC ¶ 61,221 at P 264.

<sup>56</sup> NERC Comments at 35.

<sup>57</sup> See Order No. 733, 130 FERC ¶ 61,221 at P 267–269 (explaining the Commission's concerns regarding the exclusion of supervisory relays).

<sup>58</sup> *Revision to Electric Reliability Organization Definition of Bulk Electric System*, Order No. 743-A, 134 FERC ¶ 61,210, at P 14 (2011).

<sup>59</sup> 16 U.S.C. ¶ 824o(d)(2).

as, or more effective than, the Commission's proposed approach" must not "result in a reduction in reliability" provides guidance regarding the Commission's view of what is necessary to produce not only an adequate level of reliability but also a result that accords with the section 215(d)(2) review criterion.<sup>60</sup>

34. Accordingly, for the reasons discussed above, we deny the Trade Associations' request for clarification on this issue.

### C. Scope of Commission Directives

35. In Order No. 733-A, the Commission addressed arguments on rehearing that Order No. 733 prescribed the specific technical content of certain modifications and, thereby, exceeded the Commission's authority. In response, the Commission clarified in Order No. 733-A that it did not require the ERO to adopt the precise content of Commission guidance in order to satisfy the concern identified by the Commission.<sup>61</sup> Rather, the guidance was given to inform the ERO and industry as to the underpinnings of the Commission's concerns.<sup>62</sup>

36. APPA/TAPS ask the Commission to clarify that its directive to make Reliability Standard PRC-023-1 applicable to supervisory relays does not foreclose the ERO developing a more tailored approach to addressing the Standard's applicability.

37. The Trade Associations assert that the scope of the directives clarified in Order No. 733-A belies the Commission's claim that the ERO has discretion in how it addresses the Commission's underlying reliability concern. The directives, EEI/NRECA claim, direct the ERO *how* to address the Commission's concerns and in so doing, exceed the statutory authority of the Commission to grant directives on a "specific matter." For example, according to EEI/NRECA, rather than simply state its concern that reliability is compromised by excluding supervisory relays from the scope of PRC-023-1, the Commission directed the ERO to (1) remove the exclusion of supervisory relays from the Reliability Standard, and (2) add supervisory relays to the list of protective functions described as within the scope of the Standard.

38. EEI/NRECA point to the directive to develop a test to determine sub-200 kV critical assets as another example in which the Commission restricted the ERO's

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<sup>60</sup> Order No. 743-A, 134 FERC ¶ 61,210 at P 16 (citations omitted).

<sup>61</sup> *E.g.*, Order No. 733-A, 134 FERC ¶ 61,127 at P 10–13, 23, 48.

<sup>62</sup> *Id.* P 12.

discretion by identifying specific elements that it would consider appropriate for such a test. They argue that although the Final Rule explicitly provides room for discretion, the ERO remains constrained by the Commission's restrictions on the manner in which it is permitted to address the Commission's underlying concerns. EEI/NRECA argue that, by so limiting the ERO's scope to address an identified reliability concern, the Commission exceeded its authority under the FPA and impinged on the ERO's authority to draft and propose Reliability Standards.

### **Commission Determination**

39. In response to APPA/TAPS, we clarify our directive pertaining to supervisory relays. In Order No. 733-A, the Commission discussed its directive to make supervisory relays subject to Reliability Standard PRC-023-1 and stated:

As discussed in Order No. 733, and previously in this section, the Commission is concerned with supervisory relays set below the rating of the line being continuously energized and thus no longer able to act as a check on the protection system the relays are supervising. . . . The ERO did not provide any technical rationale for excluding any load responsive phase protection systems from the requirements of PRC-023-1. Having directed the ERO to modify PRC-023-1 in a specific manner, we will accept an alternative method that addresses the Commission's concern provided such alternative is demonstrably adequate in addressing the Commission's underlying concern as efficiently and effectively as the Commission's proposal.<sup>63</sup>

The Commission clarifies that its directive regarding the applicability of the Reliability Standard to supervisory relays does not foreclose the development of an approach tailored to eliminate application of the standard to some supervisory relays but not to others, where technically justified.<sup>64</sup> In other words, the revised standard only need apply to a subset of supervisory relays.

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<sup>63</sup> *Id.* P 133-134.

<sup>64</sup> Concurrent with the issuance of this order, we are also issuing a Notice of Proposed Rulemaking in Docket No. RM11-16-000, pertaining to NERC's proposed revisions to Reliability Standard PRC-023-2. In that proceeding, the Commission proposes to approve NERC's modified Reliability Standard, which includes a provision pertaining to supervisory relays. *See Transmission Relay Loadability Reliability Standard*, Notice of Proposed Rulemaking, 136 FERC ¶ 61,187 at P 28-29, 39 (2011).

40. The Commission declines to grant clarification as to the other issues raised regarding the scope of the Commission's directives. EEI/NRECA's arguments seem to presuppose that the use of the term "specific matter" in section 215(d)(5) necessarily means a single, unitary matter.<sup>65</sup> Thus, they argue that the Commission should have articulated its concern regarding a test for sub-200 kV facilities as a single issue: the lack of a uniform test for critical sub-200 kV facilities. Instead, the Commission articulated its concern as follows:

[I]n order to provide the necessary assurance that the Standard would achieve its purpose, the test must include or be consistent with the system simulations and assessments that are already required by the existing TPL Reliability Standards, meet the system performance levels for all Category of Contingencies used in transmission planning, set forth some definition of desirable system performance, and describe the steady state and dynamic base cases that the planning coordinator must use in identifying facilities in the 100 kV to 200 kV range that are subject to PRC-023-1.<sup>66</sup>

As we said in Order No. 733-A, these are the elements that constitute the Commission's reliability concern. When the Commission's concern is manifold, it serves no purpose to pretend it is simple and deny the ERO the ability to understand the full extent of the Commission's concern. If the Commission foregoes giving a precise statement of its concern, the ERO may not know how to appropriately respond.<sup>67</sup>

41. We find our view to be consistent with the statutory language that authorizes the Commission to order the ERO to submit a new Reliability Standard or a modification to address a "specific matter" the Commission considers appropriate. If the Commission were to adopt the Trade Associations' reading of the statute, the Commission would be constrained to articulate its reliability concerns such as those quoted above one at a time, thus compelling an inefficient succession of directed modifications to the Reliability Standard.

#### **D. Expectation as to Relay Operation**

42. EEI/NRECA seek clarification as to whether the Commission expects relays to never operate during non-fault conditions. Order No. 733-A discussed an argument made

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<sup>65</sup> See EEI/NRECA Request at 29–30.

<sup>66</sup> Order No. 733-A, 134 FERC ¶ 61,127 at P 22.

<sup>67</sup> See Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 185.

by EEI that it would be better for relays to trip for certain known but uncommon, non-fault conditions rather than risk not tripping for another condition. As part of its response to this argument, the Commission said that “a protection relay, as an integral part of the Bulk-Power System, must not operate during non-fault conditions, regardless of how few times the relay may actually operate.”<sup>68</sup> EEI/NRECA assert this statement suggests the Commission wants 100 percent security and seek clarification that the Commission does not expect that relays will never operate during non-fault condition.<sup>69</sup>

43. Order No. 733-A addressed this matter in the context of stable power swings, when the Commission said “we do not direct the development of a Reliability Standard containing an absolute obligation to prevent protection relays from operating unnecessarily. . . .”<sup>70</sup> We clarify that the language identified by EEI/NRECA is the design condition expected of such protection relay systems and not an expectation that such a design will always achieve its objective 100 percent of the time. In other words, we do not expect perfect relay operation. However, the design and implementation of relay systems pursuant to Reliability Standard PRC-023 should duly consider the appropriate balance between security and dependability as they strive to avoid settings that will result in relay operation under non-fault conditions.<sup>71</sup> Accordingly, we grant clarification of this issue.

#### **E. Relays Located at Generators**

44. In Order No. 733, the Commission distinguished between two roles for protection relays located at the generator terminal on the low-voltage side of a generator step-up transformer. Such relays can: (1) provide backup protection for a Bulk-Power System element such as a transmission line outside of the generator zone of protection, or (2) provide backup protection for the generator and step-up transformer.<sup>72</sup> The Commission stated that those relays that provide backup protection to transmission lines

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<sup>68</sup> Order No. 733-A, 134 FERC ¶ 61,127 at P 131.

<sup>69</sup> EEI/NRECA Request at 33–34.

<sup>70</sup> Order No. 733-A, 134 FERC ¶ 61,127 at P 107.

<sup>71</sup> Relay dependability and security are not synonymous. The dependability of a relay addresses whether the relay will trip during a fault; security addresses whether the relay will not trip in the absence of a fault. *See* Order No. 733-A, 134 FERC ¶ 61,127 at P 127.

<sup>72</sup> Order No. 733, 130 FERC ¶ 61,221 at P 113.

and transformers are subject to Reliability Standard PRC-023-1.<sup>73</sup> In Order No. 733-A, the Commission clarified that it does not intend the Reliability Standard to apply to backup protective relays connected to current transformers at the neutral end of the generator.<sup>74</sup> Order No. 733-A also noted that Attachment A to PRC-023-1 explicitly excludes generator protection relays that are susceptible to load, but Attachment A does not exclude any other type of relay physically located on the low-voltage side of a generator step-up transformer.<sup>75</sup> Thus, the Commission concluded that, by its very terms, the Reliability Standard applies to generator protection relays located at the generator step-up transformer.<sup>76</sup>

45. Order No. 733-A states that Reliability Standard PRC-023-1 applies to relays which, though “they may be connected to current transformers located at the generator terminal or on the low-voltage side of the generator step-up transformer, are set to provide backup protection for Bulk-Power System elements.”<sup>77</sup> EEI/NRECA characterize this statement as being in conflict with the Commission’s stated expectation that “the ERO will develop [a] Reliability Standard addressing generator loadability as a new Reliability Standard with its own individual timeline, and not as a revision to an existing Standard”<sup>78</sup> and request clarification of this apparent conflict.

46. EEI/NRECA also argue that relays that sense in the direction of the transmission system serve to protect the thermal limits of the generating asset rather than loadability of the transmission system. Since the generator operates at a lower power capacity than the transmission system, EEI/NRECA claim that setting the relay in accordance with Reliability Standard PRC-023-1 may not adequately protect the generating asset. Moreover, because the relays are applied at the generating terminals and not the transmission lines, they do not restrict transmission loadability. Finally, EEI/NRECA assert that failure to clarify the scope of PRC-023-1 will change the function of these relays from protection of generation assets to supporting transmission loadability.

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<sup>73</sup> *See id.* P 112.

<sup>74</sup> Order No. 733-A, 134 FERC ¶ 61,127 at P 93.

<sup>75</sup> *Id.*

<sup>76</sup> *Id.*

<sup>77</sup> *Id.* P 94 (citation omitted).

<sup>78</sup> *Id.* P 95, *citing* Order No. 733, 130 FERC ¶ 61,221 at P 106.

### Commission Determination

47. The orders in this proceeding state that Reliability Standard PRC-023-1 applies to relays set to provide primary or backup protection to transmission elements rather than to generators.<sup>79</sup> We see no conflict between this statement and the stated expectation that the ERO will develop a new Reliability Standard addressing generator relay loadability. The Commission addressed EEI/NRECA's perceived conflict in Order No. 733 when it stated:

Our statement that such relays are subject to the Reliability Standard is not in conflict with the use of a protection system to protect the generator/step-up transformer in the context of other industry standards, such as IEEE Standard C37.102, or with the exclusion in section 3.4 of Attachment A to PRC-023-1 of generator relays that are susceptible to load. The relays that we referred to in the NOPR, while they may be physically located at the generator terminal or on the low-voltage side of the generator step-up transformer, are applied to provide backup protection for Bulk-Power System elements. This application is different from "generator relays," which are also physically located at the generator, but are applied to protect the generator.<sup>80</sup>

48. Further, we disagree with EEI/NRECA's broad claim that all relays sensing in the direction of the transmission system serve to protect the thermal limits of the generating assets and that our assertion as to the scope of PRC-023-1 changes the function of these relays from protecting generation assets to supporting transmission loadability. Certainly, some relays sensing in the direction of the transmission system are set to protect generating assets, but our statement regarding PRC-023-1's applicability was not directed at those relays. Instead, we address only that subset of relays set to provide backup protection for Bulk-Power System elements.

49. While such relays may be few in number, distance relays can be physically located at the generator terminal on the low-voltage side of a step-up transformer, sensing in the direction of the transmission system, and function as backup protection for a Bulk-Power System fault (i.e., for a transmission line outside of the generator zone of protection) in case the transmission system relays fail to clear a fault.<sup>81</sup> This understanding is

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<sup>79</sup> *Id.* P 94, 98; Order No. 733, 130 FERC ¶ 61,221 at P 112.

<sup>80</sup> Order No. 733, 130 FERC ¶ 61,221 at P 114 (citation omitted).

<sup>81</sup> *Id.* P 113.

confirmed in NERC's Technical Reference Document, *Power Plant and Transmission System Protection and Coordination*, written by industry experts and approved by NERC's Planning Committee. This document states that "[t]he generator impedance relay can be set to provide trip dependability for faults on transmission lines when relays fail."<sup>82</sup> In such instances, where the relay is set to trip for faults on transmission lines, the relay must be coordinated with generator protection devices, but the relay is designed to trip the step-up transformer and generator in order to stop current flowing from the generator to the faulted line when transmission line relays fail.<sup>83</sup>

50. Because relays can be set to trip for faults on transmission lines, they can restrict transmission loadability notwithstanding that they are applied at the generator rather than on the transmission system. If the relay can inappropriately trip the step-up transformer and generator under non-fault conditions, it can leave other generators to shoulder its share of the system load.

51. EEI/NRECA assert that, because a generator operates at a lower power capacity than the transmission facility to which it is connected, setting a relay in accordance with Reliability Standard PRC-023-1 may not adequately protect the generating asset. This assertion appears to be contradicted by the above-quoted statement in the NERC Technical Reference Document, but it does not conflict with the Commission's statements in Order No. 733 and Order No. 733-A. The Commission has not stated that a relay whose function is to protect the generating asset is subject to PRC-023-1. In Order No. 733, the Commission declined to extend the Reliability Standard to generator step-up and auxiliary transformer loadability, agreeing with the ERO that the matter could appropriately be addressed in a separate Reliability Standard.<sup>84</sup> In the context contemplated by EEI/NRECA's argument, where the relay is set to protect generating elements, the relay may be set in whatever manner is appropriate to achieve its intended purpose.

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<sup>82</sup> North American Electric Reliability Corp., *Technical Reference Document, Power Plant and Transmission System Protection Coordination* 34 (2009). The Reference Document then continues to describe the technical details on how the generator impedance relay should be set to provide trip dependability for faults on transmission lines.

<sup>83</sup> *See id.* at 35.

<sup>84</sup> Order No. 733, 130 FERC ¶ 61,221 at P 104; *see also* Order No. 733-A, 134 FERC ¶ 61,127 at P 98.

52. Accordingly, we deny the EEI/NRECA request for clarification of the Commission's statements regarding the applicability of Reliability Standard PRC-023-1 to relays located at a generator terminal that serve to protect Bulk-Power System elements.

#### **F. Untimely Arguments**

53. The Trade Associations assert the Commission's directives regarding (a) creation of a uniform test to identify critical sub-200 kV facilities, (b) subjecting supervisory relays to PRC-023-1, and (c) creation of a new Reliability Standard addressing protective relays that can differentiate between stable power swings and faults are based on errors of fact. These directives, they assert, reflect a misunderstanding of protection system engineering and of the Blackout Report. EEI/NRECA argue that, to the extent the Commission failed to consider the negative reliability implications of the directives, reached conclusions contrary to the findings or recommendations of the Blackout Report, or exceeded a mere difference of opinion regarding the directives' engineering implications, the directives are arbitrary and capricious.

54. While Order No. 733-A offered clarifications of the Commission's earlier directives regarding creating a uniform test to identify critical sub-200 kV facilities and subjecting supervisory relays to PRC-023-1, the arguments raised in the Trade Associations' motions do not arise as a result of new information set forth in our clarifications. Instead, they attempt to revisit the technical basis for the Commission's directives. The Trade Associations should have raised these arguments in response to the NOPR. Failing that, the arguments should have been raised on rehearing prior to the issuance of Order No. 733-A.

55. The Commission does not allow rehearing of an order denying rehearing.<sup>85</sup> Any other result would lead to never-ending litigation as every response by the Commission to a party's arguments would allow yet another opportunity for rehearing unless presumably that response were word-for-word identical to what the Commission earlier said.<sup>86</sup>

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<sup>85</sup> See, e.g., *Bridgeport Energy, LLC*, 114 FERC ¶ 61,265 (2006) (*Bridgeport*); *Cargill Power Markets, LLC et al.*, 114 FERC ¶ 61,093 (2006); *Southern Company Services, Inc.*, 111 FERC ¶ 61,329 (2005); *AES Warrior Run, Inc. v. Potomac Edison Company d/b/a Allegheny Power*, 106 FERC ¶ 61,181 (2004); *Southwestern Public Service Co.*, 65 FERC ¶ 61,088, at 61,533 (1993).

<sup>86</sup> See, e.g., *Bridgeport*, 114 FERC ¶ 61,265 at P 8, citing *Canadian Association of Petroleum Producers v. FERC*, 254 F.3d 289, 296 (D.C. Cir. 2001) (rejecting the notion of "infinite regress" that would "serve no useful end").

Litigation before the Commission cannot be allowed to drag on indefinitely – at some point it must end – and so the Commission does not allow parties to seek rehearing of an order denying rehearing. As the U.S. Court of Appeals for the District of Columbia Circuit has explained, even “an improved rationale” does not justify a further request for rehearing.<sup>87</sup>

56. Matters that do not arise as a result of a modification of Order No. 733 by Order No. 733-A should have been raised previously in a motion for rehearing of Order No. 733 and are therefore rejected based on the procedural defect.

57. Further, in support of their arguments, EEI/NRECA append to their motion two affidavits of Thomas E. Wiedman (Wiedman Affidavit) and William J. Miller (Miller Affidavit) addressing the Blackout Report and various engineering matters such as the role and function of supervisory relays. These issues were first addressed in the NOPR and should have been raised in comments to it.<sup>88</sup> These issues were also addressed in the Order No. 733<sup>89</sup> and again in Order No. 733-A.<sup>90</sup> The Commission looks with disfavor on parties raising issues for the first time on rehearing because other parties are not permitted to respond to a request for rehearing.<sup>91</sup> The introduction of such material is “disruptive to the administrative process because it has the effect of moving the target for parties seeking a final administrative decision.”<sup>92</sup> The Trade Associations should have raised these concerns in comments to the NOPR or on rehearing of Order No. 733 and do

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<sup>87</sup> *Southern Natural Gas Co. v. FERC*, 877 F.2d 1066, 1073 (D.C. Cir. 1989) (*Southern*) (citing *Tennessee Gas Pipeline Co. v. FERC*, 871 F.2d 1099, 1109-10 (D.C. Cir. 1989)); see also *Londonderry Neighborhood Coalition v. FERC*, 273 F.3d 416, 423-24 (1st Cir. 2001).

<sup>88</sup> E.g., NOPR, FERC Stats. & Regs. ¶ 32,642 at P 11, 30–45, 54–60, 78–80.

<sup>89</sup> E.g., Order No. 733, 130 FERC ¶ 61,221 at P 47–97, 150–173, 250-272.

<sup>90</sup> E.g., Order No. 733-A, 134 FERC ¶ 61,127 at P 14–17, 22, 30-39, 48–65, 104–113, 129–134.

<sup>91</sup> *Westar Energy, Inc.*, 134 FERC ¶ 61,176, at P 23 (2011), citing *Calpine Oneta Power v. American Elec. Power Serv. Corp.*, 114 FERC ¶ 61,030 (2006); *Midwest Indep. Transmission Sys. Op., Inc.*, 112 FERC ¶ 61,211, at P 34 (2005) (citing *Baltimore Gas & Elec. Co.*, 91 FERC ¶ 61,270 (2000) and *Baltimore Gas & Elec. Co.*, 92 FERC ¶ 61,043, at 61,114 (2000)).

<sup>92</sup> *Midwest Indep. Transmission Sys. Op., Inc.*, 112 FERC ¶ 61,211 at P 34.

not explain why they failed to provide the material contained in the affidavits at an earlier stage in this proceeding. Therefore, we reject the affidavits and disregard all citations to extra-record evidence.

58. While we reject the untimely arguments and affidavits on procedural grounds, we nonetheless review these matters and, in the alternative, deny the requests on substantive grounds. Accordingly, below, we review in summary fashion the following issues denied as untimely requests for rehearing that are raised either in the EEI/NRECA Request or in the supporting affidavits: (1) identification of critical sub-200 kV transmission facilities; (2) supervisory relays; (3) due weight owed to the ERO's recommendation; and (4) stable power swings. While some arguments regarding the weight owed to the ERO's recommendations were timely raised and are discussed above, the arguments addressed below are rejected as procedurally defective since they do not arise out of a clarification made in Order No. 733-A. Similarly, though we have already addressed stable power swings above, we return to that subject to address matters raised out-of-time in the Wiedman Affidavit.

## 1. Identification of Critical Sub-200 kV Transmission Facilities

### EEI/NRECA Arguments

59. EEI/NRECA argue that the Commission's directive to create a uniform test to identify critical sub-200 kV facilities is not supported by the Blackout Report. In particular, EEI/NRECA, relying on the Wiedman affidavit, question the accuracy of the Order No. 733-A statement that critical facilities between 100 and 200 kV must be identified and subject to PRC-023 "to prevent a recurrence of the undesirable system performance that occurred during the August 2003 blackout."<sup>93</sup> While Order No. 733-A refers to the tripping of thirteen lines during a four minute period, EEI/NRECA argue the tripping of the 138 kV lines would have happened regardless of whether they were subject to the loadability requirements of PRC-023-1.<sup>94</sup>

60. EEI/NRECA rely on the Wiedman affidavit's statements that the Blackout Report indicates that the steady state loadability of transmission relays at 345 kV were at issue. Mr. Wiedman avers that, since PRC-023 protects the loadability of the 345 kV lines, the 138 kV lines tripped due to system conditions directly related to the 345 kV line trips in the immediate vicinity.<sup>95</sup> Wiedman posits that, if the 345 kV lines did not trip (because

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<sup>93</sup> EEI/NRECA at 7; Wiedman Affidavit P 42.

<sup>94</sup> EEI/NRECA at 7-8.

<sup>95</sup> Wiedman Affidavit P 9.

the relays were properly set pursuant to PRC-023), the control room operators at FirstEnergy would have had sufficient time to manually shed load and arrest a potential cascade.<sup>96</sup> Thus, according to the affidavit, inclusion of the 138 kV facilities in PRC-023 would not have improved performance during the 2003 blackout.

### Commission Determination

61. We are unpersuaded by EEI/NRECA's reasoning. First, while NERC's predecessor organization, the North American Electric Reliability Council, recommended that transmission owners evaluate the settings of zone 3 relays on all transmission lines of 230 kV and higher, it was the U.S. – Canada Task Force, with technical advice from the Electric System Working Group,<sup>97</sup> that recommended that the review be broadened to include operationally significant 115 kV and 138 kV lines.<sup>98</sup> Moreover, NERC, utilizing industry experts in the standards drafting process, developed Reliability Standard PRC-023-1, which requires planning coordinators to determine which 100-200 kV facilities are critical to the reliability of the bulk electric system in order to identify facilities to be subject to the Standard. The Commission directive pertained to the development of a uniform test for planning coordinators to apply when identifying such facilities.

62. Second, EEI/NRECA assert that the basis for the directive to develop a uniform test is found in a flawed analysis of the events of the August 2003 Blackout, quoting Mr. Wiedman's assertion that "[t]he inclusion of sub-200 kV facilities in the PRC-023 would not have improved performance during the August 2003 Blackout."<sup>99</sup> But Order No. 733-A explained that the 138 kV lines at issue did not trip as a result of the matters addressed by Reliability Standard PRC-023-1.<sup>100</sup> Rather than the specific role played by

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<sup>96</sup> Wiedman Affidavit P 49.

<sup>97</sup> *See generally* Blackout Report, Appendix A, Members of the U.S.-Canada Power System Outage Task Force and its Three Working Groups, (composition of Task Force and the Electric System Working Group), and Appendix B, Description of Outage Investigation and Process for Development of Recommendations, at 175-187.

<sup>98</sup> Blackout Report at 156.

<sup>99</sup> EEI/NRECA Request at 8.

<sup>100</sup> Order No. 733-A, 134 FERC ¶ 61,127 at P 35 *citing* Order No. 733, 130 FERC ¶ 61,221 at P 52 (“The cascade of 138 kV lines was precipitated by faults caused by tree contact, not protective relays, and would not have been prevented if PRC-023-1 had been in effect before the blackout.”).

relays on sub-200 kV facilities during the August 2003 Blackout, the Commission's concern was the inclusiveness of the test.<sup>101</sup> After its examination of the August 2003 Blackout, the U.S. – Canada Task Force determined that zone 3 relays on operationally significant 100-200 kV circuits should be evaluated because they were one of the causes for a portion of the blackout. The Task Force adopted a methodical approach addressing each of the factors that played a role in a blackout since in order to achieve the reliability goal, all the causes must be addressed.

63. Accordingly, were these issues timely raised and not barred from consideration, we would nevertheless deny EEI/NRECA's request for clarification regarding the directive to develop a uniform test to identify critical sub-200 kV facilities.

## **2. Supervisory Relays**

### **EEI/NRECA Arguments**

64. EEI/NRECA argue that the overbroad nature of the Commission's directive on supervisory relays is based on an incorrect characterization of relay engineering and would likely lead to a reduction in reliability. Adding supervisory relays to the scope of the Standard, they contend, would add costs while threatening to harm reliability. The Miller Affidavit purports to survey supervisory relays applied for both voltage and current supervision on a variety of protection systems in normal operation and, in one instance, during protection system failures. Mr. Miller, however, states that experienced engineers generally agree with applying Reliability Standard PRC-023 to phase overcurrent supervisory elements associated with current-based communication-assisted schemes where the scheme is capable of tripping for a loss of communication.<sup>102</sup>

### **Commission Determination**

65. We do not dispute the observations concerning many technical applications raised in the Miller Affidavit. The Commission's reliability concern arises from an actual incident, and the Miller Affidavit supports application of PRC-023 to the protection scheme involved in that event. As a result of that incident, we concluded that it is inappropriate to exclude all supervising relays from the scope of PRC-023. The concern EEI/NRECA raises about our directive regarding supervising relays should be ameliorated by our clarification made above that the directive does not foreclose the

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<sup>101</sup> Order No. 733-A, 134 FERC ¶ 61,127 at P 22 (*citing* Order No. 733, 130 FERC ¶ 61,221 at P 49-50, 77-78).

<sup>102</sup> Miller Affidavit at 8.

development of a tailored approach that applies the Standard to some supervising relays but not to others.

### **3. Due Weight Owed to the ERO's Recommendation Regarding Implementation of Blackout Report's Recommendations**

#### **EEI/NRECA Arguments**

66. EEI/NRECA contend that the Commission's directives regarding PRC-023-1 are not supported by the Blackout Report, but the proposed Reliability Standard does satisfy the Blackout Report's recommendations. They argue that, had proposed Reliability Standard PRC-023-1 been properly implemented prior to August 2003, the 345 kV Sammis-Star line would not have tripped and the control room operators at FirstEnergy should then have had enough time to manually shed load thus averting the cascade. EEI/NRECA further argue that proposed Reliability Standard PRC-023-1 is therefore an appropriate exercise of NERC's technical expertise and deserves deference.

#### **Commission Determination**

67. The Commission does not share the same confidence that PRC-023-1, properly implemented, would have allowed system operators to prevent the cascade that followed the tripping of the Sammis-Star line. In filing Reliability Standard PRC-023-1 for Commission approval, the ERO was only prepared to say:

[i]t is difficult to be certain about the effects that this proposed reliability standard would have had on the end-state of the blackout. Considered in concert with other activities that have been precipitated by the blackout investigation, it seems clear that the events of the blackout would have taken a very different course and that relay loadability would not have been as pivotal a factor as seen on August 14, 2003.<sup>103</sup>

Similarly, Order No. 733-A states that "[t]o assert, as Order No. 733 does, that one cannot definitely conclude on the present record that PRC-023-1 would have prevented the spread of the blackout...by no means is intended to minimize the significance of relay loadability."<sup>104</sup>

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<sup>103</sup> NERC, Petition for of PRC-023-1 Reliability Standard, Docket No. RM08-13-000, at 7 (filed July 30, 2008).

<sup>104</sup> Order No. 733-A, 134 FERC ¶ 61,127 at P 38 (citation omitted).

68. Nevertheless, even if one were to assume the accuracy of EEI/NRECA's claim regarding PRC-023-1, it would not foreclose the Commission from making directives with respect to the subject matter of the Reliability Standard. The standard for review of proposed Reliability Standards or modifications to existing Standards is not, as presented by EEI/NRECA, an inquiry into whether they are "needed to prevent the re-occurrence of events such as those that occurred during the August 2003 [b]lackout."<sup>105</sup> A directive is authorized under section 215(d)(5) if it is appropriate to carry out the purposes of section 215 of the FPA. Thus, while the technical expertise of the ERO must be given due weight, the fact that compliance with a proposed Reliability Standard would have mitigated the August 2003 Blackout does not prevent the Commission making directives to address identified gaps in reliability associated with the Standard.

69. Accordingly, were this issue timely raised and not barred from consideration, we would nevertheless deny EEI/NRECA's request for clarification regarding whether the Commission properly gave due weight to the ERO's technical expertise.

#### **4. Stable Power Swings**

##### **Wiedman Affidavit**

70. In his affidavit, Mr. Wiedman argues the tripping of lines that occurred during the August 2003 Blackout was not the result of the inability of relays to distinguish between faults and stable power swings but rather was the result of loading conditions on extra high-voltage power lines. During the time after the Sammis-Star line tripped and the system separated, the Blackout-Report does not refer to any line trip as the result of either a stable or an unstable power swing. Furthermore, he argues, the Commission's directive does not sufficiently reflect the threat to reliability posed by the modification of existing relay settings.

##### **Commission Determination**

71. We agree with Mr. Wiedman that the Blackout Report does not identify lines as tripping because of stable or unstable power swings during the period between the Sammis-Star tripping and the system separating, nor does the report identify steady state current flows as the cause of relays tripping. His affidavit simply fails to address how it came to be that zone 3 relays tripped without stable power swings. He asserts that the Galion-Ohio Central-Muskingum 345 kV line tripped by its zone 3 relay because of a load current that was well above its emergency line conductor rating, and that several 138 kV lines tripped, mostly by zone 3 or zone 2 impedance relays, as they experienced levels

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<sup>105</sup> EEI/NRECA Request at 19.

of line overload.<sup>106</sup> But he fails to address how, absent a stable or unstable power swing, the line current rose to the point that the impedance encroached those zone 3 relays' operating zones.

72. Mr. Wiedman's assertion that the zone 3 relay on the Sammis-Star line tripped when experiencing a voltage of 95 percent of normal and a current just barely above its thermal rating is troubling. Such conditions are essentially within normal operation, and tripping would only occur if the impedance, as seen by the zone 3 relays, encroached into the operating zone of the relay. Stable power swings can cause relays to unreliably detect fault conditions. Mr. Wiedman does not deny this; he only argues the Blackout Report does not explicitly state stable power swings were the cause of any given line tripping while failing to acknowledge the Report's statements about the impact of power swings.<sup>107</sup> The ERO and the Blackout Report confirm the threat posed by stable power swings to system reliability.<sup>108</sup> We are unpersuaded by Mr. Wiedman's arguments.

73. As for Mr. Wiedman's assertion that the Commission's directive regarding stable power swings downplays the threat to reliability posed by the modification of existing relay settings, we note that the examples he gives would fail to meet the Reliability Standard PRC-001's requirement that protective systems be coordinated. There are alternative approaches to addressing our directive that Mr. Wiedman does not mention. We are therefore not convinced that the ERO's response to our directive will result in a diminution of reliability. Accordingly, were these issues timely raised and not barred from consideration, we would nevertheless deny EEI/NRECA's request for clarification regarding stable power swings.

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<sup>106</sup> Wiedman Affidavit at 1-11.

<sup>107</sup> *E.g.*, Blackout Report at 73 ("Power swings and voltage fluctuations caused by [a few initiating events as seen on August 14, 2003,] can cause other lines to detect high currents and low voltages that appear to be faults, even if faults do not actually exist on those other lines."); Blackout Report at 80 ("The Sammis-Star line tripped at 16:05:57 EDT on a zone 3 impedance relay although there were no faults occurring at the time, because increased real and reactive power flow caused the apparent impedance to be within the impedance circle (reach) of the relay.").

<sup>108</sup> *See* Section II.B. Stable Power Swings, *supra*. In addition, in its Informational Filing, the ERO states that it has unpublished analysis that show some of the lines that tripped during the August 2003 Blackout were due to stable power swings. NERC Informational Filing at 6-7.

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The Commission orders:

(A) The requests for clarification are hereby granted, in part, and denied, in part, as discussed in the body of this order.

(B) The requests for reconsideration are hereby denied.

By the Commission.

( S E A L )

Nathaniel J. Davis, Sr.,  
Deputy Secretary.

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