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UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

18 CFR Part 40

[Docket No. RM13-7-000; Order No. 793]

Protection System Maintenance Reliability Standard

(Issued December 19, 2013)

AGENCY: Federal Energy Regulatory Commission.

ACTION: Final rule.

SUMMARY: Under section 215 of the Federal Power Act (FPA), the Federal Energy Regulatory Commission (Commission) approves a revised Reliability Standard, PRC-005-2 – Protection System Maintenance, to supersede four existing Reliability Standards, PRC-005-1.1b (Transmission and Generation Protection System Maintenance and Testing), PRC-008-0 (Underfrequency Load Shedding Equipment Maintenance), PRC-011-0 (Undervoltage Load Shedding Equipment Maintenance) and PRC-017-0 (Special Protection System Maintenance and Testing).

EFFECTIVE DATE: This rule will become effective [**insert date 60 days after publication in the FEDERAL REGISTER**].

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UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Cheryl A. LaFleur, Acting Chairman;  
Philip D. Moeller, John R. Norris,  
and Tony Clark.

Protection System Maintenance Reliability Standard

Docket No. RM13-7-000

ORDER NO. 793

FINAL RULE

(Issued December 19, 2013)

1. Pursuant to section 215 of the Federal Power Act (FPA),<sup>1</sup> the Commission approves a revised Reliability Standard, PRC-005-2 – Protection System Maintenance, to supersede four existing Reliability Standards, PRC-005-1.1b (Transmission and Generation Protection System Maintenance and Testing), PRC-008-0 (Underfrequency Load Shedding Equipment Maintenance), PRC-011-0 (Undervoltage Load Shedding Equipment Maintenance) and PRC-017-0 (Special Protection System Maintenance and Testing), and six associated definitions. The modifications, in part, respond to certain Commission directives issued in Order No. 693,<sup>2</sup> in which the Commission approved

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<sup>1</sup> 16 U.S.C. 824o (2012).

<sup>2</sup> *Mandatory Reliability Standards for the Bulk Power System*, Order No. 693, 72 FR 16,416 (April 4, 2007), FERC Stats. & Regs. ¶ 31,242 (2007), *order on reh'g*, Order No. 693-A, 120 FERC ¶ 61,053 (2007).

initial versions of these four Reliability Standards governing maintenance and testing of protection systems, and maintenance of underfrequency and undervoltage load shedding equipment.

2. Reliability Standard PRC-005-2 represents an improvement over the four existing standards covering protection system maintenance and testing, by incorporating specific, required minimum maintenance activities and maximum time intervals for maintenance of individual components of protection systems and load shedding equipment affecting the bulk electric system. While the proposed Reliability Standard also gives responsible entities the option of developing their own, performance-based maintenance intervals for most components, the intervals must be designed to achieve a minimum performance level, and must be adjusted if that target performance level is not actually achieved. In addition, the proposed Reliability Standard combines the maintenance and testing requirements for protection systems into one comprehensive Reliability Standard, as was suggested by the Commission in Order No. 693.<sup>3</sup>

3. While the revised Reliability Standard contains overall improvements over the four existing Reliability Standards, as discussed below, we are directing NERC to submit an informational filing on the development of a guidance report concerning the commissioning of power system protection systems.

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<sup>3</sup> Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 1475.

4. The Commission approves the violation risk factors and all but one violation severity level for the revised Reliability Standard. The Commission directs NERC to modify the violation severity level assigned to certain failures to comply with Requirement R1. We also approve the six new definitions associated with proposed Reliability Standard PRC-005-2, i.e., Component, Component Type, Countable Event, Protection System Maintenance Program, Segment, and Unresolved Maintenance Issue. Of these newly defined terms, only the term Protection System Maintenance Program will be incorporated into NERC's Glossary of Terms, with the remainder applying only to Reliability Standard PRC-005-2.

5. Finally, we approve NERC's proposed implementation plan for Reliability Standard PRC-005-2 (as corrected in NERC's October 30, 2013 Errata filing), which requires entities to develop a compliant protection system maintenance program within twelve months, but allows for the transition over time of maintenance activities and documentation to conform to the new minimum maintenance activities and maximum maintenance intervals.

## **I. Background**

### **A. Regulatory Background**

6. Section 215 of the FPA requires a Commission-certified Electric Reliability Organization (ERO) to develop mandatory and enforceable Reliability Standards, subject

to Commission review and approval.<sup>4</sup> Once approved, the Reliability Standards may be enforced by the ERO subject to Commission oversight, or by the Commission independently.<sup>5</sup>

7. In 2006, the Commission certified NERC as the ERO pursuant to FPA section 215.<sup>6</sup> In 2007, in Order No. 693, the Commission approved an initial set of Reliability Standards submitted by NERC, including initial versions of four protection system and load-shedding-related maintenance standards, i.e., PRC-005-1, PRC-008-0, PRC-011-0, and PRC-017-0.<sup>7</sup>

8. In approving these protection system-related Reliability Standards, the Commission directed NERC to develop or to consider a number of modifications. Specifically, the Commission directed NERC (1) to develop a revision to PRC-005-1 incorporating a maximum time interval during which to conduct maintenance and testing of protection systems, and (2) to consider combining into one standard the various maintenance and testing requirements for all of the maintenance and testing-related Reliability Standards for protection systems, Special Protection Systems (SPS),

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<sup>4</sup> 16 U.S.C. 824o(c) and (d).

<sup>5</sup> *See id.* at 824o(e).

<sup>6</sup> *North American Electric Reliability Corp.*, 116 FERC ¶ 61,062, *order on reh'g & compliance*, 117 FERC ¶ 61,126 (2006), *aff'd sub nom., Alcoa, Inc. v. FERC*, 564 F.3d 1342 (D.C. Cir. 2009).

<sup>7</sup> Order No. 693, FERC Stats. & Regs. ¶ 31,242 at PP 1474, 1492, 1497, and 1514.

underfrequency load shedding (UFLS) equipment, and undervoltage load shedding (UVLS) equipment.<sup>8</sup>

9. Subsequently, in Order No. 758, issued in response to NERC's request for approval of its interpretation of PRC-005-1, the Commission issued three additional directives addressing deficiencies in the existing version of Reliability Standard PRC-005.<sup>9</sup> The Commission directed NERC to modify Reliability Standard PRC-005-1 through its standards development process to (1) identify and include the auxiliary relays and non-electrical sensing devices designed to sense or take action against any abnormal system condition that will affect reliable operation (such as sudden pressure relays); (2) include specific requirements for maintenance and testing of reclosing relays that affect the reliable operation of the bulk-power system; and (3) include specific requirements for maintenance and testing of DC control circuitry.

**B. Existing Protection System-Related Maintenance Standards**

10. Under currently-effective Reliability Standard PRC-005-1b, transmission owners, generator owners, and applicable distribution providers are required to have "a Protection System maintenance and testing program for Protection Systems that affect the reliability

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<sup>8</sup> In Order No 763, the Commission approved Reliability Standard PRC-006-1 pertaining to "underfrequency load shedding," which also encompasses "undervoltage load shedding." *Automatic Underfrequency Load Shedding and Load Shedding Plans Reliability Standards*, Order No. 763, 139 FERC ¶ 61,098 (2012).

<sup>9</sup> *Interpretation of Protection System Reliability Standard*, Order No. 758, 138 FERC ¶ 61,094, *order denying clarification*, 139 FERC ¶ 61,227 (2012).

of the BES,” and must document their compliance with that program.<sup>10</sup> The program must include maintenance and testing intervals and their basis, and a summary of maintenance and testing procedures. However, Reliability Standard PRC-005-1b does not impose any specific requirements regarding maintenance activities, standards or intervals. Similarly, Reliability Standards PRC-008-0, PRC-011-0, and PRC-017-0 require applicable transmission owners, distribution providers, and generator owners to have a maintenance and testing program in place for UFLS equipment, UVLS equipment, and special protection systems, respectively, and to document their compliance with their program. These Reliability Standards, like PRC-005-1b, do not impose any specific requirements regarding maintenance activities, standards or intervals.

**C. NERC Petition and Reliability Standard PRC-005-2**

11. On February 26, 2013, NERC submitted a petition seeking approval of Reliability Standard PRC-005-2, six new definitions associated with that standard, and an implementation plan that includes retirement of the four currently-effective Reliability Standards that address maintenance and testing of transmission and generation protection systems, UFLS and UVLS equipment, and special protection systems.<sup>11</sup> NERC

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<sup>10</sup> NERC Reliability Standard PRC-005-1b, Requirements R1 and R2.

<sup>11</sup> PRC-005-2 is not attached to this Final Rule. The complete text of the Reliability Standard is available on the Commission's eLibrary document retrieval system in Docket No. RM13-7 and is posted on NERC's web site, *available at*: <http://www.nerc.com>.



maintained that the Reliability Standard not only consolidates the four currently-effective standards into a single standard, but also addresses the directives in Order No. 693 related to those standards.<sup>12</sup>

12. The Reliability Standard includes five requirements. Under Requirement R1, each responsible entity must establish a protection system maintenance program that:

- (1) identifies which method (time-based or performance-based) will be used for each protection system component type, except that the maintenance program for all batteries associated with the station DC supply of a protection system must be time-based, and
- (2) identifies monitored component attributes for each component type where monitoring is used as a basis for extending maintenance intervals.

13. Under Requirement R2, any responsible entity that uses performance-based maintenance intervals must follow the procedures set out in Attachment A of the Reliability Standard to set and to adjust, as necessary, appropriate maintenance intervals. The Attachment A procedures allow a responsible entity to establish maintenance intervals for a given population of similar components based on historical performance, as long as there is a statistically significant population of components for which

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<sup>12</sup> NERC Petition at 2. NERC states that while the Commission issued additional directives related to the PRC-005 Reliability Standard in Order No. 758, NERC will address these remaining directives in future versions of PRC-005, and is currently addressing the maintenance and testing of reclosing relays in a new phase of Project 2007-17. *See* NERC Petition at 7-8.

performance can be examined and monitored. For example, under the Attachment A procedures, a responsible entity can only use a performance-based interval for “segments” with a component population of at least 60 components.<sup>13</sup> The maximum allowable maintenance interval for a given segment is required to be set such that the segment will experience “countable events” of no more than four percent of the components within that segment, for the greater of either the last 30 components maintained or all components maintained in the previous year.<sup>14</sup>

14. In addition, to continue to utilize a performance-based interval, the responsible entity must update its list of components and segments annually (or whenever a change occurs within a segment), must maintain a minimum number or percentage of components a year, and must analyze a given segment’s maintenance record to determine the percentage of countable events. If the percentage of countable events for the last 30 components maintained or the number of components maintained over the last year (whichever is larger) exceeds four percent, the responsible entity must implement an

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<sup>13</sup> NERC defines “segment” for purposes of PRC-005-2 as “Protection Systems or components of a consistent design standard, or a particular model or type from a single manufacturer that typically share other common elements. Consistent performance is expected across the entire population of a Segment.” NERC Petition, Ex. B (PRC-005-2) at 26.

<sup>14</sup> NERC defines “countable event” as “a failure of a component requiring repair or replacement, any condition discovered during the maintenance activities in Tables 1-1 through 1-5 and Table 3 which requires corrective action, or a Misoperation attributed to hardware failure or calibration failure.” NERC Petition, Ex. B (PRC-005-2) at 26.

action plan to reduce the expected countable events to less than four percent for that segment within the next three years.

15. Requirements R3 and R4 require a responsible entity to adhere to the requirements of its protection system maintenance program, including performance of minimum maintenance activities. Under Requirement R3, which governs time-based maintenance, the activities must be performed in accordance with the intervals prescribed in the tables attached to PRC-005-2. Under Requirement R4, the activities must be carried out in accordance with the performance-based intervals established under Requirement R2 and Attachment A.

16. Under Requirement R5, responsible entities must “demonstrate efforts to correct identified Unresolved Maintenance Issues,” which are defined as “deficienc[ies] identified during a maintenance activity that cause[] the component to not meet the intended performance, cannot be corrected during the maintenance interval, and require[] follow-up corrective action.” NERC explained that the intent of Requirement R5 is “to assure that Protection System components are returned to working order following the discovery of failures or malfunctions during scheduled maintenance.”<sup>15</sup>

17. With respect to implementation, NERC proposed to require entities to fully comply with Requirements R1, R2, and R5 within 12 months of regulatory approval (or

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<sup>15</sup> NERC Petition at 18.

24 months from the date of NERC Board approval where no regulatory approval is required).<sup>16</sup> Accordingly, applicable entities in the United States must develop their revised protection system maintenance program within one year after regulatory approval.<sup>17</sup> NERC's proposed implementation plan would allow a longer implementation period with respect to achieving full compliance with the newly-prescribed maintenance activities and documentation, permitting a transition of maintenance activities and documentation over time, with the compliance period scaled to the length of the applicable maximum maintenance interval.<sup>18</sup> Thus, for component types with the shortest allowable maintenance interval (i.e., less than one year, or between one and two years), entities would be required to fully comply with the new requirements within 18 months of regulatory approval, and 36 months of regulatory approval, respectively.<sup>19</sup> For components types with longer maintenance intervals (3, 6, and 12 years), NERC proposed to require compliance over the applicable maintenance interval in equally distributed steps. For component types with the longest maximum allowable maintenance interval (i.e., 12 years), entities must be 30 percent compliant within 5 years,

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<sup>16</sup> NERC Petition, Ex. C (Implementation Plan) at 2, 4.

<sup>17</sup> *See id.*

<sup>18</sup> *Id.* at 1-2.

<sup>19</sup> *Id.* at 4.

60 percent compliant within 9 years, and fully compliant within 13 years after regulatory approval.<sup>20</sup>

18. NERC explained that this implementation program takes into consideration that certain entities may not currently be performing all required maintenance activities specified in proposed PRC-005-2, and may not have all the documentation necessary to demonstrate compliance.<sup>21</sup> NERC further stated that “it is unrealistic for those entities to be immediately compliant with the new activities or intervals,” and that “entities should be allowed to become compliant in such a way as to facilitate a continuing maintenance program.”<sup>22</sup> Finally, NERC explained that it developed this step-wise implementation plan “in order that entities may implement this standard in a systematic method that facilitates an effective ongoing Protection System Maintenance Program.”<sup>23</sup>

**D. Notice of Proposed Rulemaking and Subsequent Filings**

19. On July 18, 2013, the Commission issued a Notice of Proposed Rulemaking (NOPR) proposing to approve Reliability Standard PRC-005-2.<sup>24</sup> The Commission

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<sup>20</sup> *Id.* at 5. NERC notes, however, that “[o]nce an entity has designated PRC-005-2 as its maintenance program for specific Protection System components, they cannot revert to the original program for those components.” *Id.* at 2.

<sup>21</sup> *Id.* at 1.

<sup>22</sup> *Id.*

<sup>23</sup> *Id.* at 2.

<sup>24</sup> *Notice of Proposed Rulemaking, Protection System Maintenance Reliability Standard*, 144 FERC ¶ 61,055 (2013) (NOPR).

explained that the revised standard represents an improvement over the four existing standards covering protection system maintenance and testing, because it incorporates specific, required minimum maintenance activities and maximum time intervals for maintenance of individual components of protection systems and load shedding equipment affecting the bulk electric system.<sup>25</sup> The Commission further noted that although the proposed Reliability Standard would give entities the option of developing performance-based maintenance intervals for eligible components, those intervals have to be designed to achieve a minimum performance level and must be adjusted if the target performance level is not achieved.<sup>26</sup>

20. The Commission requested additional information and comment on three topics pertaining to PRC-005-2: (1) verification of operability and settings upon placement in-service of new or modified protection systems; (2) use of a four percent target for countable events in performance-based programs; and (3) violation severity levels for certain Requirement R1 violations.

21. Comments were due on the NOPR on September 23, 2013. Seven sets of comments were received, as identified in Appendix A to this Final Rule.

22. On October 30, 2013, NERC submitted an errata to its February 26, 2013 petition, stating that certain procedural language regarding the process for approval of the standard

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<sup>25</sup> *Id.* P 2.

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

was inadvertently omitted. NERC submitted a revised Implementation Plan as part of that errata, asking the Commission to consider the revised plan for purposes of proposed PRC-005-2 and this proceeding.

## **II. Discussion**

23. Pursuant to section 215(d)(2) of the FPA, we approve Reliability Standard PRC-005-2, the six associated definitions referenced in the proposed standard, and NERC's proposed implementation plan, as just, reasonable, not unduly discriminatory or preferential, and in the public interest. As discussed in section A below, we believe Reliability Standard PRC-005-2 will enhance reliability through reducing the risk of protection system misoperations by establishing minimum maintenance activities and maximum maintenance time intervals. The Reliability Standard will also reduce the risk of protection system misoperations by establishing requirements for condition-based and performance-based maintenance programs where hands-on maintenance intervals are adjusted to reflect the known and reported condition or the historical performance of the relevant devices.

24. Below, we discuss the matters raised by the Commission in the NOPR or raised by commenters in response to the NOPR, as follows: (A) approval of PRC-005-2 ; (B) application of PRC-005-2 to newly-commissioned or modified components; (C) four percent target for countable events; (D) correcting unresolved maintenance issues; (E) the Violation Severity Level assignment for Requirement R1; and (F) definitions.

**A. Approval of PRC-005-2**

**NERC Petition**

25. In its petition seeking approval of PRC-005-2, NERC maintained that the proposed standard will improve reliability by:

(i) defining and establishing criteria for a Protection System Maintenance Program; (ii) reducing the risk of Protection System Misoperations; (iii) clearly stating the applicability of the Requirements in proposed PRC-005-2 to certain Functional Entities and Facilities; (iv) establishing Requirements for time-based maintenance programs that include maximum allowable maintenance intervals for all relevant devices; and (v) establishing Requirements for condition-based and performance-based maintenance programs where hands-on maintenance intervals are adjusted to reflect the known and reported condition or the historical performance, respectively, of the relevant devices.<sup>27</sup>

26. NERC asserted that the Reliability Standard not only represents a comprehensive approach to documenting and implementing programs for maintenance of all protection systems affecting the reliability of the bulk electric system, but also reduces the risk of misoperations “by applying consistent, best practice maintenance and inspection activities of Protection System Components in accordance with the maximum intervals established in the proposed Reliability Standard.”<sup>28</sup> NERC maintained that the proposed Reliability Standard represents an improvement over the four standards that would be

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<sup>27</sup> NERC Petition at 3.

<sup>28</sup> *Id.* at 11.



superseded, because none of the existing standards contain technical requirements for any of the maintenance programs, but merely specify that a program be in place and that each responsible entity comply with the requirements of its own program.<sup>29</sup>

27. NERC also maintained that PRC-005-2 satisfies three outstanding directives from Order No. 693 related to the PRC maintenance standards. First, NERC explained that the Reliability Standard includes maximum allowable intervals for maintenance of protection system components (as set out in Tables 1-1 through 1-5, Table 2, and Table 3 of Reliability Standard PRC-005-2).<sup>30</sup> Second, Reliability Standard PRC-005-2 combines the requirements for PRC-005, PRC-008, PRC-011 and PRC-017 into one new, revised standard, addressing maintenance for transmission and generation protection systems, for special protection systems, and for UFLS and UVLS equipment.<sup>31</sup> Finally, in Order No. 693, the Commission directed NERC to consider whether load serving entities and transmission operators should be included in the applicability of PRC-004.<sup>32</sup> NERC maintained that it considered whether load-serving entities and transmission operators should be subject to any of the PRC maintenance and testing requirements, but determined that the applicable maintenance requirements need only apply to equipment

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

<sup>30</sup> *Id.* at 12.

<sup>31</sup> *Id.* at 12-13.

<sup>32</sup> Order No. 693, FERC Stats & Regs. ¶ 31,242 at P 1469.

owners such as generation owners, transmission owners, and certain distribution providers.<sup>33</sup> NERC explained that “[w]hile an equipment owner may need to coordinate with the operating entities in order to schedule the actual maintenance, the responsibility resides with the equipment owners to complete the required maintenance.”<sup>34</sup>

### **NOPR Proposal**

28. In the NOPR, the Commission proposed to approve Reliability Standard PRC-005-2, finding that it would enhance reliability by incorporating specific, required minimum activities and maximum time intervals for maintenance of individual components of protection systems and load shedding equipment affecting the bulk electric system.<sup>35</sup> The Commission further noted that the proposed Reliability Standard would give entities the option of developing performance-based maintenance intervals for eligible components, but that those intervals had to be designed to achieve a minimum performance level and must be adjusted if the target performance level is not achieved.<sup>36</sup> Finally, in the NOPR the Commission stated that Reliability Standard PRC-005-2 “appears to adequately address the Commission directives from Order No. 693 with respect to: (1) including maximum allowable intervals in PRC-005; (2) combining PRC-

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<sup>33</sup> NERC Petition at 13.

<sup>34</sup> *Id.*

<sup>35</sup> NOPR, 144 FERC ¶ 61,055 at P 2.

<sup>36</sup> *Id.*

005, PRC-008, PRC-011, and PRC-017; and (3) considering whether load serving entities and transmission operators should be included in the applicability of the PRC-005 Reliability Standard.”<sup>37</sup>

### **Comments**

29. Most commenters generally support the Commission’s proposed approval of PRC-005-2. ITC “supports NERC’s proposal as improving Bulk Electric System reliability and promoting efficiency through consolidation [of protection system-related standards] into a single Standard.”<sup>38</sup> The Bureau of Reclamation states that the revised standard “is a significant improvement over the current PRC-005-1 standard because the current standard is more likely to penalize an entity that develops an ambitious maintenance program than an entity that has a less robust maintenance program . . . .”<sup>39</sup>

30. Duke Energy, however, asks that the Commission reject the revised standard. Duke Energy argues that PRC-005-2 improperly expands the applicability of the protection system maintenance standard because, “as written, it could also apply to Protection Systems which detect faults on the Bulk Electric System (BES), but which

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<sup>37</sup> *Id.* P 22.

<sup>38</sup> ITC Comments at 4.

<sup>39</sup> Bureau of Reclamation Comments at 1.

don't affect the reliable operation of the BES.”<sup>40</sup> Duke Energy argues that the Reliability Standard, as written, would apply to one of Duke Energy's typical protection schemes for dispersed, non-BES generation at distribution stations, because the relays involved are designed to detect faults on the BES although these particular protection schemes do not operate BES elements or interrupt network current flow from the BES.<sup>41</sup> Duke Energy maintains that these protection schemes initiate shutdown of non-BES generation only, and should not properly be covered under a protection system maintenance Reliability Standard. Duke Energy accordingly requests that the Commission remand the standard to NERC with a directive to limit applicability of the standard to protection systems and elements thereof “which affect the reliable operation of those BES Elements” on which they detect faults.<sup>42</sup>

### **Commission Determination**

31. We find that Reliability Standard PRC-005-2 will enhance reliability as compared to the currently existing standards, and agree with ITC that PRC-005-2 promotes efficiency by consolidating protection system maintenance requirements into a single standard. Consistent with the NOPR, we believe that Reliability Standard PRC-005-2

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<sup>40</sup> Duke Energy Comments at 2. In particular, Duke Energy cites to applicability section 4.2.1, which pertains to “protection systems that are installed for the purpose of detecting Faults on BES Elements (lines, buses, transformers, etc.).”

<sup>41</sup> *Id.* at 3-4.

<sup>42</sup> *Id.* at 5.

should reduce the risk of protection system misoperations by setting out minimum maintenance activities and maximum maintenance time intervals for individual components of protection systems.<sup>43</sup> In addition, we believe that PRC-005-2 will improve reliability by establishing requirements for condition-based and performance-based maintenance programs where maintenance intervals are adjusted to reflect the known and reported condition or the historical performance of the relevant devices. Finally, we agree with the Bureau of Reclamation that the revised standard removes the potential disincentive, inherent in the existing protection system maintenance standards, to adopt more aggressive maintenance programs because compliance is currently measured against each individual company's adopted program rather than against industry standards or minimums.

32. We are not persuaded by Duke Energy that remand of the Reliability Standard is required. Duke Energy argues that PRC-005-2 will bring a new set of protection system schemes under NERC's protection system maintenance standard requirements. We decline to make any specific determination about the applicability of this standard to specific elements or types of elements. Rather, Duke Energy may seek to raise concerns regarding applicability of the Reliability Standard to specific system elements with NERC or the relevant Regional Entity.

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<sup>43</sup> See NOPR, 144 FERC ¶ 61,055 at P 2.

**B. Verification of Operability and Settings Upon Placement In-Service**  
**NERC Petition**

33. Reliability Standard PRC-005-2 does not include separate requirements for protection system commissioning testing for new or modified equipment (i.e., testing activities necessary to ensure that new or modified equipment has been built and will function in accordance with its design). NERC maintained in its petition that such testing is often performed by a different organization (such as a start-up or commissioning group of the organization, or a contractor hired to construct and start-up or commission the facility) than the organization responsible for the on-going maintenance of the protection system, and that the activities required for such testing will not necessarily correlate to the maintenance activities required by the proposed standard.<sup>44</sup> At the same time, NERC acknowledged that “a thorough commission testing program would include, either directly or indirectly, the verification of all those Protection System attributes addressed by the maintenance activities specified in the Tables of PRC-005-2,” and that “an entity would be wise to retain commissioning records to show a maintenance start date.”<sup>45</sup>

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<sup>44</sup> NERC Petition, Ex. E (Supplementary Reference and FAQ) at 35.

<sup>45</sup> *Id.* NERC also noted that an entity “that requires that their commissioning tests have, at a minimum, the requirements of PRC-005-2 would help that entity prove time interval maximums by setting the initial time clock.” *Id.*

**NOPR Proposal**

34. In the NOPR, the Commission noted its concern that PRC-005-2 does not include a requirement to verify that protection system equipment and components operate at least as accurately as required under the PRC-005-2 maintenance standards when those components are first placed in service or are modified, even though NERC has stated that such placement into service can be used as the starting point for the maintenance interval and even though a failure to verify the accurate functioning of protection system components when placed in service or when subsequently modified has contributed to misoperations in the past.<sup>46</sup> The Commission accordingly asked for an explanation of “whether and if so, how [NERC] intends to interpret and enforce Reliability Standard PRC-005-2 to require that newly installed or modified protection system equipment or components perform at the same level as is required for subsequent compliance, including verification of applicable settings as specified whenever a relay is repaired, replaced, or upgraded with a new firmware version.”<sup>47</sup>

35. In addition, if NERC did not believe it could interpret PRC-005-2 to require verification of operability and settings of protection system components at commissioning to the same performance level as is required for subsequent compliance

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<sup>46</sup> See NOPR, 144 FERC ¶ 61,055 at PP 25-27.

<sup>47</sup> *Id.* P 27.

with PRC-005-2, the Commission requested comment on whether such a modification to the standard should be made.<sup>48</sup>

### Comments

36. NERC, the Cooperatives, ITC and Oncor all object to the application of PRC-005-2 to newly-commissioned or newly-modified protection systems or components. NERC maintains that the proposed standard was not “designed to establish requirements for commission testing and such testing would go beyond the maintenance activities identified in proposed PRC-005-2.”<sup>49</sup> NERC accordingly asserts that it “cannot interpret and enforce proposed PRC-005-2 to require that newly installed or modified protection system equipment or components perform at the same level as is required for subsequent compliance.”<sup>50</sup>

37. NERC also provides information about its efforts to reduce protection system misoperations through improved commissioning testing practices, and asks that the Commission refrain from issuing a directive to modify PRC-005-2 to address commissioning testing until NERC completes that work and can determine whether it is

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<sup>48</sup> *Id.* P 28.

<sup>49</sup> NERC Comments at 3.

<sup>50</sup> *Id.* However, NERC states in its comments, as it did in its petition, that “the date of completion of the commission testing of the Protection System component and its placement into service can be used by an entity as the starting point in determining first maintenance due dates.” *Id.* at 3-4 (citing to NERC Petition at 35-36).



sufficient to address commissioning testing.<sup>51</sup> NERC states that these efforts include development of a report by the System Protection and Control Subcommittee (SPCS), recently approved by the NERC Planning Committee, in which the SPCS “suggested improving commissioning practices through (1) analysis of protection system Misoperations; (2) sharing of lessons learned; and (3) development of an industry reference document on protection system commissioning practices.”<sup>52</sup> With respect to the first recommendation, NERC suggests it is being addressed as part of entities’ ongoing obligations under PRC-004-2a (Analysis and Mitigation of Transmission and Generation Protection System Misoperations).<sup>53</sup> As for the second recommendation, NERC notes that the SPCS is working on a lessons learned document.<sup>54</sup> As for the third recommendation, NERC indicates that it is participating in ongoing efforts of an IEEE task force, working on the development of a report to provide guidance on the commissioning of power system protection systems.<sup>55</sup> NERC commits in its Comments

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<sup>51</sup> NERC Comments at 4.

<sup>52</sup> *Id.* at 6.

<sup>53</sup> *Id.*

<sup>54</sup> *Id.*

<sup>55</sup> *Id.* at 7-8. Oncor agrees that the Commission should consider allowing NERC to continue its participation in efforts to create a document providing commissioning guidelines and best practices, instead of adding requirements to PRC-005-2. Oncor Comments at 1.

to keep the Commission informed on the progress of these ongoing efforts to reduce protection system misoperations related to commissioning testing practices.<sup>56</sup>

38. The Cooperatives agree with NERC that PRC-005-2 cannot be read to include a requirement to verify operability and settings of new or modified protection system equipment, because there is no explicit language in the requirement that would allow such an interpretation and because it would disregard the standards development process.<sup>57</sup> The Cooperatives argue that imposing a commissioning testing requirement as part of PRC-005-2 would constitute a material change to the standard, which must be addressed through the standards development process if needed.<sup>58</sup> Similarly, ITC “strongly opposes” application of PRC-005-2 to commissioning of new components, and stresses that the proposed standard was developed solely for the purpose of covering “ongoing maintenance during the life of the component, and not an initial testing when the component is first commissioned.”<sup>59</sup> Oncor supports NERC’s efforts to develop guidelines on commissioning testing practices instead of imposing additional requirements as part of PRC-005-2, and notes that there are many differences between commissioning testing and periodic maintenance testing. In addition, Oncor notes that

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<sup>56</sup> NERC Comments at 4.

<sup>57</sup> Cooperatives Comments at 3-4.

<sup>58</sup> *Id.* at 4.

<sup>59</sup> ITC Comments at 6-7.

PRC-004-2a is designed to identify deficiencies in performance and provide for correction, while PRC-005-2 is not a deficiency in performance standard.<sup>60</sup>

39. The Cooperatives also argue that the Commission should not require the development of a commissioning testing requirement that would require verification of protection system operability and settings, because such a requirement “would be redundant, difficult to formulate and enforce, and might affect some (but not all) Registered Entities’ willingness to deploy new or upgraded protection systems.”<sup>61</sup>

40. Idaho Power, on the other hand, believes that the Commission has identified a gap in the Reliability Standards that should be addressed by expanding PRC-005-2 to include newly-commissioned or modified equipment.

#### **Commission Determination**

41. While we remain concerned about the continued possibility of misoperations resulting from a failure to properly verify the operability or settings of protection system equipment upon being placed in service or modified, we will not direct NERC to modify PRC-005-2 to include such a requirement or to otherwise develop a separate commissioning testing standard at this time. Instead, we rely on NERC’s discussion of its on-going efforts to reactively and proactively reduce protection system misoperations through improved commissioning testing practices, which includes the analysis of

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<sup>60</sup> Oncor Comments at 1.

<sup>61</sup> Cooperatives Comments at 5-8.

misoperations, sharing of lessons learned, and the development of a report intended to provide guidance concerning the commissioning of power system protection systems.<sup>62</sup>

As explained in the NOPR, our concern is with a protection system that has not been verified as capable of functioning according to its design when placed in service or modified. In its Comments, NERC describes an event studied by NERC's Event Analysis and Investigation Group, in which an entity did not perform in-service testing as part of commissioning a new protection system, "resulting in line relays being placed in service with the incorrect transformer ratio."<sup>63</sup> According to NERC, this situation remained undetected until the protection system was required to operate for a system disturbance. That protection system failed to operate correctly due to the defect, consequently increasing the magnitude and scope of the system disturbance.<sup>64</sup> We believe that this example, provided by NERC, highlights our concern and the importance of commissioning testing.

42. We agree with a proactive approach to reducing misoperations, i.e., ensuring that a new or modified protection system, when placed in service, is capable of functioning according to its design so that an undetected defect resulting in a misoperation of that

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<sup>62</sup> See NERC Comments at 5-8

<sup>63</sup> *Id.* at 4.

<sup>64</sup> *Id.*

protection system does not negatively affect bulk electric system reliability. We encourage and accept NERC's commitment to keep the Commission informed of its efforts concerning this issue.<sup>65</sup> Accordingly, we direct NERC to submit, within one year of issuance of this Final Rule, an informational filing on the status of these efforts, including the development of the guidance report as described in the NERC Comments.

**C. Four Percent Target for Countable Events in Performance-Based Program**

**NERC Petition**

43. Pursuant to Requirement R2 of Reliability Standard PRC-005-2, responsible entities may choose to establish performance-based maintenance intervals for individual component types, according to the procedures set out in Attachment A of the standard. Under these procedures, the responsible entity must first develop a list of components to be included in the designated segment (with a minimum population of 60 components).<sup>66</sup> Using that analysis and looking at the greater of either the last 30 components maintained or all components maintained within the segment over the last year, the responsible entity must set a maximum allowable interval for each segment so that countable events will

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<sup>65</sup> *See id.*

<sup>66</sup> Until such time as the entity has performed and analyzed the required maintenance activities applicable to the segment for at least 30 individual components, it must maintain the segment using PRC-005-2's time-based intervals, as specified in Tables 1-1 to 1-5, 2 and 3, i.e., it cannot adopt a performance-based interval until it has performed and analyzed the maintenance history for a minimum pool of components.

occur on no more than four percent of the components within that segment. In addition, the maintenance history of the segment is to be reviewed at least annually to determine the overall performance of the segment, and, if the four percent target is not met, the entity is required to develop and implement an action plan to reduce countable events to less than four percent within three years.<sup>67</sup>

44. Under PRC-005-2, an entity would not violate Requirement R2 upon failing to achieve a four percent or less failure rate for a given segment in the first year the failure occurs, but would violate Requirement R2 if: (1) the entity could not show that the interval selected was initially set to expect a failure rate of no more than four percent; (2) the entity fails to make immediate changes to its performance-based maintenance program to achieve a four percent target within 3 years; or (3) the entity does not actually achieve a four percent failure rate for that segment within 3 years after adjusting its program.<sup>68</sup>

45. In the Technical Justification NERC submitted as part of its petition, NERC explained the basis for selecting a four percent target for countable events as follows:

The 4% number was developed using the following:

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<sup>67</sup> As NERC explains in the Supplementary Reference and FAQ (Ex. E) attached to its petition, entities using a performance-based program must not only “demonstrate how they analyze findings of performance failures and aberrations” but must also “implement continuous improvement actions” to meet the failure rate targets. *See* NERC Petition, Ex. E at 40.

<sup>68</sup> *See generally id.* at 40-53.

General experience of the drafting team based on open discussions of past performance.

Test results provided by Consumers Energy for the years 1998-2008 showing a yearly average of 7.5% out-of-tolerance relay test results and a yearly average of 1.5% defective rate.

Two failure analysis reports from Tennessee Valley Authority (TVA) where TVA identified problematic equipment based on a noticeably higher failure of a certain relay type (failure rate of 2.5%) and voltage transformer type (failure rate of 3.6%).<sup>69</sup>

### **NOPR**

46. In the NOPR, the Commission questioned whether NERC had provided sufficient support for the choice of a four percent target figure for countable events, particularly with respect to individual components known to have historically higher levels of reliability.<sup>70</sup> The Commission requested support for NERC's proposed approach in PRC-005-2, which adopts a single failure rate target for all component types, as opposed to establishing a target failure rate for each individual component.<sup>71</sup> In addition, the Commission sought comment on the selection of four percent as the appropriate target failure rate, assuming a blanket failure rate is used. Finally, the Commission proposed to direct NERC to study and submit a report and recommendations based on the study

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<sup>69</sup> NERC Petition, Ex. D (Technical Justification) at 5.

<sup>70</sup> See NOPR, 144 FERC ¶ 61,055 at PP 32-33.

<sup>71</sup> *Id.* P 34.

results concerning the expected failure rates for individual component types if the technical information to respond to the Commission's questions is not currently available.

### Comments

47. NERC comments that it continues to support the four percent failure rate target, arguing that an "acceptable failure rate needs to balance between a goal of ultimate reliability and what could be reasonably expected of a well-performing component population."<sup>72</sup> NERC maintains that the four percent performance target was selected "based on the drafting team's experience and past studies performed by several utilities," and references back to Section 9 of the Supplementary Reference and FAQ appended to its Petition.<sup>73</sup> In those supplementary materials, the choice of a four percent failure rate is explained as follows:

It is notable that 4% is specifically chosen because an entity with a small population (30 units) would have to adjust its time intervals between maintenance if more than one Countable Event was found to have occurred during the last analysis period. A smaller percentage would require that entity to adjust the time interval between maintenance activities if even one unit is found out of tolerance or causes a Misoperation.<sup>74</sup>

48. NERC further maintains that "it is appropriate to use a specified target percentage in a performance based maintenance program when applied to the results of time based

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<sup>72</sup> NERC Comments at 10.

<sup>73</sup> *Id.* at 11.

<sup>74</sup> NERC Petition, Ex. E (Supplementary Reference and FAQ) at 42.



maintenance of various component types” because the “variable performance expectations for different types of components are already reflected in the Table 1 time intervals.”<sup>75</sup> Thus, NERC explains, components with high failure rates would not generate significant extensions in allowed maintenance intervals “unless dramatic advances in component reliability validate the use of significantly lower intervals.”<sup>76</sup> NERC further explains that extension of the maintenance interval will reduce the number of Countable Events for a given year, such that highly reliable components will have a low number of permitted ‘failures’ per year.

49. NERC accordingly asks that the Commission approve the four percent target failure rate as proposed. In the alternative, if the Commission determines it needs additional information to support the four percent figure, NERC asks that it be given the opportunity to provide that additional support rather than have the Commission direct modification of the proposed standard. NERC also indicates that it will have the “ability to track trends in Misoperations as industry gains practical experience with the performance based maintenance approach reflected in proposed PRC-005-2.”<sup>77</sup>

50. Idaho Power, the only commenter other than NERC to address the four percent target failure rate, agrees with NERC that the four percent figure should be retained for

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<sup>75</sup> NERC Comments at 11-12.

<sup>76</sup> *Id.* at 12.

<sup>77</sup> *Id.* at 13.

all component types.<sup>78</sup> Idaho Power believes that the cost of developing specific failure rates for component types would outweigh the benefit of doing so. Idaho Power points out the practical limitations of developing specific failure rates, which “would need to account for different manufacturers, models, operating environments, production plants, and handling,” and would need to be updated periodically.<sup>79</sup>

### **Commission Determination**

51. We are persuaded by the comments of NERC and Idaho Power to adopt the four percent target failure rate in performance-based maintenance programs, as described in Attachment A of PRC-005-2. In addition to the rationale provided by NERC, we recognize the practical need to adopt a target failure rate that is available to smaller organizations, and the cost and resources required to develop variable rates for different component types, and thus approve the approach set forth in Attachment A of PRC-005-2. While we do not direct the submission of further data or support for the target failure rate at this time, we note NERC’s commitment to continue collecting data on misoperations,<sup>80</sup> and expect that NERC will maintain sufficient data bases to allow future evaluation of performance-based maintenance programs as compared to time-based

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<sup>78</sup> Idaho Power Comments at 2.

<sup>79</sup> *Id.*

<sup>80</sup> NERC Comments at 13.

maintenance programs, including the frequency of misoperations (including clearly tracking the underlying cause of the misoperations).

**D. Correcting Unresolved Maintenance Issues (Requirement R5)**

**NERC Petition**

52. Requirement R5 of PRC-005-2 obligates responsible entities to “demonstrate efforts to correct identified Unresolved Maintenance Issues.” NERC defines an “unresolved maintenance issue” as a “deficiency identified during a maintenance activity that causes the component to not meet the intended performance, cannot be corrected during the maintenance interval, and requires follow-up corrective action.”<sup>81</sup> In its Petition, NERC explained the rationale behind providing some latitude to complete correction or restoration of a discovered problem outside of the normal maintenance interval as follows:

The drafting team does not believe entities should be found in violation of a maintenance program requirement because of the inability to complete a remediation program within the original maintenance interval. The drafting team does believe corrective actions should be timely but concludes it would be impossible to postulate all possible remediation projects and therefore, impossible to specify bounding time frames for resolution of all possible Unresolved Maintenance Issues or what documentation might be sufficient to provide proof that effective corrective action has been initiated. Therefore

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<sup>81</sup> NERC Petition at 14.

Requirement R5 requires only the entity demonstrate efforts to correct the Unresolved Maintenance Issues.<sup>82</sup>

### **NOPR**

53. In the NOPR, the Commission agreed that it may be appropriate in certain circumstances to allow entities additional time beyond the maximum maintenance interval period to complete restorative action, including when the corrective action involves redesign, ordering additional equipment, or timing corrective work to correspond to planned outages.<sup>83</sup> However, the Commission noted its expectation that such instances would be limited, and that in most circumstances entities should have the capability to replace components and make minor repairs within the maximum maintenance interval.<sup>84</sup>

### **Comments**

54. ITC states that it “does not oppose the overall structure” in Requirement R5 for correcting an Unresolved Maintenance Issue, but has concerns about the Commission’s “expectation that ‘entities should have the capability to replace components . . . within the maximum maintenance interval.’”<sup>85</sup> ITC maintains that this expectation “ignores the challenges of maintaining older, well-functioning protection systems” that are “obsolete

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<sup>82</sup> *Id.* at 17.

<sup>83</sup> NOPR, 144 FERC ¶ 61,055 at P 37.

<sup>84</sup> *Id.*

<sup>85</sup> ITC Comments at 5.

by current technology standards and/or for which replacement parts are no longer available.”<sup>86</sup> ITC notes that its own practice is to institute a new capital project to replace obsolete protection systems with new technologies when obsolete protection systems unexpectedly fail or are found to be unacceptable when tested, which could take up to a year or more to complete.

55. By contrast, the Bureau of Reclamation argues that the Requirement R5 obligation to “demonstrate efforts to correct identified Unresolved Maintenance Issues” is unclear, and asks the Commission to direct that NERC clarify the requirement “by including a requirement for entities to develop plans with timeframes for corrective actions.”<sup>87</sup>

#### **Commission Determination**

56. We are not persuaded that any modification to Requirement R5 is needed at this time, or that it is unreasonable to expect, as stated in the NOPR, that in most circumstances responsible entities should not need longer than the maximum maintenance interval to complete corrective actions. While we agree with the Bureau of Reclamation that the adoption of a formal plan for correcting an Unresolved Maintenance Issue may help to demonstrate that an entity has demonstrated sufficient efforts to meet Requirement R5, we note that the adoption of such a plan may not be necessary in all cases, e.g., if the issue will be quickly resolved. Moreover, we can conceive of situations

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<sup>86</sup> *Id.*

<sup>87</sup> Bureau of Reclamation Comments at 2.

where the adoption of a formal plan for resolution of the issue should not be treated as a *sufficient* demonstration of effort to correct the issue.

57. With regard to ITC's comment regarding the time involved in certain replacements, particularly when they involve a new capital project, we recognize that in this circumstance (and others), it may appropriately require a significant period of time to address an Unresolved Maintenance Issue. Nonetheless, we do not believe that such a project is inconsistent with our expectation, as stated in the NOPR, that the instances in which restoration or repair is delayed beyond the normal maximum maintenance interval "will be limited and, in most circumstances, entities should have the capability to replace components and make minor repairs within the maximum maintenance interval."<sup>88</sup>

58. In addition, we note that an Unresolved Maintenance Issue could degrade protection system performance to a level that requires notification and corrective action under Reliability Standard PRC-001-1. Under PRC-001-1, if a protective relay or equipment failure reduces system reliability, the transmission operator or generator operator must notify relevant reliability entities (e.g. the host balancing authority,

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<sup>88</sup> NOPR, 144 FERC ¶ 61,055 at P 37.

reliability coordinator, and affected transmission operators and balancing authorities) of the relay or equipment failure and must take corrective action as soon as possible.<sup>89</sup>

**E. Violation Severity Level for Requirement R1 Violation – Station Batteries**

**NERC Petition**

59. Under the second sentence of Part 1.1 of Requirement R1, all batteries associated with station DC supply must be included in a time-based maintenance program, i.e., they are not eligible for a performance-based program.<sup>90</sup> In assigning violation severity levels

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<sup>89</sup> Currently approved PRC-001-1 contains the following:

**R2.** Each Generator Operator and Transmission Operator shall notify reliability entities of relay or equipment failures as follows:

**R2.1.** If a protective relay or equipment failure reduces system reliability, the Generator Operator shall notify its Transmission Operator and Host Balancing Authority. The Generator Operator shall take corrective action as soon as possible.

**R2.2.** If a protective relay or equipment failure reduces system reliability, the Transmission Operator shall notify its Reliability Coordinator and affected Transmission Operators and Balancing Authorities. The Transmission Operator shall take corrective action as soon as possible.

<sup>90</sup> NERC explained this unique treatment of station batteries as follows:

Batteries are the only element of a Protection System that is a perishable item with a shelf life. As a perishable item batteries require not only a constant float charge to maintain their freshness (charge), but periodic inspection to determine if there are problems associated with their aging process and

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for Requirement R1, NERC assigned a “lower” violation severity level for the failure to include applicable station batteries in a time-based maintenance program. NERC also assigned a “lower” violation severity level for the failure to specify whether one Component Type is being addressed by time-based or performance-based maintenance, or a combination of both. NERC explained that “[t]here is an incremental aspect to the violation [of Requirement R1] and the VSLs follow the guidelines for incremental violations.”<sup>91</sup>

### **NOPR**

60. In the NOPR, the Commission proposed to direct NERC to change the violation severity level for the failure to include station batteries in a time-based program from a “lower” designation to a “severe” designation, based on the binary nature of the requirement.<sup>92</sup> The Commission noted that entities either satisfy the obligation to include station batteries in a time-based program or fail to meet the requirement in its entirety, which is indicative of a binary requirement.<sup>93</sup> The Commission also noted that a low

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testing to see if they are maintaining a charge or can still deliver their rated output as required.

NERC Petition, Ex. D (Technical Justification) at 8.

<sup>91</sup> NERC Petition, Ex. I (Discussion of Assignments of VRFs and VSLs) at 10.

<sup>92</sup> NOPR, 144 FERC ¶ 61,055 at P 39.

<sup>93</sup> *Id.*; see also *id.* at n.53 (citing *North American Electric Reliability Corporation*, 135 FERC ¶ 61,166, at P 13 (2011)).



violation severity level designation does not properly reflect the number of historical violations associated with station battery maintenance.<sup>94</sup>

### Comments

61. NERC, Idaho Power, and the Cooperatives support NERC's initial "lower" violation severity level designation for the failure to include station batteries in a time-based maintenance program. NERC notes that the purpose of Requirement R1 (as a whole) is "to obligate the entity to establish a Protection System Maintenance Program for its Protection Systems," and that the subparts of the requirement are "not intended as separate subrequirements for compliance purposes."<sup>95</sup> NERC further notes that "it was not the intent of the standard drafting team to assign more importance to station batteries than any other Protection system component type as far as the initial establishment of the Protection System Maintenance Program."<sup>96</sup> NERC explains that the violation severity levels for Requirement R1 were assigned based on the main Requirement, and argues that it is appropriate to measure compliance with that Requirement using "a gradated level of non-compliance based on the number of component types missed . . . ."<sup>97</sup> NERC states that deletion of the failure to include station batteries in a time-based maintenance

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<sup>94</sup> *Id.* P 39.

<sup>95</sup> NERC Comments at 14.

<sup>96</sup> *Id.* at 14-15 (emphasis in original).

<sup>97</sup> *Id.* at 15.

program as a separately listed violation would be preferable to a directive requiring that failure to be treated as a “severe” level violation.<sup>98</sup>

62. NERC also disagrees with the Commission’s statement that an assignment of a “lower” violation severity level in this context is inconsistent with the Commission’s approach to binary requirements. NERC asserts that neither it nor the standard drafting team considered Requirement R1 to be binary, and NERC points out that the Commission has adopted the general rule that “gradated Violation Severity Levels, where possible, would be preferable to binary Violations Severity Levels since the application of any penalty for a violation could be more consistently and fairly applied commensurate with the degree of the violation.”<sup>99</sup>

63. The Cooperatives and Idaho Power agree that a “lower” violation severity level is appropriate in this context.<sup>100</sup> The Cooperatives assert that a “severe” designation does not reflect the level of risk associated with the failure to test a given battery, and that the number of historical violations associated with station battery maintenance merely reflects NERC’s zero-tolerance policy for missing a defined testing interval by even one day.<sup>101</sup> The Cooperatives agree with NERC that Requirement R1.1 is not binary,<sup>102</sup> and

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<sup>98</sup> *Id.*

<sup>99</sup> *Id.* at 16 (citing *North American Electric Reliability Corporation*, 123 FERC ¶ 61,284, at P 27 (2008)).

<sup>100</sup> Cooperatives Comments at 9-10; Idaho Power Comments at 2.

<sup>101</sup> Cooperatives Comments at 9.

Idaho Power maintains that NERC's proposed assignment properly takes into account "the incremental aspect to potential violations."<sup>103</sup>

64. ITC supports the NOPR proposal to direct NERC to modify the violation severity level for Part 1.1 of Requirement R1, and agrees that the requirement is essentially binary with respect to compliance.<sup>104</sup>

### **Commission Determination**

65. We are not persuaded that the failure to include station batteries in a time-based maintenance program should be assigned a "lower" violation severity level, when these components were singled out for special treatment in Requirement R1 as proposed. Furthermore, NERC does not propose gradated violation severity levels relating to whether a responsible entity includes station batteries in a time-based maintenance program. Nor does NERC explain how it would develop such gradated violation severity levels. NERC instead proposes a single, "lower" violation severity level assignment as to this requirement. NERC treats the requirement as binary, while proposing gradated violation severity levels for all other portions of Requirement R1.<sup>105</sup> In this situation,

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<sup>102</sup> *Id.*

<sup>103</sup> Idaho Power Comments at 2.

<sup>104</sup> ITC Comments at 4-5.

<sup>105</sup> NERC refers to a Commission statement that BAL-005-0, Requirement R12, which requires an applicable entity to include all tie line flows in a calculation, is not a binary requirement and can be gradated. NERC Comments at 15-16 (citing *North*

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the violation severity level must be “severe,” as NERC has previously stated.<sup>106</sup>

However, NERC is free to develop and propose gradated violation severity level assignments for its time-based maintenance program requirement as to station batteries.

66. We also note that the level of risk associated with the failure to test a given battery is not an appropriate consideration in the context of assigning violation severity levels, but rather, should be considered when assigning a violation risk factor. In this case, Requirement R1 has been assigned a medium violation risk factor, which we accept as properly reflecting NERC’s determination that a violation of Requirement R1 could directly affect the electrical state or the capability of the bulk-power system, but is

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*American Electric Reliability Corporation*, 123 FERC ¶ 61,284, at P 26 (2008)). An applicable entity’s failure to include any tie line flows in the calculation would represent the most serious excursion from compliance with this requirement and be appropriate for a “severe” violation severity level assignment. As to the requirement that a responsible entity include all batteries associated with DC station supply in a time-based maintenance program, the single instance of violation NERC identifies in its violation severity levels for PRC-005-2 Requirement R1 is a failure to include any such batteries in a time-based maintenance program. Even if this requirement can be gradated for the purpose of assigning violation severity levels, the violation NERC identifies likewise would be the most serious excursion from compliance, so that a severe violation severity level assignment would be appropriate.

<sup>106</sup> “NERC further states that it will determine whether a requirement has a single violation severity requirement or a set of violation severity levels by analyzing the performance required to satisfy a particular requirement . . . . Requirements that are binary, i.e., pass/fail, will have only one violation severity level – severe.” *North American Electric Reliability Corporation*, 135 FERC ¶ 61,166, at P 13 (2011).

unlikely to lead to bulk power system instability, separation, or cascading failures.<sup>107</sup> We accordingly direct NERC to submit a compliance filing changing the violation severity level for the failure to include station batteries in a time-based maintenance program to “severe.”<sup>108</sup>

## **F. Definitions**

### **NERC Petition**

67. NERC sought approval of six new definitions as part of proposed Reliability Standard PRC-005-2, i.e., Component, Component Type, Countable Event, Protection System Maintenance Program, Segment, and Unresolved Maintenance Issue. Of these newly defined terms, NERC proposed to include only the term Protection System Maintenance Program in its Glossary of Terms, with the remainder applying only to Reliability Standard PRC-005-2.

### **NOPR**

68. In the NOPR, the Commission proposed to approve all six definitions without modification.

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<sup>107</sup> NERC Petition, Ex. I (Discussion of Assignments of VRFs and VSLs) at 5-6.

<sup>108</sup> We disagree with NERC’s suggestion to delete this VSL assignment rather than direct a change in it because “the compliance element is covered adequately by the remaining language in the ‘lower’ VSL” for Requirement R1. NERC Comments at 15. Under NERC’s suggestion, a responsible entity that specifies that it is using a performance-based maintenance program for station batteries would be in compliance with the first sentence of Requirement R1.1, but in violation of the second sentence, without an applicable violation severity level.

### **Comments**

69. The Bureau of Reclamation asks the Commission to direct NERC to clarify section 4.2 (Applicability) to eliminate use of the vague or confusing terms “such as,” “including,” and “etc.,” including eliminating their use in the definition of the term “Element” (as referenced in PRC-005-2) and in the standard-specific definition of “Component.”<sup>109</sup> In addition, the Bureau of Reclamation suggests that the Commission require *all* definitions included in standards to be included in the NERC Glossary as a general matter, “to promote consistency among standards.”<sup>110</sup>

### **Commission Determination**

70. We are not persuaded that the use of the terms and phrases highlighted by the Bureau of Reclamation, which allow for the use of an illustrative list of elements or facilities that are included within a definition, renders that definition or the standard’s applicability impermissibly vague. Nor are we persuaded that the definitions at issue in this docket that are used in the context of this standard must be adopted in NERC’s Glossary of Terms for potential application to all standards.<sup>111</sup> However, we note that

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<sup>109</sup> Bureau of Reclamation Comments at 2.

<sup>110</sup> *Id.* at 1-2.

<sup>111</sup> This appears to be a unique situation in that the five defined terms at issue have been developed specifically for use with PRC-005-2 and do not have broader applicability. However, we note that our approval of the defined terms as part of PRC-005-2 makes them binding on the ERO, regional entities, and registered entities for purposes of PRC-005-2, regardless of whether the terms appear in NERC’s Glossary of

(continued...)

NERC should not adopt inconsistent definitions for the same term. We therefore accept the six definitions associated with PRC-005-2 as proposed by NERC without modification.

### **III. Information Collection Statement**

71. The following collection of information contained in this Final Rule is subject to review by the Office of Management and Budget (OMB) under section 3507(d) of the Paperwork Reduction Act of 1995.<sup>112</sup> OMB's regulations require approval of certain information collection requirements imposed by agency rules.<sup>113</sup> Upon approval of a collection(s) of information, OMB will assign an OMB control number and an expiration date. Respondents subject to the filing requirements of a rule will not be penalized for failing to respond to these collections of information unless the collections of information display a valid OMB control number.

72. The Commission approves Reliability Standard PRC-005-2, which replaces PRC-005-1.1b (Transmission and Generation Protection System Maintenance and Testing), PRC-008-0 (Underfrequency Load Shedding Equipment Maintenance), PRC-011-0

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Terms or as part of the individual standard. *See, e.g., Notice of Proposed Rulemaking, Monitoring System Conditions - Transmission Operations Reliability Standard, Transmission Operations Reliability Standards, Interconnection Reliability Operations and Coordination Reliability*, 145 FERC ¶ 61,158, at P 66, n.81 (2013) (“The Commission has held that definitions are standards.”).

<sup>112</sup> 44 U.S.C. 3507(d) (2012).

<sup>113</sup> 5 CFR 1320.11 (2012).

(Undervoltage Load Shedding Equipment Maintenance) and PRC-017-0 (Special Protection System Maintenance and Testing). The Reliability Standard combines the requirements for maintenance and testing of protection systems, special protection systems, underfrequency load shedding equipment, and undervoltage load shedding equipment into one, comprehensive standard. In addition, the Reliability Standard sets out minimum maintenance activities and maximum maintenance intervals for the various components of these systems, but also allows applicable entities to adopt performance-based maintenance intervals in certain circumstances.

73. Reliability Standard PRC-005-2 includes specific requirements about the minimum maintenance activities required for each type of applicable component, as well as a maximum time interval during which the maintenance must be completed. Because the specific requirements were designed to reflect common industry practice, entities are generally not expected to experience a meaningful change in actual maintenance and documentation practices. However, applicable entities will have to perform a one-time review of their current protection system maintenance programs to ensure that they meet the requirements of the revised standard PRC-005-2. Accordingly, all expected information collection costs are expected to be limited to the first year of implementation of the revised standard.

74. Public Reporting Burden: Our estimate below regarding the number of respondents is based on the NERC compliance registry as of June 10, 2013. According to the compliance registry, 544 entities are registered as distribution providers, 898 entities are registered as generation owners, and 346 entities are registered as



transmission owners within the United States. However, due to significant overlap, the total number of these affected entities (i.e., entities registered as a distribution provider, a generation owner, a transmission owner, or some combination of these three functional entities) is 867 entities.

75. Affected entities must perform a one-time review of their existing protection system maintenance program to ensure that it contains at a minimum the activities listed in Tables 1 through 3 in Reliability Standard PRC-005-2 and that the activities are performed within the applicable maximum interval listed in Tables 1 through 3. If the existing protection system maintenance program does not meet the criteria in Reliability Standard PRC-005-2, the entity will have to make certain adjustments to the program.

<b>Requirement</b>	<b>Number of Affected Entities (1)</b>	<b>Number of PSMP Reviewed Per Entity (2)</b>	<b>Average Number of Hours per Review (3)</b>	<b>Total Burden Hours (1)*(2)*(3)=(4)</b>	<b>Total Cost (4)*\$70<sup>114</sup></b>
One time review and adjustment of existing protection system maintenance program	867	1	8	6,936	\$485,520

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<sup>114</sup> This figure is the average of the salary plus benefits for a manager and an engineer. The figures are taken from the Bureau of Labor and Statistics at ([http://bls.gov/oes/current/naics3\\_221000.htm](http://bls.gov/oes/current/naics3_221000.htm)).

Title: FERC-725P, Mandatory Reliability Standards: Reliability Standard PRC-005-2

Action: Proposed Collection of Information

OMB Control No: To be determined

Respondents: Business or other for-profit and not-for-profit institutions.

Frequency of Responses: One time.

Necessity of the Information: The Reliability Standard PRC-005-2 implements the Congressional mandate of the Energy Policy Act of 2005 to develop mandatory and enforceable Reliability Standards to better ensure the reliability of the nation's Bulk-Power System. Specifically, the new Reliability Standard ensures that transmission and generation protection systems affecting the reliability of the bulk electric system are maintained and tested.

76. Internal review: The Commission has reviewed revised Reliability Standard PRC-005-2 and made a determination that approval of this standard is necessary to implement section 215 of the FPA. The Commission has assured itself, by means of its internal review, that there is specific, objective support for the burden estimates associated with the information requirements.

77. Interested persons may obtain information on the reporting requirements by contacting the Federal Energy Regulatory Commission, Office of the Executive Director, 888 First Street, NE, Washington, DC 20426 [Attention: Ellen Brown, e-mail: DataClearance@ferc.gov, phone: (202) 502-8663, fax: (202) 273-0873].

78. Comments concerning the information collections in this rule and the associated burden estimates should be sent to the Commission and to the Office of Management and

Budget, Office of Information and Regulatory Affairs [Attention: Desk Officer for the Federal Energy Regulatory Commission]. For security reasons, comments to OMB should be sent by e-mail to: oira\_submission@omb.eop.gov. Please reference Docket No. RM13-7-000 (FERC-725P) in your submission.

#### **IV. Regulatory Flexibility Act Analysis**

79. The Regulatory Flexibility Act of 1980 (RFA)<sup>115</sup> generally requires a description and analysis of rules that will have significant economic impact on a substantial number of small entities. As discussed above, Reliability Standard PRC-005-2 will apply to an estimated 867 individual entities (the number of entities registered as a distribution provider, a generator owner, a transmission owner, or any combination of those three functional entities). Comparison of the NERC Compliance Registry with data submitted to the Energy Information Administration on Form EIA-861 indicates that, of these entities, 230 may qualify as small entities.<sup>116</sup> Of the 230 small entities, 90 are registered as a combination of distribution providers, generator owners and transmission owners, but it is assumed that each entity would have only one comprehensive program to review.

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<sup>115</sup> 5 U.S.C. 601-12.

<sup>116</sup> The RFA definition of “small entity” refers to the definition provided in the Small Business Act (SBA), which defines a “small business concern” as a business that is independently owned and operated and that is not dominant in its field of operation. *See* 15 U.S.C. 632 (2006). According to the Small Business Administration, an electric utility is defined as “small” if, including its affiliates, it is primarily engaged in the generation, transmission, and/or distribution of electric energy for sale and its total electric output for the preceding fiscal year did not exceed 4 million megawatt hours.

80. The Commission estimates that, on average, each of the 230 small entities affected will have a one-time cost of \$560, representing a one-time review of the program for each entity, consisting of 8 man-hours at \$70/hour as explained above in the information collection statement. We do not consider this cost to be a significant economic impact for small entities. Accordingly, the Commission certifies that Reliability Standard PRC-005-2 will not have a significant economic impact on a substantial number of small entities.

#### **V. Environmental Analysis**

81. The Commission is required to prepare an Environmental Assessment or an Environmental Impact Statement for any action that may have a significant adverse effect on the human environment.<sup>117</sup> The Commission has categorically excluded certain actions from this requirement as not having a significant effect on the human environment. Included in the exclusion are rules that are clarifying, corrective, or procedural or that do not substantially change the effect of the regulations being amended.<sup>118</sup> The actions taken herein fall within this categorical exclusion in the Commission's regulations.

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<sup>117</sup> *Regulations Implementing the National Environmental Policy Act of 1969*, Order No. 486, FERC Stats. & Regs. ¶ 30,783 (1987).

<sup>118</sup> 18 CFR 380.4(a)(2)(ii).

## **VI. Document Availability**

82. In addition to publishing the full text of this document in the Federal Register, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the Internet through the Commission's Home Page (<http://www.ferc.gov>) and in the Commission's Public Reference Room during normal business hours (8:30 a.m. to 5:00 p.m. Eastern time) at 888 First Street, NE, Room 2A, Washington, DC 20426.

83. From the Commission's Home Page on the Internet, this information is available on eLibrary. The full text of this document is available on eLibrary in PDF and Microsoft Word format for viewing, printing, and/or downloading. To access this document in eLibrary, type the docket number excluding the last three digits of this document in the docket number field.

84. User assistance is available for eLibrary and the Commission's website during normal business hours from the Commission's Online Support at (202) 502-6652 (toll free at 1-866-208-3676) or email at [ferconlinesupport@ferc.gov](mailto:ferconlinesupport@ferc.gov), or the Public Reference Room at (202) 502-8371, TTY (202) 502-8659. E-mail the Public Reference Room at [public.referenceroom@ferc.gov](mailto:public.referenceroom@ferc.gov).

## **VII. Effective Date and Congressional Notification**

85. This Final Rule is effective **[insert date 60 days from publication in Federal Register]**.

86. The Commission has determined, with the concurrence of the Administrator of the Office of Information and Regulatory Affairs of OMB, that this rule is not a "major rule"

as defined in section 351 of the Small Business Regulatory Enforcement Fairness Act of 1996.<sup>119</sup> The Commission will submit the Final Rule to both houses of Congress and to the General Accountability Office.

By the Commission.

( S E A L )

Nathaniel J. Davis, Sr.,  
Deputy Secretary.

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<sup>119</sup> See 5 U.S.C. 804(2) (2007).

**Note: The Appendix will not appear in the *Code of Federal Regulations*.**

**Appendix A**

**Commenters**

Associated Electric Cooperative, Inc., Basin Electric Power Cooperative, Inc. and Tri-State Generation and Transmission Association (Cooperatives)

Duke Energy Corporation (Duke Energy)

Idaho Power Company (Idaho Power)

International Transmission Company d/b/a ITC*Transmission*, Michigan Electric Transmission Company, LLC, ITC Midwest LLC and ITC Great Plains, LLC (ITC)

North American Electric Reliability Corporation (NERC)

Oncor Electric Delivery Company LLC (Oncor)

United States Department of the Interior, Bureau of Reclamation (Bureau of Reclamation)