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

**INTERPRETATION OF PROTECTION) Docket No. RM10-5-000
SYSTEM RELIABILITY STANDARD)**

**COMMENTS OF THE
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION
IN RESPONSE TO NOTICE OF PROPOSED RULEMAKING**

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February 25, 2011

TABLE OF CONTENTS

| | | |
|------|----------------------------|----|
| I. | INTRODUCTION | 1 |
| II. | NOTICES AND COMMUNICATIONS | 2 |
| III. | DISCUSSION | 2 |
| IV. | CONCLUSION | 11 |

I. INTRODUCTION

The North American Electric Reliability Corporation (“NERC”)¹ hereby provides these comments in response to the Federal Energy Regulatory Commission’s (“FERC” or “Commission”) Notice of Proposed Rulemaking (“NOPR”)² regarding an interpretation of Requirement R1 of Reliability Standard PRC-005-1 — Transmission and Generation Protection System Maintenance and Testing. In the NOPR, the Commission proposed to approve the interpretation to Reliability Standard PRC-005-1 developed and approved by NERC, and proposed to direct NERC to develop modifications to the PRC-005-1 Reliability Standard to address proposed gaps in the Protection System maintenance and testing standard.

The stated purpose of PRC-005-1 is to ensure all transmission and generation Protection Systems affecting the reliability of the Bulk Electric System (BES) are maintained and tested. The proposed interpretation clarifies what equipment is to be included in the maintenance and testing programs specified by requirement R1 with reference to the definition of Protection System in the NERC Glossary of Terms. By this filing, NERC submits its response to the NOPR.

¹ The Federal Energy Regulatory Commission (“FERC” or “Commission”) certified NERC as the electric reliability organization (“ERO”) in its order issued on July 20, 2006 in Docket No. RR06-1-000. *North American Electric Reliability Corporation*, “Order Certifying North American Electric Reliability Corporation as the Electric Reliability Organization and Ordering Compliance Filing,” 116 FERC ¶ 61,062 (July 20, 2006).

² *Interpretation of Protection System Reliability Standard*, 133 FERC ¶ 61,223 (December 16, 2010) (“NOPR”).

II. NOTICES AND COMMUNICATIONS

Notices and communications with respect to this filing may be addressed to:

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III. DISCUSSION

In a November 17, 2009 filing,³ NERC requested Commission approval of a proposed interpretation to Reliability Standard PRC-005-1. The interpretation was developed in response to a request for interpretation submitted to NERC by the Regional Entities Compliance Monitoring Processes Working Group (“Working Group”).⁴ The interpretation included five specific questions, and the interpretation development team provided a response to all five of the Working Group's questions.

The proposed interpretation helps to ensure that the intent of the standard is supported through effective compliance monitoring. Protection Systems are a critical line of defense essential to the reliability of the bulk power system. Because the failure of Protection Systems can cause catastrophic events, preventive maintenance is critical to reliability. The proposed interpretation

³ See NERC, *Petition of the North American Electric Reliability Corporation for Approval of Interpretation to Reliability Standard PRC- 005-1 — Transmission and Generation Protection System Maintenance and Testing, Requirement R1*, Docket No. RM06-16-000 (November 17, 2009)

⁴ The Working Group is a subcommittee of the Regional Entity Management Group which consists of the executive management of the eight Regional Entities.

supports the reliability objective of the standard by providing greater certainty and clarity regarding the equipment that must be maintained in support of this objective. NERC agrees with and supports the Commission's proposal to approve the proposed interpretation of Requirement R1 to PRC-005-1.

A. Responses to the Commission's Requests for Additional Information and Comment

1. Modify the Reliability Standard to Include Any Component or Device that is Designed to Detect Defective Lines or Apparatuses or Other Power System Conditions of an Abnormal or Dangerous Nature and to Initiate Appropriate Control Circuit Actions

In the NOPR, the Commission states that while it is proposing to approve the interpretation to PRC-005-1, it is concerned that the interpretation highlights a gap in the Protection System Maintenance standard pursuant to Requirement R1 of PRC-005-1.⁵ Specifically, the Commission expresses concern that, in order to prevent a gap in reliability, any component that detects any quantity needed to take an action, or that initiates any control action (initial tripping, reclosing, lockout, *etc.*), affecting the reliability of the bulk power system, should also be included as a component of a Protection System.⁶ FERC therefore is proposing to direct NERC to develop a modification to the Reliability Standard to include any component or device that is designed to detect defective lines or apparatuses or other power system conditions of an abnormal or dangerous nature and to initiate appropriate control circuit actions.⁷ Additionally, the Commission is proposing that all components that serve in some protective capacity to ensure reliable operation of the Bulk-Power System should be included within the definition of "Protection System" and should be maintained and tested accordingly – not just the

⁵ NOPR at P 11.

⁶ *Id.*

⁷ *Id.*

limited subset identified in the NERC interpretation.⁸ The Commission requested comments on this general proposal.

NERC agrees that modifications to the standard are necessary to achieve the reliability objective of PRC-005-1 which is to ensure all transmission and generation Protection Systems affecting the reliability of the Bulk Electric System (“BES”) are maintained and tested. NERC believes, however, that the modifications to PRC-005-1 already underway in Project 2007-17, coupled with NERC’s recently revised definition of Protection System, address most of the issues raised in the NOPR.

NERC agrees that to achieve the reliability objective of PRC-005-1, the requirements must be applicable to all components that serve in some protective capacity to ensure reliable operation. To accomplish those needed improvements, NERC has underway the development of draft standard PRC-005-2 (Project 2007-17), which has recently been balloted for the second time. NERC believes the modifications to PRC-005 currently underway, coupled with NERC’s recently revised definition of Protection System, address most of the issues raised in the NOPR. Therefore, while NERC agrees with the reliability-related intent of the proposed directive to modify PRC-005-1, and provides comments below in response to each specific request for which FERC has proposed to direct modifications to the standard, the work already underway will achieve the reliability-related intent of the Commission’s proposed modifications to PRC-005-1. Accordingly, there is no need for the Commission to issue additional directives in response to the NOPR.⁹

⁸ *Id.*

⁹ In Order No. 693 the Commission directed revisions to PRC-005-1 to require that maintenance and testing of a protection system must be carried out within a maximum allowable interval that is appropriate for the type of the protection system. *See, Mandatory Reliability Standards for the Bulk-Power System*, 118 FERC ¶ 61,218, FERC Stats. & Regs. ¶ 31,242 (2007) (“Order No. 693”), *order on reh’g, Mandatory Reliability Standards for the Bulk-Power System*, 120 FERC ¶ 61,053 (“Order No. 693-A”) (2007).

2. Include Any Device, Including Auxiliary and Backup Protection Devices, That is Designed to Sense or Take Action Against Any Abnormal System Condition that will Affect Reliable Operation.

In the NOPR, FERC notes that NERC's proposed interpretation does not include in the existing definition of "Protection System" auxiliary relays, and that auxiliary relays need only be maintained if an entity's maintenance and testing program for DC control circuits involves maintenance and testing of imbedded auxiliary relays.¹⁰ FERC states that these exclusions contradict the purpose statement of PRC-005-1, which provides that "all transmission and generation Protection Systems affecting the reliability of the BES are maintained and tested," and therefore will result in a gap in the maintenance and testing of Protection Systems affecting the reliability of the bulk power system.¹¹ The Commission therefore is requesting comments on whether it should direct NERC to include any device, including auxiliary and backup protection devices, that is designed to sense or take action against any abnormal system condition that will affect reliable operation, in the Reliability Standard.¹²

NERC agrees with the reliability-related intent of this proposed directive that auxiliary relays that can initiate a control action should be included within the definition of "Protection System," and notes that a modification to the NERC Glossary definition of "Protection System," which partially addresses the specific concerns regarding auxiliary relays by specifying that the control circuitry is through the tip coil of the interrupting device, was recently successfully balloted, was adopted by the NERC Board of Trustees on November 19, 2010, and will be filed with FERC for approval in the near future. Additionally, the draft PRC-005-2 standard includes

¹⁰ NOPR at PP 12-13.

¹¹ *Id.* at P12.

¹² *Id.* at P 14.

extensive, specific maintenance activities related to the communications equipment and DC control circuits (including auxiliary relays that can initiate a control action).

The implementation plan approved for the revised definition of Protection System proposed a 12 month delay to give entities time to apply the expanded scope of the definition of Protection System to the requirements in PRC-005-1. The revised definition of Protection System is:

- Protective relays which respond to electrical quantities;
- Communications systems necessary for correct operation of protective functions;
- Voltage and current sensing devices providing inputs to protective relays;
- Station DC supply associated with protective functions (including station batteries, battery chargers, and non-battery-based DC supply); and
- Control circuitry associated with protective functions through the trip coil(s) of the circuit breakers or other interrupting devices.

Furthermore, the draft PRC-005-2 Reliability Standard establishes maximum maintenance intervals in accordance with FERC's directives in Order No. 693 related to PRC-005-1,¹³ PRC-008-0,¹⁴ PRC-011-0,¹⁵ and PRC-017-0.¹⁶ Accordingly, the revised definition of Protection System coupled with the proposed revisions to the PRC-005-1 standard, already address FERC's reliability concerns regarding testing of auxiliary and backup protection devices and issuing a new directive is not necessary.

Regarding FERC's proposed directive to include in the Reliability Standard any device, including auxiliary and backup protection devices, that is designed to sense or take action against any abnormal system condition that will affect reliable operation, NERC understands FERC's concerns related to protective relays that do not respond to electrical quantities and agrees that sudden pressure relays which trip for fault conditions should be maintained in accordance with

¹³ Order No. 693 at P 1475

¹⁴ *Id.* at P 1492.

¹⁵ *Id.* at P 1516.

¹⁶ *Id.* at P 1546.

NERC Reliability Standard requirements. However, NERC is not aware of any existing documents that establish a technical basis for either minimum maintenance activities or maximum maintenance intervals for these devices. NERC is concerned the scope of this proposed directive is so broad that any device that is installed on the bulk power system to monitor conditions in any fashion may be included. In fact, many of these devices are advisory in nature and should not be reflected within NERC Standards if they do not serve a necessary reliability purpose.

NERC therefore is proposing to develop, either independently or in association with other technical organizations such as IEEE, one or more technical documents which:

- i. describe the devices and functions (to include sudden pressure relays which trip for fault conditions) that should address FERC's concern; and
- ii. propose minimum maintenance activities for such devices and maximum maintenance intervals, including the technical basis for each.

These technical documents will address those protective relays that are necessary for the reliable operation of the bulk power system and will allow for differentiation between protective relays that detect faults from other devices that monitor the health of the individual equipment and are advisory in nature (*e.g.*, oil temperature). Following development of the above-referenced document(s), NERC will propose a new or revised standard (*e.g.*, PRC-005) using the NERC Reliability Standards development process to include maintenance of such devices, including establishment of minimum maintenance activities and maximum maintenance intervals. NERC does not believe it is necessary for the Commission to issue a directive to address this issue. Rather, NERC proposes to add this issue to the reliability standards issues database for inclusion in the list of issues to address the next time the PRC-005 standard is revised.

Because proposed changes to the definition of “Protection System” and revisions in the form of a draft standard PRC-005-2 will address many of the concerns the Commission raises, there is no need to issue a directive as proposed by the Commission in the NOPR. The one remaining issue needs to await the development of technical documents in support of any proposed change to a Reliability Standard dealing with other protective relays that do not respond to electrical quantities. NERC will propose appropriate changes to its standards once those technical papers are completed. There is nothing in this record to support giving this issue the priority treatment that would come from issuance of a directive under section 215(d)(5) on the matter.

3. Modify the Reliability Standard to Include the Maintenance and Testing of Reclosing Relays Affecting the Reliability of the Bulk Power System.

In the NOPR, the Commission notes that NERC’s proposed interpretation does not identify reclosing relays as a specific component of the Protection System.¹⁷ However, the Commission expresses concern that excluding the maintenance and testing of these reclosing relays will result in a gap in the maintenance and testing of relays affecting the reliability of the bulk power system.¹⁸ The Commission therefore is requesting comments on whether a modification should be made to the Reliability Standard to include the maintenance and testing of reclosing relays affecting the reliability of the bulk power system.¹⁹

NERC understands that automatic restoration of faulted components is not mandated in the NERC Reliability Standards and observes that reclosing relays are most often applied to improve system availability, as a convenience to accelerate system restoration, or both. Mal-

¹⁷ NOPR at P 15.

¹⁸ *Id.*

¹⁹ *Id.*

performance of reclosing relays so applied has no detrimental effect on the reliability of the bulk power system.

In most cases, autoreclosing cannot be relied on to meet system performance requirements because of the need to consider the impact of autoreclosing into a permanent fault. However, applications may exist in which automatic restoration is used to meet system performance requirements following temporary faults. In cases where autoreclosing relays are applied to meet performance requirements in approved NERC Reliability Standards, or where automatic restoration of service is fundamental to derivation of an Interconnection Reliability Operating Limit (“IROL”), it is reasonable to require maintenance and testing of autoreclosing relays.

NERC does not believe it is necessary for the Commission to issue a directive to address this issue. The proposed revisions to PRC-005-1 that are under development include maintenance of reclosing devices that are part of Special Protection Systems. NERC proposes to add the remaining concerns relating to this issue to the Reliability Standards issues database for inclusion in the list of issues to address the next time PRC-005 is revised.

4. Modify the Reliability Standard to Explicitly Include Maintenance and Testing of all DC Control Circuitry That is Necessary to Ensure Proper Operation of the Protection System, Including Voltage and Continuity.

In the NOPR, the Commission expresses concern that not establishing the specific requirements relative to the scope and/or methods for a maintenance and testing program for the DC circuitry results in a gap in the maintenance and testing of Protection System components affecting the reliability of the bulk power system.²⁰ FERC therefore is proposing to direct NERC to develop a modification to the Reliability Standard that explicitly includes maintenance and

²⁰ *Id.* at P 16.

testing of all DC control circuitry that is necessary to ensure proper operation of the Protection System, including voltage and continuity.²¹

NERC agrees that maintenance and testing should be required for all DC control circuitry. NERC's draft PRC-005-2 standard includes extensive, specific maintenance activities (with maximum maintenance intervals) related to the DC control circuits. These requirements also address detection of unintentional DC grounds with respect to FERC's concerns regarding insulation of the control circuitry.

NERC is uncertain whether the reference to DC control circuitry voltage is intended to include the need for sufficient insulation to maintain appropriate voltage, but observes that the draft PRC-005-2 standard addresses verification of the functionality of the DC control circuit. Accordingly, this aspect of the draft PRC-005-2 standard addresses FERC's concerns in this regard.

Because NERC's draft PRC-005-2 standard already includes provisions that address the Commission's concerns with respect to maintenance and testing of DC control circuitry, there is no need for the Commission to issue a directive on that subject.

²¹ *Id.*

IV. CONCLUSION

For the reasons stated above, NERC respectfully requests that the Commission take action consistent with these comments when it issues its Final Rule regarding the proposed interpretation to Reliability Standard PRC-005-1.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that I have served a copy of the foregoing document upon all parties listed on the official service list compiled by the Secretary in this proceeding.

Dated at Washington, D.C. this 25th day of February, 2011.

/s/ Holly A. Hawkins
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