NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

May 29, 2014

VIA ELECTRONIC FILING

Kirsten Walli, Board Secretary
Ontario Energy Board
P.O Box 2319
2300 Yonge Street
Toronto, Ontario, Canada
M4P 1E4

Re: *North American Electric Reliability Corporation*

Dear Ms. Walli:

The North American Electric Reliability Corporation ("NERC") hereby submits Petition of the North American Electric Reliability Corporation for Approval of Proposed Reliability Standards COM-001-2 and COM-002-4. NERC requests, to the extent necessary, a waiver of any applicable filing requirements with respect to this filing.

Please contact the undersigned if you have any questions.

Respectfully submitted,

/s/ Holly A. Hawkins
Holly A. Hawkins
Associate General Counsel for
North American Electric Reliability Corporation

Enclosure

3353 Peachtree Road NE
Suite 600, North Tower
Atlanta, GA 30326
404-446-2560 | www.nerc.com

ONTARIO ENERGY BOARD
OF THE PROVINCE OF ONTARIO

NORTH AMERICAN ELECTRIC	**)**
RELIABILITY CORPORATION	**)**

PETITION OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION FOR APPROVAL OF PROPOSED RELIABILITY STANDARDS COM-001-2 AND COM-002-4

Gerald W. Cauley
President and Chief Executive Officer
North American Electric Reliability Corporation
3353 Peachtree Road, N.E.
Suite 600, North Tower
Atlanta, GA 30326
(404) 446-2560
(404) 446-2595 – facsimile

Charles A. Berardesco
Senior Vice President and General Counsel
Holly A. Hawkins
Associate General Counsel
William H. Edwards
Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
(202) 644-8099 – facsimile
charlie.berardesco@nerc.net
holly.hawkins@nerc.net
william.edwards@nerc.net

Counsel for the North American Electric Reliability Corporation

May 29, 2014

TABLE OF CONTENTS

TABLE OF CONTENTS

ONTARIO ENERGY BOARD
OF THE PROVINCE OF ONTARIO

NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION)
)

PETITION OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION FOR APPROVAL OF PROPOSED RELIABILITY STANDARDS COM-001-2 AND COM-002-4

The North American Electric Reliability Corporation ("NERC") hereby submits for approval proposed Reliability Standards COM-001-2 (Communications) (Exhibit A) and COM-002-4 (Operating Personnel Communications Protocols) (Exhibit B). Each of the proposed Reliability Standards h is just, reasonable, not unduly discriminatory or preferential, and in the public interest.[1] NERC also requests approval of: (i) new defined terms "Operation Instruction", "Interpersonal Communication", and "Alternative Interpersonal Communication" for inclusion in the NERC Glossary of Terms; (ii) the Implementation Plans for the proposed Reliability Standards (Exhibits C and D); (iii) the associated Violation Risk Factors ("VRFs") and Violation Severity Levels ("VSLs") (Exhibits A, B, K, and L); and (iv) the retirement of the currently-effective Reliability Standards COM-001-1.1, and COM-002-2 as listed in the Implementation Plans.

This filing presents the technical basis and purpose of proposed Reliability Standards COM-001-2 and COM-002-4, a summary of the development history for each proposed Reliability Standard (Exhibits M and N), and a demonstration that the proposed Reliability

[1] Unless otherwise designated, capitalized terms shall have the meaning set forth in the *Glossary of Terms Used in NERC Reliability Standards* ("NERC Glossary of Terms"), *available at* http://www.nerc.com/files/Glossary_of_Terms.pdf.

Standards meet the Reliability Standards criteria (Exhibits F and G). The NERC Board of Trustees adopted proposed Reliability Standards COM-001-2 and COM-002-4 on November 7, 2012 and May 6, 2014 respectively.

I. EXECUTIVE SUMMARY

Proposed Reliability Standards COM-001-2 and COM-002-4 replace and improve upon the currently effective COM-001-1.1 and COM-002-2 Reliability Standards to establish requirements for communication capabilities and communications protocols necessary to maintain reliability. Proposed COM-001-2 establishes a clear set of requirements for what communications capabilities various functional entities must maintain for reliable communications.

Proposed COM-002-4 requires entities to have or create a set of documented communications protocols that include certain minimum mandatory protocols. Proposed COM-002-4 improves communications surrounding the issuance of Operating Instructions by employing predefined communications protocols, thereby reducing the possibility of miscommunication that could lead to action or inaction harmful to the reliability of the Bulk Electric System. In addition to setting predefined communications protocols, the proposed Reliability Standard requires use of the same protocols regardless of the current operating condition. In other words, the same protocols apply during normal, alert, and Emergency operating conditions, negating the need to identify the current operating condition to determine if a different set of protocols applies. Proposed COM-002-4 also requires entities to reinforce the use of the documented communication protocols through training, assessing adherence by operating personnel to the documented communication protocols, and providing feedback to those operating personnel on their use of the protocols. During Emergencies, operating personnel

must use the documented communication protocols for three-part communications without exception, since clear communication is essential to providing swift and coordinated response to events that are directly impacting the reliability of the Bulk Electric System.

Proposed Reliability Standards COM-001-2 and COM-002-4 address all of the pertinent Federal Energy Regulatory Commission ("FERC") directives from Order No. 693 associated with FERC approval of COM-001-1.1 and COM-002-2.[2] The revisions made to proposed COM-002-4 also address Recommendation No. 26 from the final report issued by the U.S.-Canada Power System Outage Task Force to "[t]ighten communications protocols, especially for communications during alerts and emergencies."[3]

Proposed COM-001-2 satisfies FERC's directives and improves upon Reliability Standard COM-001-1.1 by adding Generator Operators and Distribution Providers as applicable entities. Proposed COM-001-2 also identifies specific requirements for telecommunications capabilities for use in all operating conditions that reflect the roles of the applicable entities and their impact on Reliable Operation. Proposed COM-001-2 further includes adequate flexibility in its language for compliance with the Reliability Standard to permit the adoption of new technologies and cost-effective solutions.

Proposed COM-002-4 also satisfies FERC's directives and improves upon the previous Reliability Standard COM-002-2 by adding Distribution Providers as an applicable entity in the proposed Reliability Standard. Proposed COM-002-4 also meets FERC's directive to require

---

[2] *Mandatory Reliability Standards for the Bulk-Power System*, Order No. 693, 72 Fed. Reg. 16416, FERC Stats. & Regs. ¶ 31,242, at PP 487-93, 502-04, 508, 512, 514-15, 531-32, 534, 535, and 540, *order on reh'g*, Order No. 693-A, 120 FERC ¶ 61,053 (2007).

[3] U.S.-Canada Power System Outage Task Force, *Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations*, April 2004 ("Blackout Report"). On August 15, 2003, President George W. Bush and then-Prime Minister Jean Chrétien directed the creation of a Joint U.S.-Canada Power System Outage Task Force to investigate the causes of the blackout and ways to reduce the possibility of future outages. The U.S.-Canada Task Force convened, investigated the causes of this blackout, and recommended actions to prevent future widespread outages.

"tightened communications protocols, especially for communications during alerts and emergencies" by establishing a baseline set of mandatory protocols and focusing certain requirements on zero-tolerance responsibility for failure to use or misuse of the protocols for three-part communications during Emergency conditions. Under proposed COM-002-4, all applicable entities must use the same set of protocols during all operating conditions, establishing communication uniformity as much as practical on a continent-wide basis.

For the reasons discussed in this Petition, NERC respectfully requests approval of the proposed Reliability Standards as just, reasonable, not unduly discriminatory or preferential, and in the public interest.

II. NOTICES AND COMMUNICATIONS

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

Charles A. Berardesco
Senior Vice President and General Counsel
Holly A. Hawkins
Associate General Counsel
William H. Edwards
Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
(202) 644-8099 – facsimile
charlie.berardesco@nerc.net
holly.hawkins@nerc.net
william.edwards@nerc.net

Valerie L. Agnew
Director of Standards
Howard Gugel
Director, Performance Analysis
North American Electric Reliability Corporation
3353 Peachtree Road, N.E.
Suite 600, North Tower
Atlanta, GA 30326
(404) 446-2560
(404) 446-2595 – facsimile
mark.lauby@nerc.net
howard.gugel@nerc.net

III. BACKGROUND

A. NERC Reliability Standards Development Procedure

The proposed Reliability Standards were developed in an open and fair manner and in accordance with the Reliability Standard development process. NERC develops Reliability Standards in accordance with Section 300 (Reliability Standards Development) of its Rules of Procedure and the NERC Standard Processes Manual.[4] NERC's proposed rules provide for reasonable notice and opportunity for public comment, due process, openness, and a balance of interests in developing Reliability Standards and thus satisfies certain of the criteria for approving Reliability Standards. The development process is open to any person or entity with a legitimate interest in the reliability of the Bulk-Power System. NERC considers the comments of all stakeholders, and a vote of stakeholders and the NERC Board of Trustees is required to approve a Reliability Standard before the Reliability Standard is submitted to the applicable governmental authorities for approval.

IV. Reliability Standard Version History and FERC Directives

This section presents the version history of each Reliability Standard beginning with the version 0 Reliability Standards and the associated FERC directives from Order No. 693. NERC has also included relevant discussion from the Order No. 693 proceeding that has relevance to both the directives and the standards development work of the standard drafting teams to revise the COM-001 and COM-002 Reliability Standards. Discussion of the proposed Reliability Standards and how the proposed Reliability Standards satisfy the FERC directives is included below in section V of this Petition.

---

[4] The NERC *Rules of Procedure* are available at http://www.nerc.com/AboutNERC/Pages/Rules-of-Procedure.aspx. The NERC *Standard Processes Manual* is available at http://www.nerc.com/comm/SC/Documents/Appendix_3A_StandardsProcessesManual.pdf.

A. History of COM-001-1 and Associated FERC Directives

NERC originally implemented Reliability Standard COM-001-0 (Telecommunications) on April 1, 2005.[5] The version 0 Reliability Standard sought to ensure coordinated telecommunications among operating entities and established general telecommunications requirements for operating entities, including equipment testing and coordination. COM-001-0 also: (i) established English as the common language between and among operating personnel; and (ii) set the policy for using the NERCnet telecommunications system.[6] COM-001-0 applied to Transmission Operators, Balancing Authorities, Reliability Coordinators and NERCNet user organizations.[7] NERC submitted COM-001-0 in its original filing of proposed Reliability Standards.[8] NERC subsequently submitted a filing[9] to include a revised version 1 of the COM-001 Reliability Standard to add missing compliance elements.[10]

On May 11, 2006, FERC staff issued its *Staff Preliminary Assessment of the North American Electric Reliability Council's Proposed Mandatory Reliability Standards* ("Preliminary Assessment").[11] In the Preliminary Assessment, FERC staff made the following summary comments regarding COM-001-0:

---

5 *See* NERC Apr. 4, 2006 *Application for Recognition of Reliability Standards*.

6 NERCNet is a Wide Area Network using Frame Relay as its communications medium. It supports the Interregional Security Network, Interchange Distribution Calculator and the Reliability Coordinator Information System. NERCnet has been used by NERC since 1997 to allow Reliability Coordinators, Transmission Operators, and Balancing Authorities and NERCnet user organizations to share Real-time operating reliability data.

7 "NERCnet User Organizations" are defined in COM-001-1.1, Attachment 1 as "[us]ers of NERCnet who have received authorization from NERC to access the NERC network are considered users of NERCnet resources. To be granted access, users shall complete a User Application Form and submit this form to the NERC Telecommunications Manager."

8 *See* NERC Apr. 4, 2006 *Application for Recognition of Reliability Standards*.

9 *See* NERC December 5, 2006 *Application of the North American Electric Reliability Council and the North American Electric Reliability Corporation for Recognition of Proposed Reliability Standards*.

10 The currently effective and enforceable version of COM-001 is COM-001-1.1.

11 *See Staff Preliminary Assessment of the North American Electric Reliability Council's Proposed Mandatory Reliability Standards*, May 11, 2006, Docket No. RM06-16-000.

- COM-001-0 does not contain specific or minimum adequacy, redundancy and diverse routing requirements for telecommunications facilities;
- the applicability section does not specify that Generator Operators are subject to telecommunications requirements; and
- COM-001-0 contains no Compliance Measures or Levels of Non-Compliance.

FERC staff explained in the Preliminary Assessment that COM-001 contains a general requirement to provide "adequate and reliable" telecommunications facilities for all applicable operating entities. FERC staff concluded that COM-001-0 does not contain specific or minimum requirements on adequacy, redundancy and diverse routing of the telecommunications facilities necessary to ensure the exchange of operating information, both internally and among operating entities. Staff explained that leaving the specification of what constitutes adequate and reliable telecommunication facilities to operating entities could lead to claims by operating entities that they comply with the Reliability Standard when in fact they still may not have "adequate" telecommunications facilities for use during real-time normal and Emergency operations.[12] Further, FERC staff noted that while COM-001 has a redundancy and diverse routing requirement, it is effective only "where applicable," and no specification is provided regarding the circumstances where the requirement actually is applicable.

FERC approved COM-001-1 in Order No. 693, but FERC issued certain directives to improve the Reliability Standard including the additional of certain entities to the applicability of the standard and identification of specific requirements for telecommunications facilities.[13]

B. History of COM-002-2 and Associated Directives

Reliability Standard COM-002-0 was implemented on April 1, 2005. The stated purpose of the Reliability Standard was to:

[12] *Id.* at 42-43.
[13] Order No. 693 at PP 487-93, 502-04, 508.

> To ensure Balancing Authorities, Transmission Operators, and Generator Operators have adequate communications and that these communications capabilities are staffed and available for addressing a real-time emergency condition. To ensure communications by operating personnel are effective.

COM-002-0 applied to Reliability Coordinators, Balancing Authorities, Transmission Operators, and Generator Operators. Reliability Standard COM-002-1 was developed in November 2006 to replace COM-002-0. COM-002-1 added additional detail on the communications requirements between and among operating entities and included specific situations that require communications with other operating entities. COM-002-1 contained two Requirements. Requirement R1 required each Transmission Operator, Balancing Authority, and Generator Operator to have communications (voice and data links) with appropriate Reliability Coordinators, Balancing Authorities, and Transmission Operators. The communications had to be staffed and available for addressing a real-time emergency condition. In addition, each Balancing Authority and Transmission Operator had to notify its Reliability Coordinator and affected Balancing Authorities and Transmission Operators "of any condition that could threaten the reliability of its area or when firm load shedding is anticipated." Requirement R2 required each Reliability Coordinator, Transmission Operator, and Balancing Authority to use three-part communications. Each entity was required to issue directives in a clear, concise, and definitive manner; ensure the recipient of the directive repeats the information back correctly; and acknowledge the response as correct or repeat the original statement to resolve any misunderstandings.[14]

[14] Of particular note, the Reliability Standard did not place any obligation on the receiver of a communication. The responsibility for ensuring proper understanding was placed on the issuer.

NERC submitted COM-002-1 in its original filing of its proposed Reliability Standards.[15] In its subsequent December 5, 2006 filing, NERC submitted COM-002-2, which supersedes the version 1 Reliability Standard. COM-002-2 adds Measures and Levels of Non-Compliance to the version 1 Reliability Standard.

The Preliminary Assessment issued by FERC staff also identified shortcomings in the COM-002-2 Reliability Standard. FERC staff stated that the standard did not contain a requirement that appropriate operating actions be assessed and approved first and then implemented in normal and emergency operating conditions in which reliability could be impacted beyond a local area. FERC staff noted in its explanation "[e]ffective communications with proper communications protocols among the operating entities are essential for maintaining reliable system operations."

FERC staff's comments relied heavily on recommendations made in the Blackout Report. The Blackout Report included 46 specific recommendations to address the primary causes of the blackout to help prevent or minimize the scale of future blackouts. The Blackout Report also identified eight factors that were common to some of the eight major outage occurrences from the 1965 Northeast Blackout through the 2003 blackout, including "ineffective communications."[16] In particular, Recommendation No. 26 reads: "[t]ighten communications protocols, especially for communications during alerts and emergencies. Upgrade communication system hardware where appropriate." Recommendation No. 26 continues:

> NERC should work with reliability coordinators and control area operators to improve the effectiveness of internal and external communications during alerts, emergencies, or other critical situations, and ensure that all key parties, including state and local officials, receive timely and accurate information. NERC should task

[15] *See* NERC Apr. 4, 2006 *Application for Recognition of Reliability Standards.*

[16] Blackout Report at 107.

> the regional councils to work together to develop communications protocols by December 31, 2004, and to assess and report on the adequacy of emergency communications systems within their regions against the protocols by that date.[17]

The Blackout Report explained that on August 14, 2003, "reliability coordinator and control area communications regarding conditions in northeastern Ohio were in some cases ineffective, unprofessional, and confusing." The Blackout Report concluded that ineffective communications contributed to a lack of situational awareness and precluded effective actions to prevent the cascade. The Blackout Report also stated "[c]onsistent application of effective communications protocols, particularly during alerts and emergencies, is essential to reliability."[18]

In its Preliminary Assessment, FERC staff interpreted the Blackout Report recommendation's reference to "effective communications" with "tightened communications protocols" among operating entities to include two key components: (i) effective communications that are delivered in clear language via pre-established communications paths among pre-identified operating entities, and (ii) communications protocols which clearly identify that any operating actions with reliability impact beyond a local area or beyond a Reliability Coordinator's area must be communicated to the appropriate Reliability Coordinator for assessment and approval prior to their implementation to ensure reliability of the interconnected systems.[19] FERC staff concludes that the requirements in COM-002-1 fulfill the "effective communications" component of the Blackout Report recommendation, but do not meet the call for "tightened communications protocols." Specifically, FERC states that COM-002-1, or other Reliability Standards, do not contain a requirement that the appropriate operating actions in normal and emergency operating conditions that may have reliability impact beyond a local area

[17] *Id.* at 141, 161.
[18] *Id*. at 161.
[19] Preliminary Assessment at 43-44.

or Reliability Coordinator's area must be assessed and approved by the Reliability Coordinator, before implementation by the operating entities.[20]

In its comments to the Preliminary Assessment, NERC stated that it did not believe that "tightened communications protocols" should include the requirement that "the appropriate operating actions…*must be assessed and approved* by the reliability coordinator, before being implemented by the operating entities."[21] NERC further argued that other NERC standards (e.g., EOP-001 and TOP-001) require the Transmission Operator, Balancing Authority, and Reliability Coordinator to coordinate their emergency operating plans and communicate actions with one another. However, NERC did state, without elaboration, that it "agrees with the need for development of additional standards addressing consistent communications protocols among personnel responsible for the reliability of the Bulk-Power System."

FERC ultimately approved COM-002-2 in Order No. 693, but FERC issued certain directives to improve the Reliability Standard including adding Distribution Providers as an applicable entity in the Reliability Standard and requiring NERC to create tightened communications protocols, especially for communications during alerts and emergencies.[22] Section V includes a summary of these directives along with how the proposed Reliability Standard satisfies the directives.

---

[20] *Id.* at 44.

[21] NERC Jun. 26, 2006 *Comments to Preliminary Assessment*, Docket No. RM06-16-000 at 120 (quoting Preliminary Assessment) (emphasis added).

[22] In addition, FERC suggests NERC consider certain comments in the Standards Development Process. FERC asks NERC to consider the American Public Power Association's ("APPA") comments regarding the Measures and Levels of Non-Compliance when revising the Reliability Standard. APPA notes that the Levels of Non-Compliance for COM-002-2 are inadequate in two respects: (1) reliability coordinators are not included in any Level of Non-Compliance and (2) the Levels of Non-Compliance for transmission operators and balancing authorities in Compliance D.2 do not reference Requirements R1 and R2. Order No. 693 at P 533. FERC also suggests that NERC consider comments by Santa Clara, FirstEnergy and Six Cities regarding specific new improvements to the Reliability Standards. Order No. 693 at 536-39.

C. Revisions to COM Reliability Standards

1. History of Project 2006-06

Project 2006-06 – Reliability Coordination was established to ensure that reliability-related Requirements that are applicable to the Reliability Coordinator are clear, measurable, unique and enforceable, and to ensure that this set of Requirements is sufficient to maintain reliability of the Bulk Electric System. Revisions to the COM-001 and COM-002 Reliability Standards were included within the project scope in order to modify the currently-effective Reliability Standards, COM-001-1.1 and COM-002-2, to address the applicable directives in Order No. 693, while adequately addressing the communication needs of Reliability Coordinators. The project resulted in two proposed Reliability Standards, COM-001-2 and COM-002-3.

2. History of Project 2007-02

The purpose of Project 2007-02 – Operating Personnel Communications Protocols was to create a new Reliability Standard that requires real time system operators to use standardized communication protocols during normal and emergency operations to improve situational awareness and shorten response time.[23] The Project drafted Reliability Standard COM-003-1 to accomplish this goal. The Project ultimately resulted in the combination of COM-002-3 from Project 2006-06 and draft COM-003-1 into a single proposed Reliability Standard, COM-002-4.

V. JUSTIFICATION FOR APPROVAL

As discussed in Exhibits F and G and below, the proposed Reliability Standards, COM-001-2 and COM-002-4 are just, reasonable, not unduly discriminatory or preferential, and in the

[23] *See* Standard Authorization Request, *available at* http://www.nerc.com/pa/Stand/Project%20200702%20Operating%20Personnel%20Communications/SAR_Project_2007-02_Comm_Protocols_1st_Posting_15Mar07.pdf.

public interest. The following section separately provides: (i) the purpose of the proposed Reliability Standards; (ii) a description of the requirements in each of the proposed Reliability Standards, the technical basis supporting the requirements, and a description of proposed defined terms; (iii) a discussion of how the proposed Reliability Standards satisfy the outstanding FERC directives from Order No. 693; and (iv) a discussion of the enforceability of the proposed Reliability Standards.

A. Proposed Reliability Standard COM-001-2

1. Purpose of Proposed Reliability Standard

Proposed Reliability Standard COM-001-2 revises the currently effective COM-001-1.1 Reliability Standard. The purpose of proposed Reliability Standard COM-001-2 is to establish requirements for Interpersonal Communication capabilities necessary to maintain reliability. Proposed COM-001-2 applies to Reliability Coordinators, Balancing Authorities, Transmission Operators, Generator Operators, and Distribution Providers.

2. Requirements, Technical Basis and Defined Terms

The proposed Reliability Standard includes eleven requirements and two new defined terms, "Interpersonal Communication" and "Alternative Interpersonal Communication," which collectively provide a comprehensive approach to establishing communications capabilities necessary to maintain reliability. The defined terms used in the requirements of proposed COM-001-2 are:

> **Interpersonal Communication** – Any medium that allows two or more individuals to interact, consult, or exchange information.
>
> **Alternative Interpersonal Communication** – Any Interpersonal Communication that is able to serve as a substitute for, and does not utilize the same infrastructure (medium) as, Interpersonal Communication used for day-to-day operation.

These definitions provide clarity that an entity's communication capability must be redundant and that each of the capabilities must not utilize the same medium. The new definitions, therefore, improve upon the language used in the current COM-001-1.1 Reliability Standard, which states "[e]ach Reliability Coordinator, Transmission Operator and Balancing Authority shall provide ***adequate and reliable*** telecommunications facilities for the exchange of Interconnection and operating information." COM-001-1.1, Requirement R1, Part R1.4 states that "[w]here applicable, these facilities shall be redundant and diversely routed." Use of the defined terms eliminates the need to use the ambiguous phrases "adequate and reliable" and "redundant and diversely routed, which were identified in the Preliminary Assessment as potentially creating ambiguity in the Reliability Standard.

Requirements R1-R6 address the Interpersonal Communication capability and Alternative Interpersonal Communication capability of the Reliability Coordinator, Transmission Operator, and Balancing Authority. Each functional entity has a requirement to have an Interpersonal Communication capability and to designate an Alternative Interpersonal Communication capability with certain other functional entities as follows:

Requirements R1 and R2 require the Reliability Coordinator to have Interpersonal Communication capability (R1) and designate Alternative Interpersonal Communication capability (R2) with all Transmission Operators and Balancing Authorities within its Reliability Coordinator Area and each adjacent Reliability Coordinator within the same Interconnection.

Requirement R3 requires each Transmission Operator to have Interpersonal Communication capability with: (i) its Reliability Coordinator; (ii) each Balancing Authority within its Transmission Operator Area; (iii) each Distribution Provider within its Transmission Operator Area; (iv) each Generator Operator within its Transmission Operator Area; (v) each

adjacent Transmission Operator synchronously connected; and (vi) each adjacent Transmission Operator asynchronously connected.

Requirement R4 requires each Transmission Operator to designate Alternative Interpersonal Communication capability with: (i) its Reliability Coordinator; (ii) each Balancing Authority within its Transmission Operator Area; (iii) each adjacent Transmission Operator synchronously connected; and (iv) each adjacent Transmission Operator asynchronously connected.

Requirement R5 requires each Balancing Authority to have Interpersonal Communication capability with: (i) its Reliability Coordinator; (ii) each Transmission Operator that operates Facilities within its Balancing Authority Area; (iv) each Distribution Provider within its Balancing Authority Area; (v) each Generator Operator that operates Facilities within its Balancing Authority Area; and (vi) each Adjacent Balancing Authority.

Requirement R6 requires each Balancing Authority to designate Alternative Interpersonal Communication capability with: (i) its Reliability Coordinator; (ii) each Transmission Operator that operates Facilities within its Balancing Authority Area; and (iii) each Adjacent Balancing Authority.

Requirements R7 and R8 require each Distribution Provider and Generator Operator, respectively, to have Interpersonal Communication capability with: (i) its Balancing Authority; and (ii) its Transmission Operator.

Requirement R9 requires the Reliability Coordinator, Transmission Operator, and Balancing Authority to test its Alternative Interpersonal Communication capability, initiate repair, or designate a replacement alternative communication capability within two hours following the test.

Requirement R10 requires the same entities to notify the entities identified in Requirements R1, R3, and R5 of the detection of a failure of its Interpersonal Communication capability that lasts 30 minutes or longer. The notification must occur within 60 minutes of the detection of the failure. The standard drafting team determined that 60 minutes was a reasonable timeframe for completing the notification. Some commenters in the standards development process expressed concern in meeting the 60-minute notification timeframe upon the loss of their Interpersonal Communication capability. However, the standard drafting team responded that the notification requirement applies to the Balancing Authority, Reliability Coordinator and Transmission Operator, which are required to have an Alternative Interpersonal Communication capability, and should have the ability to accomplish the required notification.

Finally, Requirement R11 requires the Distribution Provider and Generator Operator to consult with its Balancing Authority and Transmission Operator, upon detecting a failure of its Interpersonal Communication capability, to determine a mutually agreeable action for the restoration of its Interpersonal Communication capability. This requirement provides a means for the Distribution Provider and Generator Operator to have an understanding with the Balancing Authority and Transmission Operator of how the restoration of the Interpersonal Communication capability will occur, providing the necessary awareness to all of the status of the Interpersonal Communication capability.

3. Improvements Reflected in Proposed COM-001-2

Proposed COM-001-2 improves the currently-effective Reliability Standard by: (1) eliminating terms that do not adequately specify the desired actions that Reliability Coordinators, Balancing Authorities, and Transmission Operators are expected to take in relation to their telecommunication facilities; (2) clearly identifying the need for applicable entities to be capable

of Interpersonal Communication and Alternative Interpersonal Communication, as those terms are defined and proposed for approval; (3) not requiring specific technology or systems to be utilized; and (4) including the Distribution Provider and Generator Operator as covered functional entities.

First, proposed COM-001-2 eliminates ambiguous terms used in COM-001-1 that do not adequately specify the desired actions that Reliability Coordinators, Balancing Authorities, and Transmission Operators are expected to take with respect to each's telecommunication facilities. For example, Requirement R1 of COM-001-1 includes the phrase "shall provide adequate and reliable telecommunications facilities." Entities explained during the Standards Development Process that "adequate and reliable" could lend itself to multiple interpretations. FERC also raised concern over this phrase in the Preliminary Assessment prior to the issuance of Order No. 693. Rather than using the term "adequate," the proposed standard now specifies the communications capability requirements between entities by function and condition in Requirements R1 through R8. The term "reliable" is replaced by a specific requirement for testing (Requirement R9), along with two new requirements for notification of a failure of an applicable entity's communication capability (Requirements R10 and R11). Further, use of two new proposed defined terms – "Interpersonal Communication" and "Alternative Interpersonal Communication" – resolves the ambiguity caused by the phrases "adequate and reliable" and "redundant and diversely routed" communications in COM-001-1. COM-001-2 instead requires the applicable entities to have a clearly defined Interpersonal Communication capability and an Alternative Interpersonal Communication capability, in addition to specifying, under what conditions, those entities that must have the capability.

Second, proposed COM-001-2 clearly identifies the need to be capable of both Interpersonal Communication and Alternative Interpersonal Communication. By clearly identifying the capability needs, the proposed Reliability Standard eliminates the inferred need for redundant, emergency telecommunication facilities. In contrast, Requirement R2 of COM-001-1, states "[s]pecial attention shall be given to emergency telecommunications facilities and equipment not used for routine communications." While this language contains an inference that some equipment is maintained for uses other than routine communications, the requirement is not clear about what capabilities must be maintained. The new term "Alternative Interpersonal Communication" clarifies this language to explicitly require Interpersonal Communication capabilities that does not utilize the same infrastructure as the communications infrastructure for day-to-day operations.

Third, the use of word "capability" in the proposed Reliability Standard ensures the standard is technologically agnostic, allowing for future changes in technology and advances in communication to be employed without requiring a change to the Reliability Standard.

Lastly, the proposed Reliability Standard expands the applicability of the Reliability Standard to cover Distribution Providers and Generator Operators. These functional entities are now required to have an Interpersonal Communication capability with the listed entities in Requirements R7 and R8, respectively. This is directly responsive to directives in Order No. 693, as discussed below.

4. Proposed COM-001-2 Satisfies FERC's Directives

In Order No. 693, FERC issued three directives to NERC to modify certain aspects of the currently effective COM-001-1 Reliability Standard. Each is explained in turn, along with how the proposed Reliability Standard satisfies the directive.

FERC reaffirmed its position taken in the *Notice of Proposed Rulemaking* that "Generator Operators" and "Distribution Providers" should be included as applicable entities in COM-001-1 to ensure there is no reliability gap during normal and emergency operations.[24] FERC argued that during a blackstart when normal communications may be disrupted, it is essential that the Transmission Operator, Balancing Authority and Reliability Coordinator maintain communications with their Distribution Providers and Generator Operators. In developing requirements for these newly applicable entities, FERC noted that the revised Reliability Standard could establish an appropriate range of requirements for telecommunication facilities that reflect their respective roles on Reliable Operation of the Bulk-Power System.

FERC also issued additional directives to revise COM-001-1[25] to: (i) identify specific requirements for telecommunications facilities for use in normal and emergency conditions that reflect the roles of the applicable entities and their impact on Reliable Operation; and (ii) include adequate flexibility for compliance with the Reliability Standard, adoption of new technologies and cost-effective solutions.[26]

Proposed COM-001-2 meets all three of FERC's directives issued in Order No. 693. First, NERC has included "Generator Operators" and "Distribution Providers" as covered applicable entities pursuant to FERC's directive.

Second, proposed COM-001-2 meets FERC's directive to "identify specific requirements for telecommunications facilities for use in normal and emergency conditions that reflect the roles of the applicable entities and their impact on Reliable Operation." The proposed Reliability Standard sets requirements to have "Interpersonal Communication" capability and "Alternative

---

[24] *Id.* at PP 487-93.
[25] *Id.* at PP 502-04.
[26] *Id.* at P 508 (summarizing FERC directives on COM-001-1).

Interpersonal Communication" capability, where noted in the requirements, without limitation on the operating condition for each of the applicable entities (*see* Requirements R1-R8). By setting parameters for the types of communications capabilities and setting requirements for maintaining capabilities between certain functional entities, the proposed Reliability Standard sets a clear baseline for communications capability during all operating conditions. In addition, the proposed Reliability Standard includes requirements for notifying other functional entities of the loss or failure of certain communications capabilities, further ensuring that entities are aware of the communications capabilities of other functional entities.

Lastly, the proposed Reliability Standard uses terminology that has sufficient flexibility for entities to adopt new technologies and cost-effective solutions. The requirements purposely use the word "capability" in a general sense in order to remain agnostic on the specific technology an entity must use, allowing opportunity for the adoption of new technology and cost-effective solutions that may become available for use in the future.

5. Revisions to Reliability Standard COM-001-1.1

Exhibit C to this filing contains an "Implementation Plan and Mapping Document" for proposed COM-001-2 that describes the associated retirement of currently effective COM-001-1.1 and provides a detailed mapping of how the requirements in COM-001-1.1 translate into proposed COM-001-2. In summary, proposed COM-001-2 will retire all Requirements of COM-001-1.1 upon proposed COM-001-2 becoming effective with the exception of Requirement R4. Requirement R4 of COM-001-1.1 will be retired by proposed Reliability Standard COM-002-4 because this Requirement was referred to Project 2007-02 for inclusion in COM-003-1, which addressed communications protocols. Of particular note in the Implementation Plan, the

standard drafting team concluded that Requirement R5 in COM-001-1.1 is redundant with EOP-008-1, Requirement R1 and, therefore, has not been carried forward in proposed COM-001-2.

Additionally, Requirement R6 of COM-001-1.1 is also being proposed for retirement, which requires adherence to certain policies and requirements when using NERCnet.[27] Specification of the types of tools to be employed and requirements for interfacing with these tools are best handled by NERC internal policies. This approach preserves NERC's ability to be responsive to new technologies and improvements in security of the tool without having to modify a Reliability Standard to do so. The development of tools should support registered entities in meeting the intent of a Reliability Standard without creating a burden on acquisition of specific technology or tools. NERC is currently transitioning NERCnet to industry. Industry will take on the network infrastructure upgrade and future maintenance and enhancements. This transition will be complete prior to the effective date of COM-001-2. Policies and requirements for use of the new tool will be addressed internally by NERC as part of the new program.

B. Proposed Reliability Standard COM-002-4

1. Purpose of Proposed Reliability Standard

Proposed Reliability Standard COM-002-4 revises the currently effective COM-002-2 Reliability Standard and the Board-adopted COM-002-3 Reliability Standard.[28] The purpose of proposed Reliability Standard COM-002-4 is to improve communications for the issuance of Operating Instructions with predefined communications protocols to reduce the possibility of

---

[27] *See infra* FN 21.

[28] The Board-adopted COM-002-3 Reliability Standard is proposed for retirement in the Implementation Plan because the proposed Reliability Standard has been combined with proposed COM-003-1 to create proposed COM-002-4. COM-002-3 has not been submitted to the applicable governmental authorities, therefore, the currently effective version of COM-002 is COM-002-2.

miscommunication that could lead to action or inaction harmful to the reliability of the Bulk Electric System. The proposed Reliability Standard combines proposed Reliability Standard COM-002-3 and the former draft COM-003-1 into a single standard that addresses communications protocols for operating personnel in Emergency and non-emergency conditions.

2. Standard Development History

The standard drafting team conducted eight comment and ballot periods in arriving at the final industry-approved language in the proposed COM-002-4 Reliability Standard. Over that time, the standard drafting team responded to comments and revised the draft Reliability Standard based on the consensus view of the standard drafting team following each consideration of comments. In addition to the required steps outlined in the Standards Development Process, the standard drafting team conducted stakeholder outreach in order to arrive at a draft Reliability Standard that meets the stated purpose of the Reliability Standard, addresses FERC's directives, and represents consensus in industry, including:

- a full-day "Communications in Operations" technical conference held February 14-15, 2013 to gather industry input on a consensus communications standard approach;
- a survey distributed to a sample of industry experts by the Director of Standards Development and the Standards Committee Chair requesting feedback on the draft standard in preparation for the eighth additional ballot; and
- consultation on the use of the term "Reliability Directive" in the COM-002-4 standard with the Project 2007-03 Real-time Transmission Operations standard drafting team and the Project 2006-06 Reliability Coordination standard drafting team.

In addition to the outreach above, the standard drafting team received input from the NERC Board of Trustees on two occasions. On August 15, the Board adopted a resolution,[29]

[29] *See Draft Minutes of the Board of Trustees*, August 15, 2013 at 3-4, *available at* http://www.nerc.com/gov/bot/Agenda%20highlights%20and%20Mintues%202013/BOT0813m-draft-complete.pdf.

which requested input from NERC's Reliability Issues Steering Committee ("RISC"), the Independent Experts Review Panel, and NERC management to inform the Board and provide input into the standard development process. These inputs were provided to the standard drafting team for its consideration and to the Operating Committee, with a request that the Operating Committee provide its input to as well. Responses from RISC, the Independent Experts Review Panel, NERC management, and the Operating Committee are included in Exhibit O.

At its November 7, 2013 meeting, the Board of Trustees adopted a resolution for the further development of the COM-003-1 Reliability Standard.[30] The resolution provided additional recommendations to the standard drafting team on the development of a subsequent revised draft.

3. Requirements, Technical Basis, and Defined Terms

Following posting six of the proposed COM-002-4 Reliability Standard, NERC staff prepared a "strawman" draft that combined the COM-002-3 and draft COM-003-1 Reliability Standards. The "strawman" provided a starting point for the standard drafting team to edit and adjust as it deemed appropriate based on its own expertise and from the feedback industry provided during the Standards Development Process.

In proposed COM-002-4, the same protocols are required to be used in connection with the issuance of Operating Instructions for *all* operating conditions – *i.e.*, non-emergency and Emergency communications. However, the proposed Reliability Standard employs the phrase "Operating Instruction during an Emergency" in certain Requirements (R5, R6, R7) to provide a

[30] *See Resolution for Agenda Item 8.i: Operating Personnel Communication Protocols*, Nov. 7, 2013, *available at* *http://www.nerc.com/gov/bot/Agenda%20highlights%20and%20Mintues%202013/Board%20COM%20Resolution%2011.7.13%20v1%20AS%20APPROVED%20BY%20BOARD.pdf*.

demarcation for what is subject to a zero-tolerance compliance approach and what is not. This separation in the requirement structure is necessary to draft Violation Severity Levels to match each compliance approach described in the Board's resolution. Where "Operating Instruction during an Emergency" is not used, an entity will be assessed under a compliance approach that focuses on whether an entity meets the initial training Requirement (either R2 or R3) and whether an entity performed the assessment and took corrective actions according to Requirement R4.

An entity should expect its operating personnel that issue and receive Operating Instructions to use the entity's documented communication protocols for the issuance and receipt of all Operating Instructions. An entity reinforces its use of the documented communication protocols through training, assessing adherence by its operating personnel to the documented communication protocols, and providing feedback to those operating personnel on their use of the protocols. During Emergencies, operating personnel must use the documented communication protocols for three-part communications without exception, since clear communication is essential to providing swift and coordinated response to events that are directly impacting the reliability of the Bulk Electric System.

a) Definition of "Operating Instruction"

The current draft of COM-002-4 no longer includes the term "Reliability Directive," which was included in previous postings as a subset within the definition of "Operating Instruction."[31] The proposed definition of "Operating Instruction" reads as follows:

[31] On November 21, 2013, FERC issued a Notice of Proposed Rulemaking, which proposes to remand certain proposed TOP and IRO standards. *Monitoring System Conditions- Transmission Operations Reliability Standard Transmission Operations Reliability Standards Interconnection Reliability Operations and Coordination Reliability Standards*, NOPR, 145 FERC ¶ 61,158 (2013). The TOP/IRO NOPR is available at: http://www.nerc.com/FilingsOrders/us/FERCOrdersRules/NOPR_TOP_IRO_RM13-12_RM13-14_RM13-

> A command by operating personnel responsible for the Real-time operation of the interconnected Bulk Electric System to change or preserve the state, status, output, or input of an Element of the Bulk Electric System or Facility of the Bulk Electric System. (A discussion of general information and of potential options or alternatives to resolve Bulk Electric System operating concerns is not a command and is not considered an Operating Instruction.)

A "command" as used in the definition refers to both oral and written commands by operating personnel. The standard drafting team purposely did not modify the word "command" with either "oral" or "written" in order to maintain its broader meaning. Instead, in the requirements of COM-002-4, the standard drafting team has specified "oral" or "written" as needed to define which types of Operating Instructions are covered by the requirement. The definition also includes a clarifying note in parentheses that general discussions are not considered Operating Instructions. This clarification was requested by and supported by industry for inclusion in the definition itself.

b) Applicability

In addition to Balancing Authorities, Reliability Coordinators, and Transmission Operators, proposed COM-002-4 applies to Distribution Providers and Generator Operators. The standard drafting team added these entities in the Applicability section because they can be and in many cases are the recipients of Operating Instructions. The standard drafting team

---

15_20131121.pdf. The proposed remand includes the defined term "Reliability Directive." FERC's proposal to remand the term "Reliability Directive" raised possible complications with the draft COM-002-4 Reliability Standard, which used the proposed definition. The standard drafting team consulted on the use of the term "Reliability Directive" in the COM-002-4 Reliability Standard with the Project 2007-03 Real-time Transmission Operations and the Project 2006-06 Reliability Coordination Standard Drafting Teams to ask whether they believed removal of the term would cause concerns. Both teams agreed that the COM-002-4 standard did not need to require a specific protocol to identify "Reliability Directives" as such and that the definition of "Operating Instruction" could be used absent the term Reliability Directive in COM-002-4 to set the protocols. This would leave the TOP and IRO standard drafting teams the flexibility to address the issues surrounding the term "Reliability Directive" in response to the FERC TOP/IRO NOPR.

determined that not including these entities would leave a gap in a communications standard that addresses operating personnel. The addition of Distribution Providers as an applicable entity also responds to FERC's directive in Order No. 693 to add them as applicable entities to the communications standard.

Recognizing that Generator Operators and Distribution Providers typically only receive Operating Instructions, the standard drafting team proposed that only Requirements R3 and R6 apply to these entities. Under proposed COM-002-4, Distribution Providers and Generator Operators are required to: (i) train operators prior to receiving an Operating Instruction; and (ii) use three part communication when receiving an Operating Instruction during an Emergency. The Measures for the requirements related to these applicable entities show that Distribution Providers and Generator Operators can demonstrate compliance for use of three-part communication when receiving an Operating Instruction during an Emergency by providing an attestation from the issuer of the Operating Instruction (i.e., a voice recording is not required). If a Distribution Provider or Generator Operator never receives an Operating Instruction, the requirements in proposed COM-002-4 would not apply. In both Requirements R3 and R6, qualifying language triggering performance based on the "receipt" of an Operating Instruction is included. This construct makes certain that appropriate entities are trained and able to use three-part communication for reliability purposes.

c) Requirements in Proposed COM-002-4

Proposed COM-002-4 has seven requirements that require certain entities to develop predefined communications protocols for the issuance of Operating Instructions. Each requirement and its Parts are discussed in detail below along with the technical basis for the inclusion of the requirement in the proposed Reliability Standard.

Requirement R1

Requirement R1 requires entities that can *both issue and receive* Operating Instructions to have documented communications protocols that include a minimum set of elements, outlined in Parts 1.1 through 1.6 of the Requirement. Because Operating Instructions affect Facilities and Elements of the Bulk Electric System, the communication of those Operating Instructions must be understood by all involved parties, especially when those communications occur between functional entities. An EPRI study reviewed nearly 400 switching mishaps by electric utilities and found that roughly 19% of errors (generally classified as loss of load, breach of safety, or equipment damage) were due to communication failures.[32] This was nearly identical to another study of dispatchers from 18 utilities that found that 18% of the operators' errors were due to communication problems.[33] The necessary protocols include the use of the English language unless agreed to otherwise (except for internal operations), protocols for use of a written or oral single-party to multiple-party burst Operating Instruction, three-part communications (including a protocol for taking an alternate action if a response is not received or if the Operating Instruction was not understood by the receiver), specification of instances that require time identification, and specification of nomenclature for Transmission interface Elements.

Requirement R1 provides consistency among communications protocols and promotes effective communications, while also allowing flexibility for entities to develop additional communications protocols based on its own operating environment. The inclusion of the elements in Parts 1.1 through 1.6 are necessary to improve communications protocols and drive uniformity.

---

[32] Beare, A., Taylor, *J. Field Operation Power Switching Safety*, WO2944-10, Electric Power Research Institute.

[33] Bilke, T., *Cause and prevention of human error in electric utility operations*, Colorado State University, 1998.

The term "documented communication protocols" in R1 refers to a set of required protocols specific to the applicable entity and the entities with whom they must communicate. An entity should include as much detail as it believes necessary in its documented communication protocols,[34] but the documented communication protocols must address all of the applicable Parts of Requirement R1. Where an entity does not already have a set of documented communications protocols that meet the Parts of Requirement R1, the entity must develop the necessary communications protocols. Entities may also adopt the documented protocols of another entity as its own communications protocols, but the entity must maintain its own set of documented communications protocols to meet Requirement R1. Each part of Requirement R1 is discussed below:

> *1.1. Require its operating personnel that issue and receive an oral or written Operating Instruction to use the English language, unless agreed to otherwise. An alternate language may be used for internal operations.*

Use of English language has been carried forward from COM-001-1.1, Requirement R4 as an essential protocol. As noted above, retirement of this requirement in COM-001-1.1 was specifically referred to Project 2007-02. Part 1.1 continues to permit the issuer and receiver to use an agreed to alternate language. This has been retained since use of an alternate language, on a case-by-case basis, may serve to better facilitate effective communications where the use of English language may create additional opportunities for miscommunications. Part 1.1 requires the use of English language (unless agreed to otherwise) when issuing oral or written[35] Operating

---

[34] On September 19, 2012, the NERC Operating Committee issued a Reliability Guideline entitled: "System Operator Verbal Communications – Current Industry Practices." As stated on page one, the purpose of the Reliability Guideline ". . . is to document and share current verbal Bulk Electric System communications practices and procedures from across the industry that have been found to enhance the effectiveness of system operator communications programs." This guideline serves as an additional source of information on best practices that entities can draw on in creating the documented communications protocols. The guideline is available at: http://www.nerc.com/comm/OC/Reliability%20Guideline%20DL/Reliability_Guideline_Final_2012.pdf.

[35] An example of a written Operating Instruction is a switching order.

Instructions. This creates a standard language (either English or an agreed upon alternate language) for use when issuing commands that could change or preserve the state, status, output, or input of an Element of the Bulk Electric System or Facility of the Bulk Electric System. Part 1.1 also clarifies that an alternate language can be used internally within the organization. The wording of the Part has been modified slightly from the language in COM-001-1.1, Requirement R4 to incorporate the term "Operating Instruction," which defines the communications that require the use of the documented communications protocols.

1.2. Require its operating personnel that issue an oral two-party, person-to-person Operating Instruction to take one of the following actions:

- *Confirm the receiver's response if the repeated information is correct.*
- *Reissue the Operating Instruction if the repeated information is incorrect, if the receiver does not issue a response, or if requested by the receiver.*
- *Take an alternative if a response is not received or if the Operating Instruction was not understood by the receiver.*

1.3. Require the receiver of an oral two-party, person-to-person Operating Instruction to take one of the following actions:

- *Repeat the Operating Instruction and wait for confirmation from the issuer that the repetition was correct.*
- *Request that the issuer reissue the Operating Instruction.*

Part 1.2 requires communications protocols for the use of three-part communications for oral two-party, person-to-person Operating Instructions *by the issuer*. Part 1.3 requires communications protocols for the use of three-part communications for oral two-party, person-to-person Operating Instructions *by the receiver*. This carries forward the requirement to use three-part communications in COM-002-2 and COM-002-3 and also adds an option in Part 1.2 for the issuer to take an alternative action to resolve the issue if the receiver does not respond or understand the Operating Instruction. The addition of this third bullet, which is not included in

COM-002-2, serves to clarify in the requirement language itself that the issuing entity can take alternate action in lieu of reissuance, if necessary.

Three-part communication reduces the opportunity for confusion and misunderstanding when issuing and receiving Operating Instructions during all operating conditions. Because three-part communication is included as a protocol for both non-emergency conditions and Emergency conditions, there will be no mental "transition" between protocols when operating conditions shift from non-emergency to Emergency. The documented communication protocols for the operating personnel will remain the same during transitions through all operating conditions. Further, the formal requirement for three-part communication in an entity's documented communications protocols will create a heightened sense of awareness in operating personnel that the task they are about to execute is critical, and recognize the risk to the reliable operation of the Bulk Electric System is increased if the communication is misunderstood.

> *1.4. Require its operating personnel that issue a written or oral single-party to multiple-party burst Operating Instruction to confirm or verify that the Operating Instruction was received by at least one receiver of the Operating Instruction.*

This Part requires specific communications protocols for the issuance of an Operating Instruction using a one-way burst messaging system. One-way burst messaging systems are used to issue Operating Instructions to many entities at once. Because the use of three-part communications is not practical when utilizing this type of communication, a separate protocol was added to the proposed Reliability Standard. During the Standards Development Process, many entities expressed concern that if one-way burst messaging systems were not addressed, it would imply that three part communication would be required for all participants in the burst message.

> *1.5. Specify the instances that require time identification when issuing an oral or written Operating Instruction and the format for that time identification.*

This Part requires entities to identify the instances where time identification is required when issuing an oral or written Operating Instruction. Clarifying time and time zone (where necessary) contributes to reducing misunderstandings and reduces the risk of a grave error during BES operations, especially when communicating across time zones or specifying an action that will take place at a future time. The Part forces entities to name the instances in the documented communications protocols themselves if time identification is used. The standard drafting team chose this method of identification in lieu of requiring time identification to maintain flexibility for the entity in designing its communications protocols, but also providing clarity in the documented communications protocols where it is used.

1.6. Specify the nomenclature for Transmission interface Elements and Transmission interface Facilities when issuing an oral or written Operating Instruction.

Similarly to Part 1.5, Part 1.6 does not prescriptively require the use of nomenclature for Transmission interface Elements and Transmission interface Facilities when issuing an oral or written Operating Instruction. The standard drafting team opted to require entities to identify the nomenclature, if it is used. This Part limits the scope to only Transmission interface Elements or Transmission interface Facilities (*e.g.*, tie lines and tie substations). This ensures that communicating parties are readily familiar with each other's interface Elements and Facilities, eliminating hesitation and confusion when referring to equipment for the Operating Instruction. This shortens response time and improves situational awareness. It also permits entities to jointly develop the nomenclature for their interface.

Requirements R2 and R3

Requirement R2 requires each Balancing Authority, Reliability Coordinator, and Transmission Operator to conduct initial training for each of their operating personnel

responsible for the Real-time operation of the Bulk Electric System on the entity's documented communication protocols.

Requirement R3 requires Distribution Providers and Generator Operators to conduct initial training on three part communication for each of their operating personnel who can receive an oral two-party, person-to-person Operating Instruction prior to that individual operator receiving an oral two-party, person-to-person Operating Instruction. Distribution Providers and Generator Operators would have to train their operating personnel prior to placing them in a position to receive an oral two-party, person-to-person Operating Instruction. Operating Personnel that would never be in a position to receive an oral two-party, person-to-person Operating Instruction, therefore, would not need initial training unless their circumstance changes.

Initial training is included in proposed COM-002-4 in response to the NERC Board of Trustees resolution, which directs that a training requirement be included. Additionally, requiring entities that issue and or receive Operating Instructions to conduct initial training with their operating personnel will ensure that all applicable operators will be trained in three-part communication. This training will reduce the possibility of a miscommunication, which could eventually lead to action or inaction harmful to the reliability of the Bulk Electric System. Ongoing training beyond initial training would fall under an entities' training program in PER-005 or could be separately listed as a type of corrective action under Requirement R4. Training is also mentioned by FERC staff in its Preliminary Assessment as an important aspect to effective communications.[36]

[36] Preliminary Assessment at 43 (citing Blackout Report at 161 which provides that lack of situational awareness can result from, among other things, inadequate operator training).

Requirement R4

Requirement R4 requires Balancing Authorities, Reliability Coordinators, and Transmission Operators to, at least once every 12 months, assess adherence by its operating personnel to the documented communication protocols in Requirement R1 and to provide feedback to its operating personnel on their performance. This also includes any corrective action taken, as appropriate, to address deviations from the documented protocols. Requirement R4 also requires the aforementioned entities to assess the effectiveness of their documented communications protocols and make changes, as necessary, to improve the effectiveness of the protocols. An entity may determine that corrective action beyond identification of the misuse of the documented communications protocols to the operating personnel is not necessary, therefore, the phrase "as appropriate" is included in the Requirement R4 language to indicate that whether to take additional corrective action is determined by the entity and not dictated by the Requirement for all instances of a misuse of a documented communication protocol. In almost all cases found by an entity, NERC expects that an entity will have some form of corrective action such as ongoing scheduled training.

Most entities currently engage in some type of assessment activity for their operating personnel and provide operators with performance feedback on their adherence to the entity's documented protocols. Doing so, provides entities an opportunity to evaluate the performance of their operating personnel and take corrective actions where necessary, which could prevent a miscommunication from occurring and thus possibly prevent an event which could be harmful to the reliability of the Bulk Electric System.

The associated Measure M4 for Requirement R4 lists the types of evidence that an entity can provide to demonstrate compliance and explains when an entity should show the corrective actions taken. Of particular interest is any corrective action taken where the miscommunication

is the sole or partial cause of an Emergency and the entity has opted to take a corrective action. While the Measure lists out this particular set of circumstances to highlight the importance, the Measure does not modify the Requirement to *require* corrective action.

Requirement R4 is the primary mechanism for implementation of the documented communication protocols in proposed COM-002-4 for non-emergency conditions. In order to meet its obligations under Requirement R4, an entity must be actively employing its documented communications protocols. However, the requirement also extends to assessing the use of communications protocols during Emergency communications. Specifically, this requirement compels entities to assess the adherence of its operating personnel to the pre-defined communication protocols, provide feedback to its operating personnel based on their performance, and implement corrective action to address deviations from those protocols or general ineffectiveness where necessary. Requirement R4 also aims to ensure that the documented protocol remains current and effective to address potential reliability issues that could be caused by non-inclusion of a communication protocol not otherwise required by Requirement R1.

The creation of an assessment obligation and a protocol effectiveness review process that arises at least once every twelve (12) months provides a short evaluation and correction cycle for entities. By providing feedback to operators on a regular basis, these entities can evaluate performance and take necessary corrective action in a timely manner. Specification that the review must occur "at least once every twelve (12) months" also does not preclude entities from employing processes that provide feedback in an even shorter timeframe or multiple times per year as part of their process design.

The language of the requirement clearly and explicitly delineates the obligations and expectations entities must meet. Requirement R4 requires that each entity maintain a successful program and measure its own compliance with its documented communications protocols. Requirement R4 intentionally does not specify a specific type of review to execute or mandate that corrective actions be taken. Entities are better equipped to design an appropriate program to meet their own operating environment and determine whether a corrective action is necessary. Because almost all entities have these types of programs in place today, this approach also provides an efficient means of establishing an assessment program by building on the programs currently in use. The primary purpose of Requirement R4 is to provide assurance that an entity is using its documented communications protocols, engaging its operators, and periodically reviewing its communications for improvement. The program required in Requirement R4 requires applicable entities to conduct retrospective review of their communications practices based on predefined documented communications protocols through an assessment design of their choosing and requires corrective actions be taken if the entity deems a corrective action necessary. As a result, Requirement R4 contains clear, unambiguous directions regarding the obligations placed on the entity.

The assessment process embodied in Requirement R4 has also been used in other NERC Reliability Standards. For example, Reliability Standard FAC-003-3 requires applicable entities to have in place "documented maintenance strategies or procedures or processes or specifications it uses to prevent the encroachment of vegetation into the MVCD of its applicable lines." Entities are required to identify "the existence of a vegetation condition that is likely to cause a Fault at any moment," and to remedy the problematic conditions. Requirement R5 states "… the applicable Transmission Owner or applicable Generator Owner ***shall take corrective action*** to

ensure continued vegetation management to prevent encroachments." This risk-based requirement obligates applicable entities to create a current "documented maintenance strategy" to prevent vegetation encroachment, identify certain constraints, assess the possibility of a potential encroachment based on the documented strategy, and take necessary corrective action to ensure continued vegetation management.

In addition, Reliability Standard PRC-005-2 requires that applicable entities "establish a Protection System Maintenance Program ("PSMP") for its Protection Systems," and then implement and follow these PSMPs to achieve ideal intended performance. Applicable entities should subsequently "demonstrate efforts to correct identified Unresolved Maintenance Issues". These standards also require applicable entities to develop a tailored baseline target for performance and retroactively measure compliance based on adherence to this predefined standard.

Additionally, Reliability Standard PRC-006-1 requires applicable entities to document certain criteria regarding the creation of islands and develop an underfrequency load-shedding ("UFLS") program to arrest declining frequency, assist recovery of frequency following underfrequency events, and provide last resort system preservation measures. The Reliability Standard requires entities to conduct various assessments to determine conformity with the UFLS program created pursuant to Requirement R3 of that Reliability Standard. While a corrective action element is not included in the Reliability Standard language itself, NERC did clarify during regulatory approval, to the satisfaction of FERC, that the language of PRC-006-1 anticipated corrective action.

Requirements R5 and R6

Requirement R5 requires entities that issue oral two-party, person-to-person Operating Instructions during an Emergency, excluding written or oral single-party to multiple-party burst

Operating Instructions, to use three-part communication or take an alternate action if the receiver does not respond or if the receiver did not understand the Operating Instruction. The language of Requirement R5 specifically excludes written or oral single-party to multiple-party burst Operating Instructions to make clear that three-part communication is not required when issuing Operating Instructions in this manner. Requirement R5 applies to each Balancing Authority, Reliability Coordinator, and Transmission Operator since these are the entities that would be in a position to issue oral two-party, person-to-person Operating Instructions during an Emergency.

Requirement R6 requires entities that receive an oral two-party, person-to-person Operating Instruction during an Emergency, excluding written or oral single-party to multiple-party burst Operating Instructions, to repeat (not necessarily verbatim) the Operating Instruction and receive confirmation from the issuer that the response was correct, or request that the issuer reissue the Operating Instruction. Requirement R6 includes the same clarifying language as Requirement R5 for the exclusion of single-party to multiple-party burst Operating Instructions. Requirement R6 applies to each Balancing Authority, Distribution Provider, Generator Operator, and Transmission Operator since these are the entities that would be in a position to receive oral two-party, person-to-person Operating Instructions during an Emergency.

The use of three-part communication when issuing and receiving Operating Instructions is always important because a miscommunication could create an Emergency. However, the use of three-part communication is critically important if an Emergency condition already exists, as further action or inaction could increase the harmful effects to the Bulk Electric System. Clear communication is essential to providing swift and coordinated response to events that are directly impacting the reliability of the Bulk Electric System.

Requirement R7

Requirement R7 requires that when a Balancing Authority, Reliability Coordinator, or Transmission Operator issues a written or oral *single-party to multiple-party burst Operating Instruction* during an Emergency, it must confirm or verify that at least one receiver of the Operating Instruction received the Operating Instruction. Because written or oral single-party to multiple-party burst Operating Instruction during an Emergency are excluded from Requirements R5 and R6, this separate Requirement is necessary to specify the performance an entity must meet to demonstrate clear communication for the use of written or oral single-party to multiple-party burst Operating Instructions during an Emergency. This prevents a gap in the means used to issue an Operating Instruction during an Emergency. This requirement is necessary because without confirmation from at least one receiver, the issuer has no way of confirming if the Operating Instruction was transmitted and received by any of the recipients. Therefore, the issuer cannot know whether to resend the Operating Instruction, wait for the recipient to take an action, or take an alternate action because the recipient cannot perform the action. As a best practice, an entity can opt to confirm receipt from more than one recipient, which is why the requirement states "at least one."

4. Improvements Reflected in COM-002-4

Proposed COM-002-4 includes a number of improvements over the currently effective Reliability Standard COM-002-2. These include: (i) removing the ambiguity surrounding the meaning of "directive" in COM-002-2; (ii) specifying specific minimum protocols that must be included and used by all applicable entities; (iii) mandating initial training for operating personnel; and (iv) adding a process for entities to assess adherence to the documented communication protocols and take corrective action.

First, proposed COM-002-4 replaces the term "directive" in COM-002-2 with a new defined term "Operating Instruction." Use of the defined term clarifies the types of commands covered by the proposed Reliability Standard, which now includes all commends "by operating personnel responsible for the Real-time operation of the interconnected Bulk Electric System to change or preserve the state, status, output, or input of an Element of the Bulk Electric System or Facility of the Bulk Electric System." It was not clear whether the term "directive" referred to either non-emergency and emergency directives, or just emergency directives. This ambiguity was the subject of the interpretation request to COM-002-2 adopted by the Board of Trustees in 2012.[37]

Second, proposed COM-002-4 adds additional mandatory communications protocols in Requirement R1 beyond the use of three-part communication covered by COM-002-2 and the use of English language found in COM-001-1.1, Requirement R4. The proposed Reliability Standard adds protocols for: the issuance of a written or oral single-party to multiple-party burst Operating Instruction; specification of the instances that require time identification when issuing an oral or written Operating Instruction and the format for that time identification; and specification of the nomenclature for Transmission interface Elements and Transmission interface Facilities when issuing an oral or written Operating Instruction. Proposed COM-002-4

[37] On October 1, 2009, a clarification was requested by the ISO-RTO Council of Requirement R2 of COM-002-2, specifically asking whether "directives" are limited to actions requested during actual and anticipated emergency operating conditions, or whether routine operating instructions are also considered "directives." The interpretation of Reliability Standard COM-002-2, approved by the NERC Board of Trustees on February 9, 2012, clarifies that COM-002-2 R2 does not specify the conditions under which a directive is issued, nor does it define directive. It only provides that the requirements be followed when a directive is issued to address a real-time emergency. Routine operating instructions during normal operations would not require the communications protocols for repeat backs as specified in R2. The NERC Board of Trustees rescinded approval of the interpretation in conjunction with its adoption and successful implementation of proposed COM-002-4 since the proposed Reliability Standard no longer uses the lower case term "directive." *See* Agenda Item 8c of the May 7, 2014 Board of Trustees Meeting, *available at* http://www.nerc.com/gov/bot/Agenda%20highlights%20and%20Mintues%202013/board_agenda_package_May_2014.pdf.

also includes specific communications protocols for the entity receiving an Operating Instruction, which is not present in COM-002-2. COM-002-2, by contrast, places the responsibility for ensuring proper three-part communication on the issuing entity only.

Third, for the first time, the COM-002 Reliability Standard will include requirements to provide initial training to operating personnel who issue and receive Operating Instructions. While many entities reported during the Standards Development Process that they already conduct training of their operating personnel, the inclusion of these requirements codifies the expectation that all operating personnel be trained on the documented communications protocols prior to being placed in a position to issue or receive an Operating Instruction. As FERC staff noted in its Preliminary Assessment and as reflected in the Blackout Report, lack of situational awareness can result from, among other things, inadequate operator training.[38]

Finally, the proposed COM-002-4 Reliability Standard adds a requirement for entities to assess adherence to the documented communication protocols and take corrective action. This aspect of the proposed Reliability Standard codifies good operating practice to review operator communications and provide feedback to the operating personnel. The requirement will also require entities to assess the effectiveness of their documented communications protocols and determine if additional protocols should be specified based on the observed use of the protocols in its operating environment. Such a requirement is not present in the prior version of the COM-002 Reliability Standard.

5. Proposed COM-002-4 Satisfies FERC's Directives

In Order Nos. 693, FERC issued directives to NERC to modify certain aspects of COM-002-2. Exhibit J of this filing provides a list of the directives and an explanation of the standard

[38] *See* Preliminary Assessment at 43 (citing Blackout Report at 161).

drafting team's consideration of each directive. In short, FERC directed NERC to include Distribution Providers as an applicable entity in the Reliability Standard. FERC stated, "during both normal and emergency operations, it is essential that the transmission operator, balancing authority and reliability coordinator have communications with distribution providers."

Second, FERC directed NERC to include a requirement for the Reliability Coordinator to assess and approve actions that have impacts beyond the area views of transmission operators or balancing authorities, including how to determine whether an action needs to be assessed by the reliability coordinator. This directive was addressed outside of the revisions to COM-002-2. It was addressed by modifications to IRO-005 and has been reassigned to Project 2014-03.

Third, FERC directed NERC to either modify the COM-002-2 Reliability Standard to require "tightened communications protocols, especially for communications during alerts and emergencies" or develop a new Reliability Standard to meet Blackout Report Recommendation No. 26. The following is a discussion of the outstanding directives addressed by proposed COM-002-4:

Addition of Distribution Providers (Order No. 693, P 512 and 540 (Part 1)): As noted above in the discussion of Requirements R3 and R6 and the Applicability section, Distribution Providers have been added to the coverage of proposed COM-002-4. Coverage within the requirements has been limited to their position as "receivers" of Operating Instructions.

Tightened Communication Protocols (Order No. 693, P 531, 534, 535, 540 (Part 3)): Proposed COM-002-4 satisfies FERC's directive regarding establishing "tightened communication protocols" through the various improvements listed in the section above. Proposed COM-002-4 improves communications protocols for the issuance of Operating Instructions in order to reduce the possibility of miscommunication that could lead to action or

inaction harmful to the reliability of the Bulk Electric System. The proposed Reliability Standard adds clarity to the scope of covered commands with the use of the new defined term "Operating Instruction. Proposed COM-002-4 also includes additional mandatory protocols that establish communication uniformity as much as practical on a continent-wide basis, while still maintaining flexibility for entities to employ additional protocols based on its own operating environment. The proposed Reliability Standard also "tightens communications protocols" by employing clear, zero-tolerance approaches for miscommunications of Operating Instructions issued during Emergencies and by mandating an assessment process aimed at reducing the number of repeat misuses of communication protocols by operating personnel.

C. Enforceability of Proposed Reliability Standards

The proposed Reliability Standards, COM-001-2 and COM-002-4 include Measures that support each requirement to help ensure that the requirements will be enforced in a clear, consistent, non-preferential manner and without prejudice to any party. The proposed Reliability Standards also include VRFs and VSLs for each requirement. The VRFs and VSLs for the proposed Reliability Standards comport with NERC and FERC guidelines related to their assignment. A detailed analysis of the assignment of VRFs, the VSLs for proposed COM-001-2 and COM-002-4 are included as Exhibit K and Exhibit L.

VI. CONCLUSION

For the reasons set forth above, NERC respectfully requests approval of:

- the proposed Reliability Standards and other associated elements included in Exhibits A and B;
- the new definitions, as noted herein;
- the VRFs and VSLs (Exhibits A, B, K, and L);
- the Implementation Plans included in Exhibits C and D; and

- the retirement of the currently effective Reliability Standards COM-001-1.1 and COM-002-2, as proposed in the Implementation Plans.

Respectfully submitted,

/s/ William H. Edwards

Charles A. Berardesco
Senior Vice President and General Counsel
Holly A. Hawkins
Associate General Counsel
William H. Edwards
Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
(202) 644-8099 – facsimile
charlie.berardesco@nerc.net
holly.hawkins@nerc.net
william.edwards@nerc.net

Counsel for the North American Electric Reliability Corporation

Date: May 29, 2014

Exhibits A—E and H – Q

(Available on the NERC Website at

http://www.nerc.com/FilingsOrders/ca/Canadian%20Filings%20and%20Orders%20DL/Attachments_COM_filing.pdf)

Exhibit F

Reliability Standards Criteria

The discussion below explains how the proposed Reliability Standard has met or exceeded the Reliability Standards criteria:

1. **Proposed Reliability Standards must be designed to achieve a specified reliability goal and must contain a technically sound means to achieve that goal.**

The proposed standard achieves the specific reliability goal of establishing requirements for Interpersonal Communication and Alternative Interpersonal Communication capabilities necessary to maintain reliability. First, proposed COM-001-2 eliminates ambiguous terms used in COM-001-1 that do not adequately specify the desired actions that Reliability Coordinators, Balancing Authorities, and Transmission Operators are expected to take with respect to each's telecommunication facilities. The proposed Reliability Standard includes two new defined terms, "Interpersonal Communication" and "Alternative Interpersonal Communication," which collectively provide a comprehensive approach to establishing communications capabilities necessary to maintain reliability. The defined terms used in the requirements of proposed COM-001-2 are:

> **Interpersonal Communication** – Any medium that allows two or more individuals to interact, consult, or exchange information.
>
> **Alternative Interpersonal Communication** – Any Interpersonal Communication that is able to serve as a substitute for, and does not utilize the same infrastructure (medium) as, Interpersonal Communication used for day-to-day operation.

These definitions provide clarity that an entity's communications capabilities must be redundant and that each of the capabilities must not utilize the same medium. The new definitions, therefore, improve upon the language used in the current COM-001-1.1 Reliability

Standard, which states "[e]ach Reliability Coordinator, Transmission Operator and Balancing Authority shall provide *adequate and reliable* telecommunications facilities for the exchange of Interconnection and operating information." COM-001-1.1, Requirement R1, Part R1.4 states that "[w]here applicable, these facilities shall be redundant and diversely routed." Use of the defined terms eliminates the need to use the ambiguous phrases "adequate and reliable" and "redundant and diversely routed, which were identified in the Preliminary Assessment as potentially creating ambiguity in the Reliability Standard.

Second, proposed COM-001-2 clearly identifies the need to be capable of both Interpersonal Communication and Alternative Interpersonal Communication. Requirements R1-R6 address the Interpersonal Communication capability and Alternative Interpersonal Communication capability of the Reliability Coordinator, Transmission Operator, and Balancing Authority.

Third, the use of word "capability" in the proposed Reliability Standard ensures the standard is technologically agnostic, allowing for future changes in technology and advances in communication to be employed without requiring a change to the Reliability Standard. Lastly, the proposed Reliability Standard expands the applicability of the Reliability Standard to cover Distribution Providers and Generator Operators. These functional entities are now required to have an Interpersonal Communication capability with the listed entities in Requirements R7 and R8, respectively.

2. Proposed Reliability Standards must be applicable only to users, owners and operators of the bulk power system, and must be clear and unambiguous as to what is required and who is required to comply.

The proposed Reliability Standard applies to Transmission Operators, Balancing Authorities, Reliability Coordinators, Distribution Providers, and Generator Operators. The

proposed Reliability Standard is clear and unambiguous as to what is required and who is required to comply. As noted above, the Requirements use two newly defined terms to clearly define the required capability needed to support the Requirements. The Requirements also clearly provide the communication capability necessary for each applicable entity.

3. A proposed Reliability Standard must include clear and understandable consequences and a range of penalties (monetary and/or non-monetary) for a violation.

The Violation Risk Factors ("VRF") and Violation Severity Levels ("VSL") for the proposed Reliability Standard comport with NERC and FERC guidelines related to their assignment. The assignment of the severity level for each VSL is consistent with the corresponding Requirement and will ensure uniformity and consistency in the determination of penalties. The VSLs do not use any ambiguous terminology, and support uniformity and consistency in the determination of similar penalties for similar violations. For these reasons, the proposed Reliability Standard includes clear and understandable consequences.

4. A proposed Reliability Standard must identify clear and objective criterion or measure for compliance, so that it can be enforced in a consistent and non-preferential manner.

The proposed Reliability Standard contains Measures that support the Requirements by clearly identifying what is required and how the requirements will be measured for compliance. The Measures, contained in Section C of the proposed COM-001-2 Reliability Standard, are as follows:

M1. Each Reliability Coordinator shall have and provide upon request evidence that it has Interpersonal Communication capability with all Transmission Operators and Balancing Authorities within its Reliability Coordinator Area and with each adjacent Reliability Coordinator within the same Interconnection, which could include, but is not limited to:

- physical assets, or

- dated evidence, such as, equipment specifications and installation documentation, test records, operator logs, voice recordings, transcripts of voice recordings, or electronic communications. (R1.)

M2. Each Reliability Coordinator shall have and provide upon request evidence that it designated an Alternative Interpersonal Communication capability with all Transmission Operators and Balancing Authorities within its Reliability Coordinator Area and with each adjacent Reliability Coordinator within the same Interconnection, which could include, but is not limited to:

- physical assets, or
- dated evidence, such as, equipment specifications and installation documentation, test records, operator logs, voice recordings, transcripts of voice recordings, or electronic communications. (R2.)

M3. Each Transmission Operator shall have and provide upon request evidence that it has Interpersonal Communication capability with its Reliability Coordinator, each Balancing Authority, Distribution Provider, and Generator Operator within its Transmission Operator Area, and each adjacent Transmission Operator asynchronously or synchronously connected, which could include, but is not limited to:

- physical assets, or
- dated evidence, such as, equipment specifications and installation documentation, test records, operator logs, voice recordings, transcripts of voice recordings, or electronic communication. (R3.)

M4. Each Transmission Operator shall have and provide upon request evidence that it designated an Alternative Interpersonal Communication capability with its Reliability Coordinator, each Balancing Authority within its Transmission Operator Area, and each adjacent Transmission Operator asynchronously and synchronously connected, which could include, but is not limited to:

- physical assets, or
- dated evidence, such as, equipment specifications and installation documentation, test records, operator logs, voice recordings, transcripts of voice recordings, or electronic communications. (R4.)

M5. Each Balancing Authority shall have and provide upon request evidence that it has Interpersonal Communication capability with its Reliability Coordinator, each Transmission Operator and Generator Operator that operates Facilities within its Balancing Authority Area, each Distribution Provider within its Balancing Authority Area, and each adjacent Balancing Authority, which could include, but is not limited to:

- physical assets, or
- dated evidence, such as, equipment specifications and installation documentation, test records, operator logs, voice recordings, transcripts of voice recordings, or electronic communications. (R5.)

M6. Each Balancing Authority shall have and provide upon request evidence that it

designated an Alternative Interpersonal Communication capability with its Reliability Coordinator, each Transmission Operator that operates Facilities within its Balancing Authority Area, and each adjacent Balancing Authority, which could include, but is not limited to:

- physical assets, or
- dated evidence, such as, equipment specifications and installation documentation, test records, operator logs, voice recordings, transcripts of voice recordings, or electronic communications. (R6.)

M7. Each Distribution Provider shall have and provide upon request evidence that it has Interpersonal Communication capability with its Transmission Operator and its Balancing Authority, which could include, but is not limited to:

- physical assets, or
- dated evidence, such as, equipment specifications and installation documentation, test records, operator logs, voice recordings, transcripts of voice recordings, or electronic communications. (R7.)

M8. Each Generator Operator shall have and provide upon request evidence that it has Interpersonal Communication capability with its Balancing Authority and its Transmission Operator, which could include, but is not limited to:

- physical assets, or
- dated evidence, such as, equipment specifications and installation documentation, test records, operator logs, voice recordings, transcripts of voice recordings, or electronic communications. (R8.)

M9. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall have and provide upon request evidence that it tested, at least once each calendar month, its Alternative Interpersonal Communication capability designated in Requirements R2, R4, or R6. If the test was unsuccessful, the entity shall have and provide upon request evidence that it initiated action to repair or designated a replacement Alternative Interpersonal Communication capability within 2 hours. Evidence could include, but is not limited to: dated and time-stamped test records, operator logs, voice recordings, transcripts of voice recordings, or electronic communications. (R9.)

M10. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall have and provide upon request evidence that it notified entities as identified in Requirements R1, R3, and R5, respectively within 60 minutes of the detection of a failure of its Interpersonal Communication capability that lasted 30 minutes or longer. Evidence could include, but is not limited to: dated and time-stamped test records, operator logs, voice recordings, transcripts of voice recordings, or electronic communications. (R10.)

M11. Each Distribution Provider and Generator Operator that detected a failure of its Interpersonal Communication capability shall have and provide upon request evidence that it consulted with each entity affected by the failure, as identified in Requirement R7 for a Distribution Provider or Requirement R8 for a Generator Operator, to determine mutually agreeable action to restore the Interpersonal Communication capability. Evidence could include,

but is not limited to: dated operator logs, voice recordings, transcripts of voice recordings, or electronic communications. (R11.)

5. **Proposed Reliability Standards should achieve a reliability goal effectively and efficiently — but do not necessarily have to reflect "best practices" without regard to implementation cost or historical regional infrastructure design.**

The proposed Reliability Standard achieves the reliability goal effectively and efficiently. The proposed Reliability Standard establishes communications capabilities and redundant communications capabilities necessary to maintain reliability. For certain applicable entities, i.e., Distribution Providers and Generator Operators, a redundant capability has not been mandated, but a Requirement to determine a mutually agreeable action for the restoration of its Interpersonal Communication capability has been included for when the applicable entity detects a failure of its Interpersonal Communication capability. This construct ensures that the communications capabilities necessary to maintain reliability are reflected in the proposed Reliability Standard while striking an appropriate balance on which applicable entities must have redundant capabilities as part of the mandatory Reliability Standard.

6. **Proposed Reliability Standards cannot be "lowest common denominator," *i.e.*, cannot reflect a compromise that does not adequately protect Bulk-Power System reliability. Proposed Reliability Standards can consider costs to implement for smaller entities, but not at consequences of less than excellence in operating system reliability.**

The proposed Reliability Standard does not reflect a "lowest common denominator" approach. On the contrary, the Reliability Standard establishes requirements for mandatory redundancies in communications capabilities necessary to maintain reliability and the testing of those communications capabilities. The proposed Reliability Standard does not represent a compromise that does not adequately protect Bulk-Power System reliability.

7. **Proposed Reliability Standards must be designed to apply throughout North America to the maximum extent achievable with a single Reliability Standard while**

not favoring one geographic area or regional model. It should take into account regional variations in the organization and corporate structures of transmission owners and operators, variations in generation fuel type and ownership patterns, and regional variations in market design if these affect the proposed Reliability Standard.

The proposed Reliability Standard applies throughout North America and does not favor one geographic area or regional model.

8. Proposed Reliability Standards should cause no undue negative effect on competition or restriction of the grid beyond any restriction necessary for reliability.

Proposed Reliability Standard COM-001-2 has no undue negative effect on competition. Since the proposed Reliability Standard only concerns communications capabilities, it also does not unreasonably restrict transmission or generation operation on the Bulk-Power System.

9. The implementation time for the proposed Reliability Standard is reasonable.

The proposed effective date for the Reliability Standard appropriately balances the urgency to implement the standard against the time needed by those who must comply to develop necessary procedures and capabilities in support of the proposed Reliability Standard. To allow entities adequate and reasonable time to comply with the proposed Reliability Standard, the effective date is first day of the second calendar quarter beyond the date that the proposed Reliability Standard is approved.

10. The Reliability Standard was developed in an open and fair manner and in accordance with the Reliability Standard development process.

The proposed Reliability Standard was developed in accordance with NERC's ANSI-accredited processes for developing and approving Reliability Standards. Exhibit M includes a summary of the Reliability Standard development proceedings, and details the processes followed to develop the Reliability Standard. These processes included, among other things,

multiple comment periods, pre-ballot review periods, and balloting periods. Additionally, all meetings of the standard drafting team were properly noticed and open to the public.

11. NERC must explain any balancing of vital public interests in the development of proposed Reliability Standards.

NERC has identified no competing public interests regarding the request for approval of the proposed Reliability Standard. No comments were received that indicated the proposed Reliability Standards conflict with other vital public interests.

12. Proposed Reliability Standards must consider any other appropriate factors.

No other factors relevant to whether the proposed Reliability Standard is just and reasonable were identified.

Exhibit G

Reliability Standards Criteria

The discussion below explains how the proposed Reliability Standard has met or exceeded the Reliability Standards criteria:

1. **Proposed Reliability Standards must be designed to achieve a specified reliability goal and must contain a technically sound means to achieve that goal.**

Proposed Reliability Standard COM-002-4 achieves the specific reliability goal of improving communications for the issuance of Operating Instructions. Proposed COM-002-4 accomplishes this purpose by requiring the use of predefined communications protocols to reduce the possibility of a miscommunication that could lead to action or inaction harmful to the reliability of the Bulk Electric System. The proposed Reliability Standard combines proposed Reliability Standard COM-002-3 and the former draft COM-003-1 into a single standard that addresses communications protocols for operating personnel in Emergency and non-emergency conditions.

In proposed COM-002-4, the same protocols are required to be used in connection with the issuance of Operating Instructions for *all* operating conditions – *i.e.*, non-emergency and Emergency communications. An entity should expect its operating personnel that issue and receive Operating Instructions to use the entity's documented communication protocols for the issuance and receipt of all Operating Instructions. An entity reinforces its use of the documented communication protocols through training, assessing adherence by its operating personnel to the documented communication protocols, and providing feedback to those operating personnel on their use of the protocols. During Emergencies, operating personnel must use the documented communication protocols for three-part communications without exception, since clear communication is essential to providing swift and coordinated response to events that are directly impacting the reliability of the Bulk Electric System. In addition to Balancing

Authorities, Reliability Coordinators, and Transmission Operators, proposed COM-002-4 applies to Distribution Providers and Generator Operators. The standard drafting team added these entities in the Applicability section because they can be and in many cases are the recipients of Operating Instructions.

2. **Proposed Reliability Standards must be applicable only to users, owners and operators of the bulk power system, and must be clear and unambiguous as to what is required and who is required to comply.**

The proposed Reliability Standard applies to Balancing Authorities, Reliability Coordinators, Transmission Operators, Distribution Providers, and Generator Operators. The proposed Reliability Standard is clear and unambiguous as to what is required and who is required to comply. The proposed Reliability Standard proposes a clear set of required protocols (Requirement R1). It also mandates initial training on the protocols (Requirements R2 and R3). As noted above, entities are further required to assess their protocols for effectiveness and assess their operating personnel's adherence to the documented communication protocols (Requirement R4).

The language of Requirement R4 clearly and explicitly delineates the obligations and expectations entities must meet. Requirement R4 requires that each entity maintain a successful program and measure its own adherence to its documented communications protocols. Requirement R4 intentionally does not specify a specific type of review to execute or mandate that corrective actions be taken. Entities are better equipped to design an appropriate program to meet their own operating environment and determine whether a corrective action is necessary. Because almost all entities have these types of programs in place today, this approach also provides an efficient means of establishing an assessment program by building on the programs currently in use. The primary purpose of Requirement R4 is to provide assurance that an entity

is using its documented communications protocols, engaging its operators, and periodically reviewing its communications for improvement. The program required in Requirement R4 requires applicable entities to conduct retrospective review of their communications practices based on predefined documented communications protocols through an assessment design of their choosing and requires corrective actions be taken if the entity deems a corrective action necessary.

3. **A proposed Reliability Standard must include clear and understandable consequences and a range of penalties (monetary and/or non-monetary) for a violation.**

The Violation Risk Factor ("VRF") and Violation Severity Level ("VSL") for the proposed Reliability Standard comport with NERC and FERC guidelines related to their assignment. The assignment of the severity level for the VSLs is consistent with the corresponding Requirement and will ensure uniformity and consistency in the determination of penalties. The VSLs do not use any ambiguous terminology, and supports uniformity and consistency in the determination of similar penalties for similar violations. For these reasons, the proposed Reliability Standard includes clear and understandable consequences.

4. **A proposed Reliability Standard must identify clear and objective criterion or measure for compliance, so that it can be enforced in a consistent and non-preferential manner.**

The proposed Reliability Standard contains Measures that support the Requirements by clearly identifying what is required and how the requirements will be measured for compliance. The Measures, contained in Section C of the proposed COM-002-4 Reliability Standard, are as follows:

> **M1.** Each Balancing Authority, Reliability Coordinator, and Transmission Operator shall provide its documented communications protocols developed for Requirement R1.

M2. Each Balancing Authority, Reliability Coordinator, and Transmission Operator shall provide its initial training records related to its documented communications protocols developed for Requirement R1 such as attendance logs, agendas, learning objectives, or course materials in fulfillment of Requirement R2.

M3. Each Distribution Provider and Generator Operator shall provide its initial training records for its operating personnel such as attendance logs, agendas, learning objectives, or course materials in fulfillment of Requirement R3.

M4. Each Balancing Authority, Reliability Coordinator, and Transmission Operator shall provide evidence of its assessments, including spreadsheets, logs or other evidence of feedback, findings of effectiveness and any changes made to its documented communications protocols developed for Requirement R1 in fulfillment of Requirement R4. The entity shall provide, as part of its assessment, evidence of any corrective actions taken where an operating personnel's non-adherence to the protocols developed in Requirement R1 is the sole or partial cause of an Emergency and for all other instances where the entity determined that it was appropriate to take a corrective action to address deviations from the documented protocols developed in Requirement R1.

M5. Each Reliability Coordinator, Transmission Operator, and Balancing Authority that issued an oral two-party, person-to-person Operating Instruction during an Emergency, excluding oral single-party to multiple-party burst Operating Instructions, shall have evidence that the issuer either: 1) confirmed that the response from the recipient of the Operating Instruction was correct; 2) reissued the Operating Instruction if the repeated information was incorrect or if requested by the receiver; or 3) took an alternative action if a response was not received or if the Operating Instruction was not understood by the receiver. Such evidence could include, but is not limited to, dated and time-stamped voice recordings, or dated and time-stamped transcripts of voice recordings, or dated operator logs in fulfillment of Requirement R5.

M6. Each Balancing Authority, Distribution Provider, Generator Operator, and Transmission Operator that was the recipient of an oral two-party, person-to-person Operating Instruction during an Emergency, excluding oral single-party to multiple-party burst Operating Instructions, shall have evidence to show that the recipient either repeated, not necessarily verbatim, the Operating Instruction and received confirmation from the issuer that the response was correct, or requested that the issuer reissue the Operating Instruction

in fulfillment of Requirement R6. Such evidence may include, but is not limited to, dated and time-stamped voice recordings (if the entity has such recordings), dated operator logs, an attestation from the issuer of the Operating Instruction, memos or transcripts.

M7. Each Balancing Authority, Reliability Coordinator and Transmission Operator that issued a written or oral single or multiple-party burst Operating Instruction during an Emergency shall provide evidence that the Operating Instruction was received by at least one receiver. Such evidence may include, but is not limited to, dated and time-stamped voice recordings (if the entity has such recordings), dated operator logs, electronic records, memos or transcripts.

5. Proposed Reliability Standards should achieve a reliability goal effectively and efficiently — but do not necessarily have to reflect "best practices" without regard to implementation cost or historical regional infrastructure design.

The proposed Reliability Standard achieves the reliability goal effectively and efficiently. The proposed Reliability Standard expands on the mandated documented protocols to be used through Requirement R1, but does not provide an exhaustive list of all possible protocols that could be employed by an entity as part of its overall documented communications protocols. This achieves the reliability goal of tightening communications protocols while allowing entities to add additional protocols, as necessary and appropriate for the operating environment. NERC has also developed a guideline of current industry practices on system operator verbal communications (Exhibit Q) to assist entities in developing "best practices" to support their documented communications protocols. Further, the requirements for training are tailored to only *initial* training since entities currently conduct ongoing training pursuant to the PER-005 Reliability Standard. In addition, Requirement R4 includes flexibility for entities to design their assessment process and determine corrective actions necessary to address deviations from the protocols in order to leverage the existing processes each entity utilizes today to accomplish the same tasks. In aggregate, COM-002-4 provides an efficient and effective means to achieve the reliability goal of improving communications for the issuance of Operating Instructions.

6. **Proposed Reliability Standards cannot be "lowest common denominator," *i.e.*, cannot reflect a compromise that does not adequately protect Bulk-Power System reliability. Proposed Reliability Standards can consider costs to implement for smaller entities, but not at consequences of less than excellence in operating system reliability.**

The proposed Reliability Standard does not reflect a "lowest common denominator" approach. This proposed Reliability Standard is the result of multiple industry ballots and revisions that reflect an active comment and response process between industry and the standard drafting team. NERC held a technical conference and did considerable amounts of outreach to regulatory staff, industry and NERC's technical committees in order to arrive at the final language in the proposed Reliability Standard. The standard drafting team also received input from the NERC Board of Trustees, NERC's Reliability Issues Steering Committee ("RISC"), the Independent Experts Review Panel, and NERC management during the standard development process. The result of these efforts was a stronger final proposed Reliability Standard that protects the Reliability of the Bulk-Power System, achieved industry approval, and provides means of improving the effectiveness of communications practices.

7. **Proposed Reliability Standards must be designed to apply throughout North America to the maximum extent achievable with a single Reliability Standard while not favoring one geographic area or regional model. It should take into account regional variations in the organization and corporate structures of transmission owners and operators, variations in generation fuel type and ownership patterns, and regional variations in market design if these affect the proposed Reliability Standard.**

The proposed Reliability Standard applies throughout North America and does not favor one geographic area or regional model.

8. Proposed Reliability Standards should cause no undue negative effect on competition or restriction of the grid beyond any restriction necessary for reliability.

Proposed Reliability Standard COM-002-4 has no undue negative effect on competition. Since the proposed Reliability Standard only concerns the use of documented protocols for communication, it also does not unreasonably restrict transmission or generation operation on the Bulk-Power System.

9. The implementation time for the proposed Reliability Standard is reasonable.

The proposed effective date for the Reliability Standard appropriately balance the urgency to implement the standard against the time needed by those who must comply to develop necessary procedures and protocols in support of the proposed Reliability Standard. To allow covered Entities adequate and reasonable time to comply with the proposed Reliability Standard, the effective date is twelve (12) months following the date that the standard is approved.

10. The Reliability Standard was developed in an open and fair manner and in accordance with the Reliability Standard development process.

The proposed Reliability Standard was developed in accordance with NERC's ANSI-accredited processes for developing and approving Reliability Standards. Exhibit N includes a summary of the Reliability Standard development proceedings, and details the processes followed to develop the Reliability Standard. These processes included, among other things, multiple comment periods, pre-ballot review periods, and balloting periods. Additionally, all meetings of the standard drafting team were properly noticed and open to the public.

11. NERC must explain any balancing of vital public interests in the development of proposed Reliability Standards.

NERC has identified no competing public interests regarding the request for approval of the proposed Reliability Standard. No comments were received that indicated the proposed Reliability Standards conflict with other vital public interests.

12. Proposed Reliability Standards must consider any other appropriate factors.

No other factors relevant to whether the proposed Reliability Standard is just and reasonable were identified.