NERC Management Response to
the Questions of the NERC Board of Trustees
on Reliability Standard COM-003-1

September 6, 2013

At the August 14-15, 2013 meeting of the Board of Trustees ("Board") of the North American Electric Reliability Corporation ("NERC"), the Board considered action on Agenda Item 7a: Operating Personnel Communication Protocols – COM-003-1 to discuss next steps for the development of a Reliability Standard[1] to respond to the Federal Energy Regulatory Commission's ("FERC") directives in Order No. 693 concerning communications. On August 15th, the Board passed a resolution to consider at its next meeting how best to act with respect to: (1) the disposition of the Board-approved interpretation of the currently effective COM-002-2 Reliability Standard; (2) the Board-approved COM-002-3 Reliability Standard; and (3) the draft COM-003-1 Reliability Standard, including whether to exercise the authority the Board has with respect to actions it can take under Section 321 of the NERC Rules of Procedure.

The Board directed NERC's Reliability Issues Steering Committee, the Independent Experts Review Panel, and NERC management to respond to certain questions related to the draft COM-003-1 Reliability Standard. The following is NERC management's responses to the questions posed in the Board resolution.

Question 1

> Proposed COM-002-3 Reliability Standard provides a standard that addresses communication protocols in an emergency. Are there circumstances that are not an emergency (as defined in COM-002-3) that can lead to reliability risks if not appropriately addressed by a standard? If so, what are these circumstances and how important is it that there be a standard to address them?

NERC Management Response

Yes, there are non-emergency circumstances that can lead to reliability risks not covered by the proposed COM-002-3 Reliability Standard that need to be addressed in a mandatory and enforceable Reliability Standard.

For example, miscommunication by operating personnel could result in switching errors during routine switching of Bulk Electric System Elements, which could jeopardize the reliable operation of the Bulk Electric System. Examples of incorrect switching include opening or closing the wrong Bulk Electric System Element. This incorrect switching could directly cause or exacerbate a serious reliability impact. Additionally, switching often involves enabling or disabling protective relaying on Bulk Electric System Elements. If this action is not performed

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

correctly, the system may be left in a vulnerable state where a future action or system condition could place the Bulk Electric System in an Emergency or result in an Adverse Reliability Impact.

Ineffective communications during non-emergency conditions could also lead to a lack of situational awareness for system operators of adjacent systems. This lack of situational awareness could result in a system operator expecting the Bulk Electric System to be in a certain configuration to take action on its system that could place the Bulk Electric System in an Emergency or could have an Adverse Reliability Impact. In fact, a lack of situational awareness was cited as a common factor in several events that contributed to the August 14, 2003 electric power blackout in large portions of the Midwest and Northeast United States and Ontario, Canada ("2003 Blackout").[2] The 2003 Blackout report noted:

> "Under *normal conditions*, parties with reliability responsibility *need to communicate important and prioritized information to each other in a timely way, to help preserve the integrity of the grid*. This is especially important in emergencies. During emergencies, operators should be relieved of duties unrelated to preserving the grid. A common factor in several of the events described above was that *information about outages occurring in one system was not provided to neighboring systems*."[3]

The report continues, in the context of Recommendation 26, that on the date of the blackout, Reliability Coordinator and control area communications regarding conditions in northeastern Ohio were, in some cases, ineffective, unprofessional, and confusing.[4] Such communications contributed to a lack of situational awareness and precluded effective actions to prevent the cascade.[5] The 2003 Blackout Report notes that consistent application of effective communications protocols, particularly during alerts and emergencies, is essential to reliability.[6] Furthermore, the need to tighten communications protocols and improve communications systems was raised by several commenters in response to the interim blackout report.

Regardless of whether the circumstance is an emergency or non-emergency, any communication that directs a system operator to change or preserve the current state of the Bulk Electric System has the potential to create a reliability risk. For this reason, it is appropriate and necessary to develop a Reliability Standard that defines the communication expectations in both emergency and non-emergency circumstances.[7] Unlike a voluntary guideline, a mandatory and enforceable standard would allow the ERO to hold entities accountable for their communications

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[2] *See* 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*, *available at* http://www.nerc.com/pa/rrm/ea/Pages/Blackout-August-2003.aspx.

[3] *Id.* at 109 (emphasis added).

[4] *Id.* at 161.

[5] *Id.*

[6] *Id.*

[7] In 2012, the Operating Committee recognized the need to provide guidance for utilities when developing a System Operator verbal communications program. This document provides a general framework to assist entities in identifying the concepts and steps to consider when developing an effective System Operator verbal communications program. However, the use of the concepts presented in the document is strictly voluntary.

and would allow the ERO to assure that entities are meeting expectations for effective communications. However, it is not necessary to develop a mandatory and enforceable Reliability Standard to define protocols for communication for all circumstances. For example, discussions between system operators of general information and of potential options or alternatives to resolve Bulk Electric System operating concerns, while important and valuable, do not necessitate coverage by a mandatory and enforceable Reliability Standard.

The following examples of actual events are provided to support the need to develop a Reliability Standard that covers circumstances that are emergencies and non-emergencies:

Desired Action	**Communication**	**Response**	**Consequence**	**Impact to Reliability**
Deploy Reserve Capacity	All call executed. No clarity in directive for action.	No response (no verbal response and no specific actions taken by all call recipients)	All call repeated six minutes later with clarity and acknowledgment.	Frequency recovery significantly delayed until corrective actions were implemented
Alleviate overloads	TOP and TO discussed options to alleviate overloads in area. No directive was actually given with a resulting delay in executing relief actions.	No specific actions taken because of confusion or lack of understanding.	Operators' communications lacked clarity and directness, which led to delays in executing the appropriate course of action. Action items were not summarized at the end of the discussions, leading to confusion over what appropriate actions were to be taken.	Emergency rating on a transmission line was exceeded for 3 hours and 5 minutes.
Shared Recognition of System Conditions	The RC attempts to ensure that identification of an abnormal condition is communicated to all system operators without delay.	Vital information was not exchanged.	The communications problems exacerbated the Event, because TOP was unable to take timely corrective action internally and in coordination with other entities.	Establishment of a shared understanding of system conditions delayed restoration.

All of these examples included communications that directed a system operator to change or preserve the current state of the Bulk Electric System. While the first example included

communications that would have been covered under COM-002-3, the last two examples included some communications that would not have been covered under COM-002-3, but would be covered under the proposed COM-003-1 standard.

Question 2

> Does the latest draft of the COM-003-1 Reliability Standard address such circumstances appropriately? Is it a "quality standard" on the basis of the criteria that are being used to assess existing and future standards by the Independent Experts Panel?

NERC Management Response

Yes, the latest draft of the COM-003-1 standard does attempt to address the circumstances described above, but it is not a "quality standard."

The current draft of COM-003-1 addresses non-emergency communications by requiring recipients to follow commands that change or preserve the state, status, output, or input of an Element of the Bulk Electric System (i.e., Operating Instructions). Therefore, in combination with COM-002-3, which covers communications during emergencies, the current draft of COM-003-1 technically addresses the communications of concern as described in the answer to Question 1.

However, the latest draft of COM-003-1 is not a "quality standard." While Requirement R1 does meet some of the quality criteria defined by the Independent Experts Panel, the Requirement is deficient because it does not include a baseline set of protocols for both emergency and non-emergency conditions. Requirements R2 and R3 are confusing and appear to only mitigate compliance risk for applicable entities. Attachment 1 provides an analysis by NERC management of the requirements included in the latest draft of the COM-003-1 standard using the criteria established by the Independent Experts Panel. In short, NERC management's analysis finds that: (1) the expectations for each function are not clear; (2) the requirements do not align with the purpose of the Reliability Standard; and (3) the Reliability Standard represents a "lowest common denominator"[8] standard.

The current draft of COM-003-1 is also not a quality standard because it:

1. **Artificially distinguishes "Operating Instructions" from "Reliability Directives" to separate the protocols from those in COM-002-3.** This separation gives the appearance that three-part communications is the only protocol necessary for Reliability Directives, while several more protocols are necessary for Operating Instructions. It is as

[8] Earlier versions of the draft COM-003-1 standard more appropriately addressed the circumstances identified in the response to Question 1 (Drafts 1-4). Prior drafts established mandatory uniform communication protocols for use in emergency and non-emergency situations. Later drafts shifted from that approach in response to industry comments focused on mitigating compliance risk. The standard drafting team, in performing their responsibility, made modifications to the standard in an attempt to achieve ballot body consensus while attempting to maintain essential communication protocols.

important, if not more important, that common communications protocols be used for emergency communications. Taking time to clearly delineate when a Reliability Directive is issued and differs from an Operating Instruction also may not be a practical exercise during a real-time situation.

2. **Does not strike the proper balance between prescriptiveness and flexibility to establish communication protocols.** COM-003-1 requires entities to self-define the conditions for which they apply the protocols in Requirement R1 of COM-003-1, including when three-part communication is necessary. This preserves avenues for potential miscommunication between parties by not creating a clear baseline of required protocols for communications.

3. **Creates a reverse incentive to issue emergency directives by connecting compliance risk in COM-003-1 to the issuance of Reliability Directives in COM-002.** This connection between compliance risk in COM-003-1 and the issuance of Reliability Directives in COM-002-3 creates an incentive to not issue a Reliability Directive to take emergency action in order to avoid compliance risk under COM-003-1. This connection should be removed to eliminate the reverse incentive.

4. **Requires approval of communications protocols by the Reliability Coordinator.** The current draft of COM-003-1 makes communications protocols subject to the approval of the Reliability Coordinator. The Reliability Coordinator should not have the responsibility or the authority to determine third-party protocols. Either the entity should have the ability to determine the necessary protocols, or the Reliability Standard should state the protocols.

Question 3

> Are there changes you would recommend to improve the current draft of the COM-003-1 Reliability Standard? Describe how the enhancements would address any gaps in bulk-power system reliability.

NERC Management Response

Yes, NERC management recommends combining the proposed COM-002-3 and COM-003-1 standards to provide a single standard to address communications protocols for emergency and non-emergency operations. A recommended draft standard is included in Attachment 2. At a minimum, the standard should:

- Require the use of established communications protocols for operations to be used in both non-emergency and emergency operations;
- Require certain baseline protocols to be used by all entities;[9]

[9] These protocols must include the use of the English language for all communications in order to retire a similar requirement that remains in COM-001 that is not reflected in the Board-approved proposed Reliability Standard COM-001-2. This issue was specifically deferred to the proposed COM-003-1 Reliability Standard.

- Require that the communications procedure be implemented;
- Require training of system operators on the communications procedure and demonstrate evidence of that training; and
- Specify a process to review communications with system operators and provide feedback on adherence to the communication protocols and identify any necessary changes to the protocols.

Also, the definition of Operating Instruction should be modified to encompass Reliability Directives. Merging the definitions eliminates the ambiguity inherent in attempting to clearly define what classifies as an Operating Instruction and what necessitates the issuance of a Reliability Directive during real-time conditions. As noted above, these two definitions are currently artificially distinguished in the current proposed COM-003-1 and COM-002-3. With this modification, COM-002-3 and COM-003-1 can be combined into a single standard to cover emergency and non-emergency communications.

Additionally, entities should be accountable for incorrect use of communication protocols in connection with a Reliability Directive, without exception. For all other Operating Instructions, compliance should be measured using standard audit practices. During an audit, an entity should present the method they used to sample communications to determine the effectiveness of their communication. They should also show how they document and determine the level of corrective actions in connection with the deficiencies that are identified, and ensure that operators are consistent in their application of protocols. This approach will provide the reasonable assurance that, while occasional non-emergency communications may not always follow every protocol, operators are proficient in the protocol use.

Question 4

> Should the proposed COM-002-3 Reliability Standard approved by the Board be rescinded and a new standard developed that addresses communications during both emergency and non-emergency conditions? If so, what key issues would it address, including an appropriate definition of "non-emergency conditions"?

NERC Management Response

Yes, the Board of Trustees should withdraw its approval of proposed Reliability Standard COM-002-3. NERC management recommends the drafting of a single standard that addresses communication during emergency and non-emergency operations. This would provide a holistic approach to creating communication protocols. The key elements of a single combined standard have already been identified in the response to Question 3. Withdrawing approval of COM-002-3 will allow the combined standard to cover issues such as protocols related to use of one-way

burst messaging systems (i.e., all-calls) that are currently not reflected in the COM-002-3 Reliability Standard.[10]

Withdrawing approval of COM-002-3 would also allow for any adjustments to COM-002-3 needed to prevent conflict between the final language of a COM-003-1 Reliability Standard and COM-002-3 should the standards remain separate. Otherwise, any further development of a COM-003-1 standard will face the same difficulty the current standard drafting team encountered working with the approved language in COM-002-3 to craft a complimentary COM-003-1.

Question 5

> Do you have any additional input regarding the development of the COM-003-1 Reliability Standard for the Board to consider in its deliberations on next steps?

NERC Management Response

Yes, additional input for the Board's consideration on the interpretation of COM-002-2 and compliance concerns related to the development of COM-003-1 is provided below.

First, NERC management recommends holding the filing of the interpretation of COM-002-2 until development of a standard covering both emergency and non-emergency conditions is completed. By submitting the interpretation, NERC places the issue of the proper scope of COM-002-2 before FERC for decision prior to the completion of further development work, which could impact the development of a single communications standard. The issue raised in the interpretation should instead be addressed through an appropriately scoped single standard proposed for FERC approval. Similarly, if the Board does not withdraw approval of COM-002-3, NERC management also recommends holding the filing of COM-002-3 so that FERC will consider COM-002-3 along with the proposed COM-003-1 standard to reduce the risk of a remand of COM-002-3.

Second, concerns over creating an operational and compliance environment that requires mining of hundreds, thousands or millions of routine/normal communications to prove compliance or make a finding of reasonable assurance of compliance was consistently cited in comments to all drafts of COM-003-1. NERC plans to address this issue in the compliance section of the standard and in development of the RSAW concurrently with development of the standard.

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[10] The standard drafting team for proposed COM-002-3 deferred the issue of protocols related to use of one-way burst messaging systems (i.e. all-calls) to the COM-003-1 Reliability Standard. All-calls can be calls initiated by one party to multiple parties where the receiving parties are in a "listen only" mode. All-calls of this nature cannot be used with a requirement for the use of three-part communication procedures specified in COM-002-3. During development of COM-003-1, NERC received a number of comments that the introduction of protocols for all-calls would create a conflict between the requirement in COM-002-3 to use three-part communication and the specific protocols for all-calls developed in COM-003-1. The result is a lack of protocols for all-calls in both standards.

Attachment 1
NERC Management Analysis of COM-003-1 Draft 6 Using Independent Experts Panel Criteria

Requirement Number	Should it be kept as it is and not consolidated with other standards/requirements?	Is it RBS format? Drafted as one of these requirement types: Performance, Risk-based (preventative), Capability, & Format for subparts	Is it technology neutral? (Yes/No)	Applicability - are the expectations for each function clear?	Does the requirement align with the Purpose?	Is it a higher solution than the lowest common denominator (considering cost)?
R1	No - should be collapsed with COM-002-3	Yes	Yes	Yes	No	No
R2	No	Yes	Yes	No	No	No
R3	No	Yes	Yes	No	No	No

Requirement Number	Measurability	Technical basis in engineering and operations	Complete? Self-contained	Clear language? Is RRO clarified?	Can it be practically implemented?	Consistent Terminology	Quality Score 0-12
R1	Yes	No	Yes	Yes	Yes	Yes	8
R2	Yes	No	Yes	No	Yes	Yes	6
R3	Yes	No	Yes	No	Yes	Yes	6

Attachment 2
Sample Requirements for a Communication Standard for Non-emergency and Emergency Operations

Operating Instruction — A command by operating personnel responsible for the real-time generation control and operation of the interconnected Bulk Electric System where the recipient of the command is expected to act 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 Reliability Directive is one form of an Operating Instruction.

While Distribution Provider is listed below, the standard would only be applicable to Distribution Providers that operate Bulk Electric System Elements (e.g. under frequency load shedding and under voltage load shedding).

R1. Each Balancing Authority, Distribution Provider, Reliability Coordinator, and Transmission Operator shall develop one or more written communications protocols. The protocols must: *[Violation Risk Factor: Low][Time Horizon: Long-term Planning]*

1.1. Require the use of the English language for all communications between and among operating personnel responsible for the real-time generation control and operation of the interconnected Bulk Electric System, unless agreed to otherwise. An alternate language may be used for internal operations.

1.2. Require the issuer of an oral two party, person-to-person Operating Instruction to wait for a response from the receiver. After the response is received, or if no response is received, require the issuer 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 or if the receiver does not issue a response.
- Reissue the Operating Communication if requested 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.

1.4. Require the issuer of an oral Operating Instruction to verbally or electronically confirm receipt from one or more receiving parties when issuing the Operating Instruction through a one-way burst messaging system used to communicate a common message to multiple parties in a short time period (e.g. an all-call system).

1.5. Require the receiver of an oral Operating Instruction to request clarification from the initiator if the communication is not understood when receiving the Operating Instruction through a one-way burst messaging system used to communicate a common message to multiple parties in a short time period (e.g. an all-call system).

1.6. Include other communications protocols as deemed necessary by the entity.

R2. Each Balancing Authority, Distribution Provider, Reliability Coordinator, and Transmission Operator shall implement the written communications protocols developed in Requirement R1. *[Violation Risk Factor: High][Time Horizon: Real-time Operations]*

R3. Each Balancing Authority, Distribution Provider, Reliability Coordinator, and Transmission Operator shall train their operating personnel responsible for the real-time generation control and operation of the interconnected Bulk Electric System on their

written communications protocols specified in Requirement R1. *[Violation Risk Factor: Low][Time Horizon: Long-term Planning]*

R4. Each Balancing Authority, Distribution Provider, Reliability Coordinator, and Transmission Operator shall implement a method to review communications with their operating personnel responsible for the real-time generation control and operation of the interconnected Bulk Electric System that provides feedback on adherence to the documented communication protocols specified in Requirement R1. *[Violation Risk Factor: Low][Time Horizon: Real-time Operations]*

R5. Each Balancing Authority, Distribution Provider, Reliability Coordinator, and Transmission Operator shall implement a method for evaluating the documented communication protocols specified in Requirement R1 that: *[Violation Risk Factor: Low][Time Horizon: Real-time Operations]*

5.1. Performs ongoing assessments of adherence to the documented communication protocols,

5.2. Evaluates the effectiveness of the documented communication protocols, and

5.3. Provides feedback to improve the effectiveness of operator communication, which may include the addition of communication protocols.