

## Standard Development Timeline

This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.

### Description of Current Draft

Completed Actions	Date
Standards Committee approved Standard Authorization Request (SAR) for posting	June 10, 2015
SAR posted for comment	June 11, 2015
45-day comment period with ballot	September 25, 2015

Anticipated Actions	Date
45-day formal comment period with additional ballot	March 2016
10-day final ballot	May 2016
NERC Board (Board) adoption	August 2016

## **New or Modified Term(s) Used in NERC Reliability Standards**

This section includes all new or modified terms used in the proposed standard that will be included in the *Glossary of Terms Used in NERC Reliability Standards* upon applicable regulatory approval. Terms used in the proposed standard that are already defined and are not being modified can be found in the *Glossary of Terms Used in NERC Reliability Standards*. The new or revised terms listed below will be presented for approval with the proposed standard. Upon Board adoption, this section will be removed.

**Term(s): None**

When this standard receives Board adoption, the rationale boxes will be moved to the Supplemental Material Section of the standard.

## A. Introduction

1. **Title:**           **Communications**
2. **Number:**       **COM-001-3**
3. **Purpose:**        To establish Interpersonal Communication capabilities necessary to maintain reliability.
4. **Applicability:**
  - 4.1. **Functional Entities:**
    - 4.1.1. Transmission Operator
    - 4.1.2. Balancing Authority
    - 4.1.3. Reliability Coordinator
    - 4.1.4. Distribution Provider
    - 4.1.5. Generator Operator
5. **Effective Date:** See Implementation Plan

## B. Requirements and Measures

- R1.** Each Reliability Coordinator shall have Interpersonal Communication capability with the following entities (unless the Reliability Coordinator detects a failure of its Interpersonal Communication capability in which case Requirement R10 shall apply):  
*[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*
  - 1.1. All Transmission Operators and Balancing Authorities within its Reliability Coordinator Area.
  - 1.2. Each adjacent Reliability Coordinator within the same Interconnection.
- 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.)

- R2.** Each Reliability Coordinator shall designate an Alternative Interpersonal Communication capability with the following entities: *[Violation Risk Factor: High]*  
*[Time Horizon: Real-time Operations]*
- 2.1.** All Transmission Operators and Balancing Authorities within its Reliability Coordinator Area.
  - 2.2.** Each adjacent Reliability Coordinator within the same Interconnection.
- 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.)
- R3.** Each Transmission Operator shall have Interpersonal Communication capability with the following entities (unless the Transmission Operator detects a failure of its Interpersonal Communication capability in which case Requirement R10 shall apply): *[Violation Risk Factor: High]* *[Time Horizon: Real-time Operations]*
- 3.1.** Its Reliability Coordinator.
  - 3.2.** Each Balancing Authority within its Transmission Operator Area.
  - 3.3.** Each Distribution Provider within its Transmission Operator Area.
  - 3.4.** Each Generator Operator within its Transmission Operator Area.
  - 3.5.** Each adjacent Transmission Operator synchronously connected.
  - 3.6.** Each adjacent Transmission Operator asynchronously connected.
- 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.)

- R4.** Each Transmission Operator shall designate an Alternative Interpersonal Communication capability with the following entities: *[Violation Risk Factor: High]*  
*[Time Horizon: Real-time Operations]*
- 4.1.** Its Reliability Coordinator.
  - 4.2.** Each Balancing Authority within its Transmission Operator Area.
  - 4.3.** Each adjacent Transmission Operator synchronously connected.
  - 4.4.** Each adjacent Transmission Operator asynchronously connected.
- 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.)
- R5.** Each Balancing Authority shall have Interpersonal Communication capability with the following entities (unless the Balancing Authority detects a failure of its Interpersonal Communication capability in which case Requirement R10 shall apply): *[Violation Risk Factor: High]* *[Time Horizon: Real-time Operations]*
- 5.1.** Its Reliability Coordinator.
  - 5.2.** Each Transmission Operator that operates Facilities within its Balancing Authority Area.
  - 5.3.** Each Distribution Provider within its Balancing Authority Area.
  - 5.4.** Each Generator Operator that operates Facilities within its Balancing Authority Area.
  - 5.5.** Each Adjacent Balancing Authority.
- 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.)
- R6.** Each Balancing Authority shall designate an Alternative Interpersonal Communication capability with the following entities: *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*
- 6.1.** Its Reliability Coordinator.
  - 6.2.** Each Transmission Operator that operates Facilities within its Balancing Authority Area.
  - 6.3.** Each Adjacent Balancing Authority.
- 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.)
- R7.** Each Distribution Provider shall have Interpersonal Communication capability with the following entities (unless the Distribution Provider detects a failure of its Interpersonal Communication capability in which case Requirement R11 shall apply): *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*
- 7.1.** Its Balancing Authority.
  - 7.2.** Its Transmission Operator.
- 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.)
- R8.** Each Generator Operator shall have Interpersonal Communication capability with the following entities (unless the Generator Operator detects a failure of its Interpersonal Communication capability in which case Requirement R11 shall apply): *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

**8.1.** Its Balancing Authority.

**8.2.** Its Transmission Operator.

**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.)

**R9.** Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall test its Alternative Interpersonal Communication capability at least once each calendar month. If the test is unsuccessful, the responsible entity shall initiate action to repair or designate a replacement Alternative Interpersonal Communication capability within 2 hours. *[Violation Risk Factor: Medium][Time Horizon: Real-time Operations, Same-day Operations]*

**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.)

**R10.** Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall notify 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 lasts 30 minutes or longer. *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*

**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.)

- R11.** Each Distribution Provider and Generator Operator that detects a failure of its Interpersonal Communication capability shall consult each entity affected by the failure, as identified in Requirement R7 for a Distribution Provider or Requirement R8 for a Generator Operator, to determine a mutually agreeable action for the restoration of its Interpersonal Communication capability. *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*
- 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.)
- R12.** Each Reliability Coordinator, Transmission Operator, Generator Operator, and Balancing Authority shall have internal Interpersonal Communication capabilities for the exchange of information necessary for the Reliable Operation of the BES. This includes communication capabilities between Control Centers within the same functional entity, or between a Control Center and field personnel. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*
- M12.** Each Reliability Coordinator, Transmission Operator, Generator Operator, and Balancing Authority shall have and provide upon request evidence that it has internal Interpersonal Communication capability, which could include, but is not limited to:
- physical assets, or
  - dated evidence, such as, equipment specifications and installation documentation, operating procedures, test records, operator logs, voice recordings, transcripts of voice recordings, or electronic communications.
- R13.** Each Distribution Provider shall have internal Interpersonal Communication capabilities for the exchange of information necessary for the Reliable Operation of the BES. This includes communication capabilities between control centers within the same functional entity, or between a control center and field personnel. *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*
- M13.** Each Distribution Provider shall have and provide upon request evidence that it has internal Interpersonal Communication capability, which could include, but is not limited to:
- physical assets, or
  - dated evidence, such as, equipment specifications and installation documentation, operating procedures, test records, operator logs, voice recordings, transcripts of voice recordings, or electronic communications.



## C. Compliance

### 1. Compliance Monitoring Process

#### 1.1. Compliance Enforcement Authority:

“Compliance Enforcement Authority” or the Regional Entity, or any entity as otherwise designated by an Applicable Governmental Authority, in their respective roles of monitoring and/or enforcing compliance with mandatory and enforceable Reliability Standards in their respective jurisdictions.

#### 1.2. Evidence Retention

The following evidence retention period(s) identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full-time period since the last audit.

The applicable entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation:

- The Reliability Coordinator for Requirements R1, R2, R9, and R10, Measures M1, M2, M9, and M10 shall retain written documentation for the most recent twelve calendar months and voice recordings for the most recent 90 calendar days.
- The Transmission Operator for Requirements R3, R4, R9, and R10, Measures M3, M4, M9, and M10 shall retain written documentation for the most recent twelve calendar months and voice recordings for the most recent 90 calendar days.
- The Balancing Authority for Requirements R5, R6, R9, and R10, Measures M5, M6, M9, and M10 shall retain written documentation for the most recent twelve calendar months and voice recordings for the most recent 90 calendar days.
- The Distribution Provider for Requirements R7 and R11, Measures M7 and M11 shall retain written documentation for the most recent twelve calendar months and voice recordings for the most recent 90 calendar days.
- The Generator Operator for Requirements R8 and R11, Measures M8 and M11 shall retain written documentation for the most recent twelve calendar months and voice recordings for the most recent 90 calendar days.
- Responsible entities under Requirement R12, Measure M12 shall retain written documentation for the most recent twelve calendar months and voice recordings for the most recent 90 calendar days.
- Responsible entities under Requirement R13, Measure M13 shall retain written documentation for the most recent twelve calendar months and voice recordings for the most recent 90 calendar days.

### **1.3. Compliance Monitoring and Enforcement Program**

As defined in the NERC Rules of Procedure, “Compliance Monitoring and Enforcement Program” refers to the identification of the processes that will be used to evaluate data or information for the purpose of assessing performance or outcomes with the associated Reliability Standard.

## Violation Severity Levels

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
<b>R1.</b>	<b>N/A</b>	<b>N/A</b>	The Reliability Coordinator failed to have Interpersonal Communication capability with one of the entities listed in Requirement R1, Parts 1.1 or 1.2, except when the Reliability Coordinator detected a failure of its Interpersonal Communication capability in accordance with Requirement R10.	The Reliability Coordinator failed to have Interpersonal Communication capability with two or more of the entities listed in Requirement R1, Parts 1.1 or 1.2, except when the Reliability Coordinator detected a failure of its Interpersonal Communication capability in accordance with Requirement R10.
<b>R2.</b>	<b>N/A</b>	<b>N/A</b>	The Reliability Coordinator failed to designate Alternative Interpersonal Communication capability with one of the entities listed in Requirement R2, Parts 2.1 or 2.2.	The Reliability Coordinator failed to designate Alternative Interpersonal Communication capability with two or more of the entities listed in Requirement R2, Parts 2.1 or 2.2.

<b>R3.</b>	<b>N/A</b>	<b>N/A</b>	The Transmission Operator failed to have Interpersonal Communication capability with one of the entities listed in Requirement R3, Parts 3.1, 3.2, 3.3, 3.4, 3.5, or 3.6, except when the Transmission Operator detected a failure of its Interpersonal Communication capability in accordance with Requirement R10.	The Transmission Operator failed to have Interpersonal Communication capability with two or more of the entities listed in Requirement R3, Parts 3.1, 3.2, 3.3, 3.4, 3.5, or 3.6, except when the Transmission Operator detected a failure of its Interpersonal Communication capability in accordance with Requirement R10.
<b>R4.</b>	<b>N/A</b>	<b>N/A</b>	The Transmission Operator failed to designate Alternative Interpersonal Communication capability with one of the entities listed in Requirement R4, Parts 4.1, 4.2, 4.3, or 4.4.	The Transmission Operator failed to designate Alternative Interpersonal Communication capability with two or more of the entities listed in Requirement R4, Parts 4.1, 4.2, 4.3, or 4.4.
<b>R5.</b>	<b>N/A</b>	<b>N/A</b>	The Balancing Authority failed to have Interpersonal Communication capability with one of the entities listed in Requirement R5, Parts 5.1, 5.2, 5.3, 5.4, or 5.5, except when the	The Balancing Authority failed to have Interpersonal Communication capability with two or more of the entities listed in Requirement R5, Parts 5.1, 5.2, 5.3, 5.4, or 5.5, except

			Balancing Authority detected a failure of its Interpersonal Communication capability in accordance with Requirement R10.	when the Balancing Authority detected a failure of its Interpersonal Communication capability in accordance with Requirement R10.
<b>R6.</b>	<b>N/A</b>	<b>N/A</b>	The Balancing Authority failed to designate Alternative Interpersonal Communication capability with one of the entities listed in Requirement R6, Parts 6.1, 6.2, or 6.3.	The Balancing Authority failed to designate Alternative Interpersonal Communication capability with two or more of the entities listed in Requirement R6, Parts 6.1, 6.2, or 6.3.
<b>R7.</b>	<b>N/A</b>	<b>N/A</b>	The Distribution Provider failed to have Interpersonal Communication capability with one of the entities listed in Requirement R7, Parts 7.1 or 7.2, except when the Distribution Provider detected a failure of its Interpersonal Communication capability in accordance with Requirement R11.	The Distribution Provider failed to have Interpersonal Communication capability with two or more of the entities listed in Requirement R7, Parts 7.1 or 7.2, except when the Distribution Provider detected a failure of its Interpersonal Communication capability in accordance with Requirement R11.
<b>R8.</b>	<b>N/A</b>	<b>N/A</b>	The Generator Operator failed to have Interpersonal	The Generator Operator failed to have Interpersonal

			Communication capability with one of the entities listed in Requirement R8, Parts 8.1 or 8.2, except when a Generator Operator detected a failure of its Interpersonal Communication capability in accordance with Requirement R11.	Communication capability with two or more of the entities listed in Requirement R8, Parts 8.1 or 8.2, except when a Generator Operator detected a failure of its Interpersonal Communication capability in accordance with Requirement R11.
<b>R9.</b>	The Reliability Coordinator, Transmission Operator, or Balancing Authority tested the Alternative Interpersonal Communication capability but failed to initiate action to repair or designate a replacement Alternative Interpersonal Communication in more than 2 hours and less than or equal to 4 hours upon an unsuccessful test.	The Reliability Coordinator, Transmission Operator, or Balancing Authority tested the Alternative Interpersonal Communication capability but failed to initiate action to repair or designate a replacement Alternative Interpersonal Communication in more than 4 hours and less than or equal to 6 hours upon an unsuccessful test.	The Reliability Coordinator, Transmission Operator, or Balancing Authority tested the Alternative Interpersonal Communication capability but failed to initiate action to repair or designate a replacement Alternative Interpersonal Communication in more than 6 hours and less than or equal to 8 hours upon an unsuccessful test.	The Reliability Coordinator, Transmission Operator, or Balancing Authority failed to test the Alternative Interpersonal Communication capability once each calendar month.  OR The Reliability Coordinator, Transmission Operator, or Balancing Authority tested the Alternative Interpersonal Communication capability but failed to initiate action to repair or designate a replacement Alternative Interpersonal Communication in more

				than 8 hours upon an unsuccessful test.
<b>R10.</b>	The Reliability Coordinator, Transmission Operator, or Balancing Authority failed to notify the entities identified in Requirements R1, R3, and R5, respectively upon the detection of a failure of its Interpersonal Communication capability in more than 60 minutes but less than or equal to 70 minutes.	The Reliability Coordinator, Transmission Operator, or Balancing Authority failed to notify the entities identified in Requirements R1, R3, and R5, respectively upon the detection of a failure of its Interpersonal Communication capability in more than 70 minutes but less than or equal to 80 minutes.	The Reliability Coordinator, Transmission Operator, or Balancing Authority failed to notify the entities identified in Requirements R1, R3, and R5, respectively upon the detection of a failure of its Interpersonal Communication capability in more than 80 minutes but less than or equal to 90 minutes.	The Reliability Coordinator, Transmission Operator, or Balancing Authority failed to notify the entities identified in Requirements R1, R3, and R5, respectively upon the detection of a failure of its Interpersonal Communication capability in more than 90 minutes.
<b>R11.</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	The Distribution Provider or Generator Operator that detected a failure of its Interpersonal Communication capability failed to consult 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 a mutually agreeable action for the restoration of the

				Interpersonal Communication capability.
<b>R12.</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	The Reliability Coordinator, Transmission Operator, Generator Operator, or Balancing Authority failed to have internal Interpersonal Communication capability for the exchange of operating information.
<b>R13.</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	The Distribution Provider failed to have internal Interpersonal Communication capability for the exchange of operating information.

**D. Regional Variances**

None.

**E. Associated Documents**

None.

**Version History**

Version	Date	Action	Change Tracking
0	April 1, 2005	Effective Date	New



0	August 8, 2005	Removed "Proposed" from Effective Date	Errata
1	November 1, 2006	Adopted by Board of Trustees	Revised
1	April 4, 2007	Regulatory Approval — Effective Date	New
1	April 6, 2007	Requirement 1, added the word "for" between "facilities" and "the exchange."	Errata
1.1	October 29, 2008	BOT adopted errata changes; updated version number to "1.1"	Errata
2	November 7, 2015	Adopted by Board of Trustees	Revised in accordance with SAR for Project 2006-06, Reliability Coordination (RC SDT). Replaced R1 with R1-R8; R2 replaced by R9; R3 included within new R1; R4 remains enforce pending Project 2007-02; R5 redundant with EOP-008-0, retiring R5 as redundant with EOP-008-0, R1; retiring R6, relates to ERO procedures; R10 & R11, new.
2	April 16, 2015	FERC Order issued approving COM-001-2	
2.1	November 13, 2015	FERC Order issued approving errata to COM-001-2.1	Errata to correct inadvertent numbering errors in the parts to Requirement R6.

### Rationale

#### **Rationale for Requirement R12:**

The focus of the requirement is on the *capabilities* that an entity must have for the purpose of exchanging information necessary for the Reliable Operation of the BES. That is, the entity must have the capability to communicate internally by, “any medium that allows two or more individuals to interact, consult, or exchange information.” The standard does not prescribe the specific type of capability (*i.e.*, hardware or software). The determination of the appropriate type of capability is left to the entity. Regardless, the entity must have the capability to exchange information *whenever* the internal Interpersonal Communications may directly impact operations of the BES. Therefore, the applicable entities must have the capability to exchange information between Control Centers of that functional entity. For example, a TOP with multiple control centers that are geographical separated must have the capability to communicate internally between or among those control centers. The communication capability may occur through any medium that supports Interpersonal Communication, such as land line telephone, cellular device, Voice Over Internet Protocol (VOIP), satellite telephone, radio, or electronic message. Also, applicable entities must have the capability to exchange information between a Control Center and field personnel. For example, a TOP system operator providing instruction to a field personnel to perform a reliability activity, such as switching Facilities.

In the course of normal control center operation, system operators within a single Control Center communicate as needed to ensure the reliability of the BES, including face-to-face communications. These internal communications are ongoing and occur throughout the day as part of day-to-day operations. However, these types of communications are not the focus of this requirement. The focus is on the capability of an entity to communicate internally where face-to-face communications are not available.

#### **Rationale for Requirement R13:**

The NERC Glossary definition for “Control Center” was not used in this requirement because Distribution Provider is not listed as an entity within the definition. The Glossary definition for “Control Center” is, “[o]ne or more facilities hosting operating personnel that monitor and control the Bulk Electric System (BES) in real-time to perform the reliability tasks, including their associated data centers, of: 1) a Reliability Coordinator, 2) a Balancing Authority, 3) a Transmission Operator for transmission Facilities at two or more locations, or 4) a Generator Operator for generation Facilities at two or more locations.” Therefore in this requirement, control center is intended to mean the Distribution Provider facilities hosting operating personnel performing the operational functions of the Distribution Provider that are necessary for the reliable operation of the BES, often referred to as a distribution control center, or distribution center. Examples of Distribution Providers exchanging information necessary for the Reliable Operation of the BES include Distribution Providers included in restoration plans, load shed plans, load reconfiguration, and voltage control plans. The Distribution Provider must have the capability to exchange information *whenever* the internal Interpersonal

## **Supplemental Material**

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Communications may directly impact operations of the BES. Therefore, the Distribution Provider must have the capability to exchange information between control centers as necessary. For example, a Distribution Provider with multiple control centers that are geographical separated, where face-to-face communications are not available, must have the capability to communicate internally between or among those control centers.