March 29, 2022

To: Market Surveillance Administrator, Market Participants and Other Interested Parties ("Stakeholders")

Re: Invitation for Stakeholder Consultation Session on the Development of the Proposed New and Amended Communication ISO Rules and Reliability Standards:

1) **Proposed amendments to Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4");**
2) **Proposed new Alberta Reliability Standard COM-001-AB-3, *Communications* ("COM-001-AB-3"); and**
3) **Proposed new Alberta Reliability Standard COM-002-AB-4, *Operating Personnel Communication Protocols* ("COM-002-AB-4"),**

collectively referred to as the ("Communication ISO Rules and Reliability Standards").

Further to the *Save the Date for Stakeholder Consultation Session on the Development of the Proposed New and Amended Communication ISO Rules and Reliability Standards*, this invitation provides additional details regarding the Stakeholder consultation session.

Along with this invitation, the AESO has posted clean and blacklines copies of draft communication ISO rules and reliability standards, comparison matrices, and related draft information documents.

Purpose

The purpose of the Stakeholder consultation session is to solicit feedback from Stakeholders on the requirements of the Communication ISO Rules and Reliability Standards, including the AESO's proposed approach to the organization of the Communication ISO Rules and Reliability Standards requirements which is described further below.

In addition, during the session, the AESO will provide an update on the related Voice Communications and Grid-Operations Wide-Area Network Development system project ("GO-WAN Project"). [1]

Background

In 2018, the AESO initiated a Stakeholder engagement on COM-001-AB1-1.1, COM-002-AB1-2a and Section 502.4. The purpose was to align with the latest NERC communication reliability standard requirements, eliminate overlap and improve clarity and organization of the voice communication, and operating personnel communication protocol requirements within these rules and standards. Background materials on this Stakeholder engagement are available on the AESO's Stakeholder Engagement webpage.

In 2020, this engagement was put on hold while the GO-WAN Project was initiated to ensure that efforts and

[1] Facility proposals related to the Voice Communications and Grid-Operations Wide-Area Network Development system project were approved by the AUC in December 2021 through AUC Decisions 27019-D01-2021 and 27027-D01-2021.

Alberta Electric System Operator
Calgary Place, 2500, 330-5th Avenue SW Calgary, AB T2P 0L4
Phone: 403-539-2450 | Fax: 403-539-2949

requirements were aligned. Following the confirmation of the GO-WAN Project scope in 2021, and in consideration of Stakeholder feedback received during the earlier Stakeholder engagement, the AESO revisited its approach to the Communication ISO Rules and Reliability Standards.

AESO's Proposed Approach to the Communication ISO Rules and Reliability Standards

The proposed approach is as follows:

- **COM-001-AB-3** is to replace COM-001-AB1-1.1 and will contain all voice communication system requirements. The majority of the COM-001-AB-3 requirements align with NERC COM-001-3, aside from differences that are needed to accommodate the legal and regulatory framework for the Alberta electricity industry. COM-001-AB-3 also contains requirements that were established by the AESO. These requirements have been deemed necessary in Alberta and are either new or have been moved from Section 502.4 and modified. For clarity, the AESO has made a distinction between the NERC and the AESO-specific requirement numbering in the proposed COM-001-AB-3. The formerly proposed Section 502.17 of the ISO rules, *Voice Communication System Requirements* has been discontinued.

- **COM-002-AB-4**, which sets out voice communication protocols, is to replace COM-002-AB1-2a. The requirements in this standard remain largely the same as previous versions consulted on, however, minor changes have been made to better align the requirements with NERC COM-002-4.

- **Proposed amended Section 502.4** is to be amended to retain the requirements related to Automated Dispatch and Messaging System. These requirements have been modified to provide further clarity on the AESO's expectation for market participants with Automated Dispatch and Messaging System.

The AESO is of the view that this approach is more logical and efficient than previous approaches considered.

Draft AESO Information Document Content

The AESO has provided a draft version of amended AESO Information Document #2012-001RS, *Communications* ("ID #2012-001RS") and draft amended AESO Information Document #2017-006R, *Automated Dispatch and Messaging System* ("ID #2017-006R") as related material for this Stakeholder consultation.

The AESO's approach is to release information documents after authoritative documents have been approved by the Alberta Utilities Commission; however, the AESO and Stakeholders have discussed information document content several times over the past 4 years. Some of this content is no longer relevant given changes to the proposed approach for and content of Communications ISO Rules and Reliability Standards.

The AESO wishes to ensure a common understanding of information document content that is still relevant and sees value in providing these draft amended information documents for Stakeholder review at this time. If there is previously discussed information document content that has not been captured and is still important to include, the AESO is interested in this feedback from Stakeholders.

In relation to ID#2017-006R, this information document provides a list of ancillary services that are dispatched through the AESO's Automated Dispatch and Messaging System. By providing the draft amended information document at this time, Stakeholders will be aware of the impact of the proposed amended Section 502.4.

Stakeholder Consultation Session Details

The Stakeholder consultation session will be a virtual session using Zoom. The AESO would like to provide Stakeholders with information for the Stakeholder consultation session as follows:

Time: 9:00 a.m. to 12:00 p.m.

Date: **May 10, 2022**

Registration Details: Registration details will be provided at least 3 weeks prior to the Stakeholder consultation session.

Agenda

Stakeholders may propose agenda items by sending an email to rules_comments@aeso.ca on or before **April 19, 2022**. The AESO will consider and accommodate these requests where possible. The agenda is subject to change upon the AESO's review of Stakeholder comments. The AESO would like to discuss the following items with Stakeholders:

1) Introductions and session overview
2) Reliability Standards and ISO Rule development timeline
3) Update on the Voice Communications and Grid-Operations Wide-Area Network Development system project
4) Proposed amended Section 502.4 and ID #2017-006R and Discussion
5) Proposed COM-001-AB-3 and ID #2012-001R and Discussion
6) Proposed COM-002-AB-4 Presentation and Discussion
7) Next Steps

The presentation, which will include the agenda, will be posted on the Stakeholder Engagement webpages on or before **May 3, 2022**.

Related Material

The following documents are posted on the AESO website:

1) Clean and blackline copies of proposed amended Section 502.4;
2) Clean and blackline copies of proposed new COM-001-AB-3;
3) Clean and blackline copies of proposed new COM-002-AB-4;
4) *Comparison Rationale Matrix* for proposed new COM-001-AB-3;
5) *Comparison Rationale Matrix* for proposed new COM-002-AB-4;
6) Proposed Amended Information Document #2017-006R, *Automated Dispatch and Messaging System Requirements* relating to proposed amended Section 502.4; and
7) Proposed Amended Information Document #2012-001RS, *Communications* relating to proposed new COM-001-AB-3.

Sincerely,

Jackie Gow

Legal Manager, ISO Rules and Alberta Reliability Standards
Legal and Regulatory Affairs
rules_comments@aeso.ca

ISO Rules
Part 500 Facilities
Division 502 Technical Requirements
Section 502.4 Automated Dispatch and Messaging System

DRAFT External Consultation Draft
March 29, 2022

Applicability

1 Section 502.4 applies to:

(a) a **pool participant** that submits **offers** or **bids** for a **pool asset**, excluding import assets and export assets, in either one or both of:

(i) the energy market; and

(ii) the **ancillary service** market, for which the **ISO** issues **dispatches** or **directives** through the **ISO**'s Automated Dispatch and Messaging System.

Requirements

2 A **pool participant** must access and operate the **ISO**'s Automated Dispatch and Messaging System application to receive **dispatches** or **directives** for each **pool asset** for which a **pool participant** submits **offers** or **bids.**

3 A **pool participant** must be available 24 hours a **day,** 7 **days** a week to respond to **dispatches** or **directives** the **ISO** issues through:

(a) the **ISO**'s Automated Dispatch and Messaging System**;** and

(b) telephone calls from the **ISO** using a direct telephone number that the **pool participant** has provided to the **ISO**.

Revision History

Effective Date	Description of Changes
yyyy-xx-xx	Removed all voice communication requirements. Modified Automated Dispatch and Messaging System applicability and regulatory requirement.
2015-03-27	Replaced "effective date" with the initial release date in sections 2(1), 2(2), and 3; and replaced the word "Effective" in the Revision History to "Date".
2014-07-02	Unbolded the reference to "outage" in Appendix 1.
2013-01-08	Appendix added containing authoritative system availability requirements specified in Table 2 of ISO OPP 003.2. Previously defined terms have been un-defined and so the words have been unbolded.
2011-06-01	Initial release.

ISO Rules
Part 500 Facilities
Division 502 Technical Requirements
Section 502.4 Automated Dispatch and Messaging System ~~and Voice Communication System Requirements~~

DRAFT External Consultation Draft
March 29, 2022

Applicability

1 Section 502.4 applies to:

~~(a) the **legal owner** of a **generating unit**;~~

~~(b) the **legal owner** of an **aggregated generating facility**;~~

~~(c) the **legal owner** of a **transmission facility**;~~

~~(d) the **legal owner** of an **electric distribution system**;~~

(a) ~~(e)~~ a **pool participant**~~;~~ that submits **offers** or **bids** for a **pool asset**, excluding import assets and export assets, in either one or both of:

~~(f) the **ISO**.~~

(i) the energy market; and

(ii) the **ancillary service** market, for which the **ISO** issues **dispatches** or **directives** through the **ISO**'s Automated Dispatch and Messaging System.

Requirements

~~**New and Existing Systems**~~

2~~**(1)** On and after June 1, 2011, a **market**~~ A pool participant ~~with any new facility which is to be directly connected to the **interconnected electric system** must comply with~~access and operate the ~~applicable minimum~~ISO's Automated Dispatch and Messaging System ~~and voice communication systems requirements of this section 502.4.~~

~~**(2)** Subject to subsection 2(3), the provisions of this section 502.4 do not apply to any Automated Dispatch and Messaging System and voice communication systems in existence as of June 1, 2011, but those systems must remain in compliance with the technical specifications and operational requirements which were in effect as of the original date of the commencement of the systems' operation, including those in Appendix 1.~~

~~**(3) The ISO may require a market participant to comply with any specific**~~application to receive **dispatches** or ~~**all of the Automated Dispatch and Messaging System and voice communication systems requirements of this section 502.4, if the ISO determines that such compliance is critical**~~**directives** for ~~**the safe and reliable operation of the interconnected electric system**~~each **pool asset** for which a **pool participant** submits **offers** or **bids**.

~~**(4)**~~3A ~~**market**~~**pool participant** ~~**in a subcategory identified in subsection 1 with a facility that has multiple control rooms** must **ensure that each control room is in compliance with the applicable**~~be available 24 hours a **day**, 7 **days** a week to respond to **dispatches** or **directives** the **ISO** issues through:

(a) the **ISO**'s Automated Dispatch and Messaging System~~;~~ and ~~voice communication systems requirements of this section 502.4.~~

~~**(5)** The **ISO** must have Automated Dispatch and Messaging System and voice communication systems in its coordination centre and other back up locations to exchange communications with the control room of any **market participant** that is required to comply with the provisions of this section 502.4.~~

~~**Successor to Prior Requirements**~~

3 Subject to subsection 2, this section 502.4 succeeds the *Operational Voice Communications Standard* in effect as of September 7, 2005, and the prior standard or any drafts of it no longer will be in force and effect as of June 1, 2011.

Systems Availability and Maintenance Requirements

4(1) All Automated Dispatch and Messaging system and voice communication systems under this section 502.4 must be continuously operational twenty four (24) hours a **day**, seven (7) **days** a week.

(2) Those systems must be maintained and serviced generally in accordance with **good electric industry practice** to ensure they are continuously operational.

Dedicated Primary Direct Access Telephone and Cell Phone Connections

5(1) If there is a requirement under this section 502.4 for one (1) or more primary direct access telephone connections to the **ISO** coordination centre from a **market participant** control room, then the connection must be dedicated for the exclusive use of the **ISO** and the **market participant**, and must not be degraded by any other communication or data transfer activities if there is any shared equipment or functionality associated with the connection.

(2) Each primary direct access telephone connection must be dedicated to the specific applicable operational function in the **ISO** coordination centre.

(3) Each primary direct access telephone number must be a primary number with automatic forwarding to another number if the primary number is busy or otherwise not available, and the use of voice mail is prohibited.

(4) Cell phone service may be used as a primary direct access telephone connection if it satisfies the requirements of subsections 4 and 5.

Mobile Satellite Telephone Service

6(1) If there is a requirement under this section 502.4 for mobile satellite network telephone service to the **ISO** from a **market participant**, then the service must be commercially available for one-to-one communications with the **ISO**.

(2) If there is a requirement for such service to be available for **dispatch** purposes, then the service must allow for multiple party communications, including those between the **ISO** and the **market participant**.

Specific Requirements

7 The more specific systems requirements are as set out in the following Table 1:

Table 1

Automated Dispatch and Messaging System and Voice Communication Systems Requirements

A. Market Participant Subcategory	B. Primary Requirements	C. Emergency and Backup Requirements
1. A **pool participant** who may receive an energy market **dispatch** or a **directive**.	1. Automated Dispatch and Messaging System; plus 2. A commercial service with a primary direct access telephone connection from the control room to the **ISO** coordination centre.	None required.
2. A **pool participant** who may receive an **ancillary service**	1. Automated Dispatch and Messaging System; plus	One of the following additional services connecting from the control room to the **ISO** coordination centre:

A. Market Participant Subcategory	B. Primary Requirements	C. Emergency and Backup Requirements
dispatch or a **directive**.	2. A commercial service with a primary direct access telephone connection from the control room to the **ISO** coordination centre, with the service having mute and conference call capabilities.	1. A mobile satellite network telephone and **dispatch** service; 2. A back up direct access telephone connection; or 3. A utility orderwire service.
3. A **legal owner** of a **generating unit** or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of less than or equal to 25kV.	1. A commercial service with a primary direct access telephone connection from the control room to the **ISO** coordination centre.	None required.
4. A **legal owner** of a **generating unit** or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of greater than 25kV where the aggregated electric energy output at the point of connection is less than 50 MW.	1. A commercial service with a primary direct access telephone connection from the control room to the **ISO** coordination centre.	A back up direct access telephone connection from the control room to the **ISO** coordination centre.
5. A **legal owner** of a **generating unit** or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of greater than 25 kV where the aggregated electric energy output at the point of connection is equal to or greater than 50 MW.	1. A commercial service with a primary direct access telephone connection from the control room to the **ISO** coordination centre, with the telephone having mute and conference call capabilities.	One of the following additional services connecting from the control room: 1. A direct access telephone connection to the control room of the **legal owner** of the **transmission facility** providing the **interconnected electric system** connection; 2. A mobile satellite telephone service to the **ISO** coordination centre; 3. A back up direct access telephone connection to the **ISO** coordination centre; or 4. A utility orderwire service to the **ISO** coordination centre.
6. A **legal owner of** a **generating unit** providing a **black start capability** service.	1. A commercial service with a primary direct access telephone connection from the control room to the **ISO** coordination centre, with the service having mute and conference call capabilities.	One of the following additional services connecting from the control room: 1. A direct access telephone connection from the control room to the operations room of the **legal owner** of the **transmission facility** providing the **interconnected electric system** connection;

A. Market Participant Subcategory	B. Primary Requirements	C. Emergency and Backup Requirements
		2. A back up direct access dedicated commercial telephone connection from the control room to the **ISO** coordination centre; or 3. A utility orderwire service from the control room to the **ISO** coordination centre.
7. A **legal owner** of a **transmission facility,** except those who operate only radial **transmission system** equipment.	1. A commercial service with primary direct access telephone connection from the control room to the **ISO** coordination centre, with the service having mute and conference call capabilities.	One of the following additional services connecting from the control room to the **ISO** coordination centre: 1. A mobile satellite network telephone service; 2. A back up direct access telephone connection; or 3. A utility orderwire service.
8. A **legal owner** of a **transmission facility** operating only radial **transmission system** equipment.	1. A commercial service with primary direct access telephone connection from the control room to the **ISO** coordination centre.	1. A back up direct access telephone connection from the control room to the **ISO** coordination centre.
9. A **legal owner** of an **electric distribution system**.	1. A commercial service with primary direct access telephone connection from the control room to the **ISO** coordination centre.	None required.
10. A **legal owner** of an **electric distribution system** who contributes **load** additions for **black start capability** process requirements.	1. A commercial service with primary direct access telephone connection from the control room to the **ISO** coordination centre.	One of the following additional services connecting from the control room: 1. A direct access telephone connection to the **legal owner** of the **transmission facility** providing the **transmission system** connection associated with the **black start capability** service. 2. A mobile satellite network telephone service to the **ISO** coordination centre; or. 3. A utility orderwire service to the **ISO** coordination centre.

Emergency and Back Up Communication Systems Requirements

8 Each applicable **market participant** and the **ISO** must use the specified emergency and back up communication systems when there is an event that causes a primary communication system to be materially disrupted or impaired, including an event such as:

(a) a real time **system emergency** condition, as may be referenced in any **reliability standard**; or

(b) a **disturbance** or interruption of service by any provider of a primary communications system service.

Testing of Emergency and Back Up Communication Systems

9(1) The **ISO** must conduct tests for all emergency and back up communication systems on a reasonable basis and the testing

schedule time and date must be made known reasonably in advance to the **operator** of a **market participant** whose system will be tested.

(2) If the test is a success then the **ISO** will not notify the **operator**, but if the test is a failure then the **ISO** will verbally notify the **operator** of the failure no later than twenty four (24) hours after the test in completed.

(3) After the **ISO** notifies the **operator** of the testing schedule, the **operator** must ensure that there are trained personnel available to conduct and facilitate the test at the designated date and time.

(4) In accordance with the confidentiality provisions of subsection 2(1) of section 103.1 of the **ISO rules** *Confidentiality*, the **ISO** must keep confidential the name of any facility that is subject to testing, and the date and time of the tests.

(5) If there is a failure of a test, then the applicable **market participant** or the **ISO**, depending on whose emergency and back up communication system has failed, must ensure the cause is investigated and repaired as soon as reasonably possible, but in any event the system must be repaired no later than five (5) **business days** after:

(a) the date of the test failure, in the case of the **ISO**; or

(b) the date of delivery of notice of the test failure, in the case of the **market participant**.

(6) The **ISO** must keep a copy of any test results for no less than two (2) calendar years after the date of the test.

Loss of Emergency and Back Up Communication Systems

10(1) If either the **ISO** or a **market participant** experiences a material disruption or complete loss of any emergency and back up communication systems at a point in time other than during a test period, then verbal notice must be given by:

(a) the **ISO** to all affected **market participants**, if the **ISO** suffers the disruption of loss; or

(b) the applicable **market participant** to the **ISO**, if the **market participant** suffers the disruption or loss.

(2) The **market participant** that experiences the disruption or loss must investigate and repair it as soon as reasonably possible, but in any event no later than five (5) **business days** after the date of the discovery of the cause of the disruption or loss.

Appendices

Appendix 1 – *Technical Standards in Effect as of 2007*

(b) telephone calls from the **ISO** using a direct telephone number that the **pool participant** has provided to the **ISO**.

Revision History

Effective Date	**Description of Changes**
2011-06-01yyyy-xx-xx	Initial releaseRemoved all voice communication requirements. Modified Automated Dispatch and Messaging System applicability and regulatory requirement.
2013-01-082015-03-27	Appendix added containing authoritative system availability requirements specified in Table 2 of ISO OPP 003.2. Previously defined terms have been un-defined and so the words have been un-bolded.Replaced “effective date” with the initial release date in sections 2(1), 2(2), and 3; and replaced the word “Effective” in the Revision History to “Date”.

2014-07-02	Unbolded the reference to “outage” in Appendix 1.
~~2015-03-27~~2013-01-08	~~Replaced “effective date” with the initial release date in sections 2(1),(2) and 3; and replaced the word “Effective” in the Revision History to “Date”.~~ Appendix added containing authoritative system availability requirements specified in Table 2 of ISO OPP 003.2. Previously defined terms have been un-defined and so the words have been unbolded.
2011-06-01	Initial release.

Appendix 1 – Technical Standards in Effect as of 2007

Standard Description	Applicable To	Standard Requirement	Reason for Standard
Maximum participant outage time	All **pool participants** receiving **dispatches** and with total **bids** or **offers** of greater than twenty-five (25) MW	Twenty-six point two five (26.25) hours per year. Ninety-nine point seven percent (99.7%) availability.	Safe and reliable operation of the power system requires high **pool participant** availability for receiving **dispatches**.
	All **pool participants** receiving **dispatches** and with total **bids** or **offers** of less than twenty-five (25) MW	One hundred (100) hours per year. Ninety-nine point eight percent (98.8%) availability.	
Maximum outage time per incident	All **pool participants** receiving **dispatches** and with total **bids** or **offers** of greater than twenty-five (25) MW	Six (6) hours	Safe and reliable operation of the power system requires high **pool participant** availability for receiving **dispatches**.
	All **pool participants** receiving **dispatches** and with total **bids** or **offers** of less than twenty-five (25) MW	Forty-eight (48) hours	
Call out response time	All **pool participants** receiving **dispatches** and with total **bids** or **offers** of greater than twenty-five (25) MW	Two (2) hours	Safe and reliable operation of the power system requires high **pool participant** availability for receiving **dispatches**.
	All **pool participants** receiving **dispatches** and with total **bids** or **offers** of less than twenty-five (25) MW	Next working **day**	

Alberta Reliability Standard
Communications
COM-001-AB-3

1. Purpose

The purpose of this **reliability standard** is to establish voice communication capabilities necessary to maintain the reliable operation of the **interconnected electric system**.

2. Applicability

This **reliability standard** applies to:

(a) the **operator** of a **transmission facility**;

(b) the **operator** of an **electric distribution system** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat;

(c) the **operator** of a **generating unit** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW;

(d) the **operator** of an **aggregated generating facility** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW; and

(e) the **ISO**.

For the purpose of the requirements contained herein, the above list of entities will be collectively referred to as “Responsible Entities”. For requirements in this **reliability standard** where a specific entity or subset of entities are the applicable entity or entities, the entity or entities are specified explicitly.

3. Requirements

R1 The **ISO** must, as it determines to be necessary to maintain reliability, have primary voice communication capability to communicate with the following entities, unless the **ISO** detects a failure of its primary voice communication capability, in which case requirement R10 applies:

(a) each **operator** of a **transmission facility**;

(b) each **operator** of an **electric distribution system** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat;

(c) each **operator** of a **generating unit** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW;

(d) each **operator** of an **aggregated generating facility** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW;

(e) each adjacent **reliability coordinator** within the **WECC**; and

(f) each adjacent **interconnected transmission operator** directly connected to Alberta.

R2 The **ISO** must designate a backup voice communication capability in each control room to communicate with the following entities:

(a) each **operator** of a **transmission facility**;

(b) each **operator** of an **electric distribution system** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat;

(c) each **operator** of a **generating unit** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW;

(d) each **operator** of an **aggregated generating facility** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW; and

(e) each adjacent **reliability coordinator** within the **WECC**;

(f) each adjacent **interconnected transmission operator** directly connected to Alberta.

R3 Each **operator** of a **transmission facility** must have primary voice communication capability to communicate with the following entities, unless the **operator** of a **transmission facility** detects a failure of its primary voice communication capability in which case requirement R10 shall apply:

(a) the **ISO;**

(b) each adjacent **operator** of a **transmission facility** that is directly connected to its **transmission facility**;

(c) each **operator** of an **electric distribution system** that is directly connected to its **transmission facility**;

(d) each **operator** of a **generating unit** that is directly connected to its **transmission facility** and has a **maximum authorized real power** greater than or equal to 5 MW;

(e) each operator of an **aggregated generating facility** that is directly connected to its **transmission facility** and has a **maximum authorized real power** greater than or equal to 5 MW; and

(f) each adjacent **interconnected transmission operator** that is directly connected to its **transmission facility**.

R3.A1[1] Each **operator** of a **transmission facility** must use a primary voice communication capability that is:

(a) a direct access telephone on the public telephone network;

(b) not degraded by any other communication functionality or any other data transfer activities if there is any shared equipment; and

(c) located in each control room.

R4 Each **operator** of a **transmission facility** must designate a backup voice communication capability with the following entities:

(a) the **ISO**;

(b) each adjacent **operator** of a **transmission facility** that is directly connected to its **transmission facility**;

(c) each **operator** of an **electric distribution system** that is directly connected to its **transmission facility**;

(d) each **operator** of a **generating unit** that is directly connected to its **transmission facility** and has a **maximum authorized real power** greater than or equal to 5 MW;

(e) each **operator** of an **aggregated generating facility** that is directly connected to its **transmission facility** and has a **maximum authorized real power** greater than or equal to 5 MW; and

[1] Any requirement that contains an A in the designation, such as R3.A1, is an additional **ISO** requirement that was established by the **ISO** for use in its **balancing authority area** and was not derived from a NERC COM-001-3 requirement.

(f) each adjacent **interconnected transmission operator** that is directly connected to its **transmission facility**.

R4.A1 Each **operator** of a **transmission facility** must have the type of backup voice communication capability, in each control room**,** as identified in:

(a) Appendix 1 for communicating with the **ISO**; and

(b) Appendix 2 for communicating with each entity specified in requirement R4.

R5 Intentionally left blank.

R6 Intentionally left blank.

R7 Each **operator** of an **electric distribution system** must have primary voice communication capability to communicate with the following entities, unless the **operator** of an **electric distribution system** detects a failure of its primary voice communication capability in which case requirement R11 shall apply:

(a) the **ISO**; and

(b) the **operator** of a **transmission facility** that is directly connected to its **electric distribution system**.

R7.A1 Each **operator** of an **electric distribution system** must use a primary voice communication capability that is:

(a) a direct access telephone on the public telephone network;

(b) not degraded by any other communication functionality or any other data transfer activities if there is any shared equipment; and

(c) located in each control room.

R7.A2 Each **operator** of an **electric distribution system** must have the type of backup voice communication capability, in each control room, as identified in:

(a) Appendix 1 for communicating with the **ISO**; and

(b) Appendix 3 for communicating with each entity specified in requirement R7.

R8 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must have primary voice communication capability to communicate with the following entities, unless the **operator** of a **generating unit** or **operator** of an **aggregated generating facility** detects a failure of its primary voice communication capability in which case requirement R11 applies:

(a) the **ISO**; and

(b) the **operator** of a **transmission facility** that is directly connected to its **generating unit** or **aggregated generating facility**.

R8.A1 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must use a primary voice communication capability that is:

(a) a direct access telephone on the public telephone network;

(b) not degraded by any other communication functionality or any other data transfer activities if there is any shared equipment; and

(c) located in each control room.

R8.A2 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must have the type of backup voice communication capability, in each control room, as identified in:

(a) Appendix 1 for communicating with the **ISO**; and

(b) Appendix 3 for communicating with each entity specified in requirement R8.

R9 The Responsible Entities must test each backup voice communication capability, as specified in Appendix 1, Appendix 2, and Appendix 3, at least once each **month**. If the test is unsuccessful, the Responsible Entity must initiate action to repair or designate a temporary replacement backup voice communication capability within 2 hours of the unsuccessful test.

R10 The **ISO** and each **operator** of a **transmission facility** must notify entities as identified in requirements R1 and R3, respectively within 60 minutes of the detection of a failure of its primary voice communication capability that lasts 30 minutes or longer.

R11 Each **operator** of an **electric distribution system**, **operator** of a **generating unit**, and **operator** of an **aggregated generating facility** that detects a failure of its primary voice communication capability must consult with each entity affected by the failure, as identified in requirement R7 for an **operator** of an **electric distribution system** or requirement R8 for an **operator** of a **generating unit** or **operator** of an **aggregated generating facility**, to determine a mutually agreeable action for the restoration of its primary voice communication capability.

R12 The **ISO** and each **operator** of a **transmission facility**, **operator** of a **generating unit**, and **operator** of an **aggregated generating facility** must have internal primary voice communication capabilities for the exchange of information necessary for the reliable operation of the **interconnected electric system**. This includes internal primary voice communication capabilities between its control rooms, and between its control rooms and field personnel.

R13 Each **operator** of an **electric distribution system** must have internal primary voice communication capabilities for the exchange of information necessary for the reliable operation of the **interconnected electric system**. This includes internal primary communication capabilities between its control rooms, and between its control rooms and field personnel.

R14.A1 Each Responsible Entity must, where its backup voice communication capability is a satellite telephone service, use a satellite network system, as approved by the **ISO**.

R15.A1 Each Responsible Entity must, where its backup voice communication capability is a satellite telephone service or utility orderwire service,[2] have backup voice communication equipment that remains operational for a minimum of 8 hours in the event of an extended power outage to its facilities.

4. Measures

The following measures correspond to the requirements identified in section 3 of this **reliability standard**. For example, MR1 is the measure for requirement R1.

MR1 Evidence of having primary voice communication capability as required in requirement R1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

[2] "utility orderwire service" means a private voice communications system that is operated and controlled by one or more **market participant** and the **ISO**. The utility orderwire service: leverages utility telecommunication network infrastructure owned by a **market participant** and the **ISO**; and may also leverage passive telecommunication infrastructure owned by a third-party.

MR2 Evidence of designating a backup voice communication capability as required in requirement R2 exists. Evidence may include 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 or other equivalent evidence.

MR3 Evidence of having primary voice communication capability as required in requirement R3 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR3.A1 Evidence of using a primary voice communication capability as required in requirement R3.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR4 Evidence of designating a backup voice communication capability as required in requirement R4 exists. Evidence may include 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 or other equivalent evidence.

MR4.A1 Evidence of having a backup voice communication capability as required in requirement R4.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR5 Intentionally left blank.

MR6 Intentionally left blank.

MR7 Evidence of having primary voice communication capability as required in requirement R7 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR7.A1 Evidence of using a primary voice communication capability as required in requirement R7.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR7.A2 Evidence of having a backup voice communication capability as required in requirement R7.A2 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR8 Evidence of having primary voice communication capability as required in requirement R8 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR8.A1 Evidence of using a primary voice communication capability as required in requirement R8.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR8.A2 Evidence of having a backup voice communication capability as required in requirement R8.A2 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR9 Evidence of testing backup voice communication capability as required in requirement R9 exists. Evidence may include dated and time-stamped test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

Evidence of initiating action to repair or designating a replacement of backup voice communication capability, which does not utilize the same infrastructure as voice communication used for day-to-day operation, as required in requirement R9 exists. Evidence may include dated and time-stamped test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR10 Evidence of notifying entities, within the minimum timeframe, after a detection of a failure of its primary voice communication capability as required in requirement R10 exists. Evidence may include dated and time-stamped test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR11 Evidence of consulting with each entity affected by the failure of its primary voice communication capability as required in requirement R11 exists. Evidence may include dated **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR12 Evidence of having internal primary voice communication capability as required in requirement R12 exists. Evidence may include 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 or other equivalent evidence.

MR13 Evidence of having internal primary voice communication capability as required in requirement R13 exists. Evidence may include 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 or other equivalent evidence.

MR14.A1 Evidence of using a satellite network system as a backup voice communication capability as required in requirement R14.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR15.A1 Evidence of ensuring a backup voice communication capability complies with the minimum operation in the event of an extended power outage as required in requirement R15.A1 exists. Evidence may include dated and time-stamped records of operations, such as, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

Appendices

Appendix 1 – *Responsible Entity Requirements for Each Backup Voice Communication Capability with the ISO*

Appendix 2 – *Operator of a Transmission Facility Requirements for Each Backup Voice Communication Capability with Adjacent Entities and Entities that are Directly Connected to its Transmission Facility*

Appendix 3 – *Operator of an Electric Distribution System, Operator of a Generating Unit, and Operator of an Aggregated Generating Facility Requirements for Each Backup Voice Communication Capability with Operators of Transmission Facilities that is Directly Connected to its Electric Distribution System, Generating Unit, or Aggregated Generating Facility*

Revision History

Date	Description
xxxx-xx-xx	Initial release.

Appendix 1
Responsible Entity Requirements for Each Backup Voice Communication Capability with the ISO

Responsible Entity Category	Responsible Entity subcategory	Responsible Entity Backup Voice Communication Capability Options for Communicating with the ISO
Each **operator** of a **transmission facility**	that operates a **transmission facility**, unless it only operates a **radial circuit**.	(1) Utility orderwire service
	that only operates a **radial circuit**.	(1) Utility orderwire service; (2) Satellite telephone service; or (3) Direct access telephone service.
Each **operator** of an **electric distribution system**		(1) Utility orderwire service; (2) Satellite telephone service; or (3) Direct access telephone service.
Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat where the **maximum authorized real power** is	less than 50 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Direct access telephone service.
	equal to or greater than 50 MW and less than 300 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Satellite telephone service.
	equal to or greater than 300 MW based on the total amount of generation operated by the control room, where the total synchronous generation is less than 300 MW, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Satellite telephone service.
	equal to or greater than 300 MW based on the total amount of synchronous generation operated by the control room or a **blackstart resource**.	(1) Utility orderwire service

Appendix 2
Operator of a Transmission Facility Requirements for Each Backup Voice Communication Capability with Adjacent Entities and Entities that are Directly Connected to its Transmission Facility

Entity	**Entity Subcategory Responsible Entity Backup Voice Communication System Options for Communicating with the ISO**	**Operator of a Transmission Facility Backup Voice Communication Capability Options for Communicating with Each Adjacent Entity**
Each adjacent **operator** of a **transmission facility** that is directly connected to its **transmission facility**	that operates a **transmission facility**, unless it only connects through a **radial circuit**.	(1) Utility orderwire service; or (2) An **operator** of a **transmission facility** that only operates a **radial circuit** may use satellite telephone service or direct access telephone service.
	that only operates a **radial circuit**.	(1) Utility orderwire service; (2) Satellite telephone service; or (3) Direct access telephone service.
Each **operator** of an **electric distribution system** that is directly connected to its **transmission facility**		(1) Utility orderwire service; (2) Satellite telephone service; or (3) An **operator** of **electric distribution system** connected only to a substation that is part of a **radial circuit** may use direct access telephone service
Each **operator** of a **generating unit** or **aggregated generating facility** that is directly connected to its **transmission facility** and the **maximum authorized real power** is:	Equal to or greater than 5 MW and less than 50 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**;	(1) Utility orderwire service; or (2) Direct access telephone service.
	equal to or greater than 50 MW and less than 300 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**;	(1) Utility orderwire service; or (2) Satellite telephone service.
	equal to or greater than 300 MW based on the total amount of generation operated by the control room, where the total synchronous generation is less than 300 MW, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**; and	(1) Utility orderwire service; or (2) Satellite telephone service.
	equal to or greater than 300 MW based on the total amount of	(1) Utility orderwire service

	synchronous generation operated by the control room or a **blackstart resource**.	
Each adjacent **interconnected transmission operator** that is directly connected to its **transmission facility**		(1) Utility orderwire service; or (2) Satellite telephone service.

Appendix 3
Operator of an Electric Distribution System, Operator of a Generating Unit, and Operator of an Aggregated Generating Facility Requirements for Each Backup Voice Communication Capability with Each Operator of Transmission Facility* that is Directly Connected to its Electric Distribution System, Generating Unit, or Aggregated Generating Facility

Responsible Entity Category	**Responsible Entity Subcategory**	**Responsible Entity Backup Voice Communication Capability Options for Communicating with the Operator of a Transmission Facility that is Directly Connected to Its Electric Distribution System, Generating Unit, or Aggregated Generating Facility**
Each **operator** of an **electric distribution system**		(1) Utility orderwire service; (2) Satellite telephone service; or (3) An **operator** of **electric distribution system** connected only to a substation that is part of a **radial circuit** may use direct access telephone service.
Each **operator** of a **generating unit** and each **operator** of an **aggregated generating facility** connecting to the **transmission system** or to **transmission facilities** within the City of Medicine Hat where the **maximum authorized real power** is:	less than 50 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Direct access telephone service.
	equal to or greater than 50 MW and less than 300 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Satellite telephone service.
	equal to or greater than 300 MW based on the total amount of generation operated by the control room, where the total synchronous generation is less than 300 MW, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Satellite telephone service.
	equal to or greater than 300 MW based on the total amount of synchronous generation operated by the control room or is a **blackstart resource**.	(1) Utility orderwire service

*Appendix 3 does not include requirements for each **operator** of a **transmission facility**

Alberta Reliability Standard
Communications
COM-001-AB-3

~~Alberta Reliability Standard~~
~~Telecommunications~~
~~**COM-001-AB1-1.1**~~

1. ~~1.~~ Purpose

The purpose of this **reliability standard** is to ~~ensure the **ISO** and each **operator** of a **transmission facility** have adequate and reliable~~establish voice ~~and message telecommunication facilities internally and with others for the exchange of **interconnection** and operating information necessary~~ communication capabilities necessary to maintain ~~reliability.~~the reliable operation of the **interconnected electric system**.

2. ~~2.~~ Applicability

This **reliability standard** applies to~~ the following~~:

(a) ~~(a)~~ the **operator** of a **transmission facility**;

the **operator** of ~~a **transmission facility** that is:~~

~~(i) part of the **bulk electric system**; or~~

~~(ii) not part of the **bulk**~~an **electric distribution system** ~~but which~~that is directly connected to the ~~**ISO**~~:

~~(a)~~(b) ~~determines is necessary for the reliable operation of either the **interconnected electric**~~**transmission system** or to **transmission facilities** within the City of Medicine Hat ~~electric system; and~~;

~~(A) publishes on the AESO website and may amend from time to time in accordance with the process set out in Appendix 1; and~~

(c) ~~(b)~~ the **operator** of a **generating unit** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW;

(d) the **operator** of an **aggregated generating facility** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW; and

~~(b)~~(e) the **ISO**.

~~3.~~ For the purpose of the requirements contained herein, the above list of entities will be collectively referred to as "Responsible Entities". For requirements in this **reliability standard** where a specific entity or subset of entities are the applicable entity or entities, the entity or entities are specified explicitly.

3. Requirements

R1 The **ISO** must, as it determines to be necessary to maintain reliability, ~~provide adequate, reliable, and, where applicable, diverse and redundant~~have primary voice ~~and message telecommunication facilities for the exchange of **interconnection** and internal Alberta operating information~~communication capability to communicate with the following entities, unless the **ISO** detects a failure of its primary voice communication capability, in which case requirement R10 applies:

(a) ~~(a)~~ each **operator** of a **transmission facility**;

(b) ~~(b)~~ each **operator** of an **electric distribution system** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat;

(c) each **operator** of a **generating unit** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW;

(d) each **operator** of an **aggregated generating facility** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW;

(e) each adjacent **reliability coordinator** within the **WECC**; and

(f) each adjacent **interconnected transmission operator** directly connected to Alberta.

R2 The **ISO** must designate a backup voice communication capability in each control room to communicate with the following entities:

(a) each **operator** of a **transmission facility**;

(b) each **operator** of an **electric distribution system** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat;

(c) each **operator** of a **generating unit** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW;

(d) each **operator** of an **aggregated generating facility** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW; and

(e) each adjacent **reliability coordinator** within the **WECC**;

~~(a)~~(f) each adjacent **interconnected transmission operator** directly connected to Alberta~~;~~.

~~(c) each adjacent **balancing authority** directly connected to Alberta; and~~

~~(d) the adjacent **reliability coordinators**.~~

~~R2~~R3 Each **operator** of a **transmission facility** must~~, as necessary to maintain reliability, provide adequate, reliable, and, where applicable, diversely routed and redundant voice and message telecommunication facilities for the exchange of **interconnection** and Alberta operating information with the following~~ have primary voice communication capability to communicate with the following entities, unless the **operator** of a **transmission facility** detects a failure of its primary voice communication capability in which case requirement R10 shall apply:

(a) ~~(a)~~ the **ISO;**

~~(a)~~(b) each adjacent **operator** of a **transmission facility**~~;~~ that is directly connected to its **transmission facility**;

(c) ~~(b)~~ each **operator** of an **electric distribution system** that is directly connected to its **transmission facility**;

(d) each **operator** of a **generating unit** that is directly connected to its **transmission facility** and has a **maximum authorized real power** greater than or equal to 5 MW;

(e) each operator of an **aggregated generating facility** that is directly connected to its **transmission facility** and has a **maximum authorized real power** greater than or equal to 5 MW; and

~~(b)~~(f) each adjacent **interconnected transmission operator** that is directly connected to ~~Alberta; and~~its **transmission facility**.

~~(c) the **ISO**.~~

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~~**COM-001-AB1-1.1**~~

R3 ~~The **ISO** and each~~**.A1**[1] Each **operator** of a **transmission facility** must ~~manage and test its alternate~~use a primary voice ~~and message telecommunication facilities.~~communication capability that is:

~~**R4** The **ISO**~~(a) a direct access telephone on the public telephone network;

(b) not degraded by any other communication functionality or any other data transfer activities if there is any shared equipment; and

(c) located in each control room.

R4 Each **operator** of a **transmission facility** must ~~provide a means to coordinate~~designate a backup voice ~~and message telecommunications~~communication capability with the following entities:

(a) the **ISO**;

(b) each adjacent **operator** of a **transmission facility**~~,~~ that is directly connected to its **transmission facility**;

(c) each **operator** of an **electric distribution system** that is directly connected to its **transmission facility**;

(d) each **operator** of a **generating unit** that is directly connected to its **transmission facility** and has a **maximum authorized real power** greater than or equal to 5 MW;

(e) each **operator** of an **aggregated generating facility** that is directly connected to its **transmission facility** and has a **maximum authorized real power** greater than or equal to 5 MW; and

~~(a)~~(f) each adjacent **interconnected transmission operator**~~, adjacent **balancing authority** and adjacent **reliability coordinators**, which coordination must include the ability to investigate and recommend solutions to voice and message telecommunications problems within Alberta~~ that is directly connected to its **transmission facility**.

~~**R5**~~ **R4.A1** Each **operator** of a **transmission facility** must ~~provide a means to coordinate voice and message telecommunications with~~ have the type of backup voice communication capability, in each control room, as identified in:

(a) Appendix 1 for communicating with the **ISO**; and

(b) Appendix 2 for communicating with each entity specified in requirement R4.

R5 Intentionally left blank.

R6 Intentionally left blank.

[1] Any requirement that contains an A in the designation, such as R3.A1, is an additional **ISO** requirement that was established by the **ISO** for use in its **balancing authority area** and was not derived from a NERC COM-001-3 requirement.

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~~**COM-001-AB1-1.1**~~

R7 Each **operator** of an **electric distribution system** must have primary voice communication capability to communicate with the following entities, unless the **operator** of an **electric distribution system** detects a failure of its primary voice communication capability in which case requirement R11 shall apply:

(a) the **ISO** ~~and adjacent **interconnected transmission operators**, which coordination must include the ability to investigate and recommend solutions to voice and message telecommunications problems within Alberta.~~; and

(b) ~~**R6**~~the **operator** of a **transmission facility** that is directly connected to its **electric distribution system**.

R7.A1 Each **operator** of an **electric distribution system** must use a primary voice communication capability that is:

(a) a direct access telephone on the public telephone network;

(b) not degraded by any other communication functionality or any other data transfer activities if there is any shared equipment; and

(c) located in each control room.

R7.A2 Each **operator** of an **electric distribution system** must have the type of backup voice communication capability, in each control room, as identified in:

(a) Appendix 1 for communicating with the **ISO**; and

(b) Appendix 3 for communicating with each entity specified in requirement R7.

R8 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must have primary voice communication capability to communicate with the following entities, unless the **operator** of a **generating unit** or **operator** of an **aggregated generating facility** detects a failure of its primary voice communication capability in which case requirement R11 applies:

(a) the **ISO**; and

(b) the **operator** of a **transmission facility** that is directly connected to its **generating unit** or **aggregated generating facility**.

R8.A1 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must use a primary voice communication capability that is:

(a) a direct access telephone on the public telephone network;

(b) not degraded by any other communication functionality or any other data transfer activities if there is any shared equipment; and

(c) located in each control room.

R8.A2 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must have the type of backup voice communication capability, in each control room, as identified in:

(a) Appendix 1 for communicating with the **ISO**; and

(b) Appendix 3 for communicating with each entity specified in requirement R8.

R9 The Responsible Entities must test each backup voice communication capability, as specified in Appendix 1, Appendix 2, and Appendix 3, at least once each **month**. If the test is unsuccessful, the Responsible Entity must initiate action to repair or designate a temporary replacement backup voice communication capability within 2 hours of the unsuccessful test.

R10 The **ISO** and each **operator** of a **transmission facility** must ~~use the English language for all communications between their respective operating personnel responsible for the real-time generation control and operation of the **interconnected electric system**~~notify entities as identified in requirements R1 and R3, respectively within 60 minutes of the detection of a failure of its primary voice communication capability that lasts 30 minutes or longer.

~~**R7**~~**R11** Each **operator** of an **electric distribution system**, **operator** of a **generating unit**, and **operator** of an **aggregated generating facility** that detects a failure of its primary voice communication capability must consult with each entity affected by the failure, as identified in requirement R7 for an **operator** of an **electric distribution system** or requirement R8 for an **operator** of a **generating unit** or **operator** of an **aggregated generating facility**, to determine a mutually agreeable action for the restoration of its primary voice communication capability.

R12 The **ISO** and each **operator** of a **transmission facility** ~~must have written operating instructions and procedures to enable continued~~, **operator** of a **generating unit**, and **operator** of an **aggregated generating facility** must have internal primary voice communication capabilities for the exchange of information necessary for the reliable operation of the **interconnected electric system**. This includes internal primary voice communication capabilities between its control rooms, and between its control rooms and field personnel.

R13 Each **operator** of an **electric distribution system** must have internal primary voice communication capabilities for the exchange of information necessary for the reliable operation of the **interconnected electric system** ~~during the loss of voice and message telecommunications facilities~~. This includes internal primary communication capabilities between its control rooms, and between its control rooms and field personnel.

~~4.~~ **R14.A1** Each Responsible Entity must, where its backup voice communication capability is a satellite telephone service, use a satellite network system, as approved by the **ISO**.

R15.A1 Each Responsible Entity must, where its backup voice communication capability is a satellite telephone service or utility orderwire service,[2] have backup voice communication equipment that remains operational for a minimum of 8 hours in the event of an extended power outage to its facilities.

4. Measures

The following measures correspond to the requirements identified in section 3 of this **reliability standard**. For example, MR1 is the measure for requirement R1.

[2] "utility orderwire service" means a private voice communications system that is operated and controlled by one or more **market participant** and the **ISO**. The utility orderwire service: leverages utility telecommunication network infrastructure owned by a **market participant** and the **ISO**; and may also leverage passive telecommunication infrastructure owned by a third-party.

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MR1 Evidence of ~~providing~~having primary voice ~~and message telecommunication facilities~~communication capability as required in requirement R1 exists. Evidence may include~~:~~

~~(a) a list identifying each telecommunication facility for the exchange of **interconnection** and Alberta operating information; and~~

physical assets, dated evidence, such as, equipment specifications and installation documentation ~~demonstrating the implementation of diverse routing and redundancy capability~~, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR2 Evidence of ~~providing voice and message telecommunication facilities~~designating a backup voice communication capability as required in requirement R2 exists. Evidence may include~~:~~

~~(a) a list identifying each telecommunication facility for the exchange of **interconnection** and Alberta operating information; and~~

physical assets, or dated evidence, such as, equipment specifications and installation documentation ~~demonstrating the implementation of diverse routing and redundancy capability, if applicable~~, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR3 Evidence of ~~managing and testing its alternate voice and message telecommunication facilities~~having primary voice communication capability as required in requirement R3 exists. Evidence may include~~:~~ physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

~~(a) a list identifying each telecommunication facility as determined to be alternate;~~

~~(b) documented procedures describing how to manage and test its alternate telecommunication facilities; and~~

~~(c) records of testing.~~

MR3.A1 Evidence of using a primary voice communication capability as required in requirement R3.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR4 Evidence of ~~providing~~designating a ~~means to coordinate~~backup voice ~~and message telecommunications~~communication capability as required in requirement R4 exists. ~~Evidence may include a documented procedure in place which identifies a process~~Evidence may include 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 or other equivalent evidence.

MR4.A1 Evidence of having a backup voice communication capability as required in requirement R4.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR5 Intentionally left blank.

MR6 Intentionally left blank.

MR7 Evidence of having primary voice communication capability as required in requirement R7 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR7.A1 Evidence of using a primary voice communication capability as required in requirement R7.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR7.A2 Evidence of having a backup voice communication capability as required in requirement R7.A2 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR8 Evidence of having primary voice communication capability as required in requirement R8 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR8.A1 Evidence of using a primary voice communication capability as required in requirement R8.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR8.A2 Evidence of having a backup voice communication capability as required in requirement R8.A2 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR9 Evidence of testing backup voice communication capability as required in requirement R9 exists. Evidence may include dated and time-stamped test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

Evidence of initiating action to repair or designating a replacement of backup voice communication capability, which does not utilize the same infrastructure as voice communication used for day-to-day operation, as required in requirement R9 exists. Evidence may include dated and time-stamped test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR10 Evidence of notifying entities, within the minimum timeframe, after a detection of a failure of its primary voice communication capability as required in requirement R10 exists. Evidence may include dated and time-stamped test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR11 Evidence of consulting with each entity affected by the failure of its primary voice communication capability as required in requirement R11 exists. Evidence may include dated **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR12 Evidence of having internal primary voice communication capability as required in requirement R12 exists. Evidence may include 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 or other equivalent evidence.

MR13 Evidence of having internal primary voice communication capability as required in requirement R13 exists. Evidence may include 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 or other equivalent evidence.

MR14.A1 Evidence of using a satellite network system as a backup voice communication capability as required in requirement R14.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

MR15.A1 Evidence of ensuring a backup voice communication capability complies with the minimum operation in the event of an extended power outage as required in requirement R15.A1 exists. Evidence may include dated and time-stamped records of operations, such as, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.

Appendices

Appendix 1 – *Responsible Entity Requirements for Each Backup Voice Communication Capability with the ISO*

Appendix 2 – *Operator of a Transmission Facility Requirements* for ~~coordinating telecommunications and a process~~*Each Backup Voice Communication Capability with Adjacent Entities and Entities that are Directly Connected to its Transmission Facility*

~~Alberta Reliability Standard~~
~~Telecommunications~~
~~**COM-001-AB1-1.1**~~

Appendix 3 – *Operator of an Electric Distribution System, Operator of a Generating Unit, and Operator of an Aggregated Generating Facility Requirements* for ~~investigating and recommending solutions to telecommunications problems.~~*Each Backup Voice Communication Capability with Operators of Transmission Facilities that is Directly Connected to its Electric Distribution System, Generating Unit, or Aggregated Generating Facility*

~~**MR5** Evidence of providing a means to coordinate voice and message telecommunications as required in requirement R5 exists. Evidence may include a documented procedure in place which identifies a process for coordinating telecommunications and a process for investigating and recommending solutions to telecommunications problems.~~

~~**MR6** Evidence of using the English language as required in requirement R6 exists. Evidence may include **operator** logs, voice recordings, electronic communications or **e-tag** records.~~

~~**MR7** Evidence of having written operating instructions and procedures as required in requirement R7 exists. Evidence may include electronic or hard copy of the operating instructions and procedures.~~

~~**5. Appendices**~~

~~Appendix 1 – *Amending Process for List of Facilities*~~

Revision History

~~Effective~~**Date**	**Description**
~~2013-10-01~~xxxx-xx-xx	Initial ~~Release~~release.
~~2015-05-01~~	~~Revised for ISO assumption of RC functionality for the Alberta footprint~~

Appendix 1
~~**Amending Process**~~**Responsible Entity Requirements** **for** ~~**List of Facilities**~~

~~In order to amend the list referenced in subsections (a)(ii)(B) of section 2, *Applicability*,~~ **Each Backup Voice Communication Capability with the ISO** ~~must:~~

~~(a) upon determining that a **transmission facility** is to be added, notify the **operator** in writing and determine an effective date, which must be no less than thirty (30) **days** after the date of notice, for the **operator** to meet the applicable requirements;~~

~~(b) upon determining that a **transmission facility** is to be deleted, notify the **operator** in writing and determine an effective date for the **operator** to no longer be required to meet the applicable requirements; and~~

~~(c) publish the amended list with effective dates on the AESO website.~~

Responsible Entity Category	**Responsible Entity subcategory**	**Responsible Entity Backup Voice Communication Capability Options for Communicating with the ISO**
Each **operator** of a **transmission facility**	that operates a **transmission facility**, unless it only operates a **radial circuit**.	(1) Utility orderwire service
	that only operates a **radial circuit**.	(1) Utility orderwire service; (2) Satellite telephone service; or (3) Direct access telephone service.
Each **operator** of an **electric distribution system**		(1) Utility orderwire service; (2) Satellite telephone service; or (3) Direct access telephone service.
Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat where the **maximum authorized real power** is	less than 50 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Direct access telephone service.
	equal to or greater than 50 MW and less than 300 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Satellite telephone service.
	equal to or greater than 300 MW based on the total amount of generation operated by the control room, where the total synchronous generation is less than 300 MW, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Satellite telephone service.

	equal to or greater than 300 MW based on the total amount of synchronous generation operated by the control room or a **blackstart resource**.	(1) Utility orderwire service

Appendix 2
Operator of a Transmission Facility Requirements for Each Backup Voice Communication Capability with Adjacent Entities and Entities that are Directly Connected to its Transmission Facility

Entity	**Entity Subcategory Responsible Entity Backup Voice Communication System Options for Communicating with the ISO**	**Operator of a Transmission Facility Backup Voice Communication Capability Options for Communicating with Each Adjacent Entity**
Each adjacent **operator** of a **transmission facility** that is directly connected to its **transmission facility**	that operates a **transmission facility**, unless it only connects through a **radial circuit**.	(1) Utility orderwire service; or (2) An **operator** of a **transmission facility** that only operates a **radial circuit** may use satellite telephone service or direct access telephone service.
	that only operates a **radial circuit**.	(1) Utility orderwire service; (2) Satellite telephone service; or (3) Direct access telephone service.
Each **operator** of an **electric distribution system** that is directly connected to its **transmission facility**		(1) Utility orderwire service; (2) Satellite telephone service; or (3) An **operator** of **electric distribution system** connected only to a substation that is part of a **radial circuit** may use direct access telephone service
Each **operator** of a **generating unit** or **aggregated generating facility** that is directly connected to its **transmission facility** and the **maximum authorized real power** is:	Equal to or greater than 5 MW and less than 50 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**;	(1) Utility orderwire service; or (2) Direct access telephone service.
	equal to or greater than 50 MW and less than 300 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**;	(1) Utility orderwire service; or (2) Satellite telephone service.
	equal to or greater than 300 MW based on the total amount of generation operated by the control room, where the total synchronous generation is less than 300 MW,	(1) Utility orderwire service; or (2) Satellite telephone service.

	unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**; and	
	equal to or greater than 300 MW based on the total amount of synchronous generation operated by the control room or a **blackstart resource**.	(1) Utility orderwire service
Each adjacent **interconnected transmission operator** that is directly connected to its **transmission facility**		(1) Utility orderwire service; or (2) Satellite telephone service.

Appendix 3
Operator of an Electric Distribution System, Operator of a Generating Unit, and Operator of an Aggregated Generating Facility Requirements for Each Backup Voice Communication Capability with Each Operator of Transmission Facility* that is Directly Connected to its Electric Distribution System, Generating Unit, or Aggregated Generating Facility

Responsible Entity Category	**Responsible Entity Subcategory**	**Responsible Entity Backup Voice Communication Capability Options for Communicating with the Operator of a Transmission Facility that is Directly Connected to Its Electric Distribution System, Generating Unit, or Aggregated Generating Facility**
Each **operator** of an **electric distribution system**		(1) Utility orderwire service; (2) Satellite telephone service; or (3) An **operator** of **electric distribution system** connected only to a substation that is part of a **radial circuit** may use direct access telephone service.
Each **operator** of a **generating unit** and each **operator** of an **aggregated generating facility** connecting to the **transmission system** or to **transmission facilities** within the City of Medicine Hat where the **maximum authorized real power** is:	less than 50 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Direct access telephone service.
	equal to or greater than 50 MW and less than 300 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Satellite telephone service.
	equal to or greater than 300 MW based on the total amount of generation operated by the control room, where the total synchronous generation is less than 300 MW, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Satellite telephone service.
	equal to or greater than 300 MW based on the total amount of synchronous generation operated by the control room or is a **blackstart resource**.	(1) Utility orderwire service

*Appendix 3 does not include requirements for each **operator** of a **transmission facility**

Alberta Reliability Standard
Operating Personnel Communications Protocols
COM-002-AB-4

1. Purpose

The purpose of this **reliability standard** is to improve communications for the issuance of operating instructions[1], including **directives** with predefined communications protocols to reduce the possibility of miscommunication that could lead to action or inaction harmful to the **reliability** of the **interconnected electric system.**

2. Applicability

This **reliability standard** applies to:

(a) the **operator** of a **transmission facility**;

(b) the **operator** of a **generating unit** that has a **maximum authorized real power** greater than or equal to 5 MW;

(c) the **operator** of an **aggregated generating facility** has a **maximum authorized real power** greater than or equal to 5 MW;

(d) the **operator** of an **electric distribution system** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat**;** and

(e) the **ISO**.

3. Requirements

R1 The **ISO** and each **operator** of a **transmission facility** must develop documented communication protocols for its operating personnel that issue or receive operating instructions, including **directives**. The protocols must, at a minimum:

R1.1 require its operating personnel that issues or receives an oral or written operating instruction to use the English language;

R1.2 require its operating personnel that issues an oral two-party, person-to-person operating instruction to take one of the following actions:

(a) confirm the receiver's response if the repeated information is correct;

(b) reissue the operating instruction if the repeated information is incorrect or if requested by the receiver; or

(c) take an alternative action if a response is not received or if the operating instruction was not understood by the receiver.

R1.3 require its operating personnel that receives an oral two-party, person-to-person operating instruction to take one of the following actions:

(a) repeat, not necessarily verbatim, the operating instruction and receive confirmation from the issuer that the response was correct; or

(b) request that the issuer reissue the operating instruction;

R1.4 require its operating personnel that issues 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;

[1] For the purposes of COM-002-AB-4, "operating instruction" means a command by operating personnel responsible for the real-time operation of the **interconnected electric system** to change or preserve the state, status, output, or input of a **system element**. A **directive** is a type of an **operating instruction**. (a discussion of general information and of potential options or alternatives to resolve **interconnected electric system** operating concerns is not a command and is not considered an operating instruction.)

R1.5 specify the instances that require time identification when issuing an oral or written operating instruction and the format for that time identification; and

R1.6 specify the nomenclature for **system elements** when issuing an oral or written operating instruction.

R2 The **ISO** and each **operator** of a **transmission facility** must conduct initial training for each of its operating personnel responsible for the real-time operation of the **interconnected electric system** on the documented communications protocols developed in accordance with requirement R1 prior to that individual **operator** issuing an operating instruction, including **directives**.

R3 Each **operator** of an **electric distribution system**, **operator** of a **generating unit**, and the **operator** of an **aggregated generating facility** must conduct initial training for each of its 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, including **directives**, to either:

(a) repeat, not necessarily verbatim, the operating instruction and receive confirmation from the issuer that the response was correct; or

(b) request that the issuer reissue the operating instruction.

R4 The **ISO** and each **operator** of a **transmission facility** must at least once every 12 **months**:

R4.1 assess adherence to the documented communications protocols in requirement R1 by its operating personnel that issue or receive operating instructions, including **directives**, provide feedback to those operating personnel, and take corrective action, as deemed appropriate by the entity, to address deviations from the documented protocols; and

R4.2 assess the effectiveness of its documented communications protocols in requirement R1 for its operating personnel that issue or receive operating instructions, include **directives**, and modify its documented communication protocols, as necessary.

R5 The **ISO**, when issuing an oral two-party, person-to-person **directive**, excluding written or oral single-party to multiple-party burst **directives**, must either:

(a) confirm the receiver's response if the repeated information is correct (in accordance with requirement R6);

(b) reissue the **directive** if the repeated information is incorrect or if requested by the receiver; or

(c) take an alternative action, if a response is not received or if the **directive** was not understood by the receiver.

R6 Each **operator** of an **electric distribution system**, **operator** of a **generating unit**, **operator** of an **aggregated generating facility,** and **operator** of **transmission facility** that receives an oral two-party, person-to-person **directive**, excluding written or oral single-party to multiple-party burst **directives**, must either:

(a) repeat, not necessarily verbatim, the **directive** and receive confirmation from the issuer that the response was correct, or

(b) request that the issuer reissue the **directive**.

R7 The **ISO** that issues a written or oral single-party to multiple-party burst **directive** must confirm or verify that the **directive** was received by at least one receiver of the **directive**.

4. Measures

The following measures correspond to the requirements identified in section 3 of this **reliability standard**. For example, MR1 is the measure for requirement R1.

MR1 Evidence of having developed documented communication protocols for operating personnel that issue or receive operating instructions, including **directives** as required in requirement R1 exists. Evidence may include documented communication protocols or other equivalent evidence.

MR2 Evidence of conducting initial training for each of its operating personnel for the real-time operation of the **interconnected electric system** as required in requirement R2 exists. Evidence may include initial training records, such as dated class rosters, training certificates, lesson plans, course materials, or other equivalent evidence.

MR3 Evidence of conducting initial training for operating personnel who can receive an oral two-party, person-to-person operating instruction, including **directives** as required in requirement R3 exists. Evidence may include initial training records, such as dated class rosters, training certificates, lesson plans, course materials, or other equivalent evidence.

MR4 Evidence of assessing the adherence to and effectiveness of the documented communication protocols in requirement R1 as required in requirement R4 exists. Evidence may include documented assessments, dated **operator** logs or other evidence of feedback, corrective actions taken, modified documented communication protocols, or other equivalent evidence.

MR5 Evidence of confirming receiver's response, reissuing the **directive**, or taking an alternative action as required in requirement R5 exists. Evidence may include dated and time-stamped voice recordings, dated and time-stamped transcripts of voice recordings, dated **operator** logs, or other equivalent evidence.

MR6 Evidence of repeating the **directive** or requesting that the issuer reissue the **directive** as required in requirement R6 exists. Evidence may include dated and time-stamped voice recordings, dated and time-stamped transcripts of voice recordings, dated **operator** logs, or other equivalent evidence.

MR7 Evidence of confirming or verifying that the **directive** was received by at least one receiver as required in requirement R7 exists. Evidence may include dated and time-stamped voice recordings, dated and time-stamped transcripts of voice recordings, dated **operator** logs, or other equivalent evidence.

Revision History

Date	Description
xxxx-xx-xx	Initial release.

Alberta Reliability Standard
Operating Personnel Communications Protocols
COM-002-AB-4

1. ~~1.~~ Purpose

The purpose of this **reliability standard** is to ~~**ensure the** ISO **and entities subject to this** reliability standard **have adequate**~~improve communications ~~**and that these**~~for the issuance of operating instructions[1], including **directives** with predefined communications ~~**capabilities are staffed and available for addressing a real-time emergency condition, and**~~protocols to reduce the possibility of miscommunication that could lead to ~~**ensure communications by operating personnel are effective**~~action or inaction harmful to the **reliability** of the **interconnected electric system**.

2. ~~2.~~ Applicability

This **reliability standard** applies to:

(a) ~~(a)~~ the **operator** of a **transmission facility**;

the **operator** of a **generating unit** that ~~is:~~

~~(a)~~(b) ~~(i) directly connected~~has a **maximum authorized real power** greater than or equal to ~~the **transmission system** or to **transmission facilities** within the City of Medicine Hat; and~~5 MW;

~~(ii) not part of an **aggregated generating facility**;~~

(c) ~~(b)~~ the **operator** of an **aggregated generating facility** has a **maximum authorized real power** greater than or equal to 5 MW;

~~(b)~~(d) the **operator** of an **electric distribution system** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat**;** and

~~(c) the **operator** of a **transmission facility**; and~~

~~(d) the **ISO**.~~

~~3. 3. Requirements~~

~~**R1** The **ISO** must have voice and data communication facilities with:~~

~~(a) each **operator** of a **transmission facility**;~~

~~(b) each adjacent **interconnected transmission operator** directly connected to Alberta; and~~

~~(c) each **adjacent balancing authority** directly connected to Alberta;~~

[1] For the purposes of COM-002-AB-4, "operating instruction" means a command by operating personnel responsible for the real-time operation of the **interconnected electric system** to change or preserve the state, status, output, or input of a **system element**. A **directive** is a type of an **operating instruction**. (a discussion of general information and of potential options or alternatives to resolve **interconnected electric system** operating concerns is not a command and is not considered an operating instruction.)

Alberta Reliability Standard
Operating Personnel Communications Protocols
COM-002-AB-4

~~**R2** The **operator** of a **transmission facility** must have voice and data communication facilities with:~~

~~(a) each adjacent **operator** of a **transmission facility**;~~

~~(b) each adjacent **interconnected transmission operator** directly connected to Alberta; and~~

~~(c) the **ISO**.~~

~~**R3** Each **operator** of a **generating unit** and each **operator** of an **aggregated generating facility** must have voice and data communication facilities with:~~

~~(a) each **operator** of a **transmission facility** to which it is directly connected; and~~

~~(c)~~(e) the **ISO**.

3. ~~R4~~Requirements

R1 The **ISO**~~,~~ and each **operator** of a **transmission facility**~~,~~ must develop documented communication protocols for its operating personnel that issue or receive operating instructions, including **directives**. The protocols must, at a minimum:

R1.1 require its operating personnel that issues or receives an oral or written operating instruction to use the English language;

R1.2 require its operating personnel that issues an oral two-party, person-to-person operating instruction to take one of the following actions:

(a) confirm the receiver's response if the repeated information is correct;

(b) reissue the operating instruction if the repeated information is incorrect or if requested by the receiver; or

(c) take an alternative action if a response is not received or if the operating instruction was not understood by the receiver.

R1.3 require its operating personnel that receives an oral two-party, person-to-person operating instruction to take one of the following actions:

(a) repeat, not necessarily verbatim, the operating instruction and receive confirmation from the issuer that the response was correct; or

(b) request that the issuer reissue the operating instruction;

R1.4 require its operating personnel that issues 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;

R1.5 specify the instances that require time identification when issuing an oral or written operating instruction and the format for that time identification; and

R1.6 specify the nomenclature for **system elements** when issuing an oral or written operating instruction.

R2 The **ISO** and each **operator** of a **transmission facility** must conduct initial training for each of its operating personnel responsible for the real-time operation of the **interconnected electric system**

on the documented communications protocols developed in accordance with requirement R1 prior to that individual **operator** issuing an operating instruction, including **directives**.

R3 Each **operator** of an **electric distribution system**, **operator** of a **generating unit**, and the **operator** of an **aggregated generating facility** ~~**and each** operator **of a** generating unit **must have personnel available for all hours of the** day**, seven (7)** days **a week, to receive and respond to any voice or data communication regarding a real-time** system emergency **condition via the**~~ must conduct initial training for each of its 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, including **directives**, to either:

(a) repeat, not necessarily verbatim, the operating instruction and receive confirmation from the issuer that the response was correct; or

(b) request that the issuer reissue the operating instruction.

R4 The **ISO** and each **operator** of a **transmission facility** must at least once every 12 **months**:

R4.1 assess adherence to the documented communications protocols in requirement R1 by its operating personnel that issue or receive operating instructions, including **directives**, provide feedback to those operating personnel, and take corrective action, as deemed appropriate by the entity, to address deviations from the documented protocols; and

R4.2 assess the effectiveness of its documented communications protocols in requirement R1 for its operating personnel that issue or receive operating instructions, include **directives**, and modify its documented communication ~~**facilities as identified in requirements R1 through R3**~~protocols, as necessary.

R5 **The** ISO ~~must notify all potentially affected adjacent **interconnected transmission operators** and **adjacent balancing authorities** through predetermined communication paths:~~

~~(a) of any threat to the **reliability** of the **interconnected electric system**; or~~

~~(b) if the **ISO** anticipates shedding **firm load**.~~

~~R6 **The** ISO **must**~~, when issuing ~~**a verbal**~~an oral two-party, person-to-person **directive**, ~~**do so in a clear, concise and definitive manner, identify the instruction as a** directive**, and**~~excluding written or oral single-party to multiple-party burst **directives**, must either:

(a) ~~**if the recipient of**~~confirm the receiver's response if the repeated information is correct (in accordance with requirement R6);

(b) reissue the **directive** if the repeated information is incorrect or if requested by the receiver; or

(c) take an alternative action, if a response is not received or if the **directive** ~~**does**~~was not ~~**respond**~~understood by ~~**repeating** the **information in the**~~receiver.

R6 Each **operator** of an **electric distribution system**, **operator** of a **generating unit**, **operator** of an **aggregated generating facility,** and **operator** of **transmission facility** that receives an oral two-party, person-to-person **directive**, ~~then the **ISO**~~excluding written or oral single-party to multiple-party burst **directives**, must ~~request the recipient to~~ either:

(a) repeat ~~the information in~~, not necessarily verbatim, the **directive**~~;~~ and receive confirmation from the issuer that the response was correct, or

(b) ~~if~~request that the ~~information in the response is not correct, the **ISO** must repeat~~issuer reissue the **directive**.

R7 The **ISO** that issues a written or oral single-party to ~~resolve any misunderstandings; and~~multiple-party burst **directive** must confirm or verify that the **directive** was received by at least one receiver of the **directive**.

~~(a) if the information is repeated correctly, the **ISO** must acknowledge this to the recipient.~~

~~4.~~

4. Measures

The following measures correspond to the requirements identified in section 3 of this **reliability standard**. For example, MR1 is the measure for requirement R1.

MR1 Evidence of having ~~**voice and data**~~developed documented communication ~~**facilities**~~protocols for operating personnel that issue or receive operating instructions, including **directives** as required in requirement R1 exists. ~~-~~Evidence may include ~~**a list of**~~documented communication ~~**facilities**~~protocols or other equivalent evidence ~~**that confirms that the communications have been provided**~~.

MR2 Evidence of ~~**having voice and data communications**~~conducting initial training for each of its operating personnel for the real-time operation of the **interconnected electric system** as required in requirement R2 exists. ~~-~~Evidence may include ~~**a list of communication facilities**~~initial training records, such as dated class rosters, training certificates, lesson plans, course materials, or other equivalent evidence ~~**that confirms that the communications have been provided**~~.

MR3 Evidence of ~~**having voice and data communications**~~conducting initial training for operating personnel who can receive an oral two-party, person-to-person operating instruction, including **directives** as required in requirement R3 exists. ~~-~~Evidence may include ~~**a list of communication facilities**~~initial training records, such as dated class rosters, training certificates, lesson plans, course materials, or other equivalent evidence ~~**that confirms that the communications have been provided**~~.

~~**MR4** Evidence of having personnel available~~**MR4** Evidence of assessing the adherence to and effectiveness of the documented communication protocols in requirement R1 as required in requirement R4 exists. ~~-~~Evidence may include ~~**operator** logs, timesheets, on-call lists or shift schedules~~documented assessments, dated **operator** logs or other evidence of feedback, corrective actions taken, modified documented communication protocols, or other equivalent evidence.

MR5 Evidence of ~~notifying entities~~confirming receiver's response, reissuing the **directive**, or taking an alternative action as required in requirement R5 exists. ~~-~~Evidence may include ~~**operator** logs or~~ dated and time-stamped voice recordings, dated and time-stamped transcripts of voice recordings, dated **operator** logs, or other equivalent evidence.

MR6 Evidence of ~~issuing verbal **directives**~~repeating the **directive** or requesting that the issuer reissue the **directive** as required in requirement R6 exists. ~~-~~Evidence may include dated and time-stamped

voice recordings, dated and time-stamped transcripts of voice recordings, dated **operator** logs, or other equivalent evidence.

MR7 Evidence of confirming or verifying that the **directive** was received by at least one receiver as required in requirement R7 exists. Evidence may include dated and time-stamped voice recordings ~~or **operator** logs~~, dated and time-stamped transcripts of voice recordings, dated **operator** logs, or other equivalent evidence.

Revision History

~~Effective~~Date	Description
~~2013-10-01~~xxxx-xx-xx	Initial release.
~~2014-01-01~~	~~Administrative update to standardize formatting, definitions and drafting style.~~ ~~Removed references to the WECC Reliability Coordinator.~~

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
Purpose To establish Interpersonal Communication capabilities necessary to maintain reliability.	**Purpose** The purpose of this **reliability standard** is to ensure the **ISO** and each **operator** of a **transmission facility** have adequate and reliable voice and message telecommunication facilities internally and with others for the exchange of **interconnection** and operating information necessary to maintain reliability.	**Purpose** The purpose of this **reliability standard** is to establish voice communication capabilities necessary to maintain the reliable operation of the **interconnected electric system**.	**Alberta Variance**[1] – The AESO added "the reliable operation of the interconnected electric system" to the purpose statement to indicate the fact that the purpose of this standard is to assist in ensuring the overall reliability of the interconnected electric system in Alberta and not just the bulk electric system in Alberta. **Reason for Difference**[2] – Modified sentence by adding "The purpose of this reliability standard is to" to align with AESO drafting standards. **Reason for Difference** – Changed "alternative" to "backup" throughout the document to align with AESO drafting standards. **Reason for Difference** – Changed "Interpersonal Communication capability" to "voice communication capability" here, and throughout the document, to specify that voice communication is needed to meet the AESO's mandate to direct the operation of the interconnected electric system in a safe, reliable, and economic manner. This applies to both primary and the backup communication capability. **Reason for Difference** – added "primary" to "voice communication capability" when

[1] A "Reason for Difference" is a change from the US Reliability Standards to align with AESO terminology.
[2] An Alberta variance is a change from the US Reliability Standard that the AESO has determined is material.

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
			referring to the main communication capability for added clarity throughout the document.
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	**Applicability** This **reliability standard** applies to the following: (a) the **operator** of a **transmission facility** that is: (i) part of the **bulk electric system**; or (ii) not part of the **bulk electric system** but which the **ISO**: (A) determines is necessary for the reliable operation of either the **interconnected electric system** or the City of Medicine Hat electric system; and (B) publishes on the AESO website and may amend from time to time in accordance with the process set out in Appendix 1; and (b) the **ISO**. **Section 502.4, Applicability** **1** Section 502.4 applies to: (a) the **legal owner** of a **generating unit**; (b) the **legal owner** of an **aggregated generating facility**; (c) the **legal owner** of a **transmission facility**; (d) the **legal owner** of an **electric distribution system**;	**Applicability** This **reliability standard** applies to: (a) the **operator** of a **transmission facility**; (b) the **operator** of an **electric distribution system** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat; (c) the **operator** of a **generating unit** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW; (d) the **operator** of an **aggregated generating facility** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW; and (e) the **ISO**. For the purpose of the requirements contained herein, the above list of entities will be collectively referred to as "Responsible Entities". For requirements in this **reliability standard** where a specific entity or subset of entities are the applicable entity or entities, the entity or entities are specified	**Reason for Difference** – In Alberta, the NERC functional entity types: Transmission Operator, Distribution Provider, and Generator Operator are referred to as an operator of a transmission facility, an operator of an electric distribution system, and an operator of a generating unit or operator of an aggregated generating facility, respectively. **Reason for Difference** – In the Alberta electricity industry structure, the AESO performs the functions of the NERC functional entities Balancing Authority and the Reliability Coordinator, and some of the functions of the Transmission Operator. **Alberta Variance** – The AESO applied this standard to each operator of a transmission facility and to each operator of an electric distribution system, that is directly connected to the transmission system or to transmission facilities within the City of Medicine Hat, rather than just to those that are part of the bulk electric system to help ensure the overall reliable operation of the interconnected electric system and not just the bulk electric

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
	(e) a **pool participant**; and (f) the **ISO**.	explicitly.	system in Alberta. **Alberta Variance** – The AESO applied this standard to each operator of a generating unit and aggregated generating facility that is directly connected to the transmission system or to transmission facilities within the City of Medicine Hat and has a maximum authorized real power greater than or equal to 5 MW as these are the entities that the AESO and each operator of a transmission facility are required to communicate with during events in real time to maintain system reliability.
Effective Date	**Effective Date** 2015-05-01 **Section 502.4 Effective Date** 2015-03-27	**Effective Date** TBD (3 calendar quarters after AUC approval)	
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	**R1** The **ISO** must, as necessary to maintain reliability, provide adequate, reliable, and, where applicable, diverse and redundant voice and message telecommunication facilities for the exchange of **interconnection** and internal Alberta operating information with the following: (a) each **operator** of a **transmission facility**; (b) each adjacent **interconnected transmission operator** directly connected to Alberta; (c) each adjacent **balancing authority** directly connected to Alberta; and (d) the adjacent **reliability coordinators**.	**R1** The **ISO** must, as it determines to be necessary to maintain reliability, have primary voice communication capability to communicate with the following entities, unless the **ISO** detects a failure of its primary voice communication capability, in which case requirement R10 applies: (a) each **operator** of a **transmission facility**; (b) each **operator** of an **electric distribution system** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat; (c) each **operator** of a **generating unit** that is directly connected to the **transmission**	**Reason for Difference**: Added the word "primary" to "communication capability" to better align with AESO terminology. **Alberta Variance**: Requirement R1 was expanded for the AESO to have primary voice communication capability with entities that are not included in the NERC requirement R1, including each adjacent interconnected transmission operator, each operator of generating unit, each operator of an aggregated generating facility, and each operator of an electric distribution system in order for the AESO to meet its mandate to ensure overall reliability of the interconnected electric

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
Interconnection.	**R4** The **ISO** must provide a means to coordinate voice and message telecommunications with each **operator** of a **transmission facility**, adjacent **interconnected transmission operator**, **adjacent balancing authority** and adjacent **reliability coordinators**, which coordination must include the ability to investigate and recommend solutions to voice and message telecommunications problems within Alberta. **Section 502.4, New and Existing Systems** **2(5)** The **ISO** must have…voice communication systems in its coordination centre and other back up locations to exchange communications with the control room of any **market participant** that is required to comply with the provisions of this section 502.4. **Subsection 502.4, Dedicated Primary Direct Access Telephone and Cell Phone Connections** **5(1)** If there is a requirement under this section 502.4 for one (1) or more primary direct access telephone connections to the **ISO** coordination centre from a **market participant** control room, then the connection must be dedicated for the exclusive use of the **ISO** and the **market participant**, and must not be degraded by any other communication or data transfer activities if there is any shared equipment or functionality associated with the connection. (2) Each primary direct access telephone connection must be dedicated to the specific applicable operational function in the **ISO** coordination centre.	**system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW; (d) each operator of an **aggregated generating facility** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW; (e) each adjacent **reliability coordinator** within the **WECC**; and (f) each adjacent **interconnected transmission operator** directly connected to Alberta.	system and not just the bulk electric system in Alberta. **Reason for Difference**: Added, to requirement R1, primary interpersonal communication requirement from NERC COM-001-3 requirement R5, which requires the balancing authority to have primary voice communication capability with each adjacent balancing authority because, in the Alberta electricity industry structure, the AESO performs the function of both the reliability coordinator and the balancing authority.
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	**MR1** Evidence of providing voice and message telecommunication facilities as required in requirement R1 exists. Evidence may include: (a) a list identifying each telecommunication facility for the exchange of **interconnection** and Alberta operating information; and	**MR1** Evidence of having primary voice communication capability as required in requirement R1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice	

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
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.)	(b) documentation demonstrating the implementation of diverse routing and redundancy capability. **MR4** Evidence of providing a means to coordinate voice and message telecommunications as required in requirement R4 exists. Evidence may include a documented procedure in place which identifies a process for coordinating telecommunications and a process for investigating and recommending solutions to telecommunications problems.	recordings, or electronic communications or other equivalent evidence.	
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.	**No equivalent**	**R2** The **ISO** must designate a backup voice communication capability in each control room to communicate with the following entities: (a) each **operator** of a **transmission facility**; (b) each **operator** of an **electric distribution system** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat; (c) each **operator** of a **generating unit** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW; (d) each **operator** of an **aggregated generating facility** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat and has a **maximum authorized real power** greater than or equal to 5 MW;	**Reason for Difference:** replaced the word "alternative" with "backup" to align with AESO terminology. **Reason for Difference:** added "in each control room" to clarify that backup voice communication system is required in all control rooms. **Alberta Variance**: Requirement R2 was expanded for the AESO to designate backup voice communication systems with entities that are not included in the NERC requirement R2, including each adjacent interconnected transmission operator, each operator of generating unit and each operator of an aggregated generating facility in order to help ensure overall reliability of the interconnected electric system and not just the bulk electric system in Alberta. **Reason for Difference**: Added, to requirement R2, backup interpersonal communication requirements from NERC

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
		(e) each adjacent **reliability coordinator** within the **WECC;** and (f) each adjacent **interconnected transmission operator** directly connected to Alberta.	COM-001-3 requirement R6, which requires the balancing authority to have backup voice communication capability with each balancing authority because, in the Alberta electricity industry structure, the AESO performs the function of both the reliability coordinator and the balancing authority.
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.)	**MR2** Evidence of providing voice and message telecommunication facilities as required in requirement R2 exists. Evidence may include: (a) a list identifying each telecommunication facility for the exchange of **interconnection** and Alberta operating information; and **(b)** documentation demonstrating the implementation of diverse routing and redundancy capability, if applicable.	**MR2** Evidence of designating a backup voice communication capability as required in requirement R2 exists. Evidence may include 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 or other equivalent evidence.	
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-*	**R2** Each **operator** of a **transmission facility** must, as necessary to maintain reliability, provide adequate, reliable, and, where applicable, diversely routed and redundant voice and message telecommunication facilities for the exchange of **interconnection** and Alberta operating information with the following: (a) each adjacent **operator** of a **transmission facility**;	**R3** Each **operator** of a **transmission facility** must have primary voice communication capability to communicate with the following entities, unless the **operator** of a **transmission facility** detects a failure of its primary voice communication capability in which case requirement R10 must apply:	**Reason for Difference** – In the Alberta electricity industry structure, the AESO performs the functions of the Balancing Authority and the Reliability Coordinator, and some of the functions of the NERC Transmission Operator. Therefore, COM-001-AB-3 requirement R3 requires each operator of a transmission facility to have a

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
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.	(b) each adjacent **interconnected transmission operator** that is directly connected to Alberta; and (c) the **ISO**. **R5** Each **operator** of a **transmission facility** must provide a means to coordinate voice and message telecommunications with the **ISO** and adjacent **interconnected transmission operators**, which coordination must include the ability to investigate and recommend solutions to voice and message telecommunications problems within Alberta. **Section 502.4, Specific Requirements** **7** The more specific systems requirements are as set out in the following Table 1: Table 1 Automated Dispatch and Messaging System and Voice Communication Systems Requirements ("Table 1"). Table 1 has 2 categories of legal owner of transmission facility (7 and 8). **A. Market Participant** **7. A.** A **legal owner** of a **transmission facility**, except those who operate only radial transmission system equipment. **B. Primary Requirement:** **1.** A commercial service with primary direct access telephone connection from the control room to the **ISO** coordination centre, with the service having mute and conference call capabilities. **A. Market Participant** **8.A.** A **legal owner** of a **transmission facility** operating only radial transmission system equipment. **B. Primary Requirement**	(a) the **ISO;** (b) each adjacent **operator** of a **transmission facility** directly connected to its **transmission facility;** (c) each **operator** of an **electric distribution system** that is directly connected to its **transmission facility**; (d) each **operator** of a **generating unit** that is directly connected to its **transmission facility** and has a **maximum authorized real power** greater than or equal to 5 MW; (e) each operator of an **aggregated generating facility** that is directly connected to its **transmission facility** and has a **maximum authorized real power** greater than or equal to 5 MW; and (f) each adjacent **interconnected transmission operator** directly connected to its **transmission facility**.	backup with the AESO and not the Reliability Coordinator and Balancing Authority. **Reason for Difference** – Included maximum authorized real power threshold in requirement R3 for required primary voice communication capability with each operator of generating unit and aggregated generating facility that are directly connected to its facility. This aligns to the entities each operator of a transmission facility is required to communicate with during events in real time to maintain system reliability.

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
	1. A commercial service with primary direct access telephone connection from the control room to the **ISO** coordination centre.		
	Section 502.4, New and Existing Systems 2(4) A **market participant** in a subcategory identified in subsection 1 with a facility that has multiple control rooms must ensure that each control room is in compliance with the applicable…voice communication systems requirements of this section 502.4. *Also partially covered in requirement R7.A1 and R8.A1.* **Section 502.4 Dedicated Primary Direct Access Telephone and Cell Phone Connections** 5(1) If there is a requirement under this section 502.4 for one (1) or more primary direct access telephone connections to the **ISO** coordination centre from a **market participant** control room, then the connection must be dedicated for the exclusive use of the **ISO** and the market participant, and must not be degraded by any other communication or data transfer activities if there is any shared equipment or functionality associated with the connection. (3) Each primary direct access telephone number must be a primary number with automatic forwarding to another number if the primary number is busy or otherwise not available, and the use of voice mail is prohibited. (4) Cell phone service may be used as a primary direct access telephone connection if it satisfies the requirements of subsections 4 and 5. *Also partially covered in requirement R7.A1 and R8.A1.*	**R3.A1**[3] Each **operator** of a **transmission facility** must use primary voice communication capability that is: (a) a direct access telephone on the public telephone network; (b) not degraded by any other communication functionality or any other data transfer activities if there is any shared equipment; and (c) located at each control room.	**Alberta Variance:** This is an Alberta-specific requirement. To improve clarity, the primary voice communication requirements currently included in Section 502.4 have been moved to COM-001-AB-3 to consolidate all voice communication requirements into one AESO authoritative document. The AESO has not included some of the existing Section 502.4 prescriptive requirements for primary voice communication systems to simplify and allow for more telecommunication technologies to be used by each operator of a transmission facility. Requirement R3.A1 partially replaces the requirements outlined in subsection 2(4), 5, and Table 1 of Section 502.4.

[3] Any requirement that contains an A in the designation, such as R3.A1, is an additional **ISO** requirement that was established by the **ISO** for use in its **balancing authority area** and was not derived from a NERC COM-001-3 requirement.

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
	Section 502.4, Specific Requirements **7** Table 1 (see requirement R3 row above for additional **legal owner** of **transmission facility** primary voice communication system requirements)		
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.)	**MR2** Evidence of providing voice and message telecommunication facilities as required in requirement R2 exists. Evidence may include: (a) a list identifying each telecommunication facility for the exchange of **interconnection** and Alberta operating information; and (b) documentation demonstrating the implementation of diverse routing and redundancy capability, if applicable. **MR5** Evidence of providing a means to coordinate voice and message telecommunications as required in requirement R4 exists. Evidence may include a documented procedure in place which identifies a process for coordinating telecommunications and a process for investigating and recommending solutions to telecommunications problems.	**MR3** Evidence of having primary voice communication capability as required in requirement R3 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence. **MR3.A1** Evidence of using a primary voice communication capability as required in requirement R3.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.	
R4 Each Transmission Operator shall designate an Alternative Interpersonal Communication capability with the following entities: *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*	**Section 502.4** **Subsection 7, Table 1** (7B and 8B) transmission facility backup voice communication requirement provided in Table A below with proposed new COM-001-AB-3 Appendix 1	**R4** Each **operator** of a **transmission facility** must designate a backup voice communication capability with the following entities: (a) the **ISO**; (b) each adjacent **operator** of a **transmission facility** that is directly connected to its	**Alberta Variance**: COM-001-AB-3 Requirement R4 was expanded. Each operator of a transmission facility is required to have backup voice communication capability with entities that are not included in the NERC requirement R4, including each operator of generating

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* (“Section 502.4”)	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
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.		**transmission facility**; (c) each **operator** of an **electric distribution system** that is directly connected to its **transmission facility**; (d) each **operator** of a **generating unit** that is directly connected to its **transmission facility** and has a **maximum authorized real power** greater than or equal to 5 MW; (e) each **operator** of an **aggregated generating facility** that is directly connected to its **transmission facility** and has a **maximum authorized real power** greater than or equal to 5 MW; and (f) each adjacent **interconnected transmission operator** that is directly connected to its **transmission facility**.	unit and operator of an aggregated generating facility that is directly connected to its transmission facility. This helps maintain the reliable operation of the interconnected electric system and ensure effective restoration in the event of a severe power system outage. This is also an expansion from existing Section 502.4 requirements. Currently, there is only specific requirements for the owner of a transmission facility to have a backup voice communication capability with the AESO.
	Section 502.4 Subsection 7, Table 1 (7B and 8B) transmission facility backup voice communication requirement provided in Table A below with proposed new COM-001-AB-3 Appendix 1	**R4.A1** Each **operator** of a **transmission facility** must have the type of backup voice communication capability, at each control room**,** as identified in: (a) Appendix 1 for communicating with the **ISO**; and (b) Appendix 2 for communicating with each entity specified in requirement R4.	**Alberta Variance**: This is an Alberta-specific requirement. Requirement R4.A1 was added to ensure the type of backup voice communication capability being used by each operator of a transmission facility is reliable and compatible with other entities that it is required to maintain backup voice communication capability with. See the comparison of Section 502.4 Table 1 and Appendix 1 and Appendix 3 below for further information.
M4 Each Transmission Operator shall have and provide upon request evidence that it designated an Alternative Interpersonal Communication capability with its Reliability Coordinator, each		**MR4** Evidence of designating a backup voice communication capability as required in requirement R4 exists. Evidence may include physical assets, or dated evidence, such as, equipment specifications and installation	

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
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.)		documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence. **MR4.A 1** Evidence of having a backup voice communication capability as required in requirement R4.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.	
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.	No equivalent	**R5** Intentionally left blank.	See Requirement R1

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
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.)	No equivalent	**MR5** Intentionally left blank.	
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.	No equivalent	**R6** Intentionally left blank.	See Requirement R2

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
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.)		**MR6** Intentionally left blank.	**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.	**Section 502.4, Specific Requirements** **7** The more specific systems requirements are as set out in the following Table 1: There are 2 categories of owners of electric distribution systems (9 and 10): **A. Market Participant** 9. A **legal owner** of an **electric distribution system**. **B. Primary Requirement:** 1. A commercial service with primary direct access telephone connection from the control room to the **ISO** coordination centre. **A. Market Participant** 10. A **legal owner** of an **electric distribution system** who	**R7** Each **operator** of an **electric distribution system** must have primary voice communication capability to communicate with the following entities, unless the **operator** of an **electric distribution system** detects a failure of its primary voice communication capability in which case requirement R11 shall apply: (a) the **ISO**; and (b) the **operator** of a **transmission facility** that is directly connected to its **electric distribution system**.	**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.

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
	contributes load additions for **black start capability** process requirements. **B. Primary Requirement:** 1. A commercial service with primary direct access telephone connection from the control room to the **ISO** coordination centre.		
	Section 502.4, New and Existing Systems *2(4) provided above in R3.A1, partially covered by this requirement R7.A1, and by requirement R8.A1 below.* **Section 502.4 Dedicated Primary Direct Access Telephone and Cell Phone Connections** 5(1), (3), and (4) *provided above in R3.A1, partially covered by this requirement R7.A1, and by requirement R8.A1 below.* **Section 502.4, Specific Requirements** 7 Table 1 (see requirement R7 row above for additional legal owner of electric distribution system primary voice communication system requirements)	**R7.A1** Each **operator** of an **electric distribution system** must use a primary voice communication capability that is: (a) a direct access telephone on the public telephone network; (b) not degraded by any other communication functionality or any other data transfer activities if there is any shared equipment; and (c) located in each control room.	**Alberta Variance:** This is an Alberta-specific requirement. To improve clarity, the primary voice communication requirements currently included in Section 502.4 of the ISO rules have been moved to COM-001-AB-3 to consolidate all voice communication requirements into one AESO authoritative document. The AESO has not included some of the existing Section 502.4 prescriptive requirements for primary voice communication capability to simplify and allow for more telecommunication technologies to be used by each operator of an electric distribution system. Requirement R7.A1 partially replaces the requirements outlined in subsection 2(4), 5, and Table 1 of Section 502.4.
	Section 502.4 Subsection 7, Table 1 (9B and 10B) electric distribution system backup voice communication requirement provided in Table A and Table B below with proposed new COM-001-AB-3 Appendix 1 and 2, respectively.	**R7.A2** Each **operator** of an **electric distribution system** must have the type of backup voice communication capability, in each control room, as identified in: (a) Appendix 1 for communicating with the **ISO**; and Appendix 3 for communicating with each entity	**Alberta Variance:** This is an Alberta-specific requirement. Requirement R7.A2 was added to ensure the type of backup voice communication capability being used by each operator of an electric distribution system is compatible with other entities that it is required to have backup voice communications capability with. See the

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
		specified in requirement R7.	comparison of Section 502.4 Table 1 and Appendix 1 and Appendix 3 below for further information.
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.)		**MR7** Evidence of having primary voice communication capability as required in requirement R7 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence. **MR7.A1** Evidence of using a primary voice communication capability as required in requirement R7.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence. **MR7.A2** Evidence of having a backup voice communication capability as required in requirement R7.A2 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.	

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
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.	**Section 502.4, Specific Requirements** **7** The more specific systems requirements are as set out in the following Table 1: Table 1 has 4 categories of **legal owners** of **generating units** and **aggregated generating facilities (3, 4, 5, and 6):** **A. Market Participant** 3. A **legal owner** of a **generating unit** or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of less than or equal to 25kV. and 4. A **legal owner** of a **generating unit** or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of greater than 25kV where the aggregated electric energy output at the point of connection is less than 50 MW. **B. Primary Requirement:** 1. A commercial service with a primary direct access telephone connection from the control room to the **ISO** coordination centre. **A. Market Participant** 5. A **legal owner** of a **generating unit** or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of greater than 25 kV where the aggregated electric energy output at the point of connection is equal to or greater than 50 MW. 6. A **legal owner** of a **generating unit** providing a **black start capability** service **B. Primary Requirement** 1. A commercial service with a primary direct access telephone connection from the control room to the **ISO** coordination centre,	**R8** Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must have primary voice communication capability to communicate with the following entities, unless the **operator** of a **generating unit** or **operator** of an **aggregated generating facility** detects a failure of its primary voice communication capability in which case requirement R11 applies: (a) the **ISO**; and (b) the **operator** of a **transmission facility** that is directly connected to its **generating unit** or **aggregated generating facility**.	

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
	with the service having mute and conference call capabilities.		
	Section 502.4, New and Existing Systems *2(4) provided above in R3.A1, partially covered by this requirement R8.A1, and by requirement R7.A1 above.* **Section 502.4 Dedicated Primary Direct Access Telephone and Cell Phone Connections** 5(1), (3), and (4) *provided above in R3.A1, partially covered by this requirement R8.A1, and by requirement R7.A1 below.* **Section 502.4, Specific Requirements** 7 Table 1 (see requirement R8 row above for additional **legal owner** of **electric distribution system** primary voice communication system requirements)	**R8.A1** Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must use a primary voice communication capability that is: (a) a direct access telephone on the public telephone network; (b) not degraded by any other communication functionality or any other data transfer activities if there is any shared equipment; and (c) located in each control room.	**Alberta Variance:** This is an Alberta-specific requirement. To improve clarity the primary voice communication requirements currently included in Section 502.4 have been moved to COM-001-AB-3 to consolidate all voice communication requirements into one AESO authoritative document. The AESO has not included some of the existing Section 502.4 prescriptive requirements for primary voice communication systems to simplify and allow for more telecommunication technologies to be used by each operator of a generating unit or an aggregated generating facility. Requirement R8.A1 partially replaces the requirements outlined in subsection 2(4), 5, and Table 1 of Section 502.4.
	Section 502.4 **Subsection 7, Table 1** (3B, 4B, 5B, and 6B) **generating unit** or **aggregated generating facilities** backup voice communication requirement provided in Table A and Table B below with proposed new COM-001-AB-3 Appendix 1 and 2, respectively.	**R8.A2** Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must have the type of backup voice communication capability in each control room as identified in: (a) Appendix 1 for communicating with the **ISO**; and (b) Appendix 3 for communicating with each entity specified in requirement R8.	**Alberta Variance:** This is an Alberta-specific requirement. Requirement R8.A2 was added to ensure the type of backup voice communication capability being used by each operator of a generating unit and operator of an aggregated generating facility is compatible with other entities it is required to have backup voice communications with. See the comparison of Section 502.4 Table 1 and Appendix 1 and Appendix 3 below for further information.

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
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.)		**MR8** Evidence of having primary voice communication capability as required in requirement R8 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence. **MR8.A1** Evidence of using primary voice communication capability as required in requirement R8.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence. **MR8.A2** Evidence of having a backup voice communication capability as required in requirement R8.A2 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.	**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	**R3** The **ISO** and each **operator** of a **transmission facility** must manage and test its alternate voice and message telecommunication facilities. **Section 502.4**	**R9** The Responsible Entities must test each backup voice communication capability, as specified in Appendix 1, Appendix 2, and Appendix 3, at least once each **month**. If the test is unsuccessful, the Responsible Entity must	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

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
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]*	**Testing of Emergency and Back Up Communication Systems** **9**(1) The **ISO** must conduct tests for all emergency and back up communication systems on a reasonable basis and the testing schedule time and date must be made known reasonably in advance to the operator of a market participant whose system will be tested. (2) If the test is a success then the **ISO** will not notify the **operator**, but if the test is a failure then the **ISO** will verbally notify the **operator** of the failure no later than twenty four (24) hours after the test in completed. (3) After the **ISO** notifies the **operator** of the testing schedule, the operator must ensure that there are trained personnel available to conduct and facilitate the test at the designated date and time. (4) In accordance with the confidentiality provisions of subsection 2(1) of section 103.1 of the **ISO rules** *Confidentiality,* the **ISO** must keep confidential the name of any facility that is subject to testing, and the date and time of the tests. (5) If there is a failure of a test, then the applicable market participant or the **ISO**, depending on whose emergency and back up communication system has failed, must ensure the cause is investigated and repaired as soon as reasonably possible, but in any event the system must be repaired no later than five (5) **business days** after: (a) the date of the test failure, in the case of the **ISO**; or (b) the date of delivery of notice of the test failure, in the case of the **market participant**. (6) The **ISO** must keep a copy of any test results for no less than two (2) calendar years after the date of the test.	initiate action to repair or designate a temporary replacement backup voice communication capability within 2 hours of the unsuccessful 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	**MR3** Evidence of managing and testing its alternate voice and message telecommunication facilities as required in requirement	**MR9** Evidence of testing backup voice communication capability as required in requirement R9 exists. Evidence may include	**M9** Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall have and provide upon

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
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.)	R3 exists. Evidence may include: (a) a list identifying each telecommunication facility as determined to be alternate; (b) documented procedures describing how to manage and test its alternate telecommunication facilities; and records of testing.		dated and time-stamped test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence. Evidence of initiating action to repair or designate a replacement of backup voice communication capability, which does not utilize the same infrastructure as voice communication used for day-to-day operation, as required in requirement R9 exists. Evidence may include dated and time-stamped test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.	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]*	No equivalent	**R10** The **ISO** and each **operator** of a **transmission facility** must notify entities as identified in requirements R1 and R3, respectively within 60 minutes of the detection of a failure of its primary voice communication capability that lasts 30 minutes or longer.	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	No equivalent	**MR10** Evidence of notifying entities, within the minimum timeframe, after a detection of a failure of its primary voice communication capability as required in requirement R10 exists. Evidence may include dated and time-stamped test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent	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

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
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.)		evidence.	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]*	No equivalent	**R11** Each **operator** of an **electric distribution system**, **operator** of a **generating unit**, and **operator** of an **aggregated generating facility** that detects a failure of its primary voice communication capability must consult with each entity affected by the failure, as identified in requirement R7 for an **operator** of an **electric distribution system** or requirement R8 for an **operator** of a **generating unit** or **operator** of an **aggregated generating facility**, to determine a mutually agreeable action for the restoration of its primary voice communication capability.	**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,	No equivalent	**MR11** Evidence of consulting with each entity affected by the failure of its primary voice communication capability as required in requirement R11 exists. Evidence may include dated **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.	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

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
transcripts of voice recordings, or electronic communications.			electronic communications.
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, and/or between a Control Center and field personnel. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*	No equivalent	**R12** The **ISO** and each **operator** of a **transmission facility**, **operator** of a **generating unit**, and **operator** of an **aggregated generating facility** must have internal primary voice communication capabilities for the exchange of information necessary for the reliable operation of the **interconnected electric system**. This includes internal primary voice communication capabilities between its control rooms, and between its control rooms and field personnel.	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, and/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.	No equivalent	**MR12** Evidence of having internal primary voice communication capability as required in requirement R12 exists. Evidence may include 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 or other equivalent evidence.	**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	No equivalent	**R13** Each **operator** of an **electric distribution system** must have internal primary voice	**Alberta Variance:** Replaced "control center" with "control room" to ensure each

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4")	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
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, and/or between a control center and field personnel. *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*		communication capabilities for the exchange of information necessary for the reliable operation of the **interconnected electric system**. This includes internal primary communication capabilities between its control rooms, and between its control rooms and field personnel.	control room that control and monitor an electric distribution system are captured by this requirement.
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.	No equivalent	**MR13** Evidence of having internal primary voice communication capability as required in requirement R13 exists. Evidence may include 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 or other equivalent evidence.	
	Subsection 502.4, Mobile Satellite Telephone Service 6(1) If there is a requirement under this section 502.4 for mobile satellite network telephone service to the **ISO** from a **market participant**, then the service must be commercially available for one-to-one communications with the **ISO**. (2) If there is a requirement for such service to be available for dispatch purposes, then the service must allow for multiple party communications, including those between the **ISO** and the	**R14.A1** Each Responsible Entity must, where its backup voice communication capability is a satellite telephone service, use a satellite network system, as approved by the **ISO**.	**Reason for Difference**: This is an Alberta-specific requirement. Requirement R14.A1 was added to ensure the type of satellite network system being used by each Responsible Entity is compatible and effective with other entities they have a backup satellite network system with. This is a modified version of what is in the currently required in subsection 6 of

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* (“Section 502.4”)	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
	market participant.		Section 502.4.
		MR14.A1 Evidence of using a satellite network system as a backup voice communication capability as required in requirement R14.A1 exists. Evidence may include physical assets, dated evidence, such as, equipment specifications and installation documentation, test records, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.	
	No equivalent	**R15.A1** Each Responsible Entity must, where its backup voice communication capability is a satellite telephone service or utility orderwire service,[4] have backup voice communication equipment that remains operational for a minimum of 8 hours in the event of an extended power outage to its facilities.	No equivalent
		MR15.A1 Evidence of ensuring a backup voice communication capability complies with the minimum operation in the event of an extended power outage as required in requirement R15.A1 exists. Evidence may include dated and time-stamped records of	

[4] “utility orderwire service” means a private voice communications system that is operated and controlled by one or more **market participant** and the **ISO**. The utility orderwire service: leverages utility telecommunication network infrastructure owned by a **market participant** and the **ISO**; and may also leverage passive telecommunication infrastructure owned by a third-party.

NERC COM-001-3	Current Alberta COM-001-AB1-1.1, *Telecommunications* and, where indicated, Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* (“Section 502.4”)	Proposed New Alberta COM-001-AB-3, *Communications*	AESO Reason for Differences or Alberta Variance to NERC COM-001-3
		operations, such as, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.	
		MR15.A1 Evidence of ensuring a backup voice communication capability complies with the minimum operation in the event of an extended power outage as required in requirement R15.A1 exists. Evidence may include dated and time-stamped records of operations, such as, **operator** logs, voice recordings, transcripts of voice recordings, or electronic communications or other equivalent evidence.	

Table A: Comparison of Section 502.4, Table 1, Columns A and C & Proposed New COM-001-AB-3, Appendix 1, *Responsible Entity Requirements for Each Backup Voice Communication Capability with the ISO*

Section 502.4, subsection 7, Table 1, *Automated Dispatch and Messaging System and Voice Communication Systems Requirements*		**COM-001-AB-3, Appendix 1, *Responsible Entity Requirements for Each Backup Voice Communication Capability with the ISO***			**AESO Reason for Differences or Alberta Variance**
A. Market Participant Subcategory	**C. Emergency and Backup Requirements**	**Responsible Entity Category**	**Responsible Entity subcategory**	**Responsible Entity Backup Voice Communication Capability Options for Communicating with the ISO**	
7. A **legal owner** of a **transmission facility**, except those who operate only radial **transmission system** equipment.	One of the following additional services connecting from the control room to the **ISO** coordination centre: 1. A mobile satellite network telephone service; 2. A back up direct access telephone connection; or 3. A utility orderwire service.	Each **operator** of a **transmission facility**	that operates a **transmission facility** unless it only operates a **radial circuit**.	(1) Utility orderwire service	**Alberta Variance:** Establishing a set of specific backup voice communication capability options for Responsible Entities is necessary to ensure Responsible Entities are using effective and compatible backup voice capability to help maintain the reliable operation of the interconnected electric system and ensure effective restoration in the event of a severe power system outage. Alberta differs from other jurisdictions for the following reasons: commercial telecom systems cover a large geographical area (large telecom systems); there are many different parties involved (several operators of transmission facilities, several operators of electric distribution systems, and many operators of generating units and operators of aggregated generating facilities); the economy heavily depends on electricity (restoration delay has significant impact); there is one effective intertie (to BC) for restoration (generators are more critical); the cold weather climate
8. A **legal owner** of a **transmission facility** operating only radial **transmission system** equipment.	1. A back up direct access telephone connection from the control room to the **ISO** coordination centre.		that only operates a **radial circuit**.	(1) Utility orderwire service; (2) Satellite telephone service; or (3) Direct access telephone service.	
9. A **legal owner** of an **electric distribution system**.	None required.	Each **operator** of an **electric distribution system**		(1) Utility orderwire service; (2) Satellite telephone service; or (3) Direct access telephone service.	
10. A **legal owner** of an **electric distribution system** who contributes load additions for **black start capability** process requirements.	One of the following additional services connecting from the control room: 1. A direct access telephone connection to the **legal owner** of the **transmission facility** providing the **transmission system** connection associated with the **black start capability service**. 2. A mobile satellite network telephone service to the **ISO** coordination centre; or 3. A utility orderwire service to the **ISO** coordination centre.				
3. A **legal owner** of a **generating unit** or **aggregated generating facilities** connecting to the	None required.	Each **operator** of a **generating unit** and			

interconnected electric system at a voltage of less than or equal to 25kV.		**operator** of an **aggregated generating facility** connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat where the **maximum authorized real power** is			(restoration delays impact personal safety); and there is an existing utility telecommunication network that can be leveraged to ensure effective and reliable telecommunications with critical facilities during normal system operations and in the event of a severe power system outage. Control rooms that operate more than 300 MW of synchronous generation and blackstart resources are critical during restoration events, as well as control rooms that operate a transmission facility, unless it only operates a radial circuit. As a result, utility orderwire service is the only option available for these control rooms. Utility orderwire service is: quick and effective dialing with dial tone; has support for multiple lines and handsets; has clear voice quality with no latency; has known extended power capabilities and system alarming; and specifically designed for power system operation. Satellite telephone service and commercial phones with enhanced performance are the most common backup systems: Satellite telephone service is preferred over commercial phones because they rely on completely independent infrastructure. As a
4. A **legal owner** of a **generating unit** or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of greater than 25kV where the aggregated electric energy output at the point of connection is less than 50 MW.	A back up direct access telephone connection from the control room to the **ISO** coordination centre.		less than 50 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Direct access telephone service.	
5. A **legal owner** of a **generating unit** or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of greater than 25 kV where the aggregated electric energy output at the point of connection is equal to or greater than 50 MW.	One of the following additional services connecting from the control room: 1. A direct access telephone connection to the control room of the **legal owner** of the **transmission facility** providing the **interconnected electric system** connection; 2. A mobile satellite telephone service to the **ISO** coordination centre; 3. A back up direct access telephone connection to the **ISO** coordination centre; or 4. A utility orderwire service to the **ISO** coordination centre.		equal to or greater than 50 MW and less than 300 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Satellite telephone service.	
			equal to or greater than 300 MW based on the total amount of generation operated by the control room, where the total synchronous generation is less than 300 MW, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Satellite telephone service.	
6. A **legal owner** of a **generating unit** providing a **black start capability service**	One of the following additional services connecting from the control room: 1. A direct access telephone connection from the control room to the operations room of the **legal owner** of the **transmission facility** providing the **interconnected electric system** connection; 2. A back up direct access dedicated commercial telephone connection from the control room to the **ISO** coordination centre; or 3. A utility orderwire service from the control room to the **ISO** coordination centre.		equal to or greater than 300 MW based on the total amount of synchronous generation operated by the control room or a **blackstart resource**.	(1) Utility orderwire service	

					result, these are preferred for generation control rooms that control greater than or equal to 50 MW and less than 300 MW of generation. Commercial backup is acceptable for control rooms that control greater than or equal to 5 MW and less than 50 MW of generation. (this rationale is applicable to Appendix 2)

Table B: Comparison of Section 502.4, Table 1, Columns A and C & Proposed New COM-001-AB-3, Appendix 2
Operator of a Transmission Facility Requirements for Each Backup Voice Communication Capability with Adjacent Entities and Entities that are Directly Connected to Its Transmission Facility

Section 502.4, subsection 7, Table 1, *Automated Dispatch and Messaging System and Voice Communication Systems Requirements*		**COM-001-AB-3, Appendix 2, *Operator of a Transmission Facility Requirements for Each Backup Voice Communication Capability with Adjacent Entities and Entities that are Directly Connected to Its Transmission Facility***		
A. Market Participant Subcategory	**C. Emergency and Backup Requirements**	**Entity**	**Entity Subcategory Responsible Entity Backup Voice Communication Capability Options for Communicating with the ISO**	**Operator of a Transmission Facility Backup Voice Communication Capability Options for Communicating with Each Entity**
No equivalent requirement	No equivalent	Each adjacent **operator** of a **transmission facility** that is directly connected to its **transmission facility**	that operates a **transmission facility** unless it only connects through a **radial circuit**.	(1) Utility orderwire service; or (2) An **operator** of a **transmission facility** that only operates a **radial circuit** may use satellite telephone service or direct access telephone service.
			that only operates a **radial circuit**.	(1) Utility orderwire service; (2) Satellite telephone service; or (3) Direct access telephone service.
		Each **operator** of an **electric distribution system** that it is directly connected to its **transmission facility**		(1) Utility orderwire service; (2) Satellite telephone service; or (3) An **operator** of **electric distribution system** connected only to a substation that is part of a **radial circuit** may use direct access telephone service
		Each **operator** of a **generating unit** or **aggregated generating facility** that is directly connected to its **transmission facility** where the **maximum authorized real power** is:	Equal to or greater than 5 MW and less than 50 MW based on the total amount of generation controlled by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**;	(1) Utility orderwire service; or (2) Direct access telephone service.
			equal to or greater than 50 MW and less than 300 MW based on the total amount of generation controlled by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**;	(1) Utility orderwire service; or (2) Satellite telephone service.
			equal to or greater than 300 MW based on the total amount of generation controlled by the control room, where the total synchronous generation is less than 300 MW, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**; and	(1) Utility orderwire service; or (2) Satellite telephone service.
			equal to or greater than 300 MW based on the total amount of synchronous generation controlled by the control room or a **blackstart resource**.	(1) Utility orderwire service

		Each adjacent **interconnected transmission operator** that is directly connected to its **transmission facility**		(1) Utility orderwire service; or (2) Satellite telephone service.

Table C: Comparison of Section 502.4, Table 1, Columns A and C & Proposed New COM-001-AB-3, Appendix 3 Operator of an Electric Distribution System, Operator of a Generating Unit, and Operator of an Aggregated Generating Facility Requirements for Each Backup Voice Communication Capability with Operator of Transmission Facility that is directly connected to its electric distribution system, generating unit, or aggregated generating facility*

Section 502.4, subsection 7, Table 1, *Automated Dispatch and Messaging System and Voice Communication Systems Requirements*		**COM-001-AB-3, Appendix 3, *Operator of an Electric Distribution System, Operator of a Generating Unit, and Operator of an Aggregated Generating Facility Requirements for its Backup Voice Communication Capability with Operator of Transmission Facility That is Directly Connected to its Electric Distribution System, Generating Unit, or Aggregated Generating Facility***			**AESO Reason for Differences or Alberta Variance**
A. Market Participant Subcategory	**C. Emergency and Backup Requirements**	**Responsible Entity Category**	**Responsible Entity Subcategory**	**Responsible Entity Backup Voice Communication Capability Options for Communicating with the Adjacent Operator of a Transmission Facility**	
9. A **legal owner** of an **electric distribution system**.	None required.	Each **operator** of an **electric distribution system**		(1) Utility orderwire service; (2) Satellite telephone service; or (3) An **operator** of **electric distribution system** connected only to a substation that is part of a **radial circuit** may use direct access telephone service.	**Alberta Variance:** For the same reasons as provided in Appendix 1, backup voice communication capability options are specified to ensure effective and reliable telecommunications between critical facilities during normal system operations and in the event of a severe power system outage.
10. A **legal owner** of an **electric distribution system** who contributes load additions for **black start capability** process requirements.	One of the following additional services connecting from the control room: 1. A direct access telephone connection to the **legal owner** of the **transmission facility** providing the **transmission system** connection associated with the **black start capability service**. 2. A mobile satellite network telephone service to the **ISO** coordination centre; or. 3. A utility orderwire service to the **ISO** coordination centre.				
3. A **legal owner** of a **generating unit** or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of less than or equal to 25kV.	None required.				
4. A **legal owner** of a	A back up direct access telephone	Each **operator** of a **generating**	less than 50 MW based on	(1) Utility orderwire service; or	

generating unit or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of greater than 25kV where the aggregated electric energy output at the point of connection is less than 50 MW.	connection from the control room to the **ISO** coordination centre.	**unit** and each **operator** of an **aggregated generating facility** connecting to the **transmission system** or to **transmission facilities** within the City of Medicine Hat where the **maximum authorized real power** is:	the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(2) Direct access telephone service.	
5. A **legal owner** of a **generating unit** or **aggregated generating facilities** connecting to the **interconnected electric system** at a voltage of greater than 25 kV where the aggregated electric energy output at the point of connection is equal to or greater than 50 MW.	One of the following additional services connecting from the control room: 1. A direct access telephone connection to the control room of the **legal owner** of the **transmission facility** providing the **interconnected electric system** connection; 2. A mobile satellite telephone service to the **ISO** coordination centre; 3. A back up direct access telephone connection to the **ISO** coordination centre; or 4. A utility orderwire service to the **ISO** coordination centre.		equal to or greater than 50 MW and less than 300 MW based on the total amount of generation operated by the control room, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Satellite telephone service.	
			equal to or greater than 300 MW based on the total amount of generation operated by the control room, where the total synchronous generation is less than 300 MW, unless the **generating unit** or **aggregated generating facility** is a **blackstart resource**.	(1) Utility orderwire service; or (2) Satellite telephone service.	
6. A **legal owner** of a **generating unit** providing a **black start capability service**	One of the following additional services connecting from the control room: 1. A direct access telephone connection from the control room to the operations room of the **legal owner** of the **transmission facility** providing the **interconnected**		equal to or greater than 300 MW based on the total amount of synchronous generation operated by the control room or is a **blackstart resource**.	(1) Utility orderwire service	

	electric system connection; 2. A back up direct access dedicated commercial telephone connection from the control room to the **ISO** coordination centre; or 3. A utility orderwire service from the control room to the **ISO** coordination centre.				

*Appendix 3 does not include requirements for each **operator** of a **transmission facility**

Table D: Existing COM-001-AB-1.1 requirements that were modified and moved to a different authoritative document and rationale

Requirement	Modified and Moved to
R6 The **ISO** and each **operator** of a **transmission facility** must use the English language for all communications between their respective operating personnel responsible for the real-time generation control and operation of the **interconnected electric system**. **MR6** Evidence of using the English language as required in requirement R6 exists. Evidence may include **operator** logs, voice recordings, electronic communications or **e-tag** records.	**Proposed COM-002-AB-4 in alignment with NERC COM-002-AB-4.** R1 The **ISO** and the **operator** of a **transmission facility** must develop documented communication protocols for its operating personnel that issue or receive operating instructions, including **directives**. The protocol must, at a minimum: R1.1 require its operating personnel that issue or receives an oral or written operating instruction to use the English language; MR1 Evidence of having developed documented communication protocols for operating personnel that issue or receive operating instructions, including **directives** as required in requirement R1 exists. Evidence may include documented communication protocols or other equivalent evidence.
R7 The **ISO** and each **operator** of a **transmission facility** must have written operating instructions and procedures to enable continued operation of the **interconnected electric system** during the loss of voice and message telecommunications facilities. **MR7** Evidence of having written operating instructions and procedures as required in requirement R7 exists. Evidence may include electronic or hard copy of the operating instructions and procedures.	This was requirement R5 in NERC COM-001-1 and retired in NERC COM-001-2. NERC stated, “The RC SDT proposes retiring COM-001-1.1, Requirement R5 as it is redundant with EOP-008-0, Requirement R1…”

Table E: Section 502.4 voice communication requirements that are not moving to COM-001 or are being retired and rationale for retirement

Section 502.4 Subsection	Rationale
1 Section 502.4 applies to:… **(c)** a **pool participant** **Related subsection 7 Table 1, rows 1 to 2 (**1. A **pool participant** who may receive an energy market **dispatch** or a **directive**; 2. A **pool participant** who may receive an **ancillary service dispatch** or a **directive.**)	The requirements regarding pool participant communication with the AESO remain in Section 502.4, however the requirements have been modified. Please see proposed amended Section 502.4 for further information.
New and Existing Systems **2(1)** On and after June 1, 2011, a **market participant** with any new facility which is to be directly connected to the **interconnected electric system** must comply with the applicable minimum ….voice communication systems requirements of this section 502.4. **2(2)** Subject to subsection 2(3), the provisions of this section 502.4 do not apply to any…voice communication systems in existence as of June 1, 2011, but those systems must remain in compliance with the technical specifications and operational requirements which were in effect as of the original date of the commencement of the systems' operation, including those in Appendix 1. **(3)** The **ISO** may require a **market participant** to comply with any specific or all of the…voice communication systems requirements of this section 502.4, if the **ISO** determines that such compliance is critical for the safe and reliable operation of the **interconnected electric system.**	Retired. Subsection 2(1) and 2(2) relate to legacy treatment. Responsible Entities that operate existing facilities, or have plans to operate a new facilities, and would like to request a waiver or variance to any proposed new COM-001-AB-3 requirement can submit a request pursuant to reliability standard ADM-002-AB-1, *Waivers and Variances.* Retired. Subsection 2(3) is unnecessary as the AESO does not see a need for voice communication, above and beyond what is prescribed in proposed new COM-001-AB-3.
Successor to Prior Requirements **3** Subject to subsection 2, this section 502.4 succeeds the *Operational Voice Communications Standard* in effect as of September 7, 2005, and the prior standard or any drafts of it no longer will be in force and effect as of June 1, 2011.	Retired. Subsection 3 is no longer needed. Section 502.4 has been in effect for 10 years.
4(1) All…and voice communication systems under this section 502.4 must be continuously operational twenty four (24) hours a day, seven (7) days a week. **(2)** Those systems must be maintained and serviced generally in accordance with **good electric industry practice** to ensure they are continuously operational.	The intent remains in Section 502.4; however, it has been modified to clarify that **pool participants** must be available 24/7 to respond to dispatches or directives, and related phone calls from the AESO.
8 Each applicable **market participant** and the **ISO** must use the specified [in Table 1] emergency and back up communication systems when there is an event that causes a primary communication system to be materially disrupted or impaired, including an event such as: **(a)** a real time system emergency condition, as may be referenced in any reliability standard; or **(b)** a disturbance or interruption of service by any provider of a primary communications system service.	It is not necessary to explicitly specify when emergency and backup communication systems should be used.
Loss of Emergency and Back Up Communication Systems 10(1) If either the **ISO** or a **market participant** experiences a material disruption or complete loss of any	The AESO is of the view that this requirement is not needed. Failure of a backup voice communication system is typically observed during testing. Therefore, requirement R9 of COM-001-AB-3 is sufficient.

emergency and back up communication systems at a point in time other than during a test period, then verbal notice must be given by: (a) the **ISO** to all affected **market participants**, if the **ISO** suffers the disruption of loss; or (b) the applicable **market participant** to the **ISO**, if the **market participant** suffers the disruption or loss. (2) The **market participant** that experiences the disruption or loss must investigate and repair it as soon as reasonably possible, but in any event no later than five (5) business days after the date of the discovery of the cause of the disruption or loss.	

NERC COM-002-4	Alberta COM-002-AB-4 (proposed)	AESO Reason for Difference and Alberta Variances
Purpose To improve communications for the issuance of Operating Instructions with predefined communications protocols to reduce the possibility of miscommunication that could lead to action or inaction harmful to the reliability of the Bulk Electric System (BES).	**Purpose** The purpose of this **reliability standard** is to improve communications for the issuance of operating instructions[1], including **directives** with predefined communications protocols to reduce the possibility of miscommunication that could lead to action or inaction harmful to the **reliability** of the **interconnected electric system.**	**Note:** NERC COM-002-4 is fundamentally and extensively different than NERC COM-002-2a. Consequently, it was decided to leave the previous version of COM-002-AB1-2a, which aligned with NERC COM-002-2a, out of this comparison matrix. The proposed new COM-002-AB-4 aligns with the NERC COM-002-4. For further information regarding the changes between NERC COM-002-2a and NERC COM-002-4, please see the blacklined version of the standard on PDF page 90 of the NERC's FERC filing document. **Reason for Difference:**[2] NERC's definition of the term Operating Instruction includes what the AESO defines as directives. To ensure clarity, the AESO is proposing to replace "Operating Instructions" with "operating instructions, including **directives**" as defined in the AESO's *Consolidated Authoritative Document Glossary*. Because the term operating instructions is currently only used in COM-002-AB-4. The AESO is proposing to add a footnote that defines the term using AESO terminology.
Applicability **4.1. Functional Entities** **4.1.1** Balancing Authority **4.1.2** Distribution Provider **4.1.3** Reliability Coordinator **4.1.4** Transmission Operator	**Applicability** This **reliability standard** applies to: (a) the **operator** of a **transmission facility**; (b) the **operator** of a **generating unit** that has a **maximum authorized real power** greater than or equal to 5 MW;	**Reason for Difference:** In Alberta, the operator of an electric distribution system performs the function of receiving operating instructions that are received by Distribution Providers, as defined by NERC.

[1] For the purposes of COM-002-AB-4, "operating instruction" means a command by operating personnel responsible for the real-time operation of the **interconnected electric system** to change or preserve the state, status, output, or input of a **system element**. A **directive** is a type of an **operating instruction**. (a discussion of general information and of potential options or alternatives to resolve **interconnected electric system** operating concerns is not a command and is not considered an operating instruction.)

[2] A "Reason for Difference" is a change from the US Reliability Standards to align with AESO terminology.

NERC COM-002-4	Alberta COM-002-AB-4 (proposed)	AESO Reason for Difference and Alberta Variances
4.1.5 Generator Operator	(c) the **operator** of an **aggregated generating facility** has a **maximum authorized real power** greater than or equal to 5 MW; (d) the **operator** of an **electric distribution system** that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat**;** and (e) the **ISO**.	**Alberta Variance**[3]: the AESO applied this standard to the operators of transmission facilities, to generating units and aggregated generating facilities with a maximum authorized real power greater than or equal to 5 MW, and to operators of electric distribution systems, that are directly connected to the transmission system or to transmission facilities within the City of Medicine Hat, rather than just to those that are part of the bulk electric system to help ensure the overall reliable operation of the interconnected electric system and not just the bulk electric system in Alberta. **Reason for Difference:** In Alberta, the ISO performs the duties of the Balancing Authority and the Reliability Coordinator, and some duties of the Transmission Operator, as defined by NERC; therefore, the ISO replaces Balancing Authority and Reliability Coordinator throughout the standard.
Effective Date: July 1, 2016 The standard shall become effective on the first day of the first calendar quarter that is twelve (12) months after the date that the standard is approved by an applicable governmental authority or as otherwise provided for in a jurisdiction where approval by an applicable governmental authority is required for a standard to go into effect. Where approval by an applicable governmental authority is not required, the standard shall become effective on the first day of the first calendar quarter that is twelve (12) months	**Effective Date** The first day of the calendar quarter that follows three full calendar quarters after approval by the Commission.	**Alberta Variance:** To align with effective date of reliability standard COM-001-AB-3, *Communications*, and Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System.*

[3] An Alberta variance is a change from the US Reliability Standard that the AESO has determined is material.

NERC COM-002-4	Alberta COM-002-AB-4 (proposed)	AESO Reason for Difference and Alberta Variances
after the date the standard is adopted by the NERC Board of Trustees or as otherwise provided for in that jurisdiction.		
R1. Each Balancing Authority, Reliability Coordinator, and Transmission Operator shall develop documented communications protocols for its operating personnel that issue and receive Operating Instructions. The protocols shall, at a minimum: **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. **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 or if requested by the receiver. • Take an alternative action if a response is not received or if the Operating Instruction was not understood by the receiver. **1.3.** Require its operating personnel that receive an oral two-party, person-to-person Operating Instruction to take one of the following actions: • Repeat, not necessarily verbatim, the Operating Instruction and receive confirmation from the issuer that the response was correct. • Request that the issuer reissue the Operating Instruction.	**R1** The **ISO** and each **operator** of a **transmission facility** must develop documented communication protocols for its operating personnel that issue or receive operating instructions, including **directives**. The protocols must, at a minimum: **R1.1** require its operating personnel that issues or receives an oral or written operating instruction to use the English language; **R1.2** require its operating personnel that issues an oral two-party, person-to-person operating instruction to take one of the following actions: (a) confirm the receiver's response if the repeated information is correct; (b) reissue the operating instruction if the repeated information is incorrect or if requested by the receiver; or (c) take an alternative action if a response is not received or if the operating instruction was not understood by the receiver. **R1.3** require its operating personnel that receives an oral two-party, person-to-person operating instruction to take one of the following actions: (a) repeat, not necessarily verbatim, the operating instruction and receive confirmation from the issuer that the response was correct; or (b) request that the issuer reissue the operating instruction;	**Alberta Variance:** The phrase "issue and receive" has been modified to "issue or receive" to clarify that the requirement applies when both the operating instructions are issued or when they are received. **Alberta Variance:** No exception will be given for the issuing or receiving of oral or written instruction or directive in English as English is the only language used for operator-to-operator communication in the Alberta electric industry. Recordings of these communications need to be understood by all relevant entities in Alberta.

NERC COM-002-4	Alberta COM-002-AB-4 (proposed)	AESO Reason for Difference and Alberta Variances
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. **1.5.** Specify the instances that require time identification when issuing an oral or written Operating Instruction and the format for that time identification. **1.6.** Specify the nomenclature for Transmission interface Elements and Transmission interface Facilities when issuing an oral or written Operating Instruction.	**R1.4** require its operating personnel that issues 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; **R1.5** specify the instances that require time identification when issuing an oral or written operating instruction and the format for that time identification; and **R1.6** specify the nomenclature for **system elements** when issuing an oral or written operating instruction.	**Alberta Variance**: For operating instructions, the nomenclature must be specified for all system elements when issuing an operating instruction, including **directives**, not just when referring to interface elements and facilities between two operating entities.
M1. Each Balancing Authority, Reliability Coordinator, and Transmission Operator shall provide its documented communications protocols developed for Requirement R1.	**MR1** Evidence of having developed documented communication protocols for operating personnel that issue or receive operating instructions, including **directives** as required in requirement R1 exists. Evidence may include documented communication protocols or other equivalent evidence.	
R2. Each Balancing Authority, Reliability Coordinator, and Transmission Operator shall conduct initial training for each of its operating personnel responsible for the Real-time operation of the interconnected Bulk Electric System on the documented communications protocols developed in Requirement R1 prior to that individual operator issuing an Operating Instruction. *[Violation Risk Factor: Low][Time Horizon: Long-term Planning]*	**R2** The **ISO** and each **operator** of a **transmission facility** must conduct initial training for each of its operating personnel responsible for the real-time operation of the **interconnected electric system** on the documented communications protocols developed in accordance with requirement R1 prior to that individual **operator** issuing an operating instruction, including **directives**.	**Alberta Variance:** The requirement is expanded to ensure the reliability of the real-time operation of the interconnected electric system, not just the bulk electric system, which aligns with the AESO's mandate to ensure the overall reliable operation of the interconnected electric system and not just the bulk electric system in Alberta.

NERC COM-002-4	Alberta COM-002-AB-4 (proposed)	AESO Reason for Difference and Alberta Variances
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.	**MR2** Evidence of conducting initial training for each of its operating personnel for the real-time operation of the **interconnected electric system** as required in requirement R2 exists. Evidence may include initial training records, such as dated class rosters, training certificates, lesson plans, course materials, or other equivalent evidence.	
R3. Each Distribution Provider and Generator Operator shall conduct initial training for each of its 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 to either: *[Violation Risk Factor: Low][Time Horizon: Long-term Planning]* • 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.	**R3** Each **operator** of an **electric distribution system**, **operator** of a **generating unit**, and the **operator** of an **aggregated generating facility** must conduct initial training for each of its 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, including **directives**, to either: (a) repeat, not necessarily verbatim, the operating instruction and receive confirmation from the issuer that the response was correct; or (b) request that the issuer reissue the operating instruction.	
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.	**MR3** Evidence of conducting initial training for operating personnel who can receive an oral two-party, person-to-person operating instruction, including **directives** as required in requirement R3 exists. Evidence may include initial training records, such as dated class rosters, training certificates, lesson plans, course materials, or other equivalent evidence.	

NERC COM-002-4	Alberta COM-002-AB-4 (proposed)	AESO Reason for Difference and Alberta Variances
R4. Each Balancing Authority, Reliability Coordinator, and Transmission Operator shall at least once every twelve (12) calendar months: *[Violation Risk Factor: Medium][Time Horizon: Operations Planning]* **4.1.** Assess adherence to the documented communications protocols in Requirement R1 by its operating personnel that issue and receive Operating Instructions, provide feedback to those operating personnel and take corrective action, as deemed appropriate by the entity, to address deviations from the documented protocols. **4.2.** Assess the effectiveness of its documented communications protocols in Requirement R1 for its operating personnel that issue and receive Operating Instructions and modify its documented communication protocols, as necessary.	**R4** The **ISO** and each **operator** of a **transmission facility** must at least once every 12 **months**: **R4.1** assess adherence to the documented communications protocols in requirement R1 by its operating personnel that issue or receive operating instructions, including **directives**, provide feedback to those operating personnel, and take corrective action, as deemed appropriate by the entity, to address deviations from the documented protocols; and **R4.2** assess the effectiveness of its documented communications protocols in requirement R1 for its operating personnel that issue or receive operating instructions, include **directives**, and modify its documented communication protocols, as necessary.	**Reason for Difference**: The term “month” is defined as a “calendar month” in the *Consolidated Authoritative Document Glossary*.
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.	**MR4** Evidence of assessing the adherence to and effectiveness of the documented communication protocols in requirement R1 as required in requirement R4 exists. Evidence may include documented assessments, dated **operator** logs or other evidence of feedback, corrective actions taken, modified documented communication protocols, or other equivalent evidence.	

NERC COM-002-4	Alberta COM-002-AB-4 (proposed)	AESO Reason for Difference and Alberta Variances
R5. Each Balancing Authority, Reliability Coordinator, and Transmission Operator that issues an oral two-party, person-to-person Operating Instruction during an Emergency, excluding written or oral single-party to multiple-party burst Operating Instructions, shall either: *[Violation Risk Factor: High][Time Horizon: Real-time Operations]* • Confirm the receiver's response if the repeated information is correct (in accordance with Requirement R6). • Reissue the Operating Instruction if the repeated information is incorrect or if requested by the receiver, or • Take an alternative action if a response is not received or if the Operating Instruction was not understood by the receiver.	**R5** The **ISO**, when issuing an oral two-party, person-to-person **directive**, excluding written or oral single-party to multiple-party burst **directives**, must either: (a) confirm the receiver's response if the repeated information is correct (in accordance with requirement R6); (b) reissue the **directive** if the repeated information is incorrect or if requested by the receiver; or (c) take an alternative action, if a response is not received or if the **directive** was not understood by the receiver.	**Reason for Difference**: Replaced "operating instructions" with only "directives" to simplify this requirement and to better align with the intent of NERC's requirement, which is for operating instructions given during an Emergency. NERC defines Emergency as: *Any abnormal system condition that requires automatic or immediate manual action to prevent or limit the failure of transmission facilities or generation supply that could adversely affect the reliability of the Bulk Electric System.* The AESO generally issues directives when in situations that NERC defines as an Emergency. Because, as defined in the AESO's *Consolidated Authoritative Document Glossary*, directives are only issued by the ISO, this requirement is only applicable to the ISO. For ease of reference, "directive" means a direction the ISO gives to a market participant instructing the market participant to take any action the ISO deems necessary to maintain the reliability of the interconnected electric system.
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	**MR5** Evidence of confirming receiver's response, reissuing the **directive**, or taking an alternative action as required in requirement R5 exists. Evidence may include dated and time-stamped voice recordings, dated and time-stamped transcripts of voice recordings, dated **operator** logs, or other equivalent evidence.	

NERC COM-002-4	Alberta COM-002-AB-4 (proposed)	AESO Reason for Difference and Alberta Variances
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.		
R6. Each Balancing Authority, Distribution Provider, Generator Operator, and Transmission Operator that receives an oral two-party, person-to-person Operating Instruction during an Emergency, excluding written or oral single-party to multiple-party burst Operating Instructions, shall either: *[Violation Risk Factor: High][Time Horizon: Real-time Operations]* □ 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.	**R6** Each **operator** of an **electric distribution system**, **operator** of a **generating unit**, **operator** of an **aggregated generating facility,** and **operator** of **transmission facility** that receives an oral two-party, person-to-person **directive**, excluding written or oral single-party to multiple-party burst **directives**, must either: (a) repeat, not necessarily verbatim, the **directive** and receive confirmation from the issuer that the response was correct, or (b) request that the issuer reissue the **directive**.	**Alberta Variance:** The ISO has been removed from this requirement because it only issues directives.
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.	**MR6** Evidence of repeating the **directive** or requesting that the issuer reissue the **directive** as required in requirement R6 exists. Evidence may include dated and time-stamped voice recordings, dated and time-stamped transcripts of voice recordings, dated **operator** logs, or other equivalent evidence.	

NERC COM-002-4	Alberta COM-002-AB-4 (proposed)	AESO Reason for Difference and Alberta Variances
R7. Each Balancing Authority, Reliability Coordinator, and Transmission Operator that issues a written or oral single-party to multiple-party burst Operating Instruction during an Emergency shall confirm or verify that the Operating Instruction was received by at least one receiver of the Operating Instruction. *[Violation Risk Factor: High][Time Horizon: Real-time Operations]*	**R7.** The **ISO** that issues a written or oral single-party to multiple-party burst **directive** must confirm or verify that the **directive** was received by at least one receiver of the **directive**.	**Alberta Variance:** As described above, the ISO is the only entity that issues directives.
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.	**MR7** Evidence of confirming or verifying that the **directive** was received by at least one receiver as required in requirement R7 exists. Evidence may include dated and time-stamped voice recordings, dated and time-stamped transcripts of voice recordings, dated **operator** logs, or other equivalent evidence.	
Compliance To view the compliance section D of the NERC reliability standard follow this link: http://www.nerc.com/pa/Stand/Reliability%20Standards/COM-002-4.pdf		
Regional Differences None identified.		

NERC COM-002-4	Alberta COM-002-AB-4 (proposed)	AESO Reason for Difference and Alberta Variances
Definition: **Operating Instruction** — 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.)	Defined in footnote 1: “operating instruction” means a command by operating personnel responsible for the real-time operation of the **interconnected electric system** to change or preserve the state, status, output, or input of a **system element**. A **directive** is a type of an **operating instruction**. (a discussion of general information and of potential options or alternatives to resolve **interconnected electric system** operating concerns is not a command and is not considered an operating instruction.)”	**Alberta Variance:** The AESO will define this term as a footnote to mean the following: “operating instruction” means a command by operating personnel responsible for the real-time operation of the **interconnected electric system** to change or preserve the state, status, output, or input of a **system element.** A **directive** is a type of an **operating instruction**. (a discussion of general information and of potential options or alternatives to resolve **interconnected electric system** operating concerns is not a command and is not considered an operating instruction.)

DRAFT Information Document Content Automated Dispatch and Messaging System Requirements ID #2017-006R

Information documents are not authoritative. Information documents are for information purposes only and are intended to provide guidance. In the event of any discrepancy between an information document and any authoritative document[1] in effect, the authoritative document governs.

1 Purpose

This information document relates to the following authoritative document:

- Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System Requirements* ("Section 502.4").

The purpose of this information document is to provide general information relating to the Automated Dispatch and Messaging System requirements.

2 Ancillary Services that are Dispatched through the Automated Dispatch and Messaging System

As referenced in the applicability section of Section 502.4, the AESO dispatches or directs the following ancillary services through the Automated Dispatch and Messaging System:

(a) spinning reserve;

(b) supplemental reserve;

(c) regulating reserve; and

(d) transmission must run.

Revision History

Posting Date	Description of Changes
TBD	Updated to align with changes to Section 502.4. Added list of ancillary services dispatched and directed through the ISO's Automated Dispatch and Messaging System for added clarity.
2017-05-30	Initial release.

[1] "Authoritative Documents" is the general name given by the AESO to categories of documents made by the AESO under the authority of the *Electric Utilities Act* and regulations, and that contain binding legal requirements for either market participants or the AESO, or both. AESO Authoritative Documents include: the ISO rules, the Alberta reliability standards, and the ISO tariff.

DRAFT Information Document Content Communications ID #2012-001RS

Information documents are not authoritative. Information documents are for information purposes only and are intended to provide guidance. In the event of any discrepancy between an information document and any authoritative document[1] in effect, the authoritative document governs.

1 Purpose

This information document relates to the following authoritative document:

- reliability standard COM-001-AB-3, *Communications* ("COM-001-AB-3")

The purpose of this information document is to provide stakeholders with clarification on COM-001-AB-3.

2 Control Room (R2, R3.A1, R4.A1, R7.A1, R7.A2, R8.A1, R8.A2, R12, and R13)[2]

The obligation of each Responsible Entity to have primary and backup voice communication capability in each control room is repeated in several requirements in COM-001-AB-3.[3] This section clarifies the meaning of control room for the purposes of COM-001-AB-3.

2.1 Control Rooms for Each Operator of a Transmission Facility and Operator of an Electric Distribution System

The AESO considers a control room for an operator of a transmission facility and operator of an electric distribution system to be:

(a) a designated area that hosts operating personnel to monitor and control a transmission facility or an electric distribution system in real-time to perform reliability tasks;

(b) used for normal and emergency operating conditions; and

(c) generally remote to the transmission facility or the electric distribution system.

2.2 Control Room for Each Operator of a Generating Unit and Operator of an Aggregated Generating Facility

The AESO considers a control room for each operator of a generating unit and operator of an aggregated generating facility to be:

(a) a designated area that hosts operating personnel to monitor and control one or more generating unit or aggregated generating facility in real-time;

(b) used for one or both of normal and emergency operating conditions; and

(c) either local or remote to the generating unit or aggregated generating facility.

3 Primary Voice Communication Capability (R3.A1, R7.A1, and R8.A1)

Requirements R3.A1, R7.A1, and R8.A1 of COM-001-AB-3 sets out primary voice communication capability requirements for each operator of a transmission facility, operator of an electric distribution system, and operator of a generating unit or an aggregated generating facility, respectively. This section provides clarity on primary voice communication capability options and required criteria set out in COM-001-AB-3.

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[1] "Authoritative document" is the general name given by the AESO to categories of documents made by the AESO under the authority of the *Electric Utilities Act* and associated regulations, and that contain binding legal requirements for either market participants or the AESO, or both. Authoritative documents include the ISO rules, the reliability standards, and the ISO tariff.

[2] Included for consultation purposes.

[3] Includes requirements R2, R3.A1, R4.A1, R7.A1, R7.A2, R8.A1, R8.A2, R12, and R13 of COM-001-AB-3.

3.1 Voice Communication Capability Options (R3.A1, R7.A1, and R8.A1)

The operator may choose any primary voice communication capability that meets the criteria set out in requirement R3.A1, R7.A1, and R8.A1 of COM-001-3. This includes Voice Over Internet Protocol (VoIP) service; a landline, also referred to as a twisted-pair line service; and cellphone service.

3.2 Direct Access Telephone and Public Telephone Network (R3.A1(a), R7.A1(a), and R8.A1(a))

The term “direct access telephone” means the entities can communicate with the operator using the primary voice communication capability without going through a manual or automated switchboard. The term “public telephone network” refers to the commercial telephone system.

3.3 Not Degraded By Any Other Communication Functionality or Any Other Data Transfer Activities if There is Any Shared Equipment (R3.A1(b), R7.A1(b), and R8.A1(b))

The following are two types of communication system configurations that have a risk of voice communication capability degradation:

(a) firstly, VoIP-type services that share network hardware and the bandwidth of procured communication services, such as private connections or the internet. For these services, there is the risk of degradation during congestion on the network hardware or communication service. At times of higher data usage such as during automatic data backups, the degradation can result in unavailability of the primary voice communication system and reduced voice quality. Each operator that uses VoIP-type services for its primary voice communication capability is expected to account for all applications that use its network hardware and communication service when deciding on the bandwidth capacity and network configuration. Each operator may need to consider prioritizing the voice communication capability through traffic prioritization or limitations to other services.

(b) secondly, the control room telephone line that is used for other applications, such as fax machines or dial-up modems. This type of set up can prevent the operator from receiving telephone calls when it is being used for other applications. To mitigate this risk, the AESO expects operators to use a separate control room telephone line for its primary voice communication system.

4 Backup Voice Communication Capability

4.1 Testing Procedure (R9)

In accordance with the testing requirement set out in requirement R9, the AESO will determine a schedule to test all backup voice communication capability with the AESO. When available, this will be provided in Appendix 1 of this information document. The AESO may be required to postpone testing to alternative days if conditions do not allow for testing on the scheduled dates. In such situations, the AESO will advise each operator of the change as soon as practicable.

4.2 Successful Test (R9)

The AESO considers a test of the backup voice communication capability to be successful when the test call is established and both parties can hear and understand each other talking. An echo or a delay of the satellite phone during backup interpersonal communication system testing does not constitute a failed test as long as each party can successfully hear and understand each other.

4.3 Utility Orderwire Service (R15.A1, Appendix 1, 2, and 3)

A definition of utility orderwire service is provided as a footnote to requirement R15.A1 of COM-001-AB-3. Examples of passive telecommunication infrastructure referenced in the definition includes dark fibre or a leased telecom tower, where all the active electronics remain owned and operated by one or more market participant. The intent is to ensure that, during a restoration event, each operator has voice

communication capability and can maintain and restore its infrastructure for voice communication capability during restoration efforts.

4.4 Satellite Telephone System Options (Appendix 1, 2, and 3)

As set out in Appendix 1, 2, and 3 of COM-001, satellite telephone systems may be used to comply with the backup voice communication capability requirement.

The AESO uses 2 satellite telephone systems: Mobile Satellite (MSAT) and Iridium. Each entity, that uses a satellite telephone system to meet its backup voice communication capability requirements set out in Appendix 1 of COM-001 is expected to use one of these systems.

Each operator of a transmission facility that uses a satellite telephone system to meet its backup voice communication capability requirements set out in Appendix 2, is expected to decide on and agree to a common system to use with each entity that is directly connected to its transmission facility. The AESO expects each operator of a transmission facility to reasonably accommodate any satellite telephone system that has sufficient interest from directly connected operators.

4.5 Backup Control System Options for Generating Unit and Aggregated Generating Facility Control Rooms (Appendix 3)

When determining the backup control system requirements for a control room as set out in Appendix 3 of COM-001-AB-3, the operator of one or more generating unit and aggregated generating facility is expected to consider the total synchronous generation and inverter-based generation that can be controlled at the control room. Two examples have been provided below to assist the operator in determining the requirement for each of its control rooms.

Example 1: An operator with a control room that can control 200 MW of synchronous generation and 400 MW of inverter-based generation may use either a satellite telephone service or a utility orderwire service to meet its backup voice communication capability requirement at that control room.

Example 2: An operator with a control room that can control 350 MW of synchronous generation and 100 MW of inverter-based generation is expected to use a utility orderwire service to meet its backup voice communication capability requirement at that control room.

5 NERC Guidance Material for NERC COM-001-3

The AESO generally agrees with the NERC guidance found in NERC COM-001-3.[4] The AESO is providing the following modified NERC guidance for clarity to ensure stakeholders are aware of how to apply this NERC guidance to Alberta. This modified guidance takes into account differences in: the scope of COM-001-AB-3 when compared to NERC COM-001-3; AESO's *Consolidated Authoritative Document Glossary* when compared to NERC's *Glossary of Terms*; and AESO and NERC functional entity types.

5.1 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 interconnected electric system. 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."[5] 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[6] have the capability to exchange information whenever the internal

[4] NERC, COM-001-3 Communications, Supplement Material section (PDF pg. 17 and 18), Effective Date: October 28, 2016, Available at: www.nerc.com.
[5] NERC, Glossary of Terms, Definition of "Interpersonal Communication" (PDF p.15), Effective: October 1, 20215. Available at: www.nerc.com.
[6] NERC language has been maintained where possible. This includes authoritative words, such as "must" and "should". The AESO is notes that information document content is not authoritative.

interpersonal communications may directly impact operations of the interconnected electric system. Therefore, the applicable entities must have the capability to exchange information between control rooms of that functional entity. For example, an operator of a transmission facility with multiple control rooms that are geographical separated must have the capability to communicate internally between or among those control rooms.

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 each control room and field personnel. For example, operator of a transmission facility operating personnel providing instruction to a field personnel to perform a reliability activity, such as switching a system element. In the course of normal control room operation, operating personnel within a single control room communicate as needed to ensure the reliability of the interconnected electric system, 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.

5.2 Rationale for Requirement R13

In this requirement, control room has the meaning provided in section 2 of this information document. Examples of an operator of an electric distribution system exchanging information necessary for the reliable operation of the interconnected electric system include operator of an electric distribution system included in restoration plans, load shed plans, load reconfiguration, and voltage control plans. The operator of an electric distribution system must have the capability to exchange information whenever the internal interpersonal communications may directly impact operations of the interconnected electric system. Therefore, the operator of an electric distribution system must have the capability to exchange information between control rooms, as necessary. For example, an operator of an electric distribution system with multiple control rooms that are geographical separated, where face-to-face communications are not available, must have the capability to communicate internally between or among those control rooms.

6 Distributed Energy Resource Voice Communication System Requirements

There are currently no defined voice communication system requirements in COM-001-AB-3 for a distributed energy resource. However, the AESO recommends that, at minimum, each operator of a distributed energy resource has primary voice communication capability to communicate with the operator of the electric distribution system that is directly connected to its distributed energy resource and with the AESO. Each operator of a distributed energy resource may also be subject to voice communication system requirements by the operator of the electric distribution system.

Revision History

Posting Date	Description of Changes
TBD	Updated to add clarity on: the meaning of control room, primary and backup voice communication capability requirements, the applicability of NERC guidance material, and voice communication system capability for operators of distributed energy resources. Removed content relating to COM-001-AB-1.1 as it is not applicable to COM-001-AB-3.
2013-10-01	Updated the authoritative document reference and combined the “Background” section with the “Purpose” section.
2012-03-07	Initial release.