POWER SYSTEM OPERATION PROCEDURE: COMMUNICATIONS AND CONTROL SYSTEMS

PREPARED BY:	System Management (WA)
DOCUMENT REF:	SO_OP_WA_3802
VERSION:	3.0
EFFECTIVE DATE:	15 June 2018
STATUS:	DRAFT FOR CONSULTATION

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VERSION RELEASE HISTORY

Version	Effective Date	Summary of Changes
1.0	1 September 2006	Power System Operation Procedure (Market Procedure) for Communications and Control Systems
2.0	Balancing Market Commencement Day	Replacement of Procedure resulting from Procedure Change Proposal PPCL0021
3.0	15 June 2018	Update to Procedure resulting from Procedure Change Proposal AEPC_2018_03

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1 PROCEDURE OVERVIEW

1.1. Relationship with the Wholesale Electricity Market Rules

1.1.1 This Power System Operation Procedure: Communications and Control Systems (**Procedure**) has been developed in accordance with clauses 2.35.4 and 2.36A.5 of the Wholesale Electricity Market Rules (WEM Rules).

1.1.2 References to particular WEM Rules within the Procedure in bold and square brackets **[Clause XX]** are current as of 27 March 2018. These references are included for convenience only, and are not part of this Procedure.

1.1.3 References to particular Technical Rules within this Procedure in bold and curly braces **{Clause XX}** are current as of 1 December 2016. These references are included for convenience only, and are not part of this Procedure.

1.2 Interpretation

1.2.1 In this Procedure:

(a) terms that are capitalised but not defined in this Procedure have the meaning given in the WEM Rules;

(b) to the extent that this Procedure is inconsistent with the WEM Rules, the WEM Rules prevail to the extent of the inconsistency;

(c) a reference to the WEM Rules or Market Procedures includes any associated forms required or contemplated by the WEM Rules or Market Procedures;

(d) unless the context requires otherwise, references to AEMO include AEMO in its System Management capacity; and

(e) words expressed in the singular include the plural or vice versa.

1.2.2 In addition, the following defined terms have the meaning given in Table 1.

Table 1 Defined Terms

Term	Definition
Automatic Generation Control (AGC)	Equipment operated by AEMO, which sends signals to generating facilities participating in the AGC scheme to automatically adjust their output so as to maintain frequency or restore frequency within the SWIS Operating Standard.
Energy Management System (EMS)	A system used to monitor and control elements of the SWIS in real time.
Inter Control-Centre Communications Protocol (ICCP)	A communications protocol used to send and receive SCADA messages between different EMS installations (typically located within different organisations).
Supervisory Control and Data Acquisition (SCADA)	Network Operator systems to acquire data from remote devices. AEMO accesses this information via the EMS, which enables AEMO to supervise and control the power system from a remote location.
Technical Specification for Operational Data Points	The document identified in step 2.1.2.

1.3 Purpose and application of this Procedure

1.3.1 The purpose of this Procedure is to document the communications and control system requirements necessary to:

(a) support the dispatch process **[Clause 2.35.4]**; and

(b) enable AEMO to remotely monitor the performance of a Network **[Clause 2.36A.5]**.

1.3.2 The Procedure specifies the main features of the speech, data and control systems that must be in place between AEMO and a Market Participant for the purpose of:

(a) issuing Dispatch Instructions, Dispatch Orders and Operating Instructions (AEMO) and confirming receipt and responding to them (Market Participant);

(b) monitoring the MW output and connection status of Facilities;

(c) communicating about other matters relating to the operation of the power system.

1.3.3 This Procedure applies to:

(a) AEMO to ensure that its communications and control systems support the dispatch process and enable it to remotely monitor the performance of a Network; and

(b) Market Participants and Network Operators in complying with this Procedure in respect of communications and control system requirements.

1.4 Associated documents

1.4.1 The following documents in Table 2 (available via the Market Web Site) provide background information to this Procedure:

Table 2 Background Documents

Reference	Title	Location
	AEMO Power System Data Communication Standard	AEMO Website
	Automatic Balancing Control (ABC) and Automatic Generation Control (AGC) Interface Requirements	AEMO Website
SO_OP_WA_3805	IMS Interface Market Procedure	AEMO Website
	Market Procedure: Balancing Facility Requirements	AEMO Website
SO_OP_WA_3801	PSOP: Commissioning and Testing	AEMO Website
SO_OP_WA_3803	PSOP: Dispatch	AEMO Website
SO_OP_WA_3808	PSOP: Power System Security	AEMO Website
	Technical Specification for Operational Data Points	AEMO Website

2 OPERATIONAL COMMUNICATIONS AND CONTROL SYSTEMS REQUIREMENTS

2.1 General requirements

2.1.1 AEMO must document the communications and control system requirements necessary to support the dispatch process **[Clause 2.35.4]**.

2.1.2 For the purposes of this Procedure, AEMO must develop a Technical Specification for Operational Data Points, detailing the general SCADA data points required.

2.1.3 AEMO may specify SCADA points required for each Registered Facility and each Facility that is intended to be registered. These could be in addition to those required by the Network Operator under its own regulatory framework.

2.1.4 The specification in step 2.1.3 must be reasonable and in accordance with the Technical Specification for Operational Data Points.

2.1.5 Market Participants and Network Operators must ensure the relevant Facility meets the specification in step 2.1.3 by the timeframe specified in step **Error! Reference source not found.**.

2.1.6 AEMO may, acting reasonably, revise the specification in step 2.1.3 at any time. AEMO must specify a reasonable timeframe for a Registered Facility to meet any new or revised specifications made in step 2.1.3.

2.2 Specific requirements – Balancing Facilities

2.2.1 Balancing Facilities that do not have special conditions imposed on them by AEMO under step 2.3.1, and which are not exempted under step 1.1, must comply with the following communications requirements:

(a) be able to receive and confirm receipt of Dispatch Instructions, Dispatch Orders and Operating Instructions from AEMO via SCADA or AEMO's IT systems as described in the Automatic Balancing Control (ABC) and Automatic Generation Control (AGC) Interface Requirements;

(b) have SMS or email capability at the location that is able to receive Dispatch Instructions, Dispatch Orders and Operating Instructions from AEMO; and

(c) have duplicated 24x7 telephone services or other voice communications in place for communication with AEMO as a back-up mechanism for AEMO's SCADA system or IT systems.

2.3 Specific requirements – Balancing Facilities with special conditions imposed

2.3.1 AEMO may determine that a Balancing Facility does not meet the relevant specifications of the Balancing Facility Requirements, and may impose special conditions [**Clause 7A.1.11**].

2.3.2 Balancing Facilities that have special conditions imposed on them under step 2.3.1 must comply with the following communications requirements:

(a) internet access via AEMO's portal or AEMO's secure business-to-business gateway;

(b) telephone services or other voice communications; and

(c) communications in place for the receipt of Dispatch Instructions, Dispatch Orders and Operating Instructions, being either:

(1) SMS; or

(2) e-mail.

2.3.3 A Facility is not required to comply with step 2.3.2 if:

(a) it is exempted under step 1.1; or

(b) the conditions imposed by AEMO in accordance with step 2.3.1 specifically exempt the requirements of step 2.3.2.

2.4 Specific requirements – Facilities providing Load Following Ancillary Service

2.4.1 All Facilities providing Load Following Ancillary Service must be connected to AEMO's Automatic Generation Control (AGC) system as per the Automatic Balancing Control (ABC) and Automatic Generation Control (AGC) Interface Requirements.

2.5 Specific requirements – Facilities providing Spinning Reserve

2.5.1 All Facilities providing Spinning Reserve must have duplicated 24x7 monitored voice communications in place for communication with AEMO unless alternative arrangements are specified in the Ancillary Service Contract.

2.6 Specific requirements – Facilities providing Load Rejection Reserve

2.6.1 All Facilities providing Load Rejection Reserve must have duplicated 24x7 monitored voice communications in place for communication with AEMO unless alternative arrangements are specified in the Ancillary Service Contract.

2.7 Specific requirements – Facilities providing Network Control Service, System Restart Service or Dispatch Support Service

2.7.1 The communications and control system requirements for Facilities contracted with AEMO to provide System Restart Service or Dispatch Support Service must be in accordance with the Ancillary Service Contract.

2.7.2 Facilities providing Network Control Services must meet the requirements specified in step 2.2 unless alternative arrangements are specified by AEMO.

2.8 Specific requirements – Demand Side Programmes

2.8.1 A Market Customer who operates a Demand Side Programme must provide duplicated monitored telephone contacts to allow AEMO to communicate Dispatch Instructions to the Market Customer during the times specified in Appendix 1(h)(ix) Standing Data.

2.9 Specific requirements – Network Operator

2.9.1 Western Power must provide AEMO with access to its operational voice communications system **{Clause 3.3.4.3}**. This can be either via physical access to a phone turret, or through connection to AEMO's operational voice communication system (via communications links provided by AEMO).

2.9.2 The operational voice communications system must provide:

(a) voice communications to Western Power's control rooms (primary and back-up) independent of the public switched telephone network; and

(b) voice communications to Market Participants, independent of the public switched telephone network (where the list of Market Participants is to be agreed between AEMO and Western Power).[1]

2.9.3 Obligations regarding confidentiality and retention of historical records in relation to this step 1.1 are specified in the IMS Interface Market Procedure.

3 LOSS OF COMMUNICATION SYSTEMS

3.1.1 Where a major loss of communications occurs, the electronic data, control systems and some of the voice communication circuits referred to in step 2 may become unavailable. Where a Facility continues to operate after a major loss of communications, the Market Participants and AEMO must revert to speech communications, including the use of back-up voice communications for the transfer of all Dispatch Instructions, Dispatch Orders, Operating Instructions and other operational information.

3.1.2 In the event indicated in step 3.1.1, AEMO may use the system referred to in step 2.9.1 to support the dispatch process.

3.1.3 Where AEMO's control centre has been evacuated and dispatch services shift to AEMO's

[1] The Technical Rules **{Clauses 3.3 and 3.6.9(d)}** currently only require back-up voice communications for generators with a capacity of 10MW or greater and generators above 1MVA that have been deemed to require this.

emergency control centre, AEMO will issue a Dispatch Advisory with appropriate contact details [**Clause 7.11.5(f)**].

3.1.4 Where a Market Participant can no longer comply with the communications requirements outlined in step 2 due to a major loss of communications, the relevant Market Participant must advise AEMO as soon as practicable, and by whatever means, that the emergency contact details are to be used for the purposes of communicating with the relevant Facilities.

4 GENERATORS OPERATED BY AEMO

4.1 Application

4.1.1 AEMO may, by agreement with a Market Participant, maintain operational control over aspects of a Registered Facility [**Clause 7.8.1**].

4.1.2 Except for the Balancing Portfolio, AEMO may only operate Facilities in step 1.1.1 if a formal operating protocol detailing the mechanism and limitations of control has been executed between AEMO and the relevant Market Participant.

4.1.3 The operating protocol referred to in step 4.1.2 must include a definition of the protocols and electronic interfaces to be used by AEMO in carrying out the remote operation and control functions (SCADA technical specification).

4.2 Exemption of Facilities under AEMO control from communications requirements

4.2.1 If a Facility is operated by AEMO under step 4.1.2, AEMO may exempt a Balancing Facility from meeting one or more of the requirements of steps 2.2.1 or 2.3.2.

4.3 Automatic execution of Dispatch Instructions and Dispatch Orders through AGC

4.3.1 If so permitted under the operating protocol referred to in step 4.1.2, AEMO may execute one or more Dispatch Instructions or Dispatch Orders relating to that Facility through AGC.

5 REQUIREMENTS NECESSARY TO REMOTELY MONITOR THE PERFORMANCE OF A NETWORK

5.1 Directions to a Network Operator

5.1.1 Where AEMO determines that it is reasonably necessary to issue a direction to a Network Operator under clause 2.36A.3 of the WEM Rules, AEMO must:

(a) identify the required changes (consulting with the Network Operator and other Market Participants where appropriate);

(b) document the required changes; and

(c) issue the direction to the Network Operator.

5.1.2 The Network Operator must respond within 10 Business Days with a proposed implementation timeframe.

5.1.3 Where AEMO agrees with the proposed implementation timeframe, the Network Operator must implement the changes within that timeframe **[Clause 2.36A.4(a)]**.

5.1.4 Where an implementation timeframe cannot be agreed, senior managers from AEMO and the

Network Operator must meet to agree a timeframe.

5.1.5 Where an implementation timeframe cannot be agreed by senior managers from AEMO and the Network Operator, AEMO acting reasonably will determine the implementation timeframe and the Network Operator must comply with this timeframe **[Clause 2.36A.4(a)]**.

5.2 Provision of Market Participant SCADA

5.2.1 Where the Network Operator is the SCADA service provider for a Market Participant, the Network Operator must act reasonably to implement the relevant specification determined in step 2.1.1 by the timeframe determined in **Error! Reference source not found.**. This implementation must include any change to the Network Operator's Energy Management System (EMS) and the Inter Control-Centre Communications Protocol (ICCP) as detailed in the IMS Interface Market Procedure.

5.2.2 AEMO may issue a direction under step 5.1.1 to meet the requirements of step 5.2.1.

5.2.3 A Network Operator must consult with AEMO to determine any specific SCADA requirements for new or modified Market Participant Facilities to be implemented within the Network Operator's EMS **{Clauses 3.3.4 and 3.4.10}**.

5.3 Data Communications Standard

5.3.1 AEMO's communication and performance requirements indicating the data communications standard for information provided by the Network Operator are detailed in the AEMO Power System Data Communication Standard, which is available on the Market Web Site.

5.3.2 Where a Network Operator is required to modify equipment to meet the standard in step 5.3.1, AEMO may agree with the Network Operator on a reasonable timeframe for implementation.

5.4 SCADA System and EMS Data via ICCP

5.4.1 The requirements for the ICCP link between AEMO and Network Operators for the provision of data are detailed in the standard indicated in step 5.3.1.

5.4.2 AEMO must specify the data to be sent via the ICCP link, which may include controls and indications.

5.4.3 The configuration of the ICCP link to enable the data to be sent will be based on an agreement between AEMO and the Network Operator. Each party will be responsible for its infrastructure implementation and maintenance costs.

5.4.4 Where a Network Operator is required to modify equipment to meet the standard in step 5.4.1 or the requirements in step 5.4.2, AEMO may agree with the Network Operator on a reasonable timeframe for implementation.