

POWER SYSTEM OPERATION PROCEDURE: ANCILLARY SERVICES

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1	1 April 2009	Power System Operation Procedure (Market Procedure) for Ancillary Services
2	Balancing Market Commencement Day	Replacement of the Procedure resulting from Procedure Change Proposal PPCL0022
3	TBC 2019	Changes resulting from Procedure Change Proposal AEPC_2019_XX

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1. PROCEDURE OVERVIEW

1.1. Relationship with the Wholesale Electricity Market Rules

- 1.1.1. This Power System Operation Procedure (PSOP): Ancillary Services (Procedure) has been developed in accordance with clauses 3.11.14, 3.11.15 and 7B.1.2 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 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, 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; and
 - (d) words expressed in the singular include the plural and vice versa; and
 - (e) unless the context requires otherwise, references to AEMO include AEMO in its System Management capacity.
- 1.2.2. In addition, the defined terms in Table 1 have the meaning given.

Table 1 Defined Terms

Term	Definition
Ancillary Service Standards	The standard for each Ancillary Service defined in clause 3.10 of the WEM Rules.
Automatic Generation Control or AGC	Equipment operated by AEMO, which sends signals to generating facilities participating in the AGC scheme to automatically adjust their output in order to maintain frequency or restore frequency to within the SWIS Operating Standard. In the WEM, AGC may also be utilised for dispatch.
Droop	A function of a governor that responds to frequency changes.

1.3. Purpose and application of this Procedure

- 1.3.1. The purpose of this Procedure is to document and specify:
- (a) the procedure to be followed by AEMO when:
 - (i) Determining Ancillary Service Requirements **[Clause 3.11.14(a)]**;
 - (ii) Entering into Ancillary Service Contracts, including the process for conducting competitive tender processes utilised for the awarding of Ancillary Service Contracts **[Clause 3.11.14(b)]**;
 - (iii) The WEM Rules require Ancillary Services to be provided **[Clause 3.11.15]**;

- (b) any technical and communication criteria that an LFAS Facility, or a type of LFAS Facility, must meet, including:
 - (i) Facility quantity parameters and limits in providing LFAS, including the Minimum LFAS Quantity **[Clause 7B.1.2(a)]**;
 - (ii) The manner and forms of communication to be used in providing LFAS, including how LFAS Facilities which are Non-Scheduled Generators, are to be activated **[Clause 7B.1.2(b)]**; and
 - (iii) The nature and type of any enablement and quantity restrictions that will apply **[Clause 7B.1.2(c)]**;
- (c) the procedure to be followed by Market Participants, Ancillary Service Providers and Network Operators where the WEM Rules require Ancillary Services to be provided **[Clause 3.11.15]**.

1.4. Associated documents

1.4.1. The following documents in Table 2 provide background information to this Procedure.

Table 2 Associated Documents

Reference	Title	Location
SO_OP_WA_3803	PSOP: Dispatch	Market Web Site
SO_OP_WA_3808	PSOP: Power System Security	Market Web Site
	ABC and AGC Interface Requirements	Market Web Site
	Technical Rules	ERA Web Site

2. FACILITY REQUIREMENTS FOR ANCILLARY SERVICES

2.1. General

2.1.1. Synergy must make its capacity to provide Ancillary Services from its Facilities available to AEMO to a standard sufficient to enable AEMO to meet its obligations in accordance with the WEM Rules **[Clause 3.11.7A]**.

2.2. Load Following Ancillary Service

2.2.1. The LFAS Facility Requirements for all Scheduled Generators and Non-Scheduled Generators providing Load Following Ancillary Service (LFAS):

- (a) for the Facility quantity parameters and limits referred to in clause 7B.1.2(a) of the WEM Rules, are that the Facility must:
 - (i) have a minimum ramp rate of at least:
 - (A) 0.2 MW/min for each MW of potential Upwards LFAS Enablement; and
 - (B) 0.2 MW/min for each MW of potential Downwards LFAS Enablement; and
 - (ii) meet the minimum required ramp rates specified in step 2.2.1(a)(i) continuously for the full range of LFAS output; and

- (b) for manner and forms of communication referred to in clause 7B.1.2(b) of the WEM Rules, are that the Facility must accept and respond to Automatic Generation Control (AGC) signals and the requirements of ABC and AGC Interface Requirements document;
- (c) for nature and type of any enablement and quantity restrictions referred to in clause 7B.1.2(c) of the WEM Rules, are that the Facility must:
 - (i) have a Minimum LFAS Quantity of 10 MW; and
 - (ii) commence ramping in five seconds or less following receipt of a signal from the AGC that orders the Facility's output to be either raised or lowered.

2.2.2. For the purposes of bidding into the LFAS Market, that is, by way of a LFAS Submission meeting the requirements of clause 7B.2.7(a) of the WEM Rules:

- (a) the Minimum LFAS Quantity must equal the value set in step 2.2.1(c)(i); and
- (b) the Ramp Rate must at least equal the values specified in step 2.2.1(a)(i).

2.3. Spinning Reserve Ancillary Service

2.3.1. Facilities may be awarded a contract to provide Spinning Reserve for a specified quantity up to the amount the Facility can increase generation, or decrease consumption over one or more of the following timeframes [**Clause 3.9.3**]:

- (a) within 6 seconds, where the response must be sustained or exceeded for at least 60 seconds;
- (b) within 60 seconds, where the response must be sustained or exceeded for at least 6 minutes; or
- (c) within 6 minutes, where the response must be sustained or exceeded for at least 15 minutes.

2.3.2. The response for:

- (a) step 2.3.1(a) must be automatic, such as:
 - (i) Droop, in the case of Scheduled Generators; or
 - (ii) Automated under-frequency relays, in the case of Interruptible Load.
- (b) steps 2.3.1(b) or 2.3.1(c) can be automatic.

2.3.3. AEMO must assess the quantity of Spinning Reserve that a Facility can provide in each of the classes in step 2.3.1 using one or more of the following methods:

- (a) by assessing the Facility's response to actual system events, based on data held by, or provided to, AEMO; or
- (b) by assessing the Facility's Standing Data, control system settings or under frequency relay system settings, test results and other relevant information.

2.3.4. AEMO may define parameters specific to an individual Facility for the provision of Spinning Reserve, including:

- (a) requirements for automatic response for Facilities that are not staffed continuously; and
- (b) limits on ramp-up rates for generators and ramp-down rates for Interruptible Load.

2.4. Load Rejection Ancillary Service

- 2.4.1. Facilities may be awarded a contract to provide Load Rejection Reserve for a specified quantity up to the amount the Facility can reduce generation or increase consumption over one or more of the following timeframes **[Clause 3.9.7]**:
- (a) within 6 seconds, where the response must be sustained or exceeded for at least 6 minutes; or
 - (b) within 60 seconds, where the response must be sustained or exceeded for at least 60 minutes.
- 2.4.2. Facilities certified for Load Rejection Reserve may provide a response using Droop.
- 2.4.3. AEMO must assess the quantity of Load Rejection Reserve that a Facility can provide in each of the timeframes in step 2.4.1 using one or more of the following methods:
- (a) by assessing the Facility's response to actual system events based on data held by, or provided to, AEMO, or
 - (b) by assessing the Facility's Standing Data, control system settings, test results and other relevant information.
- 2.4.4. AEMO may define parameters specific to an individual Facility for the provision of Load Rejection Reserve, including:
- (a) requirements for automatic response for Facilities that are not staffed continuously; and
 - (b) limits on ramp-down rate for a generator or ramp-up rate for a load.

2.5. System Restart Ancillary Service

- 2.5.1. System Restart Service is the ability of a Registered Facility which is a generation system to start without requiring energy to be supplied from a Network to assist in the re-energisation of the SWIS in the event of system shut-down, provided under an Ancillary Service Contract **[Clause 3.9.8]**.
- 2.5.2. A System Restart Facility must be capable of:
- (a) closing the generation circuit breaker onto a de-energised or dead bus;
 - (b) re-energising a restart path or section of the Network nominated by AEMO;
 - (c) operating in isochronous governor mode to set and control the frequency of the power system it is restoring to 50 Hz; and
 - (d) operating in Droop, as required by AEMO; and
 - (e) other requirements, as specified by AEMO.

- 2.5.3. AEMO may define parameters specific to an individual Facility for the provision of System Restart Reserve, including requirements for remote control by AEMO for Facilities that are not staffed continuously.
- 2.5.4. AEMO must assess whether a Facility can provide System Restart Reserve via a set of tests for the Facility that may be location-specific.

3. CERTIFICATION OF FACILITIES FOR ANCILLARY SERVICES

3.1. General

- 3.1.1. AEMO must determine and document the procedure to be followed where the WEM Rules require Ancillary Services to be provided and AEMO and Rule Participants must comply with that process [Clause 3.11.15].
- 3.1.2. The process for the provision of Ancillary Services is:
- (a) AEMO must certify that a Facility can provide an Ancillary Service; and
 - (b) a Market Participant, including Synergy, or Network Operator:
 - (i) may only provide an Ancillary Service from a Facility to the degree that the Facility is certified for that Ancillary Service in accordance with step 3.1.2(a);
 - (ii) providing an Ancillary Service, must do so in accordance with the certification in step 3.1.2(a).
- 3.1.3. AEMO's certification in step 3.1.2(a):
- (a) applies only for the duration that:
 - (i) for LFAS, other than for Synergy, the agreement in step 3.2.2(a) exists;
 - (ii) for Ancillary Services provided under an Ancillary Service Contract, the duration of that contract; or
 - (iii) for Synergy, other than for Ancillary Services provided under an Ancillary Service Contract, is detailed by AEMO; and
 - (b) shall apply from a Trading Interval determined by AEMO and may apply for a specified duration;
 - (c) must require that each Facility intended to provide an Ancillary Service meets the relevant requirements in step 2;
 - (d) must determine the level of the relevant Ancillary Service that can be provided by that Facility; and
 - (e) must include any parameters determined by AEMO in step 2.

3.2. Application for certification

- 3.2.1. A Market Participant, Network Operator or Ancillary Service Provider may apply to AEMO to provide Ancillary Services.
- 3.2.2. Other than Synergy, a Rule Participant providing an Ancillary Service may only provide:
- (a) LFAS, once an operating agreement exists between AEMO and the relevant Market Participant; and
 - (b) any other Ancillary Service, once an Ancillary Service Contract for the provision of the relevant Ancillary Service exists, as detailed in step 5.
- 3.2.3. AEMO will certify a Facility for a relevant Ancillary Service in step 3.1.2(a):
- (a) for Synergy, as part of registering the relevant Facility in accordance with clause 2.29 of the WEM Rules or as requested by Synergy;
 - (b) for all other Rule Participants, as part of establishing the agreement or Ancillary Services Contract in step 3.2.2.

3.3. Reassessment of certification

- 3.3.1. At any time, a Rule Participant may apply to AEMO for re-assessment of the certification in step 3.1.2(a), and AEMO must complete that re-assessment within a reasonable timeframe.
- 3.3.2. At any time AEMO, may, acting reasonably, determine to suspend or modify the certification in step 3.1.2(a), for reasons which may include:
- (a) a Forced Outage rate that would compromise the Facility's ability to deliver the Ancillary Service;
 - (b) non-conformance with AGC signals;
 - (c) failure to meet testing requirements for the relevant Ancillary Service; or
 - (d) non-provision of the Ancillary Service.
- 3.3.3. Following the determination in step 3.3.2, AEMO must:
- (a) Provide the relevant Rule Participant with 5 business days' notice that AEMO intends to vary the certification, detailing the reasons for the variation;
 - (b) Determine a reasonable period for the Rule Participant to rectify any issues that led to the proposed variation in certification; and
 - (c) Consider any evidence provided by a Rule Participant prior to enacting the variation in certification.

3.3.4. AEMO may withdraw the certification in step 3.1.2(a) for any Facility following a suspension that remains in place for 30 business days or more.

4. ANCILLARY SERVICE REQUIREMENTS AND OPERATION

4.1. Ancillary Services Requirements

4.1.1. AEMO must determine the Ancillary Service Requirements for each Ancillary Service:

- (a) in accordance with the SWIS Operating Standards and the Ancillary Service Standards **[Clause 3.11.1]**;
- (b) to meet the greater of the:
 - (i) relevant SWIS Operating Standard; and
 - (ii) the relevant Ancillary Service Standard; and
- (c) having regard to the relevant conditions identified in step 4.1.3;
- (d) in accordance with step 4.1.4; and
- (e) using the information identified in step 4.1.5.

4.1.2. The relevant Ancillary Service Standard in step 4.1.1 must be considered in line with the frequency that AEMO re-dispatches Facilities within a Trading Interval.

4.1.3. In determining Ancillary Service Requirements in step 4.1.1, AEMO must have regard to the conditions and situations applying during the year, which may include:

- (a) the commissioning or decommissioning of Facilities;
- (b) the performance of Facilities that give rise to the need for additional Ancillary Services;
- (c) the risk associated with non-performance of Ancillary Service providers;
- (d) the variability of demand on the SWIS; and
- (e) any other factor AEMO reasonably considers necessary.

4.1.4. The Ancillary Services Requirements for:

- (a) Spinning Reserve must include capacity utilised to meet the Upwards LFAS Quantity, so that the capacity provided to meet the Load Following requirement is counted as providing part of the Spinning Reserve Ancillary Service Requirement **[Clause 3.10.2(b)]**, but only to the degree that the Facility is able to provide for, or is certified for, both LFAS and Spinning Reserve;
- (b) Load Rejection Reserve may include capacity utilised to meet the Load Following Service Downwards LFAS Quantity, so that the capacity provided to meet the Load Following requirement is counted as providing part of the Load Rejection Reserve Service Ancillary Service Requirement but only to the degree that the Facility is able to provide for, or is certified for, both LFAS and Load Rejection Reserve.

4.1.5. AEMO may seek further information from Market Participants, Ancillary Service Providers and Network Operators in order to complete its determination of Ancillary Service Requirements where this information is relevant to the assessment.

4.1.6. Market Participants, Ancillary Service Providers and Network Operators must make every reasonable endeavour to provide any information requested by AEMO under step 4.1.5 in the form requested and as soon as practicable.

4.2. Ancillary Services Operation and Planning

4.2.1. When seeking to meet the Dispatch Criteria, AEMO must ensure that:

- (a) for Spinning Reserve, the enabled Facilities can collectively meet the Spinning Reserve Requirement at each time frame indicated in step 2.3.1;
- (b) for Load Rejection Reserve, the enabled Facilities can collectively meet the Load Rejection Reserve Requirement at each time frame indicated in step 2.4.1.

5. PROCUREMENT OF ANCILLARY SERVICES

5.1. General

5.1.1. AEMO may enter into an Ancillary Service Contract with a Rule Participant other than Synergy for Spinning Reserve Ancillary Services in specified circumstances. AEMO may also enter into an Ancillary Service Contract with a Rule Participant for the provision of a Load Rejection Reserve Service, System Restart Service or Dispatch Support Service **[Clauses 3.11.8 and 3.11.8A]**.

5.1.2. AEMO may only enter into an Ancillary Service Contract for:

- (a) Spinning Reserve Services, if it considers that:
 - (i) it cannot meet the Ancillary Service Requirements with Synergy's Registered Facilities; or
 - (ii) the Ancillary Service Contract will provide a less expensive alternative to Ancillary Services provided by Synergy's Registered Facilities**[Clause 3.11.8]**; and
- (b) Dispatch Support Ancillary Services, if it has obtained the approval of the Economic Regulation Authority **[Clause 3.11.8B]**.

5.1.3. Where AEMO intends to enter into an Ancillary Service Contract, AEMO must **[Clause 3.11.9]**:

- (a) seek to minimise the cost of meeting its obligations to schedule and dispatch facilities (or cause them to be scheduled and dispatched) to meet the Ancillary Service Requirements in each Trading Interval in accordance with Chapter 7 of the WEM Rules; and
- (b) give consideration to using a competitive tender process, unless System Management considers that this would not meet the requirements of 5.1.3(a).

5.1.4. Where AEMO determines to use a competitive tender process, AEMO must use all reasonable efforts to maximise the number of potential providers of the relevant Ancillary Service, including but are not limited to, seeking:

- (a) expressions of interest; and
- (b) proposals to provide the relevant Ancillary Service.

5.1.5. Any documents issued by AEMO seeking proposals under step 5.1.4(b) must specify the:

- (a) criteria that AEMO will use to assess proposals to provide the relevant Ancillary Service; and

- (b) process by which a Facility must be certified, as detailed in step 3.1.2.
- 5.1.6. AEMO must assess all proposals received from the process undertaken in accordance with step 5.1.4(b) using the criteria specified in the documents referred to in step 5.1.5.
- 5.1.7. AEMO will determine whether enter into an Ancillary Service contract as a result of the assessment in step 5.1.6 having regard to:
- (a) the extent to which the Facility is certified, or is expected to be certified, as per step 3.1.2(a); and
 - (b) any other factor consistent with the Wholesale Electricity Market Objectives.
- 5.1.8. Where AEMO enters into an Ancillary Service Contract as a result of the procurement process in step 5.1.3 for Spinning Reserve Services, the scope of the Ancillary Service Contract must:
- (a) not include components for the payment of energy [**Clause 3.11.8E**]; and
 - (b) only include the availability of the service based on a proportion of values determined for Margin_Peak and Margin_Off-Peak [**Clause 3.11.8E**];
 - (c) must not include components for the payment of any Upwards LFAS Enablement for a specific Trading Interval.
- 5.1.9. Ancillary Service Contracts should specify as a minimum:
- (a) a technical description of the relevant Ancillary Service;
 - (b) the performance requirements of the relevant Ancillary Service;
 - (c) testing requirements to determine performance and compliance of the relevant Ancillary Service;
 - (d) the Facilities from which the relevant Ancillary Service will be provided;
 - (e) the process by which the relevant Ancillary Service will be made available;
 - (f) the information following an activation of the relevant Ancillary Service that both parties must provide;
 - (g) the prices and payment structure;
 - (h) information disclosure requirements;
 - (i) commercial terms and conditions;
 - (j) applicable penalties for non-performance; and
 - (k) a mechanism for resolution of disputes.