



WEM Procedure: Direction of Registered Facilities in Scarcity Conditions

Prepared by: AEMO

Document ref: WEM Procedure: Direction of Registered Facilities in Scarcity Conditions

Version: 2.0

Effective date: 1 February 2025

Status: FINAL

Approved for distribution and use by:

Approved by: Alireza Fereidouni

Title: Acting Group Manager – WA Operations

Date: 29 January 2025

aemo.com.au

New South Wales | Queensland | South Australia | Victoria | Australian Capital Territory | Tasmania | Western Australia

Australian Energy Market Operator Ltd ABN 94 072 010 327

Version Release History

Version	Effective Date	Summary of Changes
1.0	15 October 2024	Final version developed in accordance with clause 7.7.14 of the WEM Rules.
2.0	1 February 2025	Updated to reflect changes to the WEM Rules via the <i>Wholesale Electricity Market Amendment (FCESS Cost Review) Rules 2024, Schedule 3</i> which commences on 1 February 2025. The changes insert the requirement for this WEM Procedure to include the processes AEMO will use to determine which Registered Facility to direct to synchronise to provide a RoCoF Control Service under clause 3.4.4(d) of the WEM Rules.

IMPORTANT NOTICE – EXPLANATORY NOTES

Disclaimer

Explanatory notes included in this document as shaded in-line text are provided for explanatory purposes only to assist with comprehension and readability. The information contained in these explanatory notes does not constitute legal or business advice and should not be relied on as a substitute for obtaining detailed advice about the *Electricity Industry Act 2004 (WA)*, the WEM Rules, or any other applicable laws, procedures or policies. AEMO has made reasonable efforts to ensure the quality of the information, but cannot guarantee its accuracy or completeness.

Accordingly, to the maximum extent permitted by law, AEMO and its officers, employees and consultants involved in the preparation of this document:

- make no representation or warranty, express or implied, as to the currency, accuracy, reliability or completeness of the explanatory information in this document; and
- are not liable (whether by reason of negligence or otherwise) for any statements or representations in this document, or any omissions from it, or for any use or reliance on the information in it.

Contents

1. Introduction	4
1.1. Purpose and scope	4
1.2. Definitions	4
1.3. Interpretation	5
1.4. Related documents	5
2. Direction of Registered Facilities for a Low Reserve Condition ESS Shortfall	7
2.1. Process to be used by AEMO to determine which Registered Facility to direct	7
3. Direction of Registered Facilities for a Low Reserve Condition Energy Shortfall	10
3.1. Process to be used by AEMO to determine which Registered Facility to direct	10
4. Direction to synchronise to provide RoCoF Control Service	12
Appendix A. Relevant clauses of the WEM Rules	13

Tables

Table 1 Definitions	4
Table 2 Related documents.....	5
Table 2 Relevant clauses of the WEM Rules	13

1. Introduction

1.1. Purpose and scope

- 1.1.1. This WEM Procedure: Direction of Registered Facilities in Scarcity Conditions (Procedure) is made in accordance with AEMO’s functions under clause 2.1A.2(h) of the Wholesale Electricity Market Rules (WEM Rules).
- 1.1.2. The Electricity Industry Act 2004 (WA), the WEM Regulations and the WEM Rules prevail over this Procedure to the extent of any inconsistency.
- 1.1.3. In this Procedure, where obligations are conferred on a Rule Participant, that Rule Participant must comply with the relevant obligations in accordance with clause 2.9.7A, 2.9.7D or 2.9.8 of the WEM Rules, as applicable.
- 1.1.4. The purpose of this Procedure is to document the process that AEMO will use to determine which Registered Facility to direct:
 - (a) under clauses 7.7.3, 7.7.4 or 7.7.5 [**Clause 7.7.14(a)**]; or
 - (b) to synchronise to provide RoCoF Control Service under clause 3.4.4(d) [**Clause 7.7.14(b)**].
- 1.1.5. Appendix A of this Procedure outlines the head of power clauses that this Procedure is made under, as well as other obligations in the WEM Rules covered by this Procedure.

1.2. Definitions

- 1.2.1. Terms defined in the *Electricity Industry Act 2004 (WA)*, the WEM Regulations and the WEM Rules have the same meanings in this Procedure unless the context requires otherwise.
- 1.2.2. The following definitions apply in this Procedure unless the context requires otherwise.

Table 1 Definitions

Term	Definition
Energy Shortfall	The situation where AEMO has issued a Low Reserve Condition Declaration in accordance with clause 3.17.1(a) due to a risk of insufficient capacity to meet expected energy demand.
ESS Shortfall	The situation where AEMO has issued a Low Reserve Condition Declaration in accordance with clause 3.17.1(c) due to a risk of a shortfall of Essential System Services that compromises AEMO’s ability to maintain Power System Security or Power System Reliability.
In-Service Only Scenario	A Scenario which includes In-Service Capacity in Real-Time Market Submissions, and excludes Available Capacity in Real-Time Market Submissions.
Market Impact	The extent to which an action taken by AEMO causes disruption to the normal functioning of the Wholesale Electricity Market by causing deviation from normal Dispatch Algorithms.
Trapezium Trapping	The market dynamic where dispatch capacity from a Facility is unavailable for optimisation within the Dispatch Algorithm due to the Enablement Limits of an Essential System Service.

1.3. Interpretation

- 1.3.1. The following principles of interpretation apply in this Procedure unless the context requires otherwise.
- (a) Clauses 1.3 to 1.5 of the WEM Rules apply in this Procedure.
 - (b) References to time are references to Australian Western Standard Time.
 - (c) Terms that are capitalised, but not defined in this Procedure, have the meaning given in the WEM Rules.
 - (d) A reference to the WEM Rules or WEM Procedures includes any associated forms required or contemplated by the WEM Rules or WEM Procedures.
 - (e) Words expressed in the singular include the plural and vice versa.
 - (f) A reference to a paragraph refers to a paragraph of this Procedure.
 - (g) A reference to an appendix refers to an appendix of this Procedure.
 - (h) A reference to a clause refers to a clause or section of the WEM Rules.
 - (i) References to WEM Rules in this Procedure in bold and square brackets **[Clause XXX]** are included for convenience only, and do not form part of this Procedure.
 - (j) Text located in boxes and headed as **E[X]** in this Procedure is included by way of explanation only and does not form part of this Procedure. The Procedure prevails to the extent of any inconsistency with the explanatory notes contained within it.
 - (k) The body of this Procedure prevails to the extent of any inconsistency with the figures, diagrams, appendices, schedules, annexures or attachments contained within this document.

1.4. Related documents

- 1.4.1. The documents in Table 2 are associated with this Procedure.

Table 2 Related documents

Reference	Title	Location
WEM Procedure	WEM Procedure: Essential System Service Quantities	WEM Website

1.5. Communications and provision of information

- 1.5.1. All communications and provision of information by a Rule Participant or Network Operator to AEMO under this Procedure must be conducted via a recorded phone line with the AEMO WEM Control Room, unless otherwise specified in this Procedure.
- 1.5.2. In response to a communication via the method outlined in paragraph 1.5.1, AEMO may request a Rule Participant or Network Operator to provide further information or communication via email in relation to a specific matter.

- 1.5.3. All communication and provision of information by AEMO to a Rule Participant or Network Operator under this Procedure will be conducted via either email or over a recorded phone line with the AEMO WEM Control Room, unless otherwise specified in this Procedure.

2. Direction of Registered Facilities for a Low Reserve Condition ESS Shortfall

2.1. Process to be used by AEMO to determine which Registered Facility to direct

2.1.1. Where AEMO has:

- (a) declared a Low Reserve Condition due to an ESS Shortfall that meets the requirements of clause 7.7.3;
- (b) published the Low Reserve Condition Declaration under clause 3.17.4; and
- (c) reasonably determined that the relevant Low Reserve Condition or any associated threat to Power System Security or Power System Reliability is unlikely to be resolved without direction of one or more specific Registered Facilities;

AEMO:

- (d) will assess the relevant power system conditions and in accordance with paragraph 2.1.3, determine the most appropriate Registered Facility or Registered Facilities to direct and the series of actions it intends to take to direct those Facilities in accordance with the priority order in paragraph 2.1.2 that will:
 - (i) be feasible, based on AEMO's assessment of the Registered Facility or Registered Facilities under paragraph 2.1.1; and
 - (ii) resolve the relevant Low Reserve Condition and/or threat to Power System Security or Power System Reliability;while making reasonable attempts to minimise the total number of required directions, number of impacted Registered Facilities, and overall deviation from normal market operations; and
- (e) will direct the most appropriate Registered Facility or Registered Facilities identified under paragraph 2.1.1(d) and in accordance with the series of actions determined under paragraph 2.1.1(d) in the Dispatch Intervals covered by the Low Reserve Condition Declaration.

E[A] Direction of a Registered facility in advance of the first Dispatch Interval of a Low Reserve Condition Declaration

As part of its assessment under paragraph 2.1.1(d), AEMO may determine for the purposes of paragraph 2.1.1(e) that a Registered Facility or Registered Facilities will require direction in one or more Dispatch Intervals immediately prior to the first Dispatch Interval included in the Low Reserve Condition Declaration. This direction would be to ensure that the relevant Registered Facility or Registered Facilities are able to provide an Essential System Service to reduce or remove the ESS Shortfall in a Dispatch Interval included in the Low Reserve Condition Declaration. A direction in this circumstance, for example to a Registered Facility that is a "slow start" Facility, will be a direction made under clause 3.4.4(d).

E[B] Shortfall co-optimisation

In many practical scenarios, it is preferable (both in terms of economic and operational efficiency) to resolve shortfalls in capacity by freeing up additional energy capacity by “unlocking” existing Essential System Service capacity on an already-operational unit (co-optimisable capacity that is otherwise committed to the Wholesale Energy Market).

In the situation where the Dispatch Algorithm fails to resolve shortfalls due to capacity being unavailable as the result of Trapezium Trapping, breaking (or preventing) Trapezium Trapping is a minimum impact intervention that otherwise preserves market offers and the optimisation space available to the Dispatch Algorithm. To prevent Trapezium Trapping, under clause 7.7.3, AEMO may direct a Market Participant to offer a 0 quantity for all Essential System Services that may restrict the operating range of their Registered Facility. This will enable the quantity of capacity that would otherwise be provided by way of an Essential System Service to be utilised to resolve the shortfall.

2.1.2. For the purpose of determining the necessary actions required to resolve the Low Reserve Condition under paragraph 2.1.1(d), the actions AEMO may take in order of lowest to highest Market Impact are as follows:

- (a) in accordance with clause 7.7.3, a direction to a Market Participant to make a Real-Time Market Submission for a Registered Facility, that has been accredited to provide an Essential System Service in accordance with clause 2.34A, that either:
 - (i) prevents Trapezium Trapping for that Registered Facility; or
 - (ii) provides for a quantity of that Essential System Service,with the exact details of the required Real-Time Market Submission to be specified by AEMO in its direction; or
- (b) in accordance with clause 7.7.5, where the Short Term PASA or the Reference Scenario for the Pre-Dispatch Schedule projects that a Registered Facility will be needed to provide an Essential System Service, a direction to a Market Participant to synchronise the Registered Facility that has been accredited to provide an Essential System Service in accordance with clause 2.34A, and to provide the required Essential System Service.

2.1.3. For the purposes of determining the most appropriate Registered Facility to be directed under paragraph 2.1.1(d) or paragraph 4.1.1(a), AEMO will take into account the following for each Registered Facility, where relevant:

- (a) the current synchronisation state, operating configuration, and Dispatch Schedule for all Market Services;
- (b) whether direction of the Registered Facility will result in an increased supply of the required Essential System Service, through either:
 - (i) direct provision of the relevant Essential System Service; or
 - (ii) redispatch of the Registered Facility to supply sufficient energy to allow co-optimisation of the required Essential System Service from another Facility;
- (c) the maximum accredited quantity of the required Essential System Service held by the Registered Facility;
- (d) whether the direction could result in:
 - (i) decommitment or reconfiguration of the Registered Facility;

- (ii) any lead time or failure risk of the Registered Facility returning to the present operational configuration; or
 - (iii) any other impact to the available capacity or performance of the Registered Facility after the relevant Low Reserve Condition ends;
- (e) the lowest Remaining Available Capacity under any current or relevant future Forced Outage or Planned Outage for the Registered Facility;
- (f) the relevant Start Decision Cutoff and time to synchronisation for the Registered Facility to reach an output level necessary to supply the required quantity of the relevant Essential System Service;
- (g) whether Energy Storage Constraints apply to the Registered Facility;
- (h) whether redispatch of the Registered Facility increases the Largest Credible Supply Contingency;
- (i) any relevant Planned Outages or issues of equipment reliability known to AEMO;
- (j) whether the output of the Registered Facility will be impacted by Network congestion or otherwise result in another Registered Facility being constrained;
- (k) the relative prices and quantities in the Real Time Market Submissions for the Registered Facility:
 - (i) during an applicable Low Reserve Condition under consideration in paragraph 2.1.1(a); and
 - (ii) for all Market Services in the Wholesale Electricity Market;
- (l) whether the Registered Facility has sufficient Capacity Credits to meet the MW quantity of capacity required to fulfil the direction;
- (m) any nearby storm activity, bushfires, or any other real time conditions or information known to AEMO that may impact the Registered Facility's performance or reliability; and
- (n) any other information known to AEMO that is relevant to the Registered Facility's performance, capability, or reliability in providing the Essential System Service.

3. Direction of Registered Facilities for a Low Reserve Condition Energy Shortfall

3.1. Process to be used by AEMO to determine which Registered Facility to direct

3.1.1. Where:

- (a) AEMO has declared a Low Reserve Condition due to an Energy Shortfall that meets the requirements of clause 7.7.4;
- (b) AEMO has published the Low Reserve Condition Declaration under clause 3.17.4;
- (c) in accordance with clause 7.7.4(b), the first Dispatch Interval of the Energy Shortfall is occurring within one week of the publication of the Low Reserve Condition Declaration referred to in paragraph 3.1.1(b); and
- (d) AEMO has determined that, during the relevant Low Reserve Condition, available capacity from one or more specific Registered Facilities is unlikely to be dispatched, as determined by AEMO through an assessment of each Registered Facility in the In-Service Only Scenario, including consideration of:
 - (i) forecast Dispatch Instructions for the Registered Facility;
 - (ii) any past dispatch non-compliance or performance of the Registered Facility at high temperatures or other relevant power system conditions; and
 - (iii) any other knowledge or past observations in relation to the Registered Facility by AEMO that indicate forecast Market Schedules are likely to differ from real time dispatch,

AEMO may direct a Market Participant to make a Real-Time Market Submission for the Registered Facility that, using its discretion and based on its assessment in paragraph 3.1.1(d) and the current operational conditions, it has determined to be the most appropriate Registered Facility or Registered Facilities to direct, requiring that Registered Facility to offer its full Reserve Capacity Obligation Quantity as In-Service Capacity for energy in accordance with clause 7.7.4.

3.1.2. AEMO may use its discretion and not direct the Market Participant in relation to the most appropriate Registered Facility identified by AEMO in accordance with paragraph 3.1.1 in circumstances where AEMO determines that:

- (a) a direction issued in respect of the specific Registered Facility would likely lead to an ESS Shortfall, in which the Registered Facility would likely be selected to supply Essential System Services under the criteria in paragraph 2.1.3; or
- (b) Power System Security or Power System Reliability would otherwise be better maintained if a direction is not made in respect of the specific Registered Facility .

3.1.3. Where AEMO uses its discretion not to direct a Market Participant for a specific Registered Facility in accordance with paragraph 3.1.2, AEMO may direct the same or a different Market Participant, as relevant, to make a Real-Time Market Submission in respect of a different Registered Facility, that is the

next most appropriate Facility to direct based on the criteria applied under paragraph 3.1.1(d), to offer its full Reserve Capacity Obligation Quantity as In-Service Capacity for energy in accordance with clause 7.7.4.

4. Direction to synchronise to provide RoCoF Control Service

E[C] RoCoF Control Service shortfall

Clause 3.9.7 defines Rate of Change of Frequency Service (RoCoF Control Service) as “the service, measured in MWs, of providing Inertia to facilitate an instantaneous response to slow down the rate of change of the SWIS Frequency”.

AEMO is required under clause 3.10.3 of the WEM Rules to schedule and dispatch both sufficient Contingency Reserve and RoCoF Control Service to ensure that these services, in combination, following a Credible Contingency Event enable the frequency in the SWIS to be maintained within prescribed technical limits, including the RoCoF Safe Limit. The WEM Procedure: Essential System Service Quantities sets out the methodology AEMO uses to determine, for each Pre-Dispatch Interval and Dispatch Interval, the RoCoF Control Service requirement (which is defined in that WEM Procedure as the portion of the RoCoF Control Service quantity that is determined endogenously in the Dispatch Algorithm) and the methodology and process AEMO uses, to meet the requirement in clause 3.10.3(b).

RoCoF Control Service shortfalls can occur in Dispatch Schedules where there is an insufficient In-Service RoCoF Control Service. Insufficient RoCoF Control Service may result in the exceedance of the RoCoF Safe Limit that applies under a Contingency Event.

- 4.1.1. Where AEMO has determined there is an insufficient quantity of RoCoF Control Service available in three or more consecutive Dispatch Intervals in the forecast Dispatch Schedule that indicate the requirements of clause 3.10.3(b) will not be met, AEMO will:
- (a) assess the relevant power system conditions and Registered Facilities according to the criteria in paragraph 2.1.3 to determine each Registered Facility’s availability for direction to provide RoCoF Control Service;
 - (b) based on its assessment in paragraph 4.1.1(a), and its assessment of the current operational conditions, determine the most appropriate Registered Facility or Registered Facilities to direct that will:
 - (i) be feasible, based on AEMO’s assessment of the capability of Registered Facilities under paragraph 2.1.3; and
 - (ii) restore and maintain the SWIS in a Secure Operating State,while making reasonable attempts to minimise the total number of required directions, number of impacted Registered Facilities, and overall deviation from normal market operations.
- 4.1.2. For the purposes of clause 3.4.4(d), AEMO will direct Market Participants to synchronise their most appropriate Registered Facility or Registered Facilities identified under paragraph 4.1.1(b) to provide RoCoF Control Service in the relevant Dispatch Intervals.

Appendix A. Relevant clauses of the WEM Rules

Table 3 details:

- (a) the head of power clauses in the WEM Rules under which the Procedure has been developed; and
- (b) each clause in the WEM Rules requiring an obligation, process or requirement be documented in a WEM Procedure, where the obligation, process or requirement has been documented in this Procedure.

Table 3 Relevant clauses of the WEM Rules

Clause
7.7.14(a)
7.7.14(b)