WEM Procedure: Facility Dispatch Process

Prepared by:	AEMO
Document ref:	
Version:	1.1~~0~~
Effective date:	TBC
Status:	DRAFT

Approved for distribution and use by:

Approved by:	Draft – not approved for distribution or use
Title:	
Date:	TBC

aemo.com.au

Version Release History

Version	Effective Date	Summary of Changes
1.0	1 October 2023	WEM Procedure developed in accordance with clauses 7.5.4, 7.6.3, 7.6.18 of the WEM Rules.
1.1	TBC	• Updates to Appendix B to correctly represent Dispatch Cap implementation. • Inclusion of Heads of Power clauses 7.10.21(a)-(e). • Fixing typographical and formatting errors.

IMPORTANT NOTICE – EXPLANATORY NOTES

Disclaimer

Explanatory notes included in this document as shaded in-line text are provided for explanatory purposes only to assist 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), 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

Tables

1. Introduction

1.1. Purpose and scope

1.1.1. This WEM Procedure: Facility Dispatch Process (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 describe the following:

(a)   the processes AEMO and Market Participants must follow in issuing, recording, receiving, confirming, and responding to Dispatch Instructions **[clause 7.6.18(a)]**;

(b)   the methodology and data requirements for converting sent-out Dispatch Instructions to as-generated Dispatch Instructions where agreed by AEMO for a Registered Facility **[clause 7.6.18(b)]**;

(c)   the process and basis for issuing Dispatch Instructions where AEMO is unable to successfully run the Dispatch Algorithm for a Dispatch Interval **[clause 7.6.3]**;

(d)   the process to be used by AEMO for selecting, applying, invoking and revoking Constraint Equations or Constraint Sets in response to Network Constraints for use in the Dispatch Algorithm **[clause 7.5.4(a)]**; ~~and~~

(e)   the circumstances in which AEMO will use Fully Co-optimised Network Constraint Equations and Alternative Network Constraint Equations in the Dispatch Algorithm **[clause 7.5.4(b)]**; ~~and~~

(f)   the processes to be followed by a Market Participant making an application under clause 7.10.12 or notifying AEMO under clause 7.10.16 **[clause 7.10.21(b)]**;

(g)   the information to be provided by a Market Participant in support of an application under clause 7.10.12 **[clause 7.10.21(c)]**;

(h)   the processes to be followed by AEMO in determining whether or not to grant permission under clause 7.10.14 or to revoke permission under clause 7.10.17 **[clause 7.10.21(d)]**; and

~~(e)~~(i)   the timeline for assessing an application under clause 7.10.12 and notifying a Market Participant of its decision in accordance with clause 7.10.15, which must not exceed 10 Business Days from the date AEMO receives the application **[clause 7.10.21(e)]**. ~~.~~

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
AEMO Linear Dispatch	Where a Registered Facility is linearly dispatched by AEMO.
AGC Participation Mode	Settings within the AEMO's Automatic Generation Control System which govern under which system conditions a Registered Facility will be issued new setpoints.
Basepoint	The SCADA point that indicates what the Registered Facility's Injection or Withdrawal would be if it was dispatched for energy, without any enablement for Regulation or Contingency Reserve.
Dispatch Algorithm Failure Event	Where the Dispatch Algorithm is not able to be successfully run to determine and publish Dispatch Instructions for a Primary Dispatch Interval.
Dispatch Instruction API	The system specified in the Dispatch Instruction API Specification (see related documents).
Fast Start Inflexibility Profile Facility (FSIP Facility)	A Fast Start Facility that has a Dispatch Inflexibility Profile included in its Real-Time Market Submission in accordance with clause 7.4.44.
Initial MW	The best estimate available to AEMO of the level of Injection or Withdrawal for a Registered Facility at the start of a Dispatch Interval.
Market Participant Interface (MPI)	A web-based application that allows Market Participants to trade in the Wholesale Electricity Market, as well as access market related data.
Network Constraint Set	A collection of one or more Fully Co-optimised Network Constraint Equations.
Operational Data Point	A data object referring to a single input or output value, monitored by a SCADA system or other appropriate communication mechanism, encompassing the "SCADA data points" referred to in the WEM Procedure: Communications and Control Systems (see related documents in section 1.4).
Primary Dispatch Interval	The first Dispatch Interval in a Dispatch Schedule, from which operative Dispatch Instructions and Market Clearing Prices are determined.
Supervisory Control and Data Acquisition (SCADA)	Supervisory Control and Data Acquisition (SCADA) is a system that is used to monitor and control field device(s) at remote locations.
SCADA Dispatch	Dispatch of a Registered Facility using values issued via AEMO's SCADA system, but where the Registered Facility is not linearly dispatched by AEMO, and instead is controlled locally to achieve the desired Injection or Withdrawal.
Wholesale Electricity Market System (WEMS)	An interface software system that AEMO uses to administer and operate the Wholesale Electricity Market.

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: Constraint Formulation	WEM Website
WEM Procedure	WEM Procedure: Limit Advice Requirements	WEM Website
WEM Procedure	WEM Procedure: Outages	WEM Website
Operational Data Point Specification	Technical Specification: Operational Data Points for Registered Facilities	WEM Website
SCADA Specification	Technical Specification: AGC, SCADA Dispatch Instructions, and Fast Start Facility Operational Behaviour	WEM Website
Dispatch Instruction API Specification	Technical Specification: Dispatch Instruction API	WEM Website

2. Dispatch Instruction Processes

2.1. Issuing Dispatch Instructions – General Provisions

2.1.1. AEMO will issue Dispatch Instructions to a Market Participant in respect of a Registered Facility via its Automatic Generation Control System where a Registered Facility is capable of responding to a Dispatch Instruction via that mechanism, including:

(a)   via AEMO Linear Dispatch[1]; or

(b)   via SCADA Dispatch[2].

2.1.2. Where a Registered Facility is participating in AEMO Linear Dispatch, AEMO may issue intermediate step change controls via the SCADA system to a Market Participant in respect of the Registered Facility in order to approximate a linear ramping profile, and in doing so AEMO will:

(a)   determine the ramping profile commencing from the last issued control from the previous Dispatch Interval;

(b)   take into account estimates of communication lag times before commencing ramping and issuing intermediate controls;

(c)   take into account limits on maximum Injection and Withdrawal made available via SCADA for the Registered Facility; and

(d)   where AEMO has approved an application under paragraph 3, ramp the Registered Facility in accordance with its as-generated Dispatch Target, in accordance with the relevant calculation determined under section 3.

2.1.3. AEMO will make Dispatch Instructions for Registered Facility's available via the system specified in the Dispatch Instruction API Specification.

2.1.4. Where both mechanisms described in paragraphs 2.1.1 and 2.1.3 are unavailable, AEMO may direct Facilities via telephone, where it is practical to do so.

2.1.5. Where the mechanisms described in paragraphs 2.1.1 and 2.1.3 become available again, Market Participants must continue to follow any Dispatch Instructions issued by AEMO under paragraph 2.1.4 until AEMO advises that the mechanisms described in paragraphs 2.1.1 and 2.1.2 are again available for use.

2.1.6. A Dispatch Instruction remains in effect until superseded by a new Dispatch Instruction.

---

[1] Note that AEMO will not actively ramp a Facility (AEMO Linear Dispatch) where the Facility has indicated via SCADA that it is not able to respond to a control signal (see description for the "AGC Control Selection" point in the Technical Specification: Operational Data Points for Registered Facilities)

[2] See descriptions for the "Dispatch Target MW" and "Dispatch Target Ramp Rate" points in the Technical Specification: Operational Data Points for Registered Facilities. These values will continue to be issued regardless of the status of the "AGC Control Selection" point

> **E[A]   Dispatch Instruction issuance timelines**
>
> As per clause 7.13.1B of the WEM Rules, AEMO will issue Dispatch Instructions every five minutes when dispatching in accordance with the Dispatch Algorithm. However, paragraph 2.1.6 covers the situation where AEMO is unable to do so due to the unavailability of the mechanisms under paragraph 2.1.1 and 2.1.2.

2.1.7.   Where AEMO issues a direction to a Market Participant in respect of Registered Facility, AEMO must as soon as practicable issue a Dispatch Instruction that reflects the direction to the extent that the direction can be represented as a Dispatch Instruction.

2.1.8.   Where:

(a)   a Semi-Scheduled Facility is not required to restrict its Injection or Withdrawal in a Dispatch Interval;, and

(b)   the Semi-Scheduled Facility is capable of receiving a Dispatch Cap via SCADA,

AEMO will issue a Dispatch Cap via SCADA with a value equal to the sum of the quantities from the Price-Quantity Pairs in the Semi-Scheduled Facilities effective Real-Time Market Submission for Injection or Withdrawal as applicable, to reflect this lack of restriction, as per Appendix B.

2.2.   Issuing Dispatch Instructions – Essential System Services

2.2.1.   Where AEMO issues Dispatch Instructions containing one or more non-zero Essential System Service Enablement Quantities to a Market Participant in respect of a Registered Facility that is participating in AEMO Linear Dispatch, AEMO will change the relevant AGC Participation Mode to reflect the combination of Essential System Service being provided by the Registered Facility as per the SCADA Specification, as soon as practicable.

2.2.2.   Where a Facility is participating in AEMO Linear Dispatch, AEMO will modify the limits in AEMO's Automatic Generation Control System to reflect the cleared quantity of the Essential System Service taking into account any changes in underlying Dispatch Target.

2.2.3.   Where a Facility was cleared for Regulation Raise or Regulation Lower in the previous Dispatch Interval, and in the current Dispatch Interval is no longer cleared for Regulation Raise or Regulation Lower or is cleared for a reduced quantity of Regulation Raise or Regulation Lower, AEMO may issue intermediate controls when ramping the Facility to its new levels to avoid large step changes that may adversely affect Power System Security or Power System Reliability.

2.3.   Recording Dispatch Instructions

2.3.1.   For each Dispatch Instruction issued under clause 7.6.8, AEMO will maintain a record of each of the data items specified in clause 7.6.8 and clause 7.6.8A.

2.3.2.   For each Dispatch Instruction issued under clause 7.6.11A, AEMO will maintain a record of of each of the data items specified in that clause.

2.4. Receipt and Confirmation of Dispatch Instructions

> ### E[B]   Acknowledging Dispatch Instructions
>
> Where facilities are participating in SCADA-based dispatch, AEMO has realtime visibility of the Dispatch Target/Cap being issued and the Facilities response. Therefore in normal circumstances acknowledging that the Facility has "received" the Dispatch Instruction provides limited operational value.
>
> **[Clause 7.6.20]** of the WEM Rules requires Market Participants that are not participating in SCADA-based dispatch to acknowledge receipt of Dispatch Instructions in accordance with the WEM Procedure. Where AEMO does not have SCADA visibility of a Facility (e.g. DER Aggregation, etc), this can help to drive visibility that a Facility may not be able to respond.
>
> Similarly, under normal circumstances this acknowledgement is not operationally critical and so would not normally be required – other than for DSP participants that are generally only dispatched during times of high system stress.
>
> Acknowledgement of receipt of a Dispatch Instruction for non-DSP participants is therefore only required where AEMO determines that the additional confirmation it is necessary to support maintaining power system security and reliability, which may include during a wide-spread SCADA disruption. In these situations AEMO will first notify Participants that acknowledgement is required via a Market Advisory.
>
> Acknowledgement of receipt of a Dispatch Instruction is made through non-SCADA systems, to the extent that they are available for Market Participants to use.

2.4.1.   Where a Market Participant's Registered Facility is participating in AEMO Linear Dispatch or SCADA Dispatch, upon receipt of the Dispatch Target or Dispatch Cap as relevant, the Market Participant must update the appropriate SCADA point with the received Dispatch Target or Dispatch Cap value as relevant, in accordance with the SCADA Specification.

> ### E[C]   Back-Indication Points for Acknowledging Dispatch Instructions
>
> Registered Facilities which existed on or before the New WEM Commencement Date which participate in SCADA Dispatch or AGC Dispatch will already have a back-indication point for the purpose of acknowledging Dispatch Instructions. Market Participants intending to register new Facilities should consult the "Technical Specification: Operational Data Points for Registered Facilities" for the required points for this functionality.

2.4.2.   Market Participants are not required to acknowledge receipt of Dispatch Instructions for Registered Facilities that are not Demand Side Programmes, unless otherwise directed by AEMO under paragraph 2.4.3.

2.4.3.   AEMO will issue a Market Advisory and direct a Market Participant to acknowledge Dispatch Instructions for a specific Registered Facility, if AEMO considers that circumstances require acknowledgement of receipt of Dispatch Instructions from Market Participants to support maintaining Power System Security and Power System Reliability, including but not limited to where AEMO is experiencing wide-spread SCADA communications issues and determines that it requires additional verification.

2.4.4.   Where a ~~a~~ Market Participant is receiving Dispatch Instructions for a Demand Side Programme, it must acknowledge receipt of the Dispatch Instruction either via the AEMO Market Participant interface or the system specified in the Dispatch Instruction API Specification, unless both of those systems are unavailable.

2.4.5.   Where a Market Participant has been directed to acknowledge Dispatch Instructions under paragraph 2.4.3, the Market Participant must acknowledge Dispatch Instructions where those Dispatch Instructions include a change in Dispatch Target, Dispatch Cap or Essential System Service Enablement Quantity from the previously issued Dispatch Instruction, using the AEMO MPI or the system specified in the Dispatch Instruction API Specification, as available.

2.4.6.   Where AEMO has directed a Market Participant to acknowledge Dispatch Instructions under paragraph 2.4.3, AEMO will deem Dispatch Instructions to be acknowledged where the Dispatch Target, Dispatch Cap and Essential System Service Enablement Quantity in that Dispatch Instruction has not changed from the previously issued Dispatch Instruction.

> ### E[D]   Unavailability of Dispatch Instruction Acknowledgement Mechanisms
>
> Where a Participant would normally be required to acknowledge a Dispatch Instruction, and AEMO's acknowledgement mechanisms are not available or not capable of processing the acknowledgement, the Participant cannot acknowledge the Dispatch Instruction and so is not required to (per paragraph 2.4.2). AEMO cannot assume that the Dispatch Instruction has been received, and so is reliant instead on Participants notifying AEMO where they are unable to comply with an issued Dispatch Instruction.

2.4.7.   A Market Participant may acknowledge the Dispatch Instruction either via the AEMO Market Participant Interface or the Dispatch Instruction API in addition to requirements under paragraph E[B].

2.4.8.   Where a Market Participant is required to acknowledge receipt of a Dispatch Instruction, the Market Participant must acknowledge the Dispatch Instruction within 5 minutes of receipt of the Dispatch Instruction.

2.5.   Response to Dispatch Instructions

> ### E[E]   Linear Ramping Exemptions
>
> It is anticipated that most Facilities will be capable of ramping linearly across a Dispatch Interval, either by directly adjusting their ramp rate, or by incrementally increasing/~~descreasing~~decreasing output with a fixed ramp rate in a step-wise manner over a Dispatch Interval to reach the necessary Dispatch Target or Dispatch Cap, within the relevant Tolerance Range or Facility Tolerance Range.
>
> Exemptions for linear ramping are possible where it is not physically possible for a Facility to maintain or approximate

2.5.1.   A Market Participant is not required to comply with an obligation under this paragraph 2.5 where one or more of the exemptions under clause 7.10.2 of the WEM Rules applies.

2.5.2.   Market Participants seeking permission to ramp at a fixed rate for a Registered Facility under clause 7.10.12 must send a written request for permission via email to AEMO, which must include the following information:

(a)   the identification of the Facility for which the permission is being sought;

(b)   a summary of the reasons why the Facility cannot ramp to a linear profile over a Dispatch Interval; and

(c)   the following evidence:

(i)   historical data of the Facility ramping across multiple 5-minute intervals, demonstrating an inability to maintain an approximately linear trajectory, taking into account the applicable Tolerance Range or Facility Tolerance Range;

(ii)   technical information confirming why it is not physically possible for the Facility to ramp or approximate a linear profile over a Dispatch Interval, including any risks to the operation of the Facility; and

(iii)   technical information confirming how the Facility can ramp to meet a Dispatch Target or Dispatch Cap, as relevant.

2.5.3.   Following receipt of a request for permission under paragraph 2.5.2, AEMO will review the information provided and, where the application is not complete, may require the relevant Market Participant to provide additional details, supporting evidence and conduct additional tests in order to make a decision.

2.5.4.   AEMO will use best endeavoursmust to review a request for permission under paragraph 2.5.2 and any additional information provided under paragraph 2.5.3 and provide a response to the relevant Market Participant within 10 business days of receiving a complete application the request, and will use best endeavours to provide a final decision within 10 business days of receiving all additional details, supporting evidence and test results as required under paragraph 2.5.3.

2.5.5.   In making a decision on whether to grant permission for a Registered Facility to ramp at a fixed rate in response to Dispatch Instructions, AEMO will take into consideration:

(a)   information provided in the request for permission under paragraph 2.5.2;

(b)   additional details, supporting evidence or test results received under paragraph 2.5.3;

(c)   how the Facility will ramp to achieve a Dispatch Target or Dispatch Cap, as relevant; and

(d)   risks to Power System Security or Power System Reliability that may arise as a result of the Registered Facility attempting to ramp linearly across a Dispatch Interval.

2.5.6.   Where AEMO has granted permission to a Market Participant under paragraph 2.5.5 for a Registered Facility to ramp at a fixed rate in response to Dispatch Instructions, that Market Participant must include the details of AEMO's decision via the Wholesale Electricity Market System (WEMS) as a supporting document for reference purposes within 20 Business Days of the date of receiving the decision.

2.5.7.   For any Registered Facility that is dispatched on a fixed ramp rate basis prior to New WEM Commencement Day, AEMO may agree with the Market Participant responsible for that Registered Facility to continue to dispatch on a fixed ramp rate for an agreed period of time in order to allow the Market Participant to complete and test any necessary modifications for linear ramping.

2.5.8.   Where AEMO makes an agreement with a Market Participant under paragraph 2.5.7, AEMO will treat that Registered Facility as if AEMO had granted temporary permission to a request for that Registered Facility made by a Market Participant under paragraph 2.5.2.

2.5.9.   Where AEMO has agreed on a temporary fixed ramping arrangement with a Market Participant under paragraph 2.5.7, that Market Participant must include the details of that agreement, including the agreed period of time, via the Wholesale Electricity Market System (WEMS) as a supporting document for reference purposes within 20 Business Days of the date of receiving AEMO's agreement.

2.5.10.   If a Market Participant for a Registered Facility is granted permission to ramp at a fixed rate under clause 7.10.14 of the WEM Rules, the Market Participant must ramp the Registered Facility using the fixed rate as per the permission provided by AEMO under paragraph 2.5.5.

2.5.11.   A Market Participant must immediately submitting any notification to AEMO, maderequired under clause 7.10.16, in writing via email.

2.5.12.   In response to a notification under clause 7.10.16, where AEMOit determines to do so under clause 7.10.17, it will revoke the permission granted under clause 7.10.14 at a time determined in consultation with the relevant Market Participant by issuing a written notice via email.

2.5.11.2.5.13.   A requirement to comply with a Dispatch Target or Dispatch Cap under this paragraph 2.5 includes an allowance for the applicable Tolerance Range or Facility Tolerance Range.

2.5.12.2.5.14.   Where a Market Participant for a Registered Facility receives a Dispatch Instruction containing a Dispatch Target, the Market Participant must ensure the Registered Facility ramps to the new Dispatch Target using a linear profile from its current level of Injection or Withdrawal.

2.5.13.2.5.15.   Where a Market Participant for a Semi-Scheduled Facility receives a Dispatch Instruction containing a Dispatch Cap for Injection, and its Initial MW value is greater than the Dispatch Cap, the Market Participant must ensure the Semi-Scheduled Facility reduces to a level of Injection less than or equal to the Dispatch Cap using a linear profile.

> ### E[F]   Dispatch Cap ramping
>
> It is possible that resources available to an Semi-Scheduled Facility (e.g. wind for a wind farm, sunlight for a solar farm) will decrease while the Facility is ramping down to a Dispatch Cap. In this case, it is acceptable that the ramp profile differs from a linear profile, as this is outside the control of the Semi-Scheduled Facility.

2.5.14.2.5.16.   Where a Market Participant for a Semi-Scheduled Facility receives a Dispatch Instruction containing a Dispatch Cap for Injection, and its Initial MW value is less than or equal to the Dispatch Cap, the Market Participant must ensure the Semi-Scheduled Facility's Injection remains less than or equal to the Dispatch Cap for the entire Dispatch Interval.

2.5.15.2.5.17.   Where a Market Participant for a Semi-Scheduled Facility receives a Dispatch Instruction containing a Dispatch Cap for Withdrawal, and its Initial MW value is less than the Dispatch Cap, the Market Participant must ensure the Semi-Scheduled Facility reduces the quantity of its Withdrawal to the Dispatch Cap using a linear profile.

2.5.16.2.5.18.   Where a Market Participant for a Semi-Scheduled Facility receives a Dispatch Instruction containing a Dispatch Cap for Withdrawal, and its Initial MW value is greater than or equal to the Dispatch Cap, the Market Participant must ensure the Semi-Scheduled Facility's Withdrawal remains greater than or equal to the Dispatch Cap for the entire Dispatch Interval.

2.5.17.2.5.19.   Where a Registered Facility is participating in AEMO Linear Dispatch, AEMO will issue the Registered Facility's Basepoint to follow a linear profile when moving to a new Dispatch Target or Dispatch Cap as applicable.

2.5.18.2.5.20.   Where a Registered Facility was enabled for a Frequency Co-Optimised Essential System Service in the previous Dispatch Interval, and is issued a new Dispatch Instruction that includes a smaller enablement quantity, or zero enablement quantity, AEMO may limit the ramp rate of that Facility during that Dispatch Interval to maintain Power System Security.

> **E[G]   Reductions in FCESS Enablement**
>
> Facilities may be driven away from their underlying Dispatch Target when providing a FCESS – e.g. when providing Regulation and responding to a low frequency.
>
> If the Facility is then subsequently disabled from providing that service (or the service quantity is reduced) there can potentially be a large deviation from its new Dispatch Target.
>
> In these circumstances AEMO may limit the ramp rate of the Facility to avoid impacting system frequency while ramping to the new Dispatch Target.

2.5.19.2.5.21.   Where a Market Participant is required to notify AEMO under clause 7.10.7, it must:

(a)   notify AEMO's control room by telephone, or another communication method as instructed by AEMO; and

(b)   notify AEMO and submit a Forced Outage for the Registered Facility if required, in accordance with the WEM Procedure: Outages.

2.5.20.2.5.22.   Where a Market Participant notifies AEMO under clause 7.10.7 that it cannot comply or fully comply with a Dispatch Instruction, it must provide the following information to AEMO as soon as reasonably practicable after notifying AEMO in addition to the information required under clauses 7.10.7 and 7.10.8:

(a)   the component of the Dispatch Instruction which it cannot comply with for the relevant Dispatch Interval, and subsequent Dispatch Intervals or Pre-Dispatch Intervals if relevant; and

(b)   an estimate of when the Registered Facility will be able to fully comply with future Dispatch Instructions.

2.5.21.2.5.23.   Where a Market Participant notifies AEMO under clause 7.10.7 that it cannot comply or fully comply with a Dispatch Instruction, as soon as practicable after notifying AEMO, it must update any SCADA indications of the limits of the relevant Registered Facility to reflect the Registered Facility's capabilities.

2.5.22.2.5.24.   Where a Market Participant has amended a Real-Time Market Submission to reflect a Dispatch Inflexibility Profile for a Facility in accordance with clause 7.6.31(a), the Market Participant must notify AEMO via telephone as soon as practicable.

2.5.23.2.5.25.   When notifying AEMO in accordance with paragraph 2.5.24, a Market Participant must:

(a)   provide information required under clause 7.6.31(b); and

(b)   advise AEMO of the expected duration of the inflexibility.

2.6. Directions

2.6.1.   AEMO may direct Market Participants and Network Operators to manage and maintain Power System Security and Power System Reliability under clause 3.4.4, clause 3.5.5 and section 7.7 of the WEM Rules.

2.6.2.   Where a Market Participant or Network Operator is unable to comply with a direction from AEMO, the Market Participant or Network Operator must:

(a)   notify AEMO by telephone that it is unable to comply or fully comply with the direction as soon as possible, providing reasons why it cannot comply with the direction; and

(b)   where the direction can be partially complied with, advise AEMO of the details of the where the direction can be partially complied.

3. Conversion of Dispatch Instructions to an as-generated basis

3.1.1. A Market Participant may make an application to AEMO requesting that AEMO issue Dispatch Instructions to a that Market Participant for a Registered Facility on an as-generated basis, subject to paragraph 3.1.11.

3.1.2. An application made under paragraph 3.1.1 must be made via the process indicated on the WEM Website, and must include:

(a) the identity of the Registered Facility to be dispatched on an as-generated basis;

(b) the reasons why the conversion of Dispatch Instructions to an as-generated basis cannot reliably be performed by the Market Participant;

(c) the Market Participant's proposed equation for conversion between sent-out Dispatch Instructions and as-generated Dispatch Instructions; and

(d) the Market Participant's proposal for intended behaviour when one or more components of the equation in paragraph 3.1.2(c) are unavailable.

3.1.3. AEMO must respond to the Market Participant to acknowledge receipt of an application made under paragraph 3.1.1 within 5 Business Days.

3.1.4. AEMO may request a Market Participant provide additional information, by email and must specify a timeframe in which the information must be provided, which may be varied in agreeance between AEMO and the Market Participant.

3.1.5. Within 30 Business Days of receipt of an application made under paragraph 3.1.1 or upon receipt of the further information under paragraph 3.1.4 (whichever is the latter), AEMO must:

(a) accept the application as proposed;

(b) accept the application with a different equation determined by AEMO under 3.1.7; or

(c) reject the application.

3.1.6. AEMO must only accept an application under paragraph 3.1.1 if in AEMO's reasonable opinion there is a genuine physical or communication issue that makes implementation of Dispatch Instructions on a sent-out basis by the Market Participant infeasible.

3.1.7. The proposed equation under paragraph 3.1.2(c) must consist of Operational Data Points available to AEMO via the SCADA system.

3.1.8. AEMO may, in consultation with a Market Participant, determine a different equation than the one proposed under paragraph 3.1.2(c) or 3.1.2(d) if in AEMO's reasonable opinion the different equation achieves better accuracy in converting Dispatch Instructions to an as-generated basis for the Registered Facility or is needed to better maintain Power System Security or Power System Reliability.

3.1.9. Where AEMO determines a different equation under paragraph 3.1.8, AEMO must notify the relevant Market Participant of the equation that it has determined within five Business Days of the determination.

3.1.10. Where AEMO has accepted an application under paragraph 3.1.5(a) or 3.1.5(b), AEMO will issue Dispatch Targets to the Market Participant for the relevant Registered Facility for both as--generated and sent-out values based on the accepted equation.

3.1.11. For any Registered Facility which is dispatched on an as-generated basis prior to the New WEM Commencement Day, AEMO may agree with the Market Participant to continue to dispatch on an as-generated basis, and where AEMO agrees to do this, AEMO will notify the Market Participant and AEMO's agreement will be treated as if AEMO had accepted an application for that Registered Facility made by a Market Participant under paragraph 3.1.1 on the basis of the equation used immediately prior to the New WEM Commencement Day.

3.1.12. Where AEMO has accepted an application under paragraph 3.1.5, or an application is treated as accepted under paragraph 3.1.11, the relevant Market Participant must submit the accepted application and related parameters via the Wholesale Electricity Market System (WEMS) as a supporting document for reference purposes within 20 Business Days of the date of acceptance.

4. Facility start-up and shut-down

4.1.1. Where a Facility is a Fast Start Facility, AEMO may agree a method with the Market Participant responsible for that Facility to automatically start the Facility, in accordance with the SCADA Specification.

4.1.2. In agreeance with a Market Participant, AEMO may provide forecast Dispatch Targets or Dispatch Caps via lookahead SCADA signals as outlined in the Operational Data Points Specification.

4.1.3. Market Participants may utilise signals under paragraph 4.1.2, to support automation of start-up and shut-down of a Facility, however Market Participants must ensure that Facilities still comply with the Dispatch Instruction issued for the Dispatch Interval that is the focus of the lookahead signal.

4.1.4. Where a Facility is participating in AEMO Linear Dispatch, Market Participants must ensure that any control signals indicating that AEMO is able to issue controls to the Facility as specified in the Operational Data Points Specification are disabled to account for Facility start-up and shut-down as necessary, and re-enabled when AEMO Linear Dispatch becomes available.

> ### E[H]   Starting and stopping
>
> Facilities participating in AEMO Linear Dispatch typically have an "AGC Control Selection" indication that informs AEMO when the Facility is available to be linearly dispatched.
>
> During start-up and shut-down sequences, and when the Facility is offline, this signal would normally be disabled. However during a start-up sequence the signal needs to be re-activated once the AGC enablement point is reached such that AEMO can re-commence sending control signals for linear dispatch. This includes where an FSIP Facility is being automatically started by AEMO.
>
> For Fast Start Facilities, AEMO can implement specific start signals and other supporting signals to support Market Participants in automating their Facility start-up.

5. Operational Communications

5.1.1. Network Operators must maintain and make their operational voice communications system available to AEMO as specified in the WEM Procedure: Communications and Control Systems.

5.1.2. Market Participants must install and maintain two independent telephone services for operational voice communication with AEMO as specified in the WEM Procedure: Communications and Control Systems (including where that is via a Network Operator's voice communication system).

5.1.3. AEMO may use the telephone services in paragraph 5.1.1 and paragraph 5.1.2 for operational communications with a Market Participant or Network Operator, including but not limited to:

(a) issuing directions, including Outage Recall Directions;

(b) rejecting Outage Plans;

(c) confirming the capability of a Facility or Network to respond to a Dispatch Instruction or a direction;

(d) seeking a revision of a Thermal Network Limit from a Network Operator to support maintaining Power System Security and Power System Reliability;

(e) seeking other information regarding the operation of a Facility or Network to support operational coordination and decision making; and

(f) testing the telephone services.

5.1.4. In addition to the telephone services identified in paragraph 5.1.1 and paragraph 5.1.2, AEMO may use any additional contact details as provided in an Outage Plan or Commissioning Test Plan for the purposes of operational coordination and decision making.

5.1.5. Network Operators must notify AEMO via telephone where a Thermal Network Limit has been revised to support real-time operation.

5.1.6. Where a Market Participant or Network Operator is required to notify or otherwise provide information to AEMO under this Procedure, and AEMO has provided specific telephone contact numbers to the Market Participant or Network Operator for the purposes of operational communications, including for a specific Facility or Network, the Market Participant or Network Operator must, wherever possible, use those telephone numbers for that purpose.

> **E[I]   Operational communications for Outages and Limit Advice**
>
> The WEM Procedure: Outages describes requirements for Market Participants and Network Operators for notifying AEMO ~~under~~ of various "close to realtime" events, such as delays to the commencement of Outages, delays to restoration of Outages, Forced Outage events, etc.
>
> The WEM Procedure: Limit Advice Requirements describes requirements for Network Operators to notify AEMO where they are revising Thermal Network Limits for use in realtime.

5.1.7. AEMO may use the telephone services identified in paragraph 5.1.1 to seek information or otherwise coordinate with a Network Operator on developing and implementing a plan under clause 3.2A to support the maintenance of Power System Security and Power System Reliability.

6. Failure to run the Dispatch Algorithm

6.1.1.   Where there is a Dispatch Algorithm Failure Event, AEMO will not issue Dispatch Instructions for that Dispatch Interval.

6.1.2.   Where the Dispatch Algorithm is not able to be successfully run for a Dispatch Interval other than the Primary Dispatch Interval, AEMO will not publish updated forecast Dispatch Instructions for this Dispatch Interval.

6.1.3.   Where the Dispatch Algorithm is not able to be successfully run for a Pre-Dispatch Interval in a Pre-Dispatch Schedule or Week-Ahead Schedule, AEMO will not publish updated Market Schedules for this Pre-Dispatch Interval, including updated forecast Dispatch Instructions.

> ### E[J]   Non-published Market Schedules
>
> Where AEMO does not publish a Market Schedule, there will be no information made available for the relevant Dispatch Schedules and/or Pre-Dispatch Schedules. Requests to the dispatch APIs will return empty responses with an appropriate "data unavailable" message.

6.1.4.   Where the Dispatch Algorithm is not able to be successfully run for a Dispatch Interval or Pre-Dispatch Interval, AEMO will as soon as practicable publish a Market Advisory indicating the commencing Dispatch Interval or Pre-Dispatch Interval for which the Dispatch Algorithm was not able to be successfully run and the Dispatch Interval for which AEMO reasonably expects to be able to next successfully run the Dispatch Algorithm.

6.1.5.   The provisions of paragraph 2.1.6 also apply where the Dispatch Algorithm is not able to be successfully run for a Primary Dispatch Interval, meaning that the latest Dispatch Instruction remains in effect and Market Participants must continue to follow the last issued Dispatch Instruction until another Dispatch Instruction is issued, or are otherwise directed by AEMO.

6.1.6.   Following receipt of the Market Advisory issued by AEMO under paragraph 6.1.4, Market Participants must review their Real-Time Market Submissions and revise where necessary, including taking into account that AEMO will be unable to issue commands relating to Fast Start Inflexibility Profiles while the Dispatch Algorithm is not able to be successfully run.

> ### E[K]   Note on paragraph's 6.1.6
>
> Depending on the nature of the Dispatch Algorithm failure, AEMO may be operating with severely degraded visibility and/or control of market systems, and may not be able to maintain more complex aspects of the algorithm through manual control. For example:
>
> * Forecasting and data flow of lookahead signals
> * Fast Start profiles and control signals.
>
> Unless otherwise informed by AEMO, Market Participants that utilise these signals should assume they are unavailable and ensure that they are ready to manually start/stop Facilities as necessary.

6.1.7.   Where AEMO determines that it must direct a Registered Facility to vary from its last Dispatch Instruction, and the mechanisms described in paragraph 2.1.1 or 2.1.2 are available for that Registered Facility, AEMO may implement the direction via those mechanisms.

6.1.8. Where AEMO is not able to issue new Dispatch Instructions, AEMO may require Market Participants to disable automated dispatch via AEMO's Automatic Generation Control System, including AEMO Linear Dispatch and SCADA Dispatch.

6.1.9. Where a Market Participant has disabled automated dispatch under paragraph 6.1.8, Market Participants must not re-activate automated dispatch via AEMO's Automatic Generation Control System, including AEMO Linear Dispatch and SCADA Dispatch, until notified by AEMO.

> **E[L]   Note on paragraph's 6.1.8 and 6.1.9**
>
> It is likely that in these situations the SCADA signals required for these functions will still be functioning, but will be stale, remaining at the last issued Dispatch Instruction until AEMO's dispatch systems have returned to normal. In these circumstances Participants will generally not be required to disable automated dispatch.
>
> However should AEMO's SCADA system also encounter failures, or if AEMO needs to direct a Facility via voice communication, Participants may be required to disable automated dispatch in order to maintain local control of the Facility.
>
> When this occurs, Participants should not re-active automated dispatch until notified by AEMO that the SCADA signals are functioning correctly again.

6.1.10. During a Dispatch Algorithm Failure Event, AEMO may use previously determined Market Schedules for guidance when directing Market Participants, taking into account other information available to AEMO, including but not limited to:

(a)   changes in Forecast Unscheduled Operational Demand from previously determined Market Schedules;

(b)   errors in Semi-Scheduled Facility and Non-Scheduled Facility forecasts included in previously determined Market Schedules;

(c)   changes to Planned Outages and the occurrence of any Forced Outages; and

(d)   any other information AEMO considers relevant for the purpose of this paragraph 6.1.10.

6.1.11. During a Dispatch Algorithm Failure Event, as soon as a Market Participant identifies that its Facility may be incapable of achieving the quantities forecast in the latest Market Schedules, it must notify AEMO via telephone and provide details of what alternative capability is available for the Facility.

6.1.12. When AEMO determines that the Dispatch Algorithm Failure Event is over and it is able to re-commence issuing Dispatch Instructions again, AEMO will publish a Market Advisory indicating the Dispatch Algorithm Failure Event is over.

6.1.13. Where the duration of multiple consecutive Dispatch Algorithm Failure Events are less than 15 minutes, AEMO may issue the Market Advisory described in paragraph 6.1.4 after the events, in which case that Market Advisory must also include the information in paragraph 6.1.12.

6.1.14. During a Dispatch Algorithm Failure Event, where AEMO is not able to manage Power System Security and Power System Reliability through the invocation and revocation of Constraint Equations and Constraint Sets, AEMO may direct Facilities based on AEMO's determination of margins required to maintain Power System Security and Power System Reliability.

E[M]   Directions to safe levels

The normal automated management of Power System Security and Power System Reliability through the application of Constraint Equations is not available to AEMO when the Dispatch Algorithm is not available.

It is not possible for AEMO to manually perform the same calculations as the Disaptch Algorithm would normally calculate, and so in these conditions AEMO may be required to apply additional margins when making direction decisions to account for the inherent variability and complexity of the power system.

7. Invocation and revocation of Network Constraint Sets and Network Constraint Equations

7.1.1.   AEMO will select and invoke Network Constraint Sets in the Dispatch Algorithm that in AEMO's reasonable opinion best reflects the conditions or forecast conditions in the SWIS at the time the Network Constraint Set is to be invoked.

7.1.2.   Where a Network Constraint Set in AEMO's reasonable opinion no longer represents conditions or forecast conditions in the SWIS, AEMO will revoke that Network Constraint Set as soon as reasonably practicable.

7.1.3.   Where a Network Planned Outage is intended to take effect in a forecast Dispatch Interval, AEMO will use the most representative Network Constraint Set for the resulting Network configuration for the affected forecast Dispatch Intervals in the Dispatch Algorithm.

7.1.4.   Where AEMO becomes aware of a Network Forced Outage, AEMO will invoke the most representative Network Constraint Set for the resulting Network configuration as soon as reasonably practicable.

7.1.5.   Where a Network Forced Outage has occurred, AEMO will schedule the forecast revocation time of any associated Network Constraint Sets based on the best available estimate of the time that the Network Forced Outage will end.

7.1.6.   Where AEMO is provided a new estimated commencement time, or end time, for a Planned Outage or Forced Outage of Network equipment by a Network Operator, AEMO will update the forecast revocation time of any associated Network Constraint Sets to account for this time within one hour of this estimate being provided to AEMO.

8. Invocation and revocation of Alternative Network Constraint Equations

8.1.1.   AEMO may invoke Alternative Network Constraint Equations in the Dispatch Algorithm to manage issues or forecast issues that arise on the SWIS, for which AEMO does not have a Network Constraint Set that fully addresses the issue, including but not limited to:

(a)   in response to a Non-Credible Contingency Event;

(b)   where a Contingency Event has occurred, and the Real Time Market Submission for an affected Registered Facility has not yet been updated to in response to the Contingency Event to reflect their new capability;

(c)   where a Registered Facility is non-compliant with its effective Dispatch Instruction, and action is required to manage the impacts on Central Dispatch Process or the Network;

(d)   as part of the delivery of a Non-Co-optimised Essential System Service; or

(e)   where the existing Network Constraint Set does not result in a Secure Operating State, and additional Constraint Equations are required to achieve a Secure Operating State.

8.1.2.   Where an Alternative Network Constraint Equation has been invoked, and is no longer suitable to manage the issue it was invoked to address, AEMO will update the Alternative Network Constraint Equation to suit the prevailing conditions in the SWIS as soon as reasonably practicable.

8.1.3.   Where an Alternative Network Constraint Equation has been invoked, and is no longer required to manage the issue it was invoked for, AEMO will revoke the Alternative Network Constraint Equation as soon as reasonably practicable.

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
7.5.4(a)
7.5.4(b)
7.6.3
7.6.18(a)
7.6.18(b)
7.10.21(a)
7.10.21(b)
7.10.21(c)
7.10.21(d)
7.10.21(e)

Appendix B. Calculation of Dispatch Caps

This appendix documents the logic implemented in AEMO's systems to calculate Dispatch Caps for Semi-Scheduled Facilities for a Dispatch Interval or Pre-Dispatch Interval.

For a Semi-Scheduled Facility, let:

DISPATCH_Q be the Dispatch Forecast value as determined by the Dispatch Algorithm.

DISPATCH_CAP_Q be the quantity of the Dispatch Cap to be set for the Semi-Scheduled Facility

RTMS_INJECTION_SUM be:

(a)   For a Primary Dispatch Interval, the sum of the quantities from all offered In-Service energy Price-Quantity Pairs for Injection; or

(b)   For a Dispatch Interval other than the Primary Dispatch Interval, or for a Pre-Dispatch Interval, the sum of the quantities from all offered In-Service energy Price-Quantity Pairs for Injection plus the quantities of any offered Available energy Price-Quantity Pairs for Injection where these are within their Start Decision Cutoff time.

RTMS_WITHDRAWAL_SUM be:

(a)   For a Primary Dispatch Interval, the sum of the quantities from all offered In-Service energy Price-Quantity Pairs for Withdrawal; or

(b)   For a Dispatch Interval other than the Primary Dispatch Interval, or for a Pre-Dispatch Interval~~For a Pre-Dispatch Interval~~, the sum of the quantities from all offered In-Service energy Price-Quantity Pairs for Withdrawal plus the quantities of any offered Available energy Price-Quantity Pairs for Withdrawal where these are within their Start Decision Cutoff time.

UIF be the Unconstrained Injection Forecast.

UWF be the Unconstrained Withdrawal Forecast.

> **E[N]   Note on Available Capacity**
>
> Note that for the Primary Dispatch Interval, Available Capacity is not considered within its Start Decision Cutoff Time, so only In-Service Capacity will be considered for this calculation.
>
> **E[O]   Note on Unconstrained Injection Forecasts and Unconstrained Withdrawal Forecasts**
>
> Note that by definition, and Unconstrained Injection Forecast must be greater than or equal to zero, and an Unconstrained Withdrawal Forecast must be less than or equal to zero.

Figure 1 below shows the logic to apply in all Dispatch Intervals and Pre-Dispatch Intervals to calculate a Dispatch Cap for a Semi-Scheduled Facility. The effect of this logic is that a Dispatch Cap will only be a value less than the total quantity offered via the effective Real-Time Market Submission where a constraint other than the Unconstrained Injection Forecast Constraint or

Unconstrained Withdrawal Forecast Constraint is binding. Put another way, a Semi-Scheduled Facility will not be restricted by their forecast values, unless another constraint requires it.

Figure 1   Dispatch Cap calculation logic flowchart
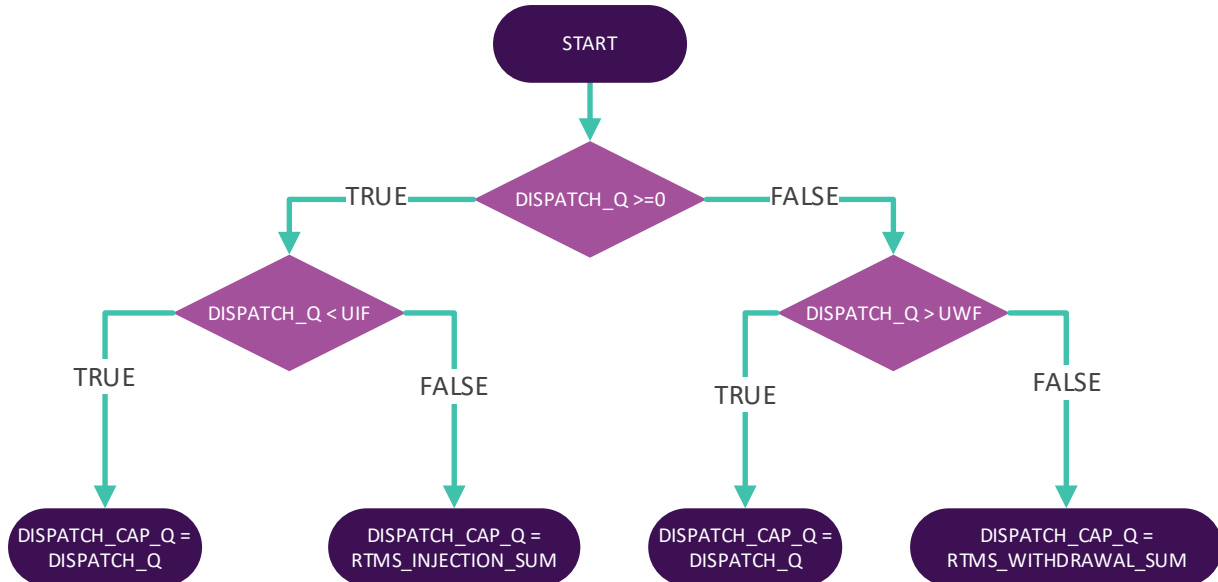
E[P]   Note: where the Unconstrained Injection Forecast is zero

In the case where *UIF* = 0, the Registered Facility will not be capped. ~~This is a known issue in the logic as implemented. If it presents recurrent operational challenges, it will be addressed. At this time, Participants are asked not to submit Unconstrained Injection Forecasts of zero, and instead use a suitably smaller number, such as~~As such, a validation exists in ~~the Real-Time Market~~ the system that processes Real-Time Market Submissions~~RTMS~~ to limit the minimum value for Unconstrained Injection Forecast to ~~be~~ 0.001 MW instead. Similar logic is applied to values received via SCADA for Unconstrained Injection Forecast, converting any received zero values to 0.001 MW.