WEM Procedure: Frequency Co-Optimised Essential System Services Accreditation

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Version	Effective Date	Summary of Changes
0.1	08 September 2021	Draft WEM Procedure for Consultation
1.0	01 October 2021	New WEM Procedure.
2.0	xx	Updated WEM Procedure

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1. Introduction

1.1. Purpose and scope

1.1.1. This WEM Procedure: Frequency Co-Optimised Essential System Services Accreditation (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 ~~outline~~ document:

~~(a) In respect to the transitional matters:~~

~~(i) the process to identify Synergy Facilities~~ that ~~which are capable of providing Regulation Raise, Regulation Lower, Contingency Reserve Raise, Contingency Reserve Lower or RoCoF Control Service [**Clause 1.49.5**];~~

~~(ii) the process to accredit capable Synergy Facilities for the equivalent Frequency Co-optimised Essential System Service [**Clause 1.49.4**];~~

~~(iii) the process to accredit LFAS Facilities~~ that previously provided load following and ancillary services and ~~which are not Synergy Facilities for Regulation Raise and Regulation Lower [**Clause 1.49.1**]; and~~

~~(iv) the process to accredit Facilities contracted to provide~~ sSpinning rReserve or lLoad rRejection rReserve under an aAncillary sService cContract at any time from ~~1 October 2020 to 30 September 2021, for Contingency Reserve Raise or Contingency Reserve Lower, as relevant [**Clause 1.49.2**]; and~~

~~(b)~~(a) the processes to be followed by AEMO, Market Participants and Network Operators in respect of the accreditation of a Facility under clause 2.34A or clause 1.49 and in respect to the provision of a Frequency Co-optimised Essential System Service **[Clause 2.34A.13]**:

(i) the format of information which Market Participants must submit ~~for the purpose of accreditation~~;

(ii) the performance parameters and requirements which must be satisfied in order for a Facility to be accredited to provide a particular Frequency Co-optimised Essential System Service (for example, minimum quantity, maximum response time, control facilities, measurement facilities);

(iii) the manner and form of control system or communication arrangements required for the provision ~~,~~ and monitoring ~~,~~ of each Frequency Co-optimised Essential System Service;

(iv) the Maximum Contingency Reserve Block Size and the method used to determine the Maximum Contingency Reserve Block Size;

(v) the format and nature of data to be provided as evidence of performance after each Contingency Event;

(vi) how AEMO will monitor and verify Facility performance against the Frequency Co-optimised Essential System Service Accreditation Parameters for the Facility including modelling and testing requirements;

(vii) how AEMO will determine a Facility Speed Factor for the Facility (so that it is possible for a Market Participant to estimate the Facility Speed Factor likely to be applied to its Facility);

(viii) the process for a Market Participant to seek to amend the Frequency Co-optimised Essential System Service Accreditation Parameters for a Facility;

(ix) the process AEMO will follow in considering whether to amend the Frequency Co-optimised Essential System Service Accreditation Parameters for a Facility, including examples of changes to Facility performance that would lead to an adjustment of the Frequency Co-optimised Essential System Service Accreditation Parameters;

(x) the processes to be followed by AEMO and Market Participants for any tests and re-tests of a Facility for the accreditation of a Facility to provide a Frequency Co-optimised Essential System Service;

(xi) timeframes for notification requirements and provision of information including updating any Standing Data or information in such other place as determined by AEMO and specified in the WEM Procedure; and

(xii) any other processes or requirements relating to the accreditation of a Facility to provide a Frequency Co-optimised Essential System Service that AEMO considers are reasonably required to enable it to perform its functions under clause ~~section~~ 2.34A ~~of the WEM Rules~~; and

~~(c)~~(b) in respect to RoCoF Ride-Through Capability **[Clause 2.34A.13(b)]**:

(i) the type and form of supporting information which AEMO may request from Market Participants and Network Operators;

(ii) the processes AEMO must follow and the matters AEMO must take into account in determining whether to deem a Facility's RoCoF Ride-Through Capability as being equal to the RoCoF Safe Limit under clause 2.34A.12H;

(iii) the processes to be followed by Market Participants and Network Operators that wish to apply for the accreditation of RoCoF Ride-Through Capability for its Facility to be determined or re-determined by AEMO;

(iv) the processes to be followed by AEMO to determine or re-determine the accredited RoCoF Ride-Through Capability for a Facility;

(v) the processes to be followed by AEMO in considering whether to re-determine the RoCoF Ride-Through Capability accredited to a Facility, which may include examples of changes to a Facility's performance that would lead to an adjustment of the RoCoF Ride-Through Capability accredited to the Facility;

(vi) the processes to be followed by AEMO, Market Participants and Network Operators for any tests and re-tests of a Facility for the accreditation, or re-accreditation, of RoCoF Ride-Through Capability for a Facility; and

(vii) the timeframes, which must be reasonable, for notification requirements and provision of information, including updating any Standing Data or information in such other place as determined by AEMO and specified in the WEM Procedure; and

~~(d)~~(c) the processes to be followed by AEMO, including a consultation process with Market Participants and Network Operators, in determining or re-determining the RoCoF Ride-Through Cost Recovery Limit **[Clause 2.34A.13(c)]**.

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	Meaning
~~Accreditation~~ Accreditation Process	The process ~~for~~ by which AEMO decides to accept or reject an application to accredit a Facility for a Frequency Co-optimised Essential System Service or RoCoF Ride-Through Capability.
Active Power	As described in the Technical Rules.
AGC Assist	An AGC control mode, as ~~specified~~ described in the Technical Specification: Operational Data Points for Registered Facilities.
~~Block Response~~ Amendment Process	Means a process in accordance with clause 2.34A.8, clause 2.34A.11, clause 2.34A.12E or clause 2.34A.12F: (a) for Frequency Co-optimised Essential System Service, of varying the Facility's Frequency Co-optimised Essential System Service Accreditation Parameters, as a result of the fact that the Facility has varied, is varying or is likely to vary significantly from that Facility's capability to deliver FCESS in accordance with that Facility's Frequency Co-optimised Essential System Service Accreditation Parameters and the relevant Performance Requirements.; and (b) for RoCoF Ride-Through Capability, of varying the Facility's RoCoF Ride Through Capability, as a result of the fact that the Facility has varied, is varying or is likely to vary significantly from that Facility's capability to operate in accordance with that Facility's accredited RoCoF Ride-Through Capability.~~A manner of providing a Contingency Reserve Raise and or Contingency Reserve Lower where that response delivers a specific amount of service when one or more specified conditions are met, where each Block Responseamount of service is a quantity independently capable of responding to Contingency Events.~~
Continuous Response	A manner of providing a Contingency Reserve Raise or Contingency Reserve Lower where that response delivers a variable amount of service commensurate with the size of the frequency disturbance (including using Droop Response).
Continuous Uninterrupted Operation	Has the meaning outlined in A12.1 of Appendix 12 of the WEM Rules.
Droop Dead ~~B~~band Setting	The band, expressed in Hz, defined by two frequency settings DB_+ and $DB\_$ and, ~~in Hz~~ used in calculating the frequency deviation DB(Δf) in Hz for droop control as follows: $\mathrm{DB}(\Delta f) = \begin{cases} \Delta f - DB_+, & \Delta f > DB_+ \\ \Delta f + DB\_, & \Delta f < DB\_ \\ \text{else } 0 \end{cases}$ where: - $\Delta f = f - f_0$, the frequency deviation from nominal frequency (f_0) - f_0 is 50 Hz
Droop Setting	The proportional rate (expressed as a percentage) at which a Facility under droop control offsets its A~~a~~ctive ~~p~~Power (MW) setpoint in response to frequency deviations: $\text{Droop Setting (\%)} = 100 \times \frac{\Delta f / f_0}{\Delta P / P_N}$ Where - f_0 is 50 Hz, the nominal SWIS frequency in Hz - $\Delta f = f - f_0$ is the frequency deviation from nominal frequency in Hz - ΔP is the a~~A~~ctive p~~P~~ower offset, in MW

Term	Meaning
	- P_N is the total nominal power capacity of all Energy Producing Systems and Loads delivering the service, in MW.
High-Resolution Time Synchronised Data	Measurements of the following types of data including but not limited to: 1. Substation busbar voltage, current, Active Power and Reactive Power real and Rreactive pPower output (MW and MVAr) and frequency; and 2. Circuit breaker and protection devices status.
High-Resolution Time Synchronised Data Recorder	Equipment installed to collect High-Resolution Time Synchronised Data.
Inertial Component	The response of a Facility to a variation in Local Frequency due to the Facility's Inertia capability.
Inverter Based Load	One or more electricity consuming resources or devices located behind a single network connection point or electrically connected behind two or more shared network connection points, that is supplied by power electronics, including inverters, and potentially susceptible to inverter control instability.
Local Frequency	The frequency of the electricity experienced by the Facility, measured by the High-Resolution Time Synchronised Data Recorder for that Facility, in Hz.
Minimum Regulation Quantity	The minimum quantity of Regulation Raise or Regulation Lower service that a Facility may be accredited toor offer.
Operating Configuration	A manner of operating a Facility providing an FCESS, which may modify the capabilities of that Facility, including but not limited to: 1. Fuel type (where Facility is capable of operating using different fuels) 2. Control mode 3. Quantity of components of that Facility which are Available Capacity, In-Service Capacity or uUn-Aavailable Ccapacity.
Performance Requirements	FCESS requirements which must be met for a Facility to be accredited in accordance with paragraph 23 and must be met by a Facility when enabled for an FCESS. 1. for Regulation Raise and Regulation Lower, the relevant Performance R requirements detailed in paragraph 3.14.1; 2. for Contingency Reserve Raise, the relevant Performance R requirements detailed in paragraph 3.24.2; 3. for Contingency Reserve Lower, the relevant Performance R requirements detailed in paragraph 3.24.2; and 4. for RoCoF Control Service, the relevant Performance R requirements detailed in paragraph 3.34.3.
Primary Frequency Response	The response of Energy Producing Systems and Loads to arrest locally detected changes in frequency by changing their Injection or Withdrawal.
Protection System	Has the meaning outlined in A12.1 of Appendix 12.
Reactive Power	As described in the Technical Rules.
Reference Profile	The theoretical Primary Frequency Response of a Facility to Local Frequency excursions, calculated in accordance with paragraph 6.2.57.2.5
Reference Speed Factor	The Facility Speed Factor used to calculate a Reference Profile.
RoCoF	Has the meaning outlined in A12.1 of Appendix 12.
RoCoF Sensitive Equipment	Equipment identified by AEMO which may be sensitive to high RoCoF.

Term	Meaning
Standing Operating Configurations	The Operating Configurations under which that Facility intends to most often deliver the relevant Frequency Co-optimised Essential System Service ~~FCESS~~.
Total Fault Clearance Time	Has the meaning outlined in A12.1 of Appendix 12.
Un-Available Capacity	Neither Available Capacity or In-Service Capacity.
Underlying System Load	AEMO's estimate of behind-the-meter demand that is responsive to changes in frequency. Underlying System Load may differ from Forecast Operational Demand due to "behind the meter" and other non-registered generation sources.

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 a clause refers to a clause or section of the WEM Rules.

(h) 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.

(i) Text located in boxes and headed as Explanatory Note 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.

(j) 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
Application Form	Frequency Co-Optimised Essential System Service Application Form	AEMO Website

Reference	Title	Location
~~RoCoF Sensitive Equipment~~Guideline	Guideline: RoCoF Sensitive Equipment	AEMO Website
Technical Rules	Technical Rules	Western Power Website
Technical Specification ~~ABC and AGC Interface Requirements~~	Technical Specification: Automatic Generation Control, SCADA Dispatch Instructions, and Fast Start Facility Operational Behaviour ~~ABC and AGC Interface Requirements~~	AEMO Website
~~Operational Data Points~~Technical Specification	Technical Specification: Operational Data Points for Registered Facilities	AEMO Website
Testing Guidelines	Guideline: Frequency Co-optimised Essential System Service Testing	AEMO Website
~~Commissioning Tests~~ WEM Procedure	~~Power System Operation~~WEM Procedure: Commissioning Tests	AEMO Website
~~Communications and Control Systems~~ WEM Procedure	WEM Procedure: Communications and Control Systems	AEMO Website
WEM Rules	Wholesale Electricity Market Rules	Energy Policy WA Website

1.5. Communications and provision of information

1.5.1. All communications and provision of information by a Market Participant or Network Operator to AEMO under this Procedure must be conducted via email, unless otherwise specified in this Procedure.

1.5.2. All communication and provision of information by AEMO to a Market Participant or Network Operator under this Procedure will be conducted via email, unless otherwise specified in this Procedure.

~~2. PRE-Market Start Frequency Co-Optimised EssentIAl System Service Accreditation~~

~~**E[A] Identification of Capable Balancing Portfolio Facilities**~~

~~**E[A1] Approach**~~

~~Clauses 1.49.4 and 1.49.5 of the WEM Rules require Synergy to consult with AEMO to identify Facilities registered to Synergy which are capable of delivering Ancillary Services and for Synergy to apply to AEMO for Accreditation of those Facilities for the equivalent Frequency Co-Optimised Essential System Services (FCESS).~~

~~Paragraph 2.1 outlines a process for Synergy to consult with AEMO to identify capable Facilities, which must then be accredited through the transitional Accreditation outlined in paragraphs 2.2, 2.3 and 2.4.~~

~~Non-Synergy Facilities currently certified or contracted to provide Ancillary Services must seek Accreditation for the equivalent FCESS in accordance with clauses 1.49.1 and 1.49.2 of the WEM Rules through the transitional Accreditation process outlined in paragraphs 2.2, 2.3 and 2.4.~~

~~Facilities which are not required to accredit for FCESS (those not currently providing Ancillary Services) may, prior to New WEM Commencement Day, apply to AEMO for Accreditation under the new Accreditation process outlined in paragraph 3, and must meet all relevant Performance Requirements for the relevant FCESS in order to be accredited.~~

~~2.1. Identification of Capable Balancing Portfolio Facilities~~

~~2.1.1. In accordance with clause 1.49.4 of the WEM Rules, Synergy must identify which of its Facilities are capable of providing LFAS, Spinning Reserve, Load Rejection Reserve or RoCoF Control Service, and submit a request to AEMO to assess the capability of each Facility for each FCESS by nominating the Facilities and associated services by email to wa.sm.operations@aemo.com.au.~~

~~2.1.2. AEMO must determine, in accordance with paragraphs 2.1.3 and 2.1.4, the capability of each Facility nominated by Synergy under paragraph 2.1.1 to provide each FCESS and will use best endeavours to respond within 20 Business Days of receipt of Synergy's submission. AEMO may include partial results or a revised timeframe in its response where AEMO has yet to complete its full determination.~~

~~2.1.3. AEMO may determine a Facility is capable of:~~

(a) Regulation Raise and/or Regulation Lower where a Facility is capable of providing LFAS;

(b) Contingency Reserve Raise where a Facility is capable of providing Spinning Reserve;

(c) Contingency Reserve Lower where a Facility is capable of providing Load Rejection Reserve; and

(d) RoCoF Control Service where a Facility has Inertia.

2.1.4. AEMO's determination under paragraph 2.1.2 may consider information gained through:

(a) analysis of historical enablement of a Facility for the services identified in paragraph 2.1.1;

(b) analysis of historical submissions made by Synergy in accordance with clause 7.6A.2(a)iii. of the WEM Rules;

(c) analysis of historical data available to AEMO which demonstrates the capability of a Facility in delivering the services identified in paragraph 2.1.1;

(d) consultation with Synergy;

(e) consultation with Western Power; and

(f) other sources available to AEMO that it reasonably considers relevant in assessing the capability of Synergy's Facilities.

2.1.5. For each Synergy Facility which AEMO determines is capable of delivering Regulation Raise and/or Regulation Lower in accordance with paragraph 2.1.2, Synergy must apply for Accreditation for that Facility for Regulation Raise and Regulation Lower in accordance with paragraph 2.2.2.

2.1.6. For each Synergy Facility which AEMO determines is capable of delivering Contingency Reserve Raise in accordance with paragraph 2.1.2, Synergy must apply for Accreditation for that Facility for Contingency Reserve Raise in accordance with paragraph 2.3.2.

2.1.7. For each Synergy Facility which AEMO determines is capable of delivering Contingency Reserve Lower in accordance with paragraph 2.1.2, Synergy must apply for Accreditation for that Facility for Contingency Reserve Lower in accordance with paragraph 2.3.2.

2.1.8. For each Synergy Facility which AEMO determines is capable of delivering RoCoF Control Service in accordance with paragraph 2.1.2, Synergy must apply for Accreditation for that Facility for RoCoF Control Service in accordance with paragraph 2.4.1.

2.2. Load Following Services

2.2.1. In accordance with clause 1.49.1 of the WEM Rules a Market Participant must apply to AEMO for Accreditation of each relevant Facility for Regulation Raise and Regulation Lower.

2.2.2. A Market Participant making an application under paragraphs 2.2.1 or 2.1.5 must submit a request to AEMO in accordance with the details on the WEM Website, identifying each Facility for which it is seeking Accreditation, including any relevant information required in the Frequency Co-optimised Essential System Service Application Form for Regulation Raise or Regulation Lower.

2.2.3. AEMO must determine the Accreditation Parameters listed in paragraph 4.4.1, for a Facility identified under paragraph 2.2.2. In determining the Accreditation Parameters, AEMO may consider the following information:

(a) Standing Data available for that Facility;

(b) any other information available to AEMO that it reasonably considers relevant in assessing the capability of a Facility identified in paragraph 2.2.2; and

(c) additional information reasonably requested by AEMO from the Market Participant.

2.2.4. Where AEMO is unable to determine a Facility's Accreditation Parameters using the information available to it under paragraph 2.2.3, AEMO may request Facility testing to verify the capability of the Facility in delivery of Regulation Raise and Regulation Lower services.

2.2.5. Where AEMO requests Facility testing in accordance with paragraph 2.2.4, AEMO must specify the tests to be conducted in accordance with paragraph 9. AEMO must agree with the Market Participant a time and date by which the Market Participant must provide the test results.

2.2.6. A Market Participant must conduct all tests specified by AEMO under paragraph 2.2.5 and submit results of the tests by the time and date specified in paragraph 2.2.5.

2.2.7. AEMO must use best endeavours to notify the Market Participant of the Accreditation Parameters it has determined for its Facility within 20 Business Days of the later of:

(a) receipt of an application under paragraph 2.2.2; or

(b) receipt of all test data submitted following testing conducted in accordance with paragraph 2.2.6,

or otherwise a date reasonably specified by AEMO.

2.2.8. Where a Market Participant has been notified in accordance with paragraph 2.2.7, it must submit the Facility Accreditation Parameters to AEMO in accordance with paragraph 10.1.1.

2.3. Spinning Reserve and Load Rejection Reserve

2.3.1. In accordance with clause 1.49.2 of the WEM Rules, a Market Participant or Ancillary Service Provider must apply to AEMO for Accreditation of each relevant Facility for Contingency Reserve Raise and Contingency Reserve Lower as applicable.

2.3.2. A Market Participant or Ancillary Service Provider making an application under paragraphs 2.3.1, 2.1.6 or 2.1.7 must submit a request to AEMO in accordance with the details on the WEM Website to identify each Facility for which it is seeking Accreditation, including any relevant information identified in the Frequency Co-optimised Essential System Service Application Form for the Contingency Reserve Raise or Contingency Reserve Lower service.

2.3.3. AEMO must determine the Accreditation Parameters listed in the relevant paragraph 4.4.1 for a Facility identified under paragraph 2.3.2. In determining the Accreditation Parameters, AEMO may consider the following information:

(a) Standing Data available for that Facility;

(b) any other information available to AEMO that it reasonably considers relevant in assessing the capability of a Facility identified in paragraph 2.3.2;

(c) information gained through consultation with Western Power;

(d) additional information reasonably requested by AEMO from the Market Participant or Ancillary Service Provider; and

(e) as applicable, at AEMO's discretion, the performance of similar Facilities.

2.3.4. Where AEMO is unable to determine a Facility's Accreditation Parameters using the information available to it under paragraph 2.3.3, AEMO may request Facility testing to verify the capability of the Facility in delivery of Contingency Reserve Raise and/or Contingency Reserve Lower services.

2.3.5. Where AEMO requests Facility testing in accordance with paragraph 2.3.4, it must specify the tests to be conducted in accordance with paragraph 9.2.1. AEMO and the Market Participant or Ancillary Service Provider must agree a time and date by which the Market Participant or Ancillary Service Provider must provide the testing results.

2.3.6. A Market Participant or Ancillary Service Provider must conduct all tests specified by AEMO under paragraph 2.3.5 and submit results of the tests, by the time and date specified in paragraph 2.3.5.

2.3.7. AEMO must use best endeavours to notify the Market Participant or Ancillary Service Provider of the Accreditation Parameters it has determined for its Facility within 20 Business Days of the later of:

(a) receipt of an application under paragraph 2.3.2; or

(b) receipt of test data submitted following testing conducted in accordance with paragraph 2.3.6,

or otherwise a date reasonably specified by AEMO.

2.3.8. Where a Market Participant has been notified in accordance with paragraph 2.3.7, it must submit the Facility Accreditation Parameters to AEMO in accordance with paragraph 10.1.1.

2.4. RoCoF Control Service

2.4.1. Synergy, where required to apply under paragraph 2.1.8 must submit a request to AEMO in accordance with the details on the WEM Website to identify each Facility for which it is seeking Accreditation, including any relevant information identified in the Frequency Co-optimised Essential System Service Application Form for RoCoF Control Service.

2.4.2. AEMO must determine the Accreditation Parameters listed in paragraph 4.4.1, for a Facility identified under paragraph 2.4.1. In determining the Accreditation Parameters, AEMO may consider the following information:

(a) analysis of historical data available to AEMO which demonstrates the capability of a Facility to provide Inertia;

(b) information gained through consultation with Synergy;

(c) information under an approved Registered Generator Performance Standard, or equivalent data held by AEMO for the Facility;

(d) information gained from consultation with Western Power; and

(e) any other information available to AEMO that it reasonably considers relevant in assessing the capability of Facilities identified in paragraph 2.4.1.

2.4.3. AEMO must use best endeavours to notify Synergy of the Accreditation Parameters it has determined for its Facility within 20 Business Days following receipt of an application under paragraph 2.4.1 or otherwise a date reasonably specified by AEMO.

2.4.4. Where a Market Participant has been notified in accordance with paragraph 2.4.3, it must submit the Facility Accreditation Parameters to AEMO in accordance with paragraph 10.1.1.

3.2. ACCREDITATION PROCESS

3.1.2.1. Application for FCESS

3.1.1.2.1.1. A Market Participant may apply to AEMO for AccreditationAccreditation Process or Amendment Re-AccreditationProcess of a Facility to provide one or more Frequency Co-optimised Essential System Services (FCESS) referred to in clause 2.34A.1 of the WEM Rules.

3.1.2.2.1.2. An application made under paragraph 2.1.1 to undertake the AccreditationAccreditation Process or Amendment Re-AccreditationProcess must be in the format detailed on inof theAEMO's application form published on the WEM Website, and include:

(a) all items identified inrequired by clause 2.34A.3 of the WEM Rules;

(b) the Market Participant's name;

(c) the FCESS for which the Market Participant is seeking AccreditationAaccreditation Process;

(d) the proposed values for the Frequency Co-optimised Essential System Service FCESS Accreditation Parameters (Accreditation Parameters) for each relevant FCESS, as detailed in paragraph 3.6.1; and

(e) any available evidence that the Facility can meet the Performance Requirements for the relevant FCESS (which can be provided in formats such as .doc, .xls, .pdf, etc.).

~~3.1.3.~~2.1.3. Where a Market Participant has~~i~~ undertaken ~~s undertaking~~ an Amendment Process and the available quantity of a Frequency Co-optimised Essential System Service for dispatch has been reduced, the Market Participant must ~~ensure to~~ submit an Outage for the relevant Facility, reflecting the reduced availability of the relevant Frequency Co-optimised Essential System Service, in accordance with the WEM Procedure: Outages.

~~3.1.4.~~2.1.4. AEMO ~~must~~ will determine ~~the capability of a~~whether the Facility is capable of~~to~~ meeting the relevant ~~FCESS~~ Performance Requirements, ~~for~~ relating to the ~~Accreditation~~Accreditation Process or Amendment ~~Re-Accreditation~~Process for which it has received an application under paragraph 2.1.1, by considering all information provided by the Market Participant as part of the application and, where relevant, testing data provided in accordance with paragraph 2.1.11.

2.1.5. For each Facility that meets the relevant Performance Requirements in paragraph 2.1.3, AEMO ~~must~~ will determine the relevant values for the ~~Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters.

2.1.6. Market Participants must submit proposed values for the Frequency Co-optimised Essential System Service Accreditation Parameters for their Facility in accordance with paragraph 2.1.2(d)~~as part of an application for Accreditation Process~~. Through the Accreditation Process, AEMO may identify alternative values for each Accreditation Parameter.

~~1.1.6 Where AEMO identifies alternative Accreditation Parameter Values, AEMO must advise the Market Participant and review the application using the amended alternative Accreditation Parameter Values.~~

> ~~**E[B] Proposed Accreditation Parameters**~~
>
> ~~**Market Participants must submit proposed values for Accreditation Parameters for their Facility as part of an application for Accreditation. Through the determination Accreditation process, AEMO may identify alternative values for each Accreditation Parameter, for example:**~~
>
> ~~(a) increased values, where that Facility is capable of meeting the Performance Requirements for at a greater quantity; or~~
>
> ~~(b) decreased values, where that Facility is incapable of meeting the Performance Requirements under for the proposed Accreditation Parameters.~~
>
> ~~This process will allow a Market Participant to accredit a Facility for the largest quantity for which it is capable of meetingpertaining to its capability for meeting the relevant Performance Parameters and for which that Market Participant wishes to be accredited.~~

~~3.1.5.~~

2.1.7. Where AEMO identifies alternative Accreditation Parameter v~~V~~alues in accordance with paragraph 2.1.6, AEMO must advise the Market Participant and review the application, made under paragraph 2.1.1, using the ~~amended~~ alternative Accreditation Parameter v~~V~~alues.

~~3.1.6.~~2.1.8. In making the determination under paragraphs 2.1.3 and 2.1.5, AEMO may consider information received through:

(a) assessing the application~~information~~ provided under paragraph 2.1.2, including:~~;~~

(i) analysing historical data available to AEMO ~~which~~ that demonstrates the capability of a Facility to deliver Frequency Co-optimised Essential System Services;

(ii) assessing data under a Registered Generator Performance Standard for that Facility;

(iii) assessing Standing Data for that Facility;

(iv) consulting with the Market Participant, including ~~to~~ discussing variation of~~y~~ the proposed ~~Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters;

(v) consulting with Western Power; and

(vi) considering any other information available to AEMO that it reasonably considers relevant in assessing the capability of the Facilities identified in the application under paragraph 2.1.2; and

(b) in accordance with clause 2.34A.4~~7 of the WEM Rules~~, requesting additional ~~supporting~~ information in support of an application, specifying a time and date for the information to be provided; and

(c) where reasonably required to ~~assess~~ conduct the ~~Accreditation~~Accreditation Process for~~of the~~ a Facility for the relevant FCESS, requesting Facility testing in accordance with clause 2.34A.4A to verify the capability of the Facility in delivery of the relevant FCESS [~~**Clause 2.34A.4A**~~].

~~3.1.7.~~2.1.9. Where AEMO requests additional supporting information under paragraph ~~3.1.5(b)~~2.1.8(b), a Market Participant must provide that information by the time and date specified by AEMO under paragraph 2.1.8(b)~~2.1.92.1.53.1.5(b)~~ or request the application is withdrawn in accordance with paragraph 2.1.12.

~~3.1.8.~~2.1.10. Where AEMO requests Facility testing in accordance with paragraph 2.1.8~~2.1.63.1.5~~(c), it must specify the tests to be conducted in accordance with the guideline created under paragraph 8. AEMO, in consultation with ~~and~~ the Market Participant, ~~must~~ will specify~~agree~~ a time and date by which the Market Participant must provide the test results.

~~3.1.9.~~2.1.11. A Market Participant must, where requested ~~to undertake testing~~ by AEMO under paragraph 2.1.7(c) to undertake testing, either:

(a) undertake all tests specified under paragraph 2.1.10~~2.1.10~~ and submit results of the tests by the time and date ~~agreed~~ specified by AEMO under that~~in~~ paragraph 2.1.10~~2.1.10~~; or

(b) request the application for ~~AccreditationaAccreditation Process~~for that FCESS is withdrawn ~~from Accreditation~~ in accordance with paragraph 2.1.12~~2.1.12~~.

~~3.1.10.~~2.1.12. A Market Participant may, in writing to AEMO, withdraw an application for ~~AccreditationaAccreditation Process at any time prior to AEMO's determination in paragraph 2.1.3~~3.1.3 ~~by notifying AEMO in writing [~~in accordance with ~~C~~clause 2.34A.4C~~], unless that application relates to an application for Re-Accreditation~~.

~~3.1.11.~~2.1.13. Under clause 2.34A.4, AEMO's determinations, under paragraphs 2.1.3 and 2.1.5 must be made within the later of, as relevant:

(a) 20 Business Days of receipt of a complete application under paragraph 2.1.2~~2.1.2~~;

(b) 20 Business Days from the time and date specified by AEMO under paragraph 2.1.8(b)~~(b), or where AEMO has not specified a time and date, 20 Business Days following receipt of the information by AEMO~~; or

~~(c)~~ 20 Business Days of receipt of testing data submitted ~~following testing conducted in accordance with~~under paragraph 2.1.11(a)~~2.1.5~~3.1.5~~(c); or~~

~~(d)~~(c) ~~a date reasonably determined by AEMO, where AEMO reasonably determines a need to prioritise an application made under paragraphs 00~~2.1, ~~00~~2.2, ~~0~~2.3 or ~~00~~2.4~~,~~.

3.1.12. Where AEMO prioritises an application under paragraph 2.1.112.1.103.1.10(c)(d), AEMO must notify the Market Participant for that Facility to identify that an alternative application has been prioritised, including the date by which AEMO will determine the AccreditationAccreditation Process for its Facility.

3.1.13. Where AEMO determines, under paragraph 2.1.3, that a Facility is capable of meeting the relevant Performance Requirements for a relevant FCESS, AEMO must must approve the will accept that application in accordance with clause 2.34A.4 and inform the Market Participant in accordance with clause 2.34A.6and notify the Market Participant of the results of its determination, including all Accreditation Parameters for which the Facility may be accredited.

3.1.14.2.1.14. Prior to making a determination under paragraph 3.1.3, AEMO may request the relevant Market Participant to clarify or update information in the Application.

3.1.15.2.1.15. Where AEMO determines, under paragraph 2.1.3, that the capability of the Facility does not meet the relevant Performance Requirements for the relevant FCESS, it must reject the application in accordance with clause 2.34.4 and notify the Market Participant, including reasons for its decision [Cprovided in accordance with clause 2.34A.5].

2.1.16. In accordance wiAs required thby clause 2.34A.6(f), where AEMO approves an application under paragraph 2.1.14, aA Market Participant must include the information notified by AEMO under paragraph 2.1.13outlined iin its Standing Data for the Facility.

2.1.17. AEMO may request a Market Participant to include additional information to that required under paragraph 2.1.16 in its Standing Data for the Facility.

2.1.18. Where AEMO makes a request under paragraph 2.1.17, a Market Participant must include the requested information in its Standing Data for the Facility.

3.1.16. Changes to Standing Data information provided by a Market Participant under paragraph 2.1.162.1.16, mustwill be made in accordance with paragraph 1010.Where a Market Participant has been notified in accordance with paragraph 3.1.10 that its Facility is capable of meeting the relevant Performance Requirements for the relevant FCESS, it must submit the Facility Accreditation Parameters for the Facility to AEMO in accordance with paragraph 10.1.1.

3.1.17.2.1.19.

4.3. Performance Parameters and Requirements

~~E[C] Relevant Documents~~

~~Paragraphs 4.1, 4.2 and 4.3 include relevant Performance Requirements that a Facility must meet in order to be accredited for Regulation Raise, Regulation Lower, Contingency Reserve Raise, Contingency Reserve Lower and RoCoF Control Service. These sections paragraphs also reference other AEMO WEM Procedures, Technical Specifications and Guidelines to for which that Facility must comply in order to be accredited. These include the Technical Specification Operational Data Points for Registered Facilities and the WEM Procedure: Communications and Control Systems WEM Procedure. Facilities providing Regulation Raise or Regulation Lower must also meet the relevant requirements of ABC and AGC Interface Requirements.~~

~~E[C1] Technical Specification: Operational Data Points for Registered Facilities~~

~~A Facility required to deliver a an FCESS whilst under the control of Automatic Generator Control AGC must comply with the relevant requirements of the Technical Specification: Operational Data Points for Registered Facilities, being Appendix C Operational Data Point Requirements for AGC Operation by meeting the requirements of Appendix C. Operational Data Point Requirements for AGC Operation. Appendix C provides information on relevant SCADA points thatwhich must be provided for Facilities operating under AGC Control.~~

~~E[C2] Communications and Control Systems WEM Procedure~~

~~A Facility must comply with the relevant requirements of the WEM Procedure: Communications and Control Systems WEM Procedure. These requirements include the obligation to have a suitable High-Resolution Time Synchronised Data Recorder (for Contingency Reserve services and RoCoF Control Service) and duplicate voice communications with AEMO.~~

4.1.3.1. Regulation Raise and Regulation Lower Performance Requirements

~~E[D]~~E[A] Regulation Raise and Regulation Lower

Regulation Raise and Regulation Lower services are provided by Facilities responding to control signals from AEMO's energy management system via the Automatic Generationor Control System (AGC) ~~scheme~~. Figure E[~~(~~1~~)~~] provides a graph of a Facility enabled for energy, Regulation Raise and Regulation Lower. The energy ramp displayed shows the ramp associated with cleared energy in that Dispatch Interval, while the green and yellow regions show the enabled Regulation Raise and Regulation Lower regions within which AEMO may control the Facility through AGC~~.~~. Control signals are issued every four~~4~~ seconds (subject to Facility dead bands), with an obligation for the Facility to begin ramping within a specified time period outlined in the WEM Procedure: Communications and Control Systems ~~WEM Procedure~~. The Facility must follow the AGC control signals to the maximum extent possible while accounting for its Droop Dead ~~b~~Band Settings and response to Local Frequency based on its Droop Response.

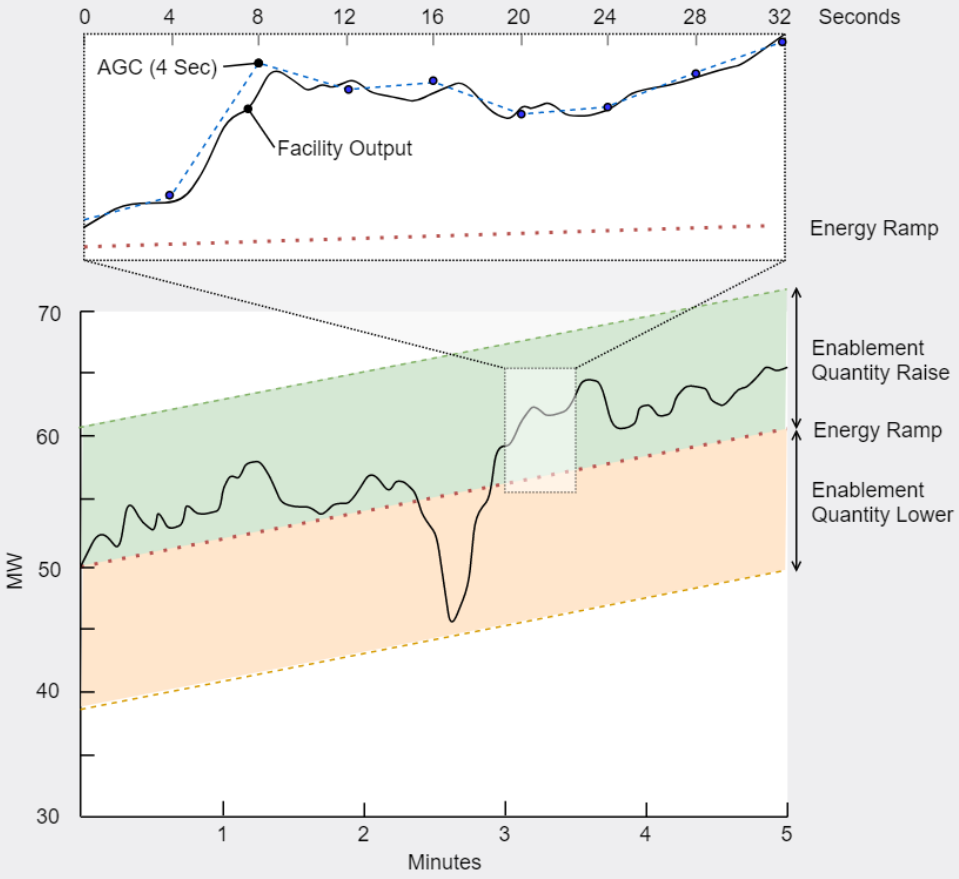

Figure E[1] Regulation Raise and Regulation Lower control.

~~4.1.1.~~3.1.1. All Facilities providing Regulation Raise or Regulation Lower must:

(a) be capable of continuously receiving and responding to a control signal in a manner that meets the requirements of AEMO's AGC ~~scheme~~, to increase or decrease Injection or Withdrawal (as applicable), within the enabled Regulation Raise or Regulation Lower range for that Facility;

(b) have a ramp rate sufficient to deliver the maximum quantity of Regulation Raise or Regulation Lower in five~~5~~ minutes;

(c) meet the required ramp rate specified in paragraph 3.1.1(b) continuously within the Enablement Limit ~~for the full range of enabled Regulation Raise or Regulation Lower~~;

(d) have a communication lag time less than the maximum communication lag time ~~where~~ specified in ~~accordance with~~ the WEM Procedure: Communications and Control Systems~~Communication and Control Systems WEM Procedure~~;

(e) as applicable, have a Minimum Regulation Quantity for Regulation Raise ~~Quantity~~ and ~~Minimum~~ Regulation Lower ~~Quantity~~ of at least 10 MW; and

(f) meet the relevant requirements of the:

(i) Technical Specification: Operational Data Points for Registered Facilities; ~~and~~

(ii) WEM Procedure: Communications and Control Systems~~Communications and Control Systems WEM Procedure.~~; and

~~(ii)~~(iii) Technical Specification: Automatic Generation Control, SCADA Dispatch Instructions, and Fast Start Facility Operational Behaviour.

~~**Regulation Raise and Regulation Lower Quantities**~~

~~AEMO undertakes system studies to assist with determining the minimum Performance Requirements for Regulation Raise and Regulation Lower.~~

~~These quantities include the Minimum Regulation Quantity, which is the minimum quantity of Regulation Raise or Regulation Lower that any Facility may be accredited for or offer (paragraph 3.1.1(e)). In setting these quantities, AEMO has undertaken system studies to consider:~~

~~the capability of AEMO's AGC to manage system frequency in accordance with the SWIS Frequency Operating Standards with Facilities enabled for a range of quantities of Regulation Raise and Regulation Lower;~~

~~the capability of AEMO's AGC to manage system frequency in accordance with the SWIS Frequency Operating Standards with varying communication lag times; and~~

~~errors due to SCADA measurement accuracy.~~

~~Measurements at th~~

E[A] Regulation Raise and Regulation Lower Quantities

AEMO undertakes system studies to assist with determining the minimum Performance Requirements for Regulation Raise and Regulation Lower. In setting these quantities, AEMO has undertaken system studies to consider:

(a) the capability of AEMO's AGC to manage system frequency in accordance with the SWIS Frequency Operating Standards with Facilities enabled for a range of quantities of Regulation Raise and Regulation Lower;

(b) the capability of AEMO's AGC to manage system frequency in accordance with the SWIS Frequency Operating Standards with varying communication lag times; and

(c) errors due to SCADA measurement accuracy.

~~E[E] Regulation Raise and Regulation Lower Quantities~~

~~AEMO undertakes system studies to assist with determining set the minimum Performance Requirements for Regulation Raise and Regulation Lower.~~

~~These quantities include the Minimum Regulation Quantity, as which is the minimum quantity that any Facility may be accredited for, or offer of, Regulation Raise or Regulation Lower that any Facility may be accredited for or offer (paragraph 3.1.1(e)). In setting these quantities, AEMO has undertakens system studies to consider:~~

~~(a) the capability of AEMO's Automatic Generator Control systemsAGC to manage system frequency in accordance with the SWIS Frequency Operating Standards with Facilities enabled for a range of quantities of Regulation Raise and Regulation Lower;~~

~~(b) the capability of AEMO's Automatic Generator Control systemsAGC to manage system frequency in accordance with the SWIS Frequency Operating Standards with varying communication lag times; and~~

~~(c) errors due to SCADA measurement accuracy.~~

~~These quantities are expected to be reviewed by AEMO on an ongoing basis to ensure the Performance Requirements associated with Regulation Raise and Regulation Lower allow AEMO to maintain Power System Security and maintain frequency in accordance with the SWIS Frequency Operating Standards.~~

3.1.2. Measurements at ~~or close to~~ the relevant connection point must be used to measure Regulation Raise and~~/or~~ Regulation Lower quantities~~must be measured at or close to the relevant connection point~~ to calculate the Injection or Withdrawal at the Facility connection point.

~~4.1.2.~~3.1.3. If Regulation Raise and Regulation Lower cannot be measured in accordance with paragraph 3.1.2, ~~the Market Participant must provide to AEMO~~ measurements from an alternative measurement point, as approved by AEMO, may be considered to calculate the Injection or Withdrawal at the Facility connection point.~~or, if otherwise agreed with AEMO, measurements may be provided to calculate the Injection or Withdrawal at the Facility connection point~~.

~~4.1.3.~~3.1.4. All Facilities providing Regulation Raise or Regulation Lower using multiple Operating Configurations must be capable of meeting the relevant Performance Requirements under all relevant Operating Configurations.

~~4.1.4.~~3.1.5. All Facilities providing Regulation Raise or Regulation Lower must meet the requirements of paragraph 3.5~~3.43.43.44.4~~.

~~4.2.~~3.2. Contingency Reserve Raise and Contingency Reserve Lower Performance Requirements

~~4.2.1.~~3.2.1. All Facilities providing Contingency Reserve Raise must be capable of automatically responding to downward excursions of Local Frequency by one or more of:

(a) increasing Injection in proportion to a frequency deviation, or by a specified quantity for a Block Response;

(b) decreasing Withdrawal in proportion to a frequency deviation, or by a specified quantity for a Block Response; or

(c) moving from Withdrawal to Injection in proportion to a frequency deviation, or by a specified quantity for a Block Response.

4.2.2.3.2.2. All Facilities providing Contingency Reserve Lower must be capable of automatically responding to upward excursions of Local Frequency by one or more of:

(a) decreasing Injection in proportion to a frequency deviation, or by a specified quantity for a Block Response;

(b) increasing Withdrawal in proportion to a frequency deviation, or by a specified quantity for a Block Response; or

(c) moving from Injection to Withdrawal in proportion to a frequency deviation, or by a specified quantity for a Block Response.

E[F]E[B] Contingency Reserve Raise and Contingency Reserve Lower Quantities

AEMO has set minimum Performance Requirements for Contingency Reserve Raise and Contingency Reserve Lower under paragraph , including a minimum quantity that any Facility may be accredited for, or offer.

In setting the minimum quantity under paragraph 3.2.33.2.3, AEMO has considered the cost impact to both AEMO and to Market Participants in undertaking the required AccreditationAccreditation Process, including testing requirements and subsequent monitoring and verification. **AEMO will review the minimum quantity and request feedback from industry on the capability of Facilities to offer the service in accordance with the Performance Requirements in this paragraph** 3.24.2.

4.2.3.3.2.3. All Facilities providing Contingency Reserve Raise or Contingency Reserve Lower must be capable of delivering a minimum response, required under paragraph 3.2.1 or 3.2.2 (as relevant) and, determined in accordance with paragraph 3.46.16.16.17.1, of at least 5 MW;

4.2.4.3.2.4. All Facilities providing Contingency Reserve Raise or Contingency Reserve Lower must be capable of sustaining the response required under paragraphs 3.2.1 or 3.2.2 (as relevant) for at least 15 minutes in accordance with [Cclause 7.10.18].

4.2.5.3.2.5. The response under paragraphs 3.2.1 and or 3.2.2 must be controlled automatically through the following methods:

(a) Droop Response (to provide a Continuous Response); or

(b) a control scheme to deliver a set quantity (to provide a Block Response).

4.2.6.3.2.6. Where the response under paragraphs 3.2.1 and or 3.2.2 (as relevant) is controlled by a control scheme to deliver a set quantity, in accordance with paragraph 3.2.5(b)3.2.83.2.83.2.54.2.5 the Facility must be capable of adjusting the setpoint frequency, at which the Facility responds, to outside of the Normal Operating Frequency Bandbetween 47.0 Hz and 49.8 Hz in accordance with AEMO telemetered setpoints.

4.2.7.3.2.7. Where the response under paragraph 3.2.1 is controlled by a control scheme to deliver a set quantity, in accordance with paragraph 3.2.5(b)3.2.83.2.83.2.54.2.5,; the Facility must:

(a) the Facility must be capable of disabling the response when not enabled for Contingency Reserve Raise or Contingency Reserve Lower, subject to any relevant Registered Generator Performance Standard for that Facility; and

~~(b)~~ ~~the Market Participant for the relevant Facility's must agree propose a~~ Restoration Profile, if applicable, must ~~with to~~ be approved by AEMO.

~~(c)~~(b)

~~E[G] Droop Settings~~

~~The 2% Droop Setting requirement in paragraph 4.2.8 sets a minimum for service provision, AEMO may consider lower droop settings in the future to reflect the capability of high-speed technologies.~~

~~4.2.8.~~3.2.8. Where the response under paragraph~~s~~ 3.2.1 ~~and~~ or 3.2.2 (as relevant)~~3.2.23.2.2~~ is controlled by Droop Response, in accordance with 3.2.5(a)~~3.2.83.2.83.2.54.2.5~~ the Facility:

(a) may have asymmetrical Droop Settings for Contingency Reserve Raise and Contingency Reserve Lower;

(b) must have a minimum Droop Setting of 2%; ~~and~~

(c) must have a maximum Droop Setting of 4%; ~~,~~and

~~(c)~~

~~(d)~~

~~(e)~~(d) ~~and~~ is not required to respond inside its Droop Dead Bb~~b~~and Setting.

~~4.2.9.~~3.2.9. Unless otherwise ~~agreed~~ approved by AEMO under paragraph 3.2.10, all Facilities providing Contingency Reserve Raise or Contingency Reserve Lower must operate in AGC Assist while enabled for Contingency Reserve.

~~4.2.10.~~3.2.10. AEMO may ~~agree to~~approve an alternative mechanism to AGC Assist, where a Facility is able to demonstrate that it is capable of autonomously providing an ongoing response to an extended high or low frequency event for up to 15 minutes.

~~4.2.11.~~3.2.11. Where a Facility operates in AGC Assist, in accordance with paragraph 3.2.9, that Facility must be capable of receiving and responding to AGC signals in accordance with the Technical Specification: Operational Data Points for Registered Facilities.

~~4.2.12.~~3.2.12. All Facilities providing Contingency Reserve Raise as a Block Response must have demonstrated Block Responses less than or equal to the Maximum Contingency Reserve Block Size, as ~~specified~~ determined under paragraph 4.1.

~~4.2.13.~~3.2.13. All Facilities providing Contingency Reserve Raise or Contingency Reserve Lower must have a suitable High-Resolution Time Synchronised Data Recorder, located at or close to the relevant connection point or connection points, that is capable of disturbance recording in accordance with the WEM Procedure: Communications and Control Systems ~~WEM Procedure~~.

~~4.2.14.~~3.2.14. All Facilities providing Contingency Reserve Raise or Contingency Reserve Lower must meet the relevant requirements of:

(a) Technical Specification: Operational Data Points for Registered Facilities; and

(b) WEM Procedure: Communications and Control Systems ~~WEM Procedure~~.

4.2.15.3.2.15. Where If a Facility is unable to meet any of thea Performance Requirements specified in paragraphs 3.2.6, 3.2.7(a), , 3.2.9 o,r 3.5.1, 3.5.1, 3.5.2, 3.5.3 or 3.5.4, AEMO may determine that the Facility is exempt from the relevant Performance Requirements, where it determines an alternative means of providing the service is available and is sufficient to allow AEMO to maintain Power System Security and Power System Reliability.

4.2.16.3.2.16. Where AEMO has determined that a Facility is exempt from a Performance Requirement, in accordance with paragraph 3.2.15, it may:

(a) set a time period for that exemption; and

(b) may revoke that exemption at any time and request the Amendment Re-AccreditationProcess be undertaken forof that Facility, in accordance with paragraph 7.2.1, where AEMO considers that the alternative means of providing the service is no-longer sufficient to allow AEMO to maintain Power System Security and Power System Reliability.

4.2.17.3.2.17. All Facilities providing Contingency Reserve Raise or Contingency Reserve Lower using multiple Operating Configurations must be capable of meeting the relevant Performance Requirements under each all relevant Operating Configurations.

4.2.18.3.2.18. All Facilities providing Contingency Reserve Raise or Contingency Reserve Lower must meet the general performance requirements outlined inof paragraph 3.53.43.43.44.4.

4.3.3.3. RoCoF Control Service Performance Requirements

4.3.1.3.3.1. All Facilities providing seeking Aaccreditation Process for RoCoF Control Service must provide iInertiave a quantity of Inertia, measured in rotational MWs at 50 Hz.

4.3.2.3.3.2. All Facilities providing RoCoF Control Service must have a suitable High-Resolution Time Synchronised Data Recorder, located at or close to the relevant connection point, that is capable of disturbance recording in accordance with the WEM Procedure: Communications and Control Systems WEM Procedure.

4.3.3.3.3.3. All Facilities providing RoCoF Control Service must meet the relevant requirements of:

(a) Technical Specification: Operational Data Points for Registered Facilities; and

(b) WEM Procedure: Communications and Control Systems WEM Procedure.

4.3.4.3.3.4. All Facilities providing RoCoF Control Service must meet the general performance requirements outlined inof paragraph 3.5 3.43.43.44.4.

3.4. Updating minimum response values

3.4.1. When AEMO determines that the minimum response required under paragraph 3.1.1(e) or 3.2.3 is no longer appropriate for any reason, it will review and update the Minimum Regulation Quantity or minimum quantity of Contingency Reserve Raise and/or Contingency Reserve Lower that a Facility can be accredited for.

3.4.2. Prior to updating a minimum quantity under paragraph 3.4.1, AEMO will consult Market Participants by publishing the following on the WEM Website:

(a) the proposed new Minimum Regulation Quantity or minimum quantity of Contingency Reserve Raise and/or Contingency Reserve Lower;

(b) the reason for the proposed change; and

(c) the deadline for submissions on the proposed new minimum quantity and the contact details to which the submission must be made.

3.4.3. A Market Participant may make a submission to AEMO using the contact details and by the time stipulated on the WEM Website under paragraph 3.4.2(c).

3.4.4. AEMO will consider submissions provided under paragraph 3.4.3, publish the final updated Minimum Regulation Quantity or minimum quantity of Contingency Reserve Raise and/or Contingency Reserve Lower that a Facility can be accredited for on the WEM Website and issue a notice to affected Market Participants.

~~4.4.~~3.5. General performance requirements

~~4.4.1.~~3.5.1. All ~~a~~Facilities providing FCESS must maintain Continuous Uninterrupted Operation where a power system disturbance causes the frequency to:

(a) reach 52.0 Hz for a period of up to 2 minutes;

(b) operate between 49.0 Hz to 51.0 Hz continuously;

(c) reach 48.0 Hz for a period of at least 15 minutes;

(d) reach 47.5 Hz for a period of at least 5 minutes; or

(e) reach 47.0 Hz for a period of at least 10 seconds,

as shown in Figure 3.5.1–1~~Figure 3.5.1–1~~.

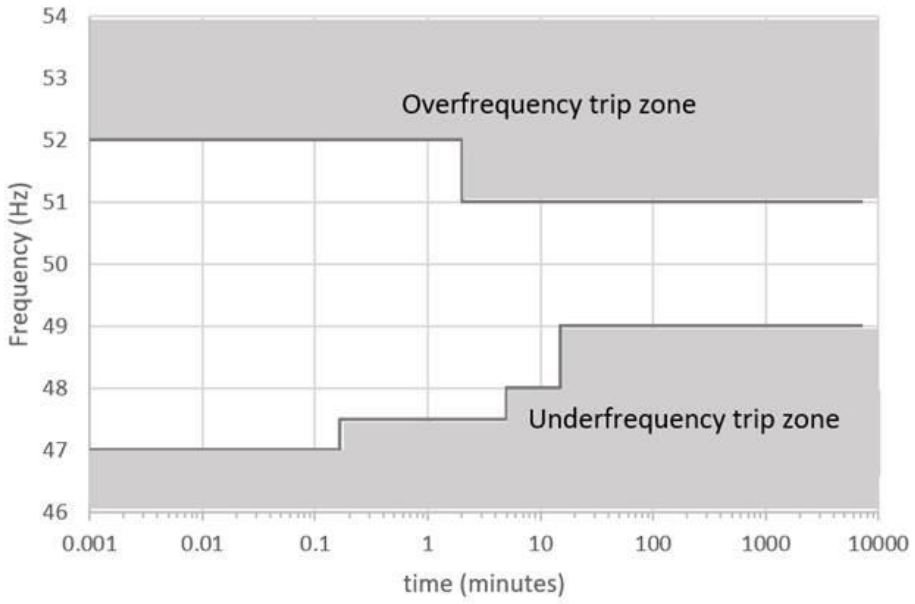

Figure 3.5.1–1 Frequency variations that a Facility must ride through to meet the minimum Facility performance standard

~~4.4.2.~~3.5.2. All Facilities providing FCESS must maintain Continuous Uninterrupted Operation for the period of a power system disturbance where ~~a power system~~the disturbance causes the RoCoF to:

(a) reach 2 Hz/s over 250 milliseconds during the disturbance; or

(b) reach 1 Hz/s over 1 second during the disturbance.

~~4.4.3.~~3.5.3. All Facilities providing FCESS must maintain Continuous Uninterrupted Operation for the period of a power system disturbance where ~~a power system~~the disturbance causes the voltage to vary within the following ranges:

(a) voltage does not exceed 120% of nominal voltage after T(ov);

(b) voltage does not exceed 115% of nominal voltage for more than 0.1 seconds after T(ov);

(c) voltage does not exceed 110% of nominal voltage for more than 0.9 seconds after T(ov);

(d) voltage remains at 0% of nominal voltage for no more than 450 milliseconds after T(uv), subject to any relaxation under paragraph 3.5.4;

(e) voltage does not stay below 70% of nominal voltage for more than 450 milliseconds after T(uv);

(f) voltage does not stay below 80% of nominal voltage for more than 2.0 seconds after T(uv); and

(g) voltage does not stay below 90% of nominal voltage for more than 5.0 seconds after T(uv).

as shown in Figure 3.5.3–1~~Figure 3.5.3–1~~

Where:

T(ov) means a point in time when the voltage first varied above 110% of nominal voltage before returning to between 90% and 110% of nominal voltage; and

T(uv) means a point in time when the voltage first varied below 90% of nominal voltage before returning to between 90% and 110% of nominal voltage.

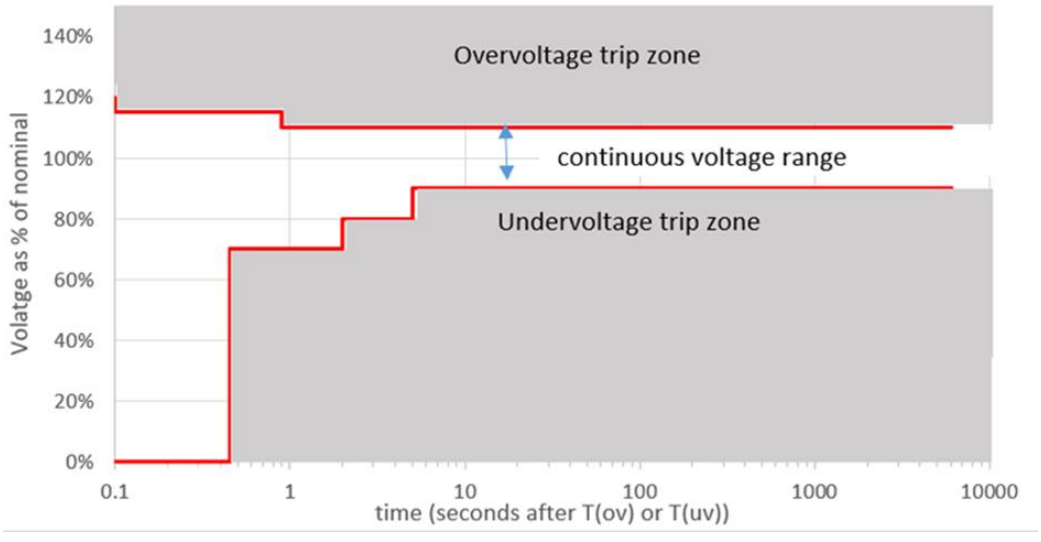

Figure 3.5.3–1 Voltage variations that a Facility must ride through to meet the minimum Facility performance standard

4.4.4.3.5.4. The duration of the zero percent voltage level may be relaxed through agreement with the Network Operator and AEMO, but shall not be lower than the maximum Total Fault Clearance Time with no circuit breaker fail, as specified in the Technical Rules.

4.4.5.3.5.5. A Facility providing FCESS and each of its operating units, including Generating Units, asynchronous bidirectional units and Inverter Based Loadsinverter-based loads, must remain in Continuous Uninterrupted Operation for any disturbance caused by:

(a) a Credible Contingency; or

(a) a single phase to ground, phase to phase or two phase to ground fault or three phase fault in a transmission or distribution system that, which could be cleared within the longest time expected to be taken for all relevant primary Protection Systems to clear the fault,

(b) a single phase to ground, phase to phase or two phase to ground fault or three phase fault in a transmission or distribution system, which could be cleared within the longest time expected to be taken for all relevant primary Protection Systems to clear the fault,

provided that the event is not one that would disconnect the Facility and each of its operating units, including Generating Units, asynchronous bidirectional units and inverter Inverter Based Loads-based loads, from the SWIS by removing Network elements from service or as a result of the operation of an inter-trip, Protection Scheme or runback scheme approved by the Network Operator and AEMO.

4.4.6.3.5.6. A bidirectional Facility seeking FCESS accreditationaAccreditation Process must demonstrate being able to transition between consuming and generating energy cross the zero-point while actively providing the relevant service. Failure to demonstrate this ability, will require alternative , otherwise the Aaccreditationed FCESS range would be limited and must be agreed with AEMOParameters to be demonstrated to reflect capability in each of the different Operating Configurations. .

4.5.3.6. Accreditation ParametersFrequency Co-optimised Essential System Service Accreditation Parameters

4.5.1.3.6.1. The Accreditation ParametersFrequency Co-optimised Essential System Service Accreditation Parameters for all Facilities, for each relevant FCESS are detailed in Table 3.

Table 3 Accreditation ParametersFrequency Co-optimised Essential System Service Accreditation Parameters

Accreditation Parameter		Regulation Raise	Regulation Lower	Contingency Reserve Raise	Contingency Reserve Lower	RoCoF Control Service
(a)	the maximum quantity of FCESS that the Facility can deliver under any Operating Configuration	Yes	Yes	Yes	Yes	Yes
(b)	where relevant, alternative maximum quantities of FCESS that the Facility can deliver using its Standard	Yes	Yes	Yes	Yes	Yes

Accreditation Parameter		Regulation Raise	Regulation Lower	Contingency Reserve Raise	Contingency Reserve Lower	RoCoF Control Service
	Standing Operating Configurations					
(c)	the Standing Enablement Minimum and Standing Enablement Maximum for the Facility under any Operating Configuration	Yes	Yes	Yes	Yes	Yes
(d)	where relevant, the alternative Standing Enablement Minimums and Standing Enablement Maximums for the Facility using its Standing ~~Standard~~ Operating Configurations	Yes	Yes	Yes	Yes	Yes
(e)	the Standing Low Breakpoint and Standing High Breakpoint for the Facility under any Operating Configuration	Yes	Yes	Yes	Yes	Yes
(f)	where relevant, the Standing Low Breakpoints and Standing High Breakpoints for the Facility using its Standing ~~Standard~~ Operating Configurations	Yes	Yes	Yes	Yes	Yes
(g)	whether the Facility will provide Contingency Reserve Raise or Contingency Reserve Lower response using a Block Response or a Continuous Response			Yes	Yes	
(h)	whether the Facility will provide a Block Response and, therefore, is subject to the Maximum Contingency Reserve Block Size determined under paragraph 4.1			Yes	Yes	
(i)	where a Facility is subject to the Maximum Contingency Reserve Block Size, the size of each relevant Block Response			Yes	Yes	
(j)	where a Facility provides Contingency Reserve Raise or Contingency Reserve Lower ~~response~~ using Droop			Yes	Yes	

Accreditation Parameter		Regulation Raise	Regulation Lower	Contingency Reserve Raise	Contingency Reserve Lower	RoCoF Control Service
	Response, the Droop Setting for that Facility					
(k)	where a Facility provides Contingency Reserve Raise or Contingency Reserve Lower ~~response~~ using Droop Response, the Droop Dead ~~b~~Band Setting for that Facility			Yes	Yes	
(l)	Any exemptions applying to the~~at~~ Facility determined in accordance with paragraph 3.2.15			Yes	Yes	
(m)	a Facility Performance Factor of 1	Yes	Yes		Yes	Yes
(n)	the Facility Speed Factor for Contingency Reserve Raise for that Facility			Yes		
(o)	for a Facility that is an Interruptible Load, the Restoration Profile of the Interruptible Load ~~if applicable~~			Yes		

~~E[H]~~E[C] Facility Performance Factor

Facility Performance Factors are designed to dynamically reflect the value of a Facility's enabled quantity for an Essential System Service and that Essential System Service's~~in~~ contributi~~ong~~ to the total ~~required~~ quantity of Essential System Service that is required to maintain Power System Security ~~and Power System Reliability~~quantity. Facility Performance Factors will vary by Dispatch Interval according to power system conditions (including System Inertia and Contingency Event S~~s~~izes ~~alongside other factors~~).

As outlined in Table 3(m), ~~From New WEM Commencement Day, only Contingency Reserve Raise will apply to a~~Aa Facility Performance Factor (based on the Facility Speed Factor determined~~ailed~~ under paragraph ~~7~~6.2~~6.2~~) will only be applied to Contingency Reserve Raise~~)~~, and, for all other services, the Facility Performance Factor will be set at 1. An explanation of the calculation of Facility Performance Factors for Contingency Reserve Raise is contained in the WEM Procedure: Essential System Service Quantities.

It is intended that inclusion of dynamic Facility Performance Factors for other Essential System Services will be considered by AEMO in the future.

~~5.~~4. Setting Of FCESS Performance Requirements

~~5.1.~~4.1. Maximum Contingency Reserve Block Size

~~E[I]~~E[D] Maximum Contingency Reserve Block Size

The Maximum Contingency Reserve Block Size concept is designed to mitigate the risk associated with partially clearing Contingency Reserve Raise ~~which~~ that is delivered as a Block Response. Facilities that provide Contingency Reserve Raise as a Block Response are only capable of delivering either the full quantity or zero. For example, if a Facility provides 100 MW Contingency Reserve Raise as a Block Response, the only delivery of that service would be 100 MW or zero.

However, if this Facility is the marginal provider of Contingency Reserve Raise, activation of the full 100 MW may result in an over-frequency event~~the system may not require 100 MW~~. Thereforeat is, the Dispatch Algorithm ~~may~~ will only clear 5 MW for that Facility ~~and activation of the full 100 MW may result in an over-frequency event~~to avoid Power System Security risks. To mitigate this risk, AEMO ~~must~~ will set the Maximum Contingency Reserve Block Size, reflective of forecast system conditions.

~~This p~~Paragraph 4.1~~4.1~~ provides the guidance for AEMO's assessment of the ~~size of the~~ Maximum Contingency Reserve Block Size and how it may be updated to reflect changing system conditions.

The proposed methodology considers a worst-case scenario, to determine the maximum block size that would cause power system frequency to exceed the Normal Operating Frequency Band. The Maximum Contingency Reserve Block Size then limits the quantity to be provided ~~in~~ for ~~each~~ total offered tranches.

~~Any Facility which delivers Contingency Reserve services in a block manner must be capable of independently triggering enabled tranches.~~

4.1.1. AEMO's method for determining ~~must determine~~ the Maximum Contingency Reserve Block Size is to calculate ~~as~~ the Block Response quantity of Contingency Reserve Raise ~~which would~~that causes either the SWIS Frequency to exceed the Normal Operating Frequency Band or the SWIS RoCoF to exceed the RoCoF Safe Limit, assuming the p~~P~~ower s~~S~~ystem conditions ~~which~~ that would have the largest impact~~, per megawatt, on SWIS Frequency~~, and that Block Response quantity will equal the Maximum Contingency Reserve Block Size.

~~5.1.1.~~4.1.2. In ~~determining~~calculating the Block Response quantity of Contingency Reserve Raise ~~Maximum Contingency Reserve Block Size~~ under paragraph 4.1.1, AEMO may undertakes system studies to consider:

(a) low Underlying System Load condition;

(b) low System Inertia condition; and

~~(a)~~(c) any other relevant assumptions, including frequency setting of Block Responses.

~~(b)~~(d) AEMO ~~must~~ will publish the Maximum Contingency Reserve Block Size on the WEM Website.

~~5.1.2.~~4.1.3. AEMO ~~must~~ will publish the Maximum Contingency Reserve Block Size on the WEM Website.

~~5.1.3.~~4.1.4. AEMO may re-determine the Maximum Contingency Reserve Block Size at any time.

4.1.5. AEMO may determine that a Market Participant must ~~seek~~ undertake the Amendment~~Re-Accreditation~~ Process under paragraph 7.2.1, where the Maximum Contingency Reserve Block Size is varied under paragraph ~~5.1.1~~4.1.3.

4.1.6. Where AEMO makes a determination under paragraph 4.1.5, it will advise the Market Participant that it must undertake the Amendment ~~Re-Accreditation~~ Process under paragraph 7.2.1 and provide a timeframe by which it must submit an application to undertake an Amendment ~~Re-Accreditation~~ Process.

4.1.7. A Market Participant must submit an application to undertake a Amendment~~Re-Accreditation~~ Process by the time stipulated in AEMO's notification under paragraph 4.1.6.

~~5.1.4.~~4.1.8. Any Facility which delivers Contingency Reserve services in a block manner must be capable of independently triggering enabled tranches.

~~6.~~5. Performance Verification FOR FCESS

~~6.1.~~5.1. Performance verification for FCESS

~~**E[J] Monitoring Performance of providers of Regulation**~~

~~**AEMO will monitor performance of Facilities providing Regulation Raise and Regulation Lower to track actual behaviour against Performance Requirements and relevant Facility Accreditation Parameters, to identify:**~~

~~(a) whether there is a persistent deviation above the threshold~~ for that Accreditation Parameter~~; and~~

~~(b) rate of change of difference between desired and actual~~ performance ~~either increasing or not decreasing above threshold rate.~~

~~**AEMO will record the following data for E**~~each ~~**period identified as having a persistent deviation above the threshold is allocated a:**~~

~~(a) difference from desired (by MW and/or percentage); and~~

~~(b) the length of the period.~~

~~AEMO will review ongoing data from this analysis under paragraph 6.1.1 and trigger a Re-Accreditation under paragraph 6.1.5 where AEMO considers a Facility is consistently failing to perform in accordance with the Performance Requirements. Where the Facility is failing to perform in accordance with its Accreditation Parameters, AEMO will determine whether to trigger a Re-Accreditation based on the criteria in paragraph 6.1.6.~~

5.1.1. For the purposes of monitoring and verifying Facility performance against the ~~FCESS Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters, AEMO will model expected Facility performance and duration in accordance with the Facility's ~~FCESS Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters against the Facility's actual performance and duration.

~~6.1.1.~~5.1.2. AEMO ~~must~~ will monitor compliance with relevant Performance Requirements and ~~Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters for each Facility accredited to provide FCESS by:

(a) for Regulation Raise and Regulation Lower, monitoring the degree to which a Facility performs under~~follows~~ AGC; and

(b) for Contingency Reserve Raise, Contingency Reserve Lower and RoCoF Control Service, monitoring the response of th~~eat~~ Facility to C~~c~~ontingency E~~e~~vents.

5.1.3. AEMO may request a Market Participant to undertake testing to verify Facility performance against the Frequency Co-optimised Essential System Service Accreditation Parameters for the Facility, under an approved Commissioning Test Plan in accordance with the WEM Procedure: Commissioning Tests by the time specified by AEMO in its request (where relevant).

~~6.1.2.~~5.1.4. AEMO ~~must~~ will undertake a review of the performance of Facilities accredited for Frequency Co-optimised Essential System Service~~FCESS~~ where:

(a) AEMO becomes aware, through monitoring in accordance with paragraph 5.1.1 that a Facility's performance is varying from the ~~required~~ relevant Performance Requirements or the Facility's ~~Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters; ~~and~~or

(b) AEMO's ~~undertakes a scheduled~~ review of Facilities' performance is scheduled in accordance with paragraph 5.1.5.

~~6.1.3.~~5.1.5. Every two years, AEMO ~~must~~ will undertake a review of ~~any~~ Facilities accredited for ~~any~~ FCESS, where that Facility has either:

(a) not been enabled for the relevant FCESS in the previous two years; or

(b) has not delivered the relevant FCESS in the previous two years.~~.~~

~~6.1.4.~~5.1.6. AEMO's review under paragraph 5.1.4~~5.1.35.1.35.1.35.1.35.1.35.1.26.1.2~~ may include analysis of the extent to which each ~~relevant~~ Facility meets the relevant Performance Requirements and ~~Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters ~~, through assessment of service delivery~~ whilst enabled for the relevant FCESS, through analyses ~~including~~using:

(a) ~~analysis of~~ SCADA data collected for the relevant Facility;

(b) ~~analysis of~~ High-Resolution Time Synchronised Data;

(c) ~~analysis of~~ Essential System Service Enablement Quantities ~~enablement quantities~~ for the relevant Dispatch Intervals; and

(d) ~~analysis of~~ Forced Outage rates.

6.1.5.5.1.7. Where, following a review under paragraph 5.1.45.1.35.1.35.1.35.1.26.1.2, AEMO determines a Facility has not been consistently meeting the relevant Performance Requirements for the relevant FCESS, or has not been enabled for that FCESS over the review period, it must will trigger an Amendment Re-AccreditationProcess for the relevant FCESS for that Facility under paragraph 7.2.17.2.18.2.1, and publish a notice on the WEM Website outlining that the Facility has been required to undertake an Amendment Re-AccreditationProcess.

6.1.6.5.1.8. Where, following a review under paragraph 5.1.45.1.35.1.35.1.35.1.26.1.2, AEMO determines a Facility has not been delivereding the relevant FCESS in accordance with its relevant Accreditation ParametersFrequency Co-optimised Essential System Service Accreditation Parameters, AEMO must will determine whether the variation from its Frequency Co-optimised Essential System Service Accreditation Parameters is significant and limitshas threatened, or is threatening, AEMO's ability to maintain Power System Security or Power System Reliability, by reviewing the:

(a) reviewing the magnitude of variance from the relevant Facility's Accreditation ParametersFrequency Co-optimised Essential System Service Accreditation Parameters; and

(b) reviewing the regularity of variance from the relevant Facility's Accreditation ParametersFrequency Co-optimised Essential System Service Accreditation Parameters; and

(c)(b) establishing whether those variances limit AEMO's ability to maintain Power System Security or Power System Reliability.

5.1.9. Where AEMO determines, under paragraph 5.1.8, that there is a significant variation of a Facility from its Accredited Parameters that has threatened, or is threatening, AEMO's ability to maintain Power System Security or Power System Reliabilityunder paragraph 5.1.75.1.66.1.6, it must trigger an Amendment Re-AccreditationProcess forof that Facility under pParagraph 7.2.17.2.18.2.1, and publish a notice on the WEM Website outlining that the Facility has been required to undertake AmendmentRe-Accreditation Process.

6.1.7.5.1.10. A Market Participant responsible for a Facility accredited for FCESS , acting in good faith, must notify AEMO as soon as practicable, where it is aware that the Facility will be, is likely to become or has become unable to respond or provide the full range of responses required in accordance with paragraph 3.5.

~~7.~~6. Frequency Co-optimised Essential System Service Accreditation Parameters ~~FCESS Accreditation Parameter~~ Determination

~~7.1.~~6.1. Determination of Maximum Quantity for Contingency Reserve

~~E[K]E[E]~~ Determination of Maximum Quantity for Contingency Reserve

In accordance with paragraph 6.1.2, ~~AEMO will determine the maximum quantity for which a Facility may be accredited for Contingency Reserve Raise or Contingency Reserve Lower, as the maximum quantity under any Operating Configuration for which that Facility can deliver:~~

~~(a) for Contingency Reserve Raise, to a Local Frequency excursion of 48.975 Hz; and~~

~~(b) for Contingency Reserve Lower, to a Local Frequency excursion of 51.025 Hz.~~

~~t~~The~~is~~ determination of a maximum quantity for Contingency Reserve ~~will~~ would be capped by the Facility's expected maximum response based on its characteristics, including the nominal size of relevant components of a Facility and their Droop Settings and Droop Dead ~~b~~Band Settings.

For example, a Facility with a Droop Dead ~~b~~Band Setting of 0.025 Hz and a Droop Setting $\boldsymbol{s = 4\%}$ ~~will~~ would be able to theoretically receive a~~A~~accreditation for a ~~theoretical~~ maximum of half its nominal power capacity:

$$\frac{\boldsymbol{\Delta P}}{\boldsymbol{P_N}} = \frac{\mathbf{DB}(\boldsymbol{\Delta f})}{\boldsymbol{f_0 s}} = \frac{(\mathbf{1.025 - 0.025})\text{Hz}}{\mathbf{50}\text{Hz} * \mathbf{4\%}} = \mathbf{0.5}$$

The same facility with a 2% Droop Setting ~~will~~ would be eligible to receive a~~A~~accreditation for a quantity up to its full nominal power capacity.

In accordance with paragraph 3.2.4, ~~T~~the~~is~~ determination of a maximum quantity for Contingency Reserve ~~will~~ would also be capped at the maximum quantity that can be delivered and sustained for 15 minutes, as demonstrated through Facility testing, where operational data is insufficient for AEMO to reasonably determine a Facility is capable of delivering that response.

~~7.1.1.~~6.1.1. AEMO ~~must~~ will determine a maximum quantity of Contingency Reserve Raise or Contingency Reserve Lower for each Facility ~~seeking~~ undertaking an ~~Accreditation~~Accreditation Process or ~~Re-Accreditation~~Amendment Process for Contingency Reserve Raise or Contingency Reserve Lower.

~~7.1.2.~~6.1.2. AEMO's determination under paragraph 6.1.1 ~~must~~ will be: ~~to the lesser of:~~

(a) the lesser of:

(i) the Facility's maximum theoretical response ~~to~~:

(A) for Contingency Reserve Raise, to a Local Frequency excursion from 50 Hz to 48.975 Hz; and

(B) for Contingency Reserve Lower, to a Local Frequency excursion from 50 Hz to 51.025 Hz; and~~.~~

(ii) any proposed ~~Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters, including those subsequently amended in consultation with AEMO; and

(b) the greater of:

(i) where the Facility was tested, the maximum response that meets the relevant Performance Requirements achieved through testing ~~which meets the relevant Performance Requirements~~; and

(ii) where the Facility's capability in response to system events can be determined from operational data, AEMO's reasonable determination of the Facility's capability.

6.1.3. AEMO will determine the maximum quantity for which a Facility may be accredited for Contingency Reserve Raise or Contingency Reserve Lower, as the maximum quantity under any Operating Configuration ~~for which~~ that Facility can deliver:

(a) for Contingency Reserve Raise, to a Local Frequency excursion of 48.975 Hz; and

~~(c)~~(b) for Contingency Reserve Lower, to a Local Frequency excursion of 51.025 Hz.

~~7.2.~~6.2. Speed Factor Determination

~~7.2.1.~~6.2.1. AEMO ~~must~~ will determine a Facility Speed Factor in accordance with paragraph 6.2.2 ~~6.2.2~~ for each Facility ~~seeking~~ undertaking an ~~Accreditation~~Accreditation Process or Amendment ~~Re-Accreditation~~Process for Contingency Reserve Raise ~~in accordance with paragraph 6.2.27.2.2~~.

~~7.2.2.~~6.2.2. In determining a Facility Speed Factor for a Facility, AEMO ~~must~~ will calculate the Primary Frequency Response ~~,~~ from data captured from a High-Resolution Time Synchronised Data Recorder, including frequency profile and measured Active Power~~including frequency profile and measured Active Power~~, following:

(a) testing, for all required tests undertaken in accordance with paragraphs ~~2.3.4,~~ 2.1.7(c) or 8.2.1 for the relevant ~~Accreditation~~Accreditation Process or Amendment ~~Re-Accreditation~~Process; or

(b) two or more Contingency Events, with at least one occurring in the previous two years, where:

(i) the SWIS Frequency moved ~~below~~:

(A) more than 0.3 Hz below the Normal Operating Frequency Band; or

(B) ~~below~~ the Facility frequency setpoint, where that Facility controls the response in accordance with paragraph 3.2.5(b) ~~3.2.83.2.83.2.54.2.5(b)~~; and

(ii) the ~~relevant~~ Facility was enabled for Contingency Reserve Raise in the relevant Dispatch Intervals.

~~7.2.3.~~6.2.3. In determining the Facility Speed Factor under paragraph ~~6.2.26.2.2,~~ AEMO may filter, exclude, or apply substitutions or other corrections to High-Resolution Time Synchronised Data, ~~under paragraph 6.2.27.2.2~~ where AEMO determines the data ~~to be~~is erroneous or not ~~n~~reflective of Primary Frequency Response, including where there are:

(a) corrupt or missing data, due to recording or communications device errors; and

(b) responses associated with switching transients and other local voltage phenomena.

~~E[L]~~E[F]Data Filtering

Figure E[2] shows an example situation in which a recording with erroneous data can be identified, filtered and ~~then still~~ used for the ~~Accreditation~~Accreditation Process ~~under~~ in accordance with paragraph 6.2.3(a). In this instance, the "spikes" can be attributed to device errors through cross-refencing with other near-by recorders, and then removed by applying a rolling median filter to the data.

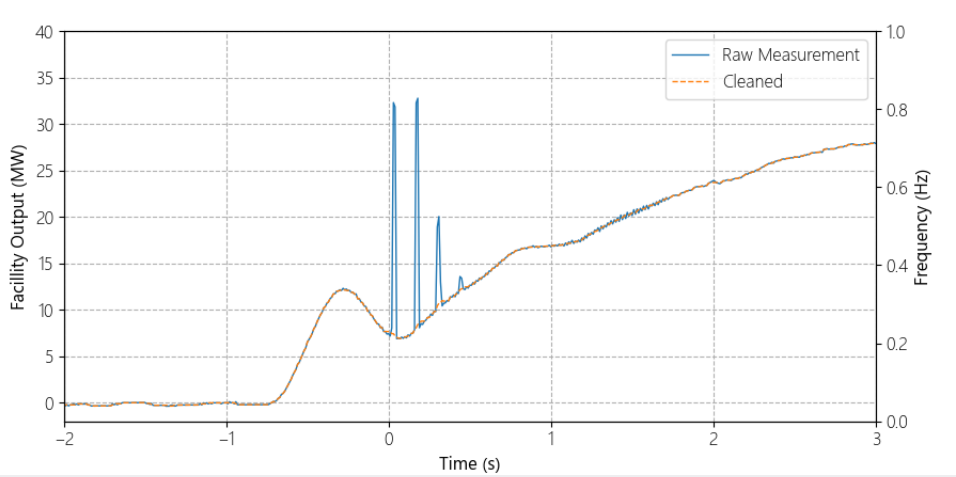

Figure E[2] Example of filtering erroneous data from a high-speed recording

~~E[M]~~E[G] Inertial Component

Where AEMO determines a Facility Speed Factor, it will subtract the Inertial Component from a Facility's Primary Frequency Response in accordance with paragraph 6.2.4. AEMO will ~~use~~ determine that Facility's Inertia under paragraph 6.3 to calculate Inertial Component. ~~from that Facility's generation system model under an approved Registered Generator Performance Standard or another available model where a Registered Generator Performance Standards is not available. It is t~~Therefore, ~~it is important for a Market Participant to verify the generation system model prior to seeking undertaking the Accreditation to ensure that its contribution is accurately reflected for a Rate of Change of Frequency Control Service and, for a Contingency Reserve Raise service, in the Facility Speed Factor assessment under paragraph 6.2.~~

~~7.2.4.~~6.2.4. AEMO ~~must~~ will estimate and exclude the contribution of ~~any contribution of~~data, ~~identified in accordance with paragraph 6.2.3~~the Facility's Inertial Component, as determined under paragraph 6.3, ~~the Facility's Inertial Component, to the Primary Frequency Response identified in accordance with paragraph 6.2.3~~7.2.3, from the Primary Frequency Response, ~~by using the Facility's generation system model associated with an approved Registered Generator Performance Standard, or where this is unavailable, the most up to date model of the Facility that is available to AEMO~~.

7.2.5.6.2.5. In calculating the Primary Frequency Response, AEMO must will develop a series of profiles, known as a Reference Profiless, for each frequency profile tested or observed under paragraph 6.2.2, being the theoretical response of that Facility to Local Frequency excursions. TheA Reference Profiles will and must include a range of profiles, accounting for the requirements of the Dispatch Algorithm, each corresponding to different reference Facility Speed Factors to enablefor the Facility to reach its full theoretical response to that frequency excursion.

7.2.6.6.2.6. For each Reference Profile developed in accordance with paragraph 6.2.5, AEMO must will calculate the theoretical response to a frequency excursion with time, determined as the solution P(t) to:

$$\frac{dP}{dt} = \frac{P_{setpoint}(f) - P(t)}{\tau}$$

Where:

- $P_{setpoint}$ is the droop control setpoint offset (from basepoint) calculated in accordance with paragraph 6.2.7
- $P(t)$ is the increase or reduction (from base point) in Facility Active Power
- τ is the Reference Speed Factor (in seconds)

7.2.7.6.2.7. When determining a Reference Profile in accordance with paragraph 6.2.6, AEMO must will determine the droop control setpoint offset, as:

$$P_{setpoint}(f) = \min(PFR, \frac{-P_N}{s * f_0}\mathrm{DB}(\Delta f))$$

Where for:

(a) Continuous Response (Droop Response):

- PFR is the cleared Contingency Reserve quantity, in MW
- P_N is the total nominal power capacity of all Energy Producing Systems and Loads delivering the service (as per Registered Generator Performance Standards, where applicable), in MW
- f_0 is the nominal frequency (50 Hz), in Hz
- s is the Droop Setting for that Facility, in %
- DB is the effective frequency deviation after applying a symmetric Droop Dead bBand Setting for that Facility, in Hz
- Δf is $f - f_0$, or the frequency deviation from nominal frequency, in Hz

(b) a control scheme to deliver a set quantity (Block Response):

- PFR is the cleared Contingency Reserve quantity, in MW
- P_N is assumed to be equal to PFR, in MW
- f_0 is the nominal frequency (50 Hz), in Hz
- s is assumed to be equal to the Droop Setting of 2% to reach nominal power capacity, in %
- DB is the effective frequency deviation after applying a symmetric Droop Dead bBand Setting (assumed to be 0.025 Hz) for that Facility, and is, in Hz assumed to be 0.025 Hz

- Δf is $f - f_0$, or the frequency deviation from nominal frequency, whereich f is assumed to be 48.975 Hz, in Hz

~~E[N]~~E[H] Determination of Facility Speed Factor

~~E[N1]~~E[H1] Reference Profiles

Determination of Reference Profiles under paragraph 6.2.5~~6.2.5~~ allows AEMO to generate a theoretical Facility response for a given Contingency Reserve Raise enablement, frequency excursion and Facility Speed Factor.

Figure E[3] shows a comparison of a measured response against a range of Reference Profiles (being the theoretical response) calculated in accordance with paragraph 6.2.6. Figure E[4] shows the same data as Figure E[3], with Active Power Injection integrated to energy.

Under paragraph 6.2.5, AEMO ~~will process~~develops Reference Profiles for each relevant frequency profile, calculated under ~~in~~ paragraph 6.2.2 and the Primary Frequency Response for which a Facility is undertaking an ~~seeking Accreditation~~Accreditation Process.

The Reference Profiles in Figure ~~-~~E[~~2~~3] are based on the acceptable range of Facility Speed Factors, as published by AEMO in accordance with paragraph ~~-~~ 6.2.11~~6.2.106.2.106.2.11~~, ~~band~~ ~~acceptable range~~ at th~~at~~e time (i.e. [0.2, 0.5, 1, 3, 6, 10, 15] (s)), where a faster response has a lower Facility Speed Factor. ~~Figure E[34] shows the integrated response (in MWs) of the same Facility as an integrated response (in MWs) compared to integrated Reference Profiles., tThis shows the Facility response exceedsing the that of associated with the Reference Speed Factor of two three seconds at the frequency nadir time. Reference Speed Factor.~~

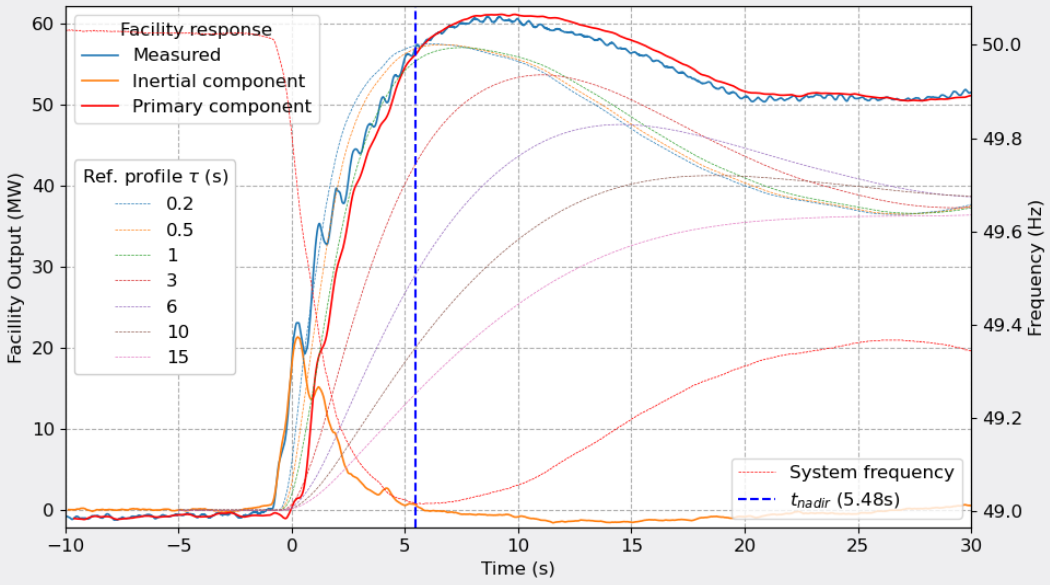

Figure E[3] Example of measured response against theoretical Response Profiles.

Figure E[4] shows the integrated response (in MWs) of the same Facility (PFR) compared to integrated Reference Profiles (ranging from 0.2 to 15 seconds). This shows the Facility response exceeds that associated with the Reference Speed Factor of three seconds at the frequency nadir time.

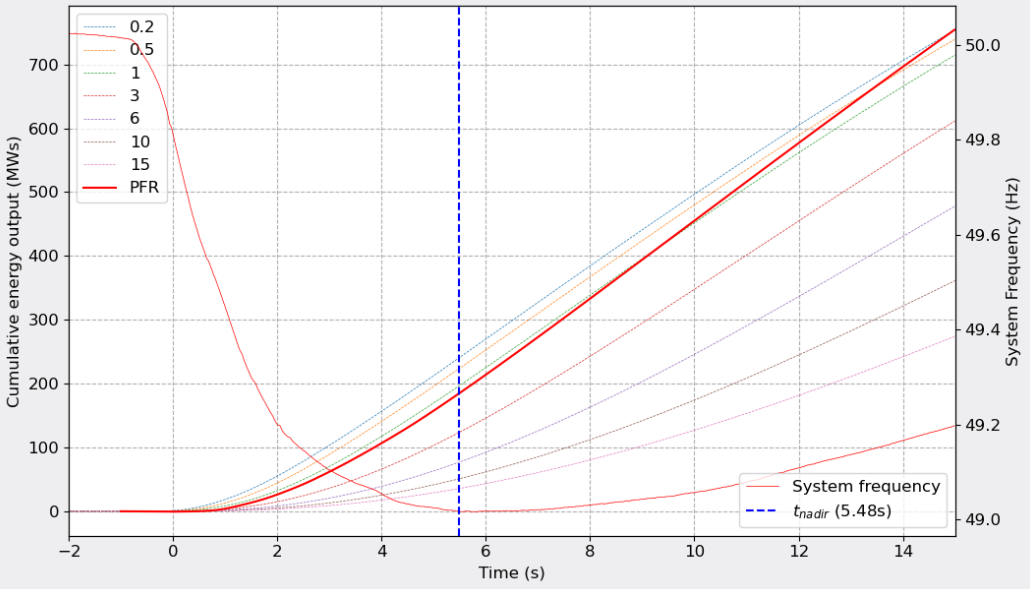

Figure E[4] Example of measured response against theoretical Response Profiles after integration.

For a large disturbance (maximum credible contingency), a Facility's Droop Response control system, calculating a theoretical response to frequency excursioned under paragraph 6.2.6, will "washout" such that $P_{setpoint}$ will reach PFR almost instantaneously. Under these circumstances, the expected output of the machine reduces to:

$$P(t) \approx PFR * \left(1 - e^{-\frac{t}{\tau}}\right) \quad \text{E[M1]E[N1](1)}$$

7.2.8. AEMO must will take the relevant integral of the Facility's Primary Frequency Response derived each Facility Response under paragraph 6.2.47.2.4 andand each Reference Profile developed under paragraph 6.2.56.2.56.2.57.2.5 at the frequency nadir time or four seconds (whichever comes first) and .

7.2.9. For the each integral of the Facility's Primary Frequency Response, which AEMO reasonably determines considers is representative of that Facility's capability, AEMO must will determine the highest integral the integral of the Reference Profiless calculated for theat frequency excursion which that aredoes not is exceeded bysed by the integral of the Facility's Primary FrequencyFacility Response at the greater of:

7.2.10.

7.2.11. the frequency nadir time; or

7.2.12. 4 seconds.

6.2.8. AEMO will take the relevant integral of the Facility's Primary Frequency Response and each Reference Profile developed under paragraph 6.2.5 at the frequency nadir time or four seconds (whichever comes first) and determine the highest integral Reference Profile that does not exceed the integral of the Facility's Primary Frequency Response.

~~7.2.13.~~6.2.9. AEMO ~~must~~ will determine the Facility Speed Factor to be~~as~~ the Reference Speed Factor associated with the ~~Reference Profile with the~~ highest integral ~~Reference Speed Factor for all~~ Reference Profile ~~with integrals~~ determin~~ed~~ations under paragraph 6.2.8~~6.2.8 1.1.11.1.11.1.11.1.16.2.86.2.97.2.9~~.

6.2.10. Facilities seeking ~~Aa~~accreditation for Contingency Reserve Raise must have a Facility Speed Factor within the~~an~~ acceptable range, otherwise they are not eligible for Contingency Reserve Raise a~~A~~ccreditation.~~.~~

~~7.2.14.~~6.2.11. AEMO ~~must~~ will determine and publish the range of acceptable Reference ~~Facility~~ Speed Factors on the WEM Website.

6.2.12. AEMO may re-determine the range of Reference Speed Factors associated with the Reference Profiles developed under paragraph 6.2.5 at any time.

6.2.13. Where AEMO re-determines the range of Reference Speed Factors under paragraph 6.2.12~~.~~, it will notify affected Market Participants and publish the updated Reference Speed Factors on the WEM Website.

6.3. Determination of Facility's Inertia

E[I] Determination of Facility's Inertia

It is important for a Market Participant to verify the generation system model prior to undertaking the Accreditation Process to ensure that, for a Contingency Reserve Raise service, the Inertial Component's~~its~~ contribution is accurately reflected ~~for a Rate of Change of Frequency Control Service and, for a Contingency Reserve Raise service,~~ in the Facility Speed Factor assessment under paragraph 6.2.

For Rate of Change of Frequency Control Service, the Inertia value (in MWs) may be taken from evidence of the relevant equipment's capability, including from manufacturer data or in accordance with paragraph 6.3.1.

6.3.1. AEMO will use the following evidence to determine Inertial Component or Inertia (as relevant):

(a) manufacturer data, where available; or

(b) where manufacturer data is not available or sufficient, an approved Registered Generator Performance Standard or other evidence, including the most up to date model of the Facility, of the relevant equipment's capability, where this Registered Generator Performance Standard or evidence is accepted by AEMO for the purposes of this paragraph.

~~8.~~7. ~~from a Facility's generation system model under an approved Registered Generator Performance Standard or may consider the most up to date model of the Facility that is available to AEMO where a Registered Generator Performance Standard is not available.~~Amendment of ~~Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters

~~8.1.~~7.1. Market Participant Triggers ~~for~~an Amendment Process for ~~its~~of Facility's Frequency Co-optimised Essential System Service Accreditation Parameters~~Identified Variation to its Facility's Accreditation Parameters~~

~~8.1.1.~~7.1.1. Where a Market Participant is required to provide information to AEMO under clause 2.34A.8 or paragraph 2, ~~identifies that its Facility varied, is varying or is likely to vary significantly from its Accreditation Parameters or the Performance Requirements for the relevant FCESS~~ it must ~~notify~~ provide this information to AEMO ~~[Clause 2.34A.8]~~ in accordance with the details on the WEM Website and~~, which~~ must include details of:

(a) the name of the Facility;

(b) the relevant ~~Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters or Performance Requirements; and

(c) the proposed ~~Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters for which the Market Participant requests the Amendment ~~Re-Accreditation~~Process to be undertaken, where relevant.

8.1.2. Where the notification in accordance with paragraph 8.1.1, has been made at least 12 months after Accreditation in accordance with paragraphs, 2.2.1, 2.3.1, 2.4.1 and 3.1.1 or a Re-Accreditation in accordance with paragraph 8, AEMO willmust request that Facility undertake Re-Accreditation in accordance with paragraph 3.1.1 [Clause 2.34A.10(a)].

7.1.2. Where the notification in accordance with paragraph 7.18.1, has been made less than 12 months following the pre-market start FCESS Accreditation or Accreditation in accordance with paragraph s 2.2.1, 2.3.1, 2.4.1 and 2.1.13.1.1 or a Re-Accreditation in accordance with paragraph 78 [Clause 2.34A.10(b)]AEMO receives a request underin the circumstances outlined in clause 2.34A.10(b), AEMO maywill request the relevant Market Participant to provide reasons for the variation or likely variation.

7.1.3. A Market Participant must provide the information requested under paragraph 7.1.2 within 10 Business Days of that request, using the contact details on the WEM Website.

7.1.4. After reviewing the information provided under paragraph 7.1.3, AEMO may request further information from the Market Participant to assist with its decision to undertake the Amendment Process and will specify a time for this information to be provided.

7.1.5. If AEMO issues a request under paragraph 7.1.4, the Market Participant must provide the information requested by the time and in the manner specified in the request.

8.1.3.7.1.6. Upon receipt of information under paragraph 7.1.3 and, where relevant, paragraph 7.1.5, AEMO will, as soon as practicable,must either:

(a) decline the request and notify the Market Participant, providing the reasons for its decision [**Clause 2.34A.11**; or

(b) approve the request and notify the Market Participant that the Facility must apply to undertake the Amendment Re-AccreditationProcess in accordance with paragraph 2.1.1.

8.1.4.7.1.7. AEMO'sIn making a determination under paragraph 7.1.2, AEMO will must consider:

(a) whether the relevant Market Participant for the Facility is requesting its Accreditation ParametersFrequency Co-optimised Essential System Service Accreditation Parameters be reduced to a lower level of service;

(b) the magnitude of the variation to the Accreditation ParametersFrequency Co-optimised Essential System Service Accreditation Parameters; and

(c) any other factors that AEMO deems relevant.

~~8.2.~~7.2. AEMO Triggers ~~for~~an Amendment Process ~~of~~for a Facility's Frequency Co-optimised Essential System Service Accreditation Parameters ~~AEMO Identified Variation to its Facility's Accreditation Parameters~~

~~8.2.1.~~7.2.1. In the circumstances outlined in clause 2.34A.11, AEMO ~~If AEMO identifies a Facility has varied, is varying or is likely to vary from its Accreditation Parameters or the Performance Requirements for the relevant FCESS, under paragraph 4.2.16, 6.1.5 or 6.1.7, AEMO may reassess the Accreditation Parameters [2.34A.11] (i.e. perform the Re-Accreditation) and may~~ will request the relevant Market Participant to provide reasons for the variation or likely variation.

~~8.2.2.~~7.2.2. A Market Participant must provide the information requested ~~ny response to a request~~ under paragraph 7.2.1~~, must be provided to AEMO~~ within 10 Business Days of that request, ~~in accordance with~~using the ~~notification~~ contact details on the WEM Website.

7.2.3. AEMO will review the information provided under paragraph 7.2.2 and determine whether to undertake the Amendment Process. ~~either does not respond longer than a delay it is set to or is not capable of adjusting the setpoint frequency, at which the Facility responds, to between 47.0 Hz and 49.8 Hz~~

7.2.4. Examples of changes to Facility performance that may lead to an adjustment of the Frequency Co-optimised Essential System Service Accreditation Parameters include where a Facility:

(a) has not met a general performance requirement outlined in paragraph 3.5 ~~3.5~~ on one occasion; or

(b) is controlled by a control scheme to deliver a set quantity and does not respond for a period longer than a delay to which it is set ~~to~~ on one occasion; or

(c) is controlled by a control scheme to deliver a set quantity and is not capable of adjusting the setpoint frequency, at which the Facility responds, to outside of the Normal Operating Frequency Band~~to between 47.0 Hz and 49.8 Hz~~ on one occasion.

7.2.5. After reviewing the information provided under paragraph 7.2.3, AEMO may request further information from the Market Participant to assist with its decision to undertake the Amendment Process and will specify a time for this information to be provided.

7.2.6. If AEMO issues a request under paragraph 7.2.4, the Market Participant must provide the information requested by the time and in the manner specified in the request.

7.2.7. Within 20 Business Days of receiving a response under paragraph 7.2.3 or, where relevant, paragraph 7.2.6, AEMO will either:

(a) decide that the Amendment Process is not required and notify the Market Participant, providing the reasons for its decision; or

(b) ~~approve the request and~~ notify the Market Participant that the Facility must apply to undertake the Amendment Process in accordance with paragraph 2.1.1, include reasons for its determination and specify a timeframe by which the Amendment Process must be commenced.

~~approve the request and notify the Market Participant that the Facility must apply to undertake the Amendment Process in accordance with paragraph 2.1.1~~

7.2.8. Where AEMO has notified a Market Participant under paragraph 7.2.7(b) that it must undertake the Amendment Process, that Market Participant must commence undertaking the Amendment Process in accordance with paragraph 2.1.1 within the timeframe specified in AEMO's notification.

7.2.9. In addition to the requirements of paragraph 2.1where AEMO determines it will undertake the Amendment Process under clause 2.34A.11, it will consider:

(a) any information received under paragraph 7.2.2 and paragraph 7.2.6;

(b) the magnitude of the variation to the Frequency Co-optimised Essential System Service Accreditation Parameters or Performance Requirements and whether this magnitude is significant; and

(c) any other information or evidence it considers relevant to its reassessment,

~~8.2.3.~~7.2.10. Where AEMO undertakes the Amendment Process and is required to notify the Market Participant in accordance with clause 2.34A.11 ~~in accordance with paragraph 7.2.48.2.4 determines an amendment to a Facility's Accreditation Parameters~~, its~~ must~~ notification will include~~y the Market Participant for that Facility, inclusive of~~:

(a) the name of the Facility;

(b) the amended ~~Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters for the Facility (where relevant);

(c) the date that the amendments will take effect from; and

(d) the reasons for its decision.

~~8.2.4. AEMO must determine, whether to amend the Accreditation Parameters for a Facility identified in paragraph 7.2.18.2.1 and may consider:~~

~~(a) any information received under paragraph 7.2.28.2.2; and~~

~~(b) the magnitude of the variation to the Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters ~~or Performance Requirements.~~

7.2.11. Where a Market Participant receives notification under paragraph 7.2.10 that its Frequency Co-optimised Essential System Service Accreditation Parameters are amended, it must submit the data and details pertaining to those Frequency Co-optimised Essential System Service Accreditation Parameters to AEMO in accordance with paragraph 10.

7.3. .Revoking Facility Frequency Co-optimised Essential System Service accreditation

7.3.1. Where AEMO undertakes an Amendment Process for a Facility under paragraph 7.1 or 7.2 and paragraph 2.1or where an application for an Amendment Process is withdrawn under paragraph 2.1.11(b),~~(b),~~ it may determine that it is necessary to vary the Frequency Co-optimised Essential System Service Accreditation Parameters such that it is no longer accredited for a service.

7.3.2. Where Frequency Co-optimised Essential System Service Accreditation Parameters are varied in accordance with paragraph 7.3.1, this has the effect of revoking the accreditation for the relevant Frequency Co-optimised Essential System Service.

7.3.3. Where a Market Participant fails to commence undertaking the Amendment Process within the timeframe specified under paragraph 7.2.8, AEMO may revoke the accreditation for the relevant Frequency Co-optimised Essential System Service.

7.3.4. If an accreditation is revoked, the Market Participant must apply to undertake the Accreditation Process in accordance with paragraph 2 for the relevant Frequency Co-optimised Essential System Service Accreditation Parameters for the Facility.

7.3.5. Where a Market Participant receives notification that its Frequency Co-optimised Essential System Service Accreditation Parameters are revoked, it must submit the data and details pertaining to the revocation of those Frequency Co-optimised Essential System Service Accreditation Parameters to AEMO in accordance with paragraph 10.

~~9.~~8. Testing and re-testing

~~9.1.~~8.1. General Testing Requirements

AEMO ~~must~~ will develop a Frequency Co-optimised Essential System Services Testing Guideline and publish the guideline on the WEM Website.

~~9.1.1.~~

~~9.1.2.~~8.1.2. Tests included in the Frequency Co-optimised Essential System Services Testing Guideline for all relevant Operating Configurations may include, but are not limited to~~, for all relevant Operating Configurations~~:

(a) for Regulation Raise and Regulation Lower:

(i) testing a Facility's ability to maintain trajectory within ± 5% of ~~ramp rate at the Facility's~~its maximum ramp rate, to the extent possible ~~allowing for~~ within the~~a~~ parameters of the Facility's Generator Performance Standards (including required Droop Response) over two consecutive ~~d~~Dispatch ~~i~~intervals; and

(ii) testing a Facility's ability to meet the requirements of paragraph~~s~~ 3.1.1, by following AGC ~~control~~ performance over an activation period of two~~2~~ hours; and

(b) for Contingency Reserve Raise, Contingency Reserve Lower and RoCoF Control Service:~~;~~

(i) Injection of a frequency bias.

~~9.1.3.~~8.1.3. AEMO may amend the Frequency Co-Optimised Essential System Services Testing Guideline, as required, and publish the updated version on the WEM Website.

~~9.2.~~8.2. Frequency Co-Optimised Essential System Services~~FCESS~~ Tests

8.2.1. During the Accreditation Process or Amendment Process, ~~W~~where AEMO requires a test or re-test of a Facility in order to:

(a) ~~-~~assess its ability to deliver Regulation, ~~or~~

(b) to tune a Facility in its AGC ~~system~~, or

(c) to deliver Contingency Reserve Raise, Contingency Reserve Lower or RoCoF Control Service,

it ~~must~~ will request ~~specify~~ the Facility conduct ~~the~~ tests that AEMO considers suitable, which may include those specified in the ~~to be conducted in accordance with the~~ Frequency Co-Optimised Essential System Services Testing Guideline.

8.2.2. A Market Participant must conduct the tests ~~required~~ requested by AEMO under paragraph 8.2.1~~8.2.1~~ under an approved Commissioning Test Plan in accordance with the WEM Procedure: Commissioning Tests by the time specified by AEMO in its request (where relevant).

~~9.2.1.~~

~~10.~~9. RoCoF Ride-Though Capability

~~10.1.~~9.1. Deeming a Facility's RoCoF Ride-Through Capability

9.1.1. For the purposes of clause 2.34A.12H, where an application for registration of a new Facility is accepted by AEMO, AEMO will deem the RoCoF Ride-Through Capability for the Facility to be at the RoCoF Safe Limit.

9.1.2. For all existing Facilities that have not undertaken an Accreditation Process or Amendment Process or have not commenced an Amendment Process as required by paragraph 9.3.8~~.~~, AEMO will deem the RoCoF Ride-Through Capability for the Facility to be at the RoCoF Safe Limit.

9.1.3. Where a Market Participant becomes aware that its RoCoF Ride-Through Capability for the Facility is deemed to be the RoCoF Safe Limit, it must submit the data pertaining to the deemed RoCoF Safe Limit to AEMO in accordance with paragraph 9.

~~Unless AEMO makes a determination under paragraph 10.2.611.2.6For the purposes of clause 2.34A.14, where an application for registration of a Facility is accepted by AEMO, AEMO will must deem to accredit the RoCoF Ride-Through Capability for any the Facility to be at the RoCoF Safe Limit.~~

~~10.2.~~9.2. ~~Accreditation~~Accreditation Process or Amendment ~~Re-Accreditation~~Process of a Facility's RoCoF Ride-Through Capability

~~10.2.1.~~9.2.1. AEMO ~~must~~ will publish a guideline containing a list of RoCoF Sensitive Equipment on the WEM Website~~, which it~~ and may update this list from time to time.

~~10.2.2.~~9.2.2. A Market Participant ~~or Network Operator~~ may apply to vary the RoCoF Ride-Through Capability, from that determined under paragraph 9.1.1 or 9.1.2 or a value previously determined by AEMO under paragraph 9.2.7~~,~~ for its Facility at any time~~;~~ by submitting an application to AEMO ~~in accordance with~~using the contact details on the WEM Website.

~~10.2.3.~~9.2.3. An application made under paragraph 9.2.2 must include:

(a) evidence that the Facility has maintained Continuous Uninterrupted Operation, ~~under~~ during a range of RoCoF events, ~~that~~ and demonstrates the ability of that Facility to ride through a RoCoF event in accordance with the RoCoF Ride-Through Capability ~~that~~ for which the Market Participant is seeking ~~Accreditation~~aAccreditation ~~Process for~~;

(b) an engineering report demonstrating RoCoF Ride-Through Capability, which is derived from an engineering study~~, that~~ and ~~must~~ contains details of the results and methodology of that engineering study; or~~;~~

(c) a Registered Generator Performance Standard for the relevant Facility that includes a registered RoCoF Ride-Through Capability supported by documents equivalent to those required by paragraph 9.2.3(a) or 9.2.3(b).

~~10.2.4.~~9.2.4. An engineering report for a Facility, provided under paragraph 9.2.3(b), must identify all types of equipment, that is utilised ~~as part of~~during the operation of the Facility and ~~that~~ is sensitive to RoCoF, and:

(a) for a Network Operator, this may include any type of equipment identified by AEMO as RoCoF Sensitive Equipment and, if applicable, must include any reasons why it has chosen not to include a type of equipment identified by AEMO as RoCoF Sensitive Equipment; and

(b) for a Market Participant that is not a Network Operator, must include any type of equipment identified by AEMO as RoCoF Sensitive Equipment.

9.2.5. The engineering report provided under paragraph 9.2.3(b) must include, for each type of equipment identified under paragraph 9.2.4, the highest RoCoF under~~for~~ which that equipment can operate safely and reliably over any 500-millisecond period, and justification for that value.

~~10.2.5.~~9.2.6. The information required under paragraph 9.2.5~~which~~ can be provided by including:

(a) manufacturer data for that equipment;

(b) testing results for that equipment; or

(c) any other supporting evidence.

9.2.7. Where it determines it is necessary and relevant, AEMO may request a Market Participant undertakes testing or retesting of equipment contained in the list of RoCoF Sensitive Equipment published on the WEM Website in accordance with paragraph 9.2.1.

9.2.8. Where AEMO requests testing or retesting in accordance with paragraph 9.2.7, it will consult the Market Participant in relation to the timing of the testing and specify a time and date for the completion of testing in its request under paragraph 9.2.7

9.2.9. Where AEMO requests testing or retesting in accordance with paragraph 9.2.7, the Market Participant must undertake testing in accordance with AEMO's request.

~~10.2.6.~~9.2.10. For each application made under paragraph 9.2.2, AEMO ~~must~~ will determine whether to set the RoCoF Ride Through Capability for the Facility as the value proposed in the application or to retain the last determined value.

~~10.2.7.~~9.2.11. AEMO ~~must~~ will notify the relevant Market Participant ~~or Network Operator~~ of its determination under paragraph 9.2.7 within 20 Business Days of the later of:

(a) receipt of the application; or

(b) receipt of additional information requested by AEMO under paragraph 9.2.13,

~~(b)~~

(c) or a date reasonably determined by AEMO.

~~10.2.8.~~9.2.12. In making a determination under paragraph 9.2.7, AEMO will~~may consider~~10.2.811.2.8, ~~AEMO may~~ consider:

(a) the degree to which the engineering report and ~~included~~ data provided under paragraph 9.2.3(b) ~~11.2.3(c)~~ supports the proposed RoCoF Ride-Through Capability for that Facility;

(b) historical data available to AEMO ~~which~~ that demonstrates the capability of a Facility to operate safely and reliably under high RoCoF events; and

(c) where AEMO considers it appropriate, a relevant Registered Generator Performance Standard.

9.2.13. AEMO may request a Market Participant provide additional ~~Where AEMO requires additional~~ information ~~(which may include additional engineering studies)~~ to support its determination under paragraph 9.2.7 ~~under paragraph 10.2.510.2.510.2.511.2.5,~~.

9.2.14. Where a Market Participant receives a request under paragraph 9.2.13, it must provide the requested information in the manner and by the date and time specified by AEMO in its request.

9.2.15. Additional supporting information requested by AEMO under paragraph 9.2.13 may include additional engineering studies or any other information AEMO considers relevant, (which can be provided in formats such as .doc, .xls, .pdf, etc.).

~~10.2.9. it must will request the relevant Market Participant or Network Operator provide that information in a specified manner and by a specified date.~~

~~10.2.10.Where a Market Participant or Network Operator receives a request under paragraph 10.2.911.2.9, it must provide the requested information in the manner and by the date specified by AEMO in its request.~~

~~10.2.11.~~9.2.16. Where AEMO has notified the Market Participant ~~or Network Operator~~ under paragraph 9.2.11 that it has set the RoCoF Ride Through Capability for the Facility as the value proposed in the application, the Market Participant ~~or Network Operator~~ must submit the accredited RoCoF Ride-Through Capability for that Facility into Standing Data in accordance with paragraph 10.1.1 ~~or paragraph 9.1.210.1.2 as appropriate,~~ within five~~5~~ Business Days of receiving the notification.

9.3. AEMO Triggers for Amendment Process of RoCoF Ride-Through Capability

9.3.1. AEMO may review the performance of a Facility to determine whether the RoCoF Ride-Through Capability determined under paragraph 9.2, is appropriate, where:

(a) AEMO reasonably determines a Facility has not operated safely and reliably due to its current RoCoF Ride-Through Capability;

(b) AEMO amends the list of RoCoF Sensitive Equipment in accordance with paragraph 9.2.1; or

(c) AEMO is notified by a Market Participant that its RoCoF Ride-Through Capability has varied, is varying, or is likely to vary from the current RoCoF Ride-Through Capability, in accordance with paragraph 9.3.2~~0010.3.2~~.

9.3.2. Where AEMO identifies a Facility may have varied, is varying, or is likely to vary significantly from its accredited RoCoF Ride-Through Capability, it must notify the relevant Market Participant in accordance with clause 2.34A.12F and request reasons for the variation.

9.3.3. Where a Market Participant is notified in accordance with paragraph 9.3.2 ~~0010.3.2~~, it must provide relevant reasons for the variation, and any proposed rectification, including the proposed timing for that rectification, to AEMO using the contact details on the WEM Website, within 10 Business Days.

~~10.2.12.~~9.3.4. After reviewing the information provided under paragraph 9.3.3, AEMO may request further information ~~or testing~~ from the Market Participant to assist with its decision to require the Amendment Process and will specify a time for this information to be provided ~~or testing to be conducted~~.

~~10.2.13.~~9.3.5. If AEMO issues a request under paragraph 9.3.4, the Market Participant must provide the information ~~or test results~~ requested by the time and in the manner specified in the request.

9.3.6. AEMO will determine, for each relevant Facility identified under paragraph 9.3.2 ~~0010.3.2~~, whether to require the Amendment Process be undertaken for that Facility's RoCoF Ride-Through Capability by considering:

(a) information received under paragraph 9.3.3 ~~0010.3.3~~;

(b) any rectification proposed by that Market Participant; and

~~(d)~~(c) any other information available to AEMO;

9.3.7. AEMO will notify a Market Participant of its determination under paragraph 9.3.4 ~~0010.3.4~~, within 20 Business Days of receiving a response under paragraph 9.3.31.1.1 and will include reasons for its determination in its notification.

9.3.8. Where AEMO has notified a Market Participant under paragraph 9.3.7~~10.3.5~~ that it must undertake the Amendment Process for that Facility's RoCoF Ride-Through Capability, that Market Participant must undertake the Amendment Process in accordance with paragraph 9.2.2~~10.2.2~~ within the timeframe specified in AEMO's notification.

9.3.9. Where a Market Participant does not commence undertaking an Amendment Process within the timeframe specified under paragraph 9.3.8, AEMO will deem the Facility to be at the RoCoF Safe Limit.

~~10.3. AEMO Triggers for~~ Amendment ~~Re-Accreditation~~Process ~~of RoCoF Ride-Through Capability~~

~~10.3.1. AEMO may review the performance of a Facility to determine whether the RoCoF Ride-Through Capability for which a Facility is accredited, is appropriate, where:~~

~~(a) AEMO reasonably determines a Facility has not operated safely and reliably due to RoCoF; or~~

~~(b) AEMO amends the list of RoCoF Sensitive Equipment in accordance with paragraph 10.2.111.2.1; orand~~

~~(c) AEMO is notified by a Market Participant or Network Operator that its RoCoF Ride-Through Capability has varied, is varying, or is likely to vary [**Clause 2.34A.12D**], as notified in accordance with the details on the WEM Website.~~

10.3.2. Where, in accordance with paragraph 10.3.111.3.1 AEMO identifies a Facility may have varied, is varying, or is likely to vary significantly from its accredited RoCoF Ride-Through Capability it must notify the relevant Market Participant or Network Operator for the Facility and request reasons for the variation.

10.3.3. Where a Market Participant or Network Operator is notified in accordance with paragraph 10.3.211.3.2, it must provide the relevant reasons for the variation, and any proposed rectification inclusive of timing for that rectification, to AEMO in accordance with the notification details on the WEM Website, within 20 Business Days.

10.3.4. AEMO must determine, for each relevant Facility under paragraph 10.3.211.3.2 whether to require Amendment Re-AccreditationProcess of that Facility's RoCoF Ride-Through Capability by considering:

(a) information received under paragraph 10.3.311.3.3;

(b) any rectification proposed by that Market Participant or Network Operator; and

(c) any other information available to AEMO;

10.3.5. AEMO must notify a Market Participant or Network Operator of its determination under paragraph 10.3.411.3.4, within 20 Business Days of receiving a response under paragraph 10.3.311.3.3 including reasons for its determination.

10.3.6. Where AEMO has notified a Market Participant under paragraph 10.3.510.3.411.3.4 that it must seek Amendment Re-AccreditationProcess for that Facility's RoCoF Ride-Through Capability, that Market Participant must apply for Amendment Re-AccreditationProcess in accordance with paragraph 10.2.211.2.2.

11.10. Updates to Standing Data

11.1.10.1. Standing Data

11.1.1.10.1.1. Where a Market Participant is required tomust:

(a) submit data and details of Accreditation ParametersFrequency Co-optimised Essential System Service Accreditation Parameters into Standing Data as part of an FCESS AccreditationAccreditation Process or Amendment Re-AccreditationProcess; or

(b) submit data and details of submit an accredited RoCoF Ride-Through Capability into Standing Data as part of an Accreditation Process or Amendment Processunder 10.2,

it must :

prior to New WEM Commencement Day, submit in accordance with the details on the WEM Website; or

following New WEM Commencement Day submit this information and data into Standing Data in accordance withusing the contact details on the WEM Website,

~~(c)~~ within five~~5~~ Business Days of receiving confirmation of the accredited ~~Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters or ~~an accredited~~ RoCoF Ride-Through Capability from AEMO.~~Where a Network Operator is required to submit an accredited RoCoF Ride-Through Capability, it must submit it in accordance with the details on the WEM Website within 5five Business Days of receiving an accredited RoCoF Ride-Through Capability from AEMO.~~

10.1.2. Where a Market Participant ~~or Network Operator~~ submits data and details in relation to ~~Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters or an accredited RoCoF Ride-Through Capability under paragraph 10.1.1, AEMO ~~must~~ will publish the relevant ~~Accreditation Parameters~~Frequency Co-optimised Essential System Service Accreditation Parameters or RoCoF Ride-Through Capability for that Facility on the WEM Website in accordance with clause 2.34A.14 ~~of the WEM Rules~~.

~~12.~~11. RoCoF Ride-Through Cost Recovery Limit

~~E[O]~~E[J] RoCoF Ride-Through Cost Recovery Limit

The RoCoF Ride-Through Cost Recovery Limit is a value, determined in accordance with clause 2.34A.12I and paragraph ~~ 11~~, which, in combination with the RoCoF Safe Limit (as prescribed under the Frequency Operating Standard) creates a range for~~of~~ RoCoF Ride-Through Capability. ~~for which~~ Facilities with accredited or deemed RoCoF Ride-Through Capability~~capabilities~~ are considered causers for the purposes of cost-recovery of the RoCoF Control Service, i.e., RoCoF Causers.

Figure E[4] provides a simplified example of Facilities ~~which~~ that may be a~~a~~ccredited for a ~~their~~ RoCoF Ride-Through Capability ~~to a value~~ greater than the RoCoF Ride-Through Cost Recovery Limit. In this example, the RoCoF Causers are deemed by AEMO to have a RoCoF Ride-Through Capability at the RoCoF Safe Limit. In this example, those Facilities would be RoCoF Causers for the purposes of RoCoF Control Service cost recovery.

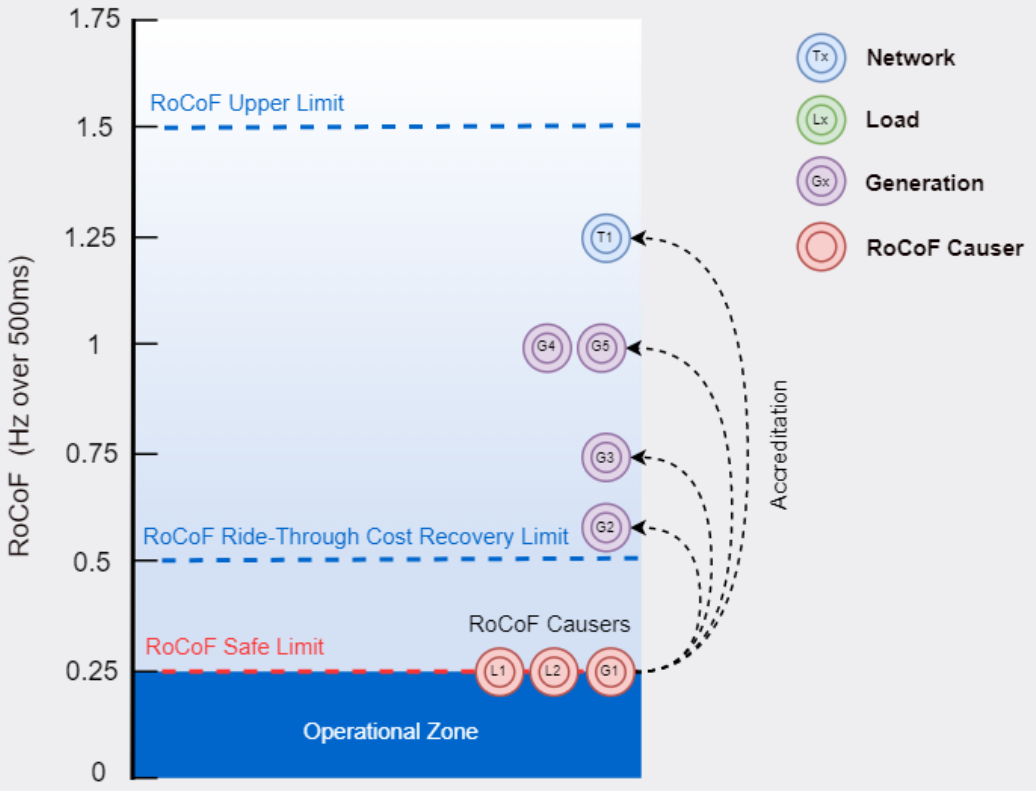

Figure E[5] RoCoF Ride-Through Cost Recovery Limit

~~12.1.1.~~11.1.1. AEMO must determine and publish on the WEM Website~~,~~ the RoCoF Upper Limit at least annually [Clause 7.~~13A.1~~5.14].

~~12.1.2.~~11.1.2. In determining the RoCoF Upper Limit, under paragraph 11.1.1, AEMO ~~must~~ will consider:

(a) the p~~P~~ower s~~S~~ystem conditions ~~which~~ that would have the largest impact, per megawatt, on SWIS Frequency ~~System~~ conditions;

(b) ~~that~~ whether only Primary Frequency Response is used to arrest ~~system~~ SWIS F~~f~~requency (excluding any Inertial Component);

~~(c)~~ any other factor AEMO considers relevant.

~~12.1.3. AEMO must will set the initial RoCoF Ride-Through Cost Recovery Limit as 0.25 Hz per 500ms above the RoCoF Safe Limit.~~

~~In determining the RoCoF Ride-Through Cost Recovery Limit, AEMO mustAEMO must determine the proposed RoCoF Ride-Through Cost Recovery Limit [**Clause 2.34A.12I**] as the lesser of:~~

~~not set the value higher than the RoCoF Upper Limit; 0.25 Hz over 500 milliseconds above the RoCoF Safe Limit; and~~

~~set the limit to a precision of 0.1 Hz over 500 milliseconds; and the RoCoF Upper Limit,~~

~~subject to clause 11.1.4(a), set the limit above the RoCoF Safe Limit by at least 0.25 Hz over 500 milliseconds.~~

~~(c) rounded up to the nearest 0.1 Hz.~~

11.1.3. AEMO will set the initial RoCoF Ride-Through Cost Recovery Limit as 0.25 Hz per 500ms above the RoCoF Safe Limit.

~~12.1.4.~~11.1.4. AEMO:

(a) must re-determine the proposed RoCoF Ride-Through Cost Recovery Limit in accordance with paragraph ~~11.1.511.1.511.1.500~~ 11.1.5, where the Frequency Operating Standard is amended to vary the RoCoF Safe Limit; and

(b) may re-determine the proposed RoCoF Ride-Through Cost Recovery Limit, in accordance with paragraph 11.1.5~~00~~ where;

(i) the RoCoF Upper Limit is varied; or

(ii) AEMO is requested by a Market Participant to vary the RoCoF Ride Through Cost Recovery Limit and AEMO considers it appropriate to re-determine the RoCoF Ride-Through Cost Recovery Limit.

11.1.5. In determining the RoCoF Ride-Through Cost Recovery Limit under paragraph 11.1.3, AEMO must, in accordance with clause 2.34A.12I:

(a) not set the value higher than the RoCoF Upper Limit;

(b) set the limit to a precision of 0.1 Hz over 500 milliseconds; and

(c) subject to paragraph 11.1.5(a)~~11.1.511.1.511.1.500(a)~~, set the limit above the RoCoF Safe Limit by at least 0.25 Hz over 500 milliseconds.

~~12.1.5.~~11.1.6. Where AEMO determines a proposed RoCoF Ride-Through Cost Recovery Limit in accordance with paragraph 11.1.3~~ 11.1.411.1.411.1.400,~~ it must publish the proposed RoCoF Ride-Through Cost Recovery Limit on the WEM Website and undertake the consultation process outlined in paragraphs 11.1.7 to 11.1.9.

~~12.1.6.~~11.1.7. Where AEMO publishes a proposed RoCoF Ride-Through Cost Recovery Limit in accordance with paragraph 11.1.5, it must ~~notify~~provide a notification to~~, within 2 Business Days,~~ any relevant Market Participant~~ or Network Operator~~ , within two Business Days, where the proposed RoCoF Ride-Through Cost Recovery Limit would cause that Market Participant~~ or Network Operator~~'~~s~~ Facility to be a RoCoF Causer.

~~12.1.7.~~11.1.8. Market Participants ~~and Network Operators~~ may, ~~in accordance with~~using the contact details on the WEM Website, submit a response to the proposed RoCoF Ride-Through Cost Recovery Limit within 20 Business Days of the notification made under paragraph 11.1.7. This response must ~~,~~ include, but is not required to be limited ~~t~~o~~ing~~:

(a) whether that Market Participant ~~or Network Operator~~ supports the proposed RoCoF Ride-Through Cost Recovery Limit, and the reasons why; or

(b) whether that Market Participant ~~or Network Operator~~ does not support the proposed RoCoF Ride-Through Cost Recovery Limit, and the reasons why.

~~12.1.8.~~11.1.9. AEMO ~~must~~ will review and consider any issues raised ~~from~~ in responses submitted in accordance with 11.1.8~~,~~ and, within three~~3~~ months of the closing date for submissions under paragraph~~ ~~ 11.1.8~~12.1.8~~, will either:

(a) determine the proposed RoCoF Ride-Through Cost Recovery Limit as the RoCoF Ride-Through Cost Recovery Limit and publish on the WEM Website:

(i) the RoCoF Ride-Through Cost Recovery Limit; and

(ii) the reasons for its decision, or

(b) determine a new ~~amend proposed the proposed~~ RoCoF Ride-Through Cost Recovery Limit, and publish on the WEM Website:

(i) the proposed RoCoF Ride-Through Cost Recovery Limit~~ in accordance with 11.1.612.1.6~~; and

(ii) its~~the~~ reasons for ~~its decision~~proposing a new RoCoF Ride-Through Cost Recovery Limit.

Appendix A. Relevant clauses of the WEM Rules

Table 4 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 4 Relevant clauses of the WEM Rules

Clause
2.34A.13(a)(i) (FCESS)
2.34A.13(a)(ii) (FCESS)
2.34A.13(a)(iii) (FCESS)
2.34A.13(a)(iv) (FCESS)
2.34A.13(a)(v) (FCESS)
2.34A.13(a)(vi) (FCESS)
2.34A.13(a)(vii) (FCESS)
2.34A.13(a)(viii) (FCESS)
2.34A.13(a)(ix) (FCESS)
2.34A.13(a)(x) (FCESS)
2.34A.13(a)(xi) (FCESS)
2.34A.13(a)(xii) (FCESS)
2.34A.13(b)(i) (RoCoF)
2.34A.13(b)(ii) (RoCoF)
2.34A.13(b)(iii) (RoCoF)
2.34A.13(b)(iv) (RoCoF)
2.34A.13(b)(v) (RoCoF)
2.34A.13(b)(vi) (RoCoF)
2.34A.13(b)(vii) (RoCoF)

Clause
2.34A.13(c) (RoCoF)
~~Clause~~
~~1.49.5~~
~~1.49.4~~
~~1.49.1~~
~~1.49.2~~
~~2.34A.13~~
~~2.34A.13~~
~~2.34A.13~~
~~2.34A.13~~
~~2.34A.13~~
~~2.34A.13~~
~~2.34A.13~~
~~2.34A.13~~
~~2.34A.13~~
~~2.34A.13~~
~~2.34A.13~~
~~2.34A.13~~
~~2.34A.13 (RoCoF)~~
~~2.34A.13 (RoCoF)~~
~~2.34A.13 (RoCoF)~~
~~2.34A.13 (RoCoF)~~
~~2.34A.13 (RoCoF)~~
~~2.34A.13 (RoCoF)~~
~~2.34A.13 (RoCoF)~~
~~2.34A.13 (RoCoF)~~

Clauses that are not heads of power or clauses requiring an obligation, process or requirement be documented in a WEM Procedure:

Clause
1.49.1
1.49.2
1.49.5
1.49.4