



NCESS Service Specification (Minimum Demand)

No: NCESS Service Specification

Prepared by: AEMO WA System Design & Transformation

Document ref: NCESS Service Specification (Minimum Demand)

Version: 2.0

Effective date: 12 July 2023

Status: Final

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Date: 12 July 2023

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Version Release History

Version	Effective Date	Summary of Changes
2.0	12 July 2023	Final NCESS Service Specification
1.0	16 May 2023	Draft version developed in accordance with clause 3.11B.1 of the WEM Rules

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1. Introduction

1.1. Purpose and scope

- 1.1.1. AEMO has prepared this Non-Co-optimised Essential System Service (NCESS) Service Specification in accordance with clause 3.11B.4(b) of the Wholesale Electricity Market Rules (**WEM Rules**). This NCESS Service Specification includes:
- (a) the service requirements;
 - (b) the expected technical capability of a facility or equipment that may be able to provide the service;
 - (c) where applicable, the likely network location where the service is to be provided;
 - (d) the maximum quantity of the service required;
 - (e) the expected commencement and duration of the service;
 - (f) the reasonable expectation of the frequency of service utilisation, the expected duration of each utilisation and when the service is expected to be utilised during typical days;
 - (g) any operational requirements or limitations;
 - (h) the material contractual terms associated with the NCESS, including required pricing structure;
 - (i) the selection criteria that may apply to the NCESS Submissions; and
 - (j) any other relevant matters.

1.2. Definitions

- 1.2.1. Terms defined in the *Electricity Industry Act 2004*, the WEM Regulations and the WEM Rules have the same meaning in this document unless the context requires otherwise.
- 1.2.2. Capitalised terms used in this document:
- (a) (for terms that are currently defined in the WEM Rules) have the meaning given in the WEM Rules;
 - (b) (for terms that will be defined in the WEM Rules from 1 October 2023) have the corresponding meaning¹; and
 - (c) otherwise have the meaning set out in Table 1.

Table 1 Definitions

Term	Meaning
Contract Term	The period (specified in paragraph 2.2 of this document) during which the NCESS provider must make the Service available.
Baseline Quantity	The baseline quantity calculated under paragraph 5.2 of this document for the Minimum Demand Service, that is used to measure the quantity of the Service provided in a Dispatch Interval.

¹ Amending Rules gazetted and awaiting commencement can be found here: <https://www.wa.gov.au/government/document-collections/wholesale-electricity-market-rules>.

Term	Meaning
Maximum NCESS Contract Amount	The maximum amount that is payable to the NCESS provider under the NCESS Contract on the assumed basis that the Service is available during each Dispatch Interval in the Availability Period.
Minimum Demand Service	Has the meaning given in paragraph 2.1.2 of this document.
Service Equipment	The Registered Facility or Unregistered Equipment from which the Service is required to be provided under the NCESS Contract.
Service Quantity	The quantity of the Service that the NCESS provider is required to provide under the NCESS Contract.
Unregistered Equipment	Means any facility or equipment that is not registered and not required to be registered under this document.

2. Service details

2.1. Service requirements

- 2.1.1. This NCESS Service Specification is for a Minimum Demand Service.
- 2.1.2. The Minimum Demand Service (measured in MW of response capability) is to decrease Injection or increase Withdrawal.

Service requirements

AEMO considers that a Registered Facility (as distinct from Unregistered Equipment) is unable to provide a Minimum Demand Service as a decrease of Injection. This is because the Central Dispatch Process will require an Energy Producing System to operate at 0 MW Injection through security-constrained economic dispatch in minimum demand scenarios.

Maximum quantity of service required

- 2.1.3. An NCESS Submission must specify a Service Quantity between 1 MW and 114 MW. The maximum quantity of the Minimum Demand Service required (from all NCESS providers) is 114 MW.

Minimum and maximum Service Quantity

AEMO has specified a minimum quantity of 1 MW for each service to account for contract-specific activation and operational impacts. The maximum quantity for each service (from a single NCESS provider) reflects AEMO's forecast limits for the Largest Credible Load Contingency.

2.2. Contract Term, timing and duration

- 2.2.1. The commencement date for the NCESS is the later of 1 October 2023 and the date when all Conditions Precedent are satisfied.
- 2.2.2. The end date for the NCESS is 1 October 2024 (which cannot be extended). This results in a maximum contract term of 12 months, or less, depending on the date when all Conditions Precedent are satisfied.
- 2.2.3. The timing of the Minimum Demand Service (subject to paragraphs 2.2.5 and 4.2) is:

- (a) for Unregistered Equipment with a dynamic service quantity – the relevant Service Quantity must be available for the relevant Trading Intervals between 10:00 AM and 2:00 PM, unless varied by AEMO for a Trading Day in accordance with paragraph 2.2.4; or
- (b) otherwise – the Service Quantity must be available during the 8 Trading Intervals between 10:00 AM and 2:00 PM, unless varied by AEMO for a Trading Day in accordance with paragraph 2.2.4.

2.2.4. AEMO may vary the service timing for a single Trading Day to any 8 consecutive Trading Intervals between 9:00 AM and 3:00 PM by 6:00 PM on the Scheduling Day for the Trading Day where it reasonably determines the service is required at a different time on that Trading Day.

2.2.5. The duration of each service is:

- (a) for a Registered Facility – as dispatched in accordance with the Central Dispatch Process during any Dispatch Intervals specified in paragraph 2.2.2; and
- (b) for Unregistered Equipment – as activated by AEMO for one or more Trading Intervals specified in paragraph 2.2.3, up to a maximum of 8 consecutive Trading Intervals per activation.

2.3. Expectation of the frequency of service utilisation

2.3.1. The expected frequency of service utilisation for the Minimum Demand Service is shown in Figure 1.

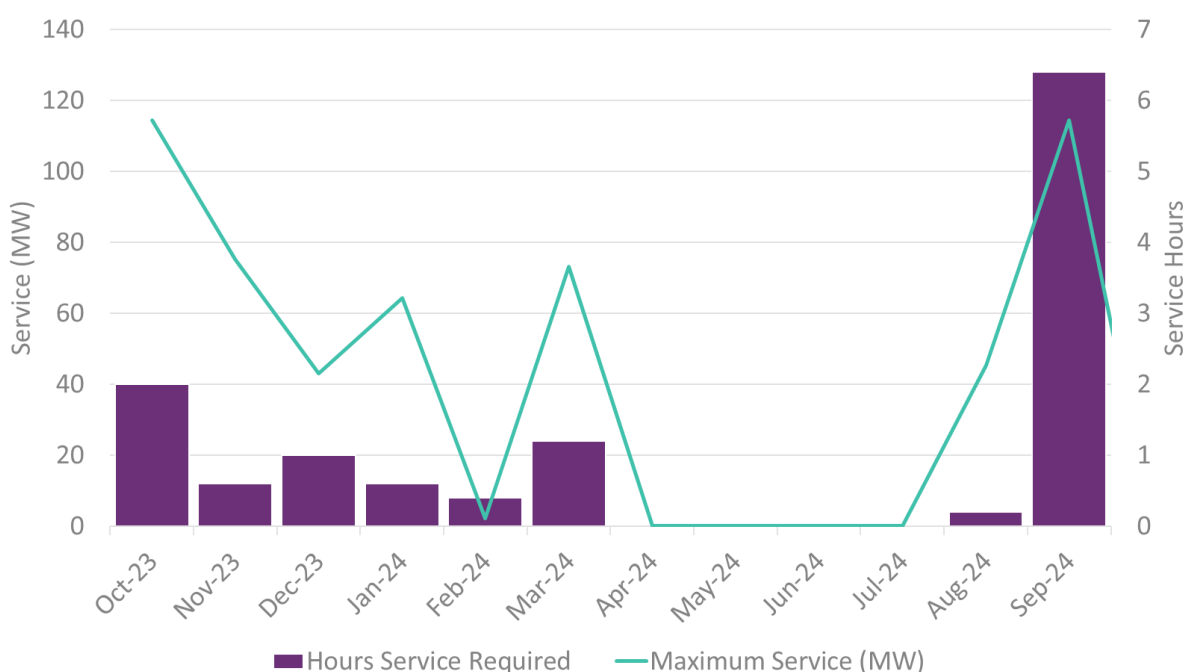


Figure 1 Expected utilisation of Minimum Demand Service.

3. Who can provide the services

3.1. Expected technical capability of facility or equipment that may be able to provide service

3.1.1. The expected technical capability of a facility or equipment that may be able to provide the service is:

- (a) one of the following:
 - (i) a Scheduled Facility or Semi-Scheduled Facility that is currently registered;
 - (ii) a facility or equipment that is currently unregistered but intends or is required in accordance with paragraph 3.4.1 to register as a Scheduled Facility or Semi-Scheduled Facility; or
 - (iii) Unregistered Equipment that meets the control and communication requirements specified in paragraph 3.1.2; and
- (b) the capability to deliver the Service Quantity continuously for 48 consecutive Dispatch Intervals at all relevant times during the contract term.

3.1.2. The control and communication requirements for Unregistered Equipment that provides the service are:

- (a) a single point of communication for activation;
- (b) a capability to activate the Service Quantity in accordance with paragraph 4.1.3; and
- (c) visibility, through communication protocols approved by AEMO, of:
 - (i) Injection or Withdrawal; and
 - (ii) Service Quantity availability,
at a granularity of no more than 5 minutes (unless AEMO agrees to a different granularity).

3.1.3. Where the Service Quantity for Unregistered Equipment comprises more than 10 MW behind a single Transmission Node, AEMO may require aggregated visibility under paragraph 3.1.2(c) for connection points at that Transmission Node.

3.2. Likely network location where service will be provided

3.2.1. Subject to paragraph 3.2.2, the services may be delivered at any location in the South West Interconnected System (SWIS), excluding areas which are likely to be subject to frequent constrained operation for Withdrawal at SWIS minimum demand.

3.2.2. Due to impacts on SWIS minimum demand, the services may not be provided by any facility or equipment connected to any location east of the Merredin Terminal.

3.2.3. AEMO (as part of the selection criteria under paragraph 7.1.1) may consider the level of constrained operation that the facility or equipment may be subject to.

3.3. Eligibility

3.3.1. The eligibility requirements for all NCESS providers are as follows:

- (a) for existing registered Scheduled Facilities or Semi-Scheduled Facilities:

- (i) AEMO has not assigned Capacity Credits for either of the 2022/23 and 2023/24 Capacity Years with respect to the Service Quantity; and
- (ii) AEMO has not reduced the Capacity Credits of the facility during the 2022/23 Capacity Year at the time of NCESS submission evaluation under clause 3.11B.9(a)(ii) of the WEM Rules;
- (b) for a Load:
 - (i) the Load is not (and has not been) associated with any Demand Side Programme during the 2022/23 or 2023/24 Capacity Year; and
 - (ii) where the Load relates to a customer who is not a Contestable Customer, the Load has an Interval Meter that records usage by Trading Interval;
- (c) the nominated Service Quantity is additional Withdrawal or reduction in Injection relative to existing patterns of consumption for that Facility or equipment;
- (d) as required under clause 3.11B.10(b)(i) of the WEM Rules – the facility or equipment will be able to provide the Service Quantity by the date specified in paragraph 2.2.1;
- (e) as required under clause 3.11B.10(b)(ii) of the WEM Rules – sufficient Environmental Approvals have been granted; and
- (f) no other relevant contractual or legal arrangement relating to the Service Quantity is expected to exist at any time during the Contract Term that may adversely affect service delivery.

3.4. Registration and certification

- 3.4.1. Any facility or equipment with a System Size greater than 10 MW will be required to be registered in accordance with the WEM Rules as a Scheduled Facility or Semi-Scheduled Facility.

3.5. Service Quantity

- 3.5.1. The Service Quantity is the MW quantity provided for the service and is measured by reference to the relevant Baseline Quantity for the service, calculated in accordance with paragraphs 5.2.1 and 5.2.2, where the Service Quantity for Unregistered Equipment for the Minimum Demand Service may be a dynamic quantity based on a methodology approved by AEMO.

4. How the service is to be provided

4.1. Operational requirements and limitations

- 4.1.1. The Minimum Demand Service must be offered for every Dispatch Interval required by paragraph 2.2.2:
 - (a) for a Scheduled Facility or Semi-Scheduled Facility – as Real-Time Market Submissions for energy for the Minimum Demand Service – as offers for Withdrawal greater than or equal to the sum of the Service Quantity and the Baseline Quantity; and
 - (b) for Unregistered Equipment – as a standing contractual offer to Withdraw a quantity greater than or equal to the sum of the relevant Service Quantity and the Baseline Quantity.

- 4.1.2. Where an NCESS provider provides the Minimum Demand Service through a Scheduled Facility or a Semi-Scheduled Facility, the NCESS provider may offer a Frequency Co-optimised Essential System Services quantity that includes the Service Quantity in its Real-Time Market Submissions.
- 4.1.3. Where an NCESS provider provides the Minimum Demand Service from Unregistered Equipment, AEMO may require the NCESS provider to activate the service for any quantity up to the relevant Service Quantity by giving notice to the NCESS provider up to 12 Dispatch Intervals (corresponding to 1 hour) in advance. The notice will specify the relevant Dispatch Intervals and the quantity required.
- 4.1.4. AEMO will use reasonable endeavours to only activate Unregistered Equipment when it considers that Real-Time Market outcomes may be insufficient to ensure Power System Security and Power System Reliability at times of minimum demand.
- 4.1.5. AEMO will require the NCESS provider of Unregistered Equipment utilising customers who are not Contestable Customers to provide Interval Meter data for all designated connection points in a reasonable timeframe, unless this information is not provided to AEMO by the Meter Data Agent.
- 4.1.6. AEMO must exclude any connection point from a NCESS provider that is not the Market Participant for the connection point where the connection point is included in any existing or expected NCESS Contract with the relevant Market Participant.

4.2. Maintenance and reliability

- 4.2.1. The NCESS provider must:
 - (a) maintain the facility or equipment in accordance with good electricity industry practice; and
 - (b) notify AEMO as soon as the NCESS provider becomes aware of any requirement for unplanned maintenance that affects or could reasonably be expected to affect the ability of the facility or equipment to provide the Service Quantity.
- 4.2.2. The NCESS provider must plan maintenance in accordance with clause 3.18 of the WEM Rules, unless AEMO determines another process is more appropriate.
- 4.2.3. Where AEMO approves maintenance plans under paragraph 4.2.2, the NCESS provider will not be deemed unavailable under paragraph 5.4.1 for the duration of the approval.
- 4.2.4. The NCESS provider must notify AEMO promptly after changing or modifying the facility or equipment in a way that reduces or could reasonably be expected to reduce the availability of the service. AEMO may require the NCESS provider (at the NCESS provider's cost) to conduct a test of the facility or equipment (in its changed or modified configuration) to demonstrate that the service is available.

5. Measurement, unavailability and payment

5.1. Measurement

- 5.1.1. AEMO will determine historical and actual Injection or Withdrawal from:
- (a) for Registered Facilities – SCADA end-of-interval values;
 - (b) for Unregistered Equipment utilising Loads containing only Contestable Customers – Interval Meter Data provided by the Meter Data Agent; and
 - (c) for Unregistered Equipment utilising customers who are not Contestable Customers – Interval Meter Data provided by the Meter Data Agent or the NCESS provider.

5.2. Baseline Quantity

- 5.2.1. The Baseline Quantity will determine the baseline from which the Service Quantity is measured.
- 5.2.2. The Baseline Quantity for the Minimum Demand Service for:
- (a) a Non-Intermittent Generating System registered as a Scheduled Facility or Semi-Scheduled Facility, to increase Withdrawal, is zero;
 - (b) an Electric Storage Resource registered as part of a Scheduled Facility or Semi-Scheduled Facility, to increase Withdrawal, is zero; or
 - (c) A Registered Facility that is a Load, or Unregistered Equipment, to decrease Injection or increase Withdrawal, will be determined by:
 - (i) a method to identify a baseline Injection or Withdrawal proposed by the NCESS provider and approved by AEMO; or
 - (ii) the method described in Appendix A.

5.3. Minimum availability requirement

- 5.3.1. A minimum availability requirement will apply for the service.
- 5.3.2. For the purposes of determining whether the minimum availability requirement for the service has been met, and the extent of any shortfall, the availability of the service will be measured over a relevant period in accordance with paragraph 5.3.3.
- 5.3.3. The availability of the service for a relevant period is calculated as $(B-U)/B \times 100$, expressed as a percentage, where:

U = the number of Dispatch Intervals during which the service is deemed unavailable in the relevant period as determined by paragraph 5.4; and

B = the total number of Dispatch Intervals required by paragraph 2.2.2 for the relevant service in the relevant period.

- 5.3.4. The minimum availability requirement for the service in each relevant period is 90%.

5.4. Unavailability

- 5.4.1. The service will be deemed unavailable in any Dispatch Interval required by paragraph 2.2.2 where:
- (a) the conditions precedent specified in paragraph 6.2 have not been met;
 - (b) the NCESS provider notifies AEMO of an inability to provide the Service Quantity (including by not offering in accordance with paragraph 4.1.1) except where AEMO approves maintenance plans under paragraph 4.2.2;
 - (c) the NCESS provider does not provide the quantity specified in a Dispatch Instruction or activation instruction under paragraph 4.1.4, as applicable, with respect to the service;
 - (d) AEMO loses communication with, or SCADA visibility of the facility or equipment for the entire Dispatch Interval;
 - (e) the facility or equipment is subject to a Commissioning Test Plan; or
 - (f) AEMO otherwise reasonably determines, based on energy or fuel storage information (including storage state of charge) or other relevant information available to AEMO, including with respect to Outages not approved under paragraph 4.2.2, that the facility or equipment is unable to provide the Service Quantity.
- 5.4.2. Until remedied, the service will be deemed unavailable from any Dispatch Interval where the facility or equipment fails any test required by AEMO.

5.5. Payment

- 5.5.1. The contract amount payable will consist of:
- (a) for a Registered Facility and Unregistered Equipment – an availability payment (which is not payable unless and until the NCESS provider satisfies the conditions precedent specified in paragraph 6.2); and
 - (b) for Unregistered Equipment – an activation payment.
- 5.5.2. The availability payment will be payable for all relevant Dispatch Intervals required by paragraph 2.2.2, excluding Dispatch Intervals during which the facility or equipment is deemed to be unavailable as specified in paragraph 5.4.
- 5.5.3. The activation payment will be payable for all relevant Dispatch Intervals required by paragraph 2.2.2 for which AEMO has activated the service in accordance with paragraph 4.1.4, excluding Dispatch Intervals during which the facility or equipment is deemed to be unavailable as specified in paragraph 5.4.
- 5.5.4. Availability payments and activation payments will be made:
- (a) for Registered Facilities – in accordance with the WEM Rules; or
 - (b) for Unregistered Equipment – weekly in accordance with a payment mechanism specified by AEMO.

6. General

6.1. Material contract terms

6.1.1. All items identified in this NCESS Service Specification are material contract terms.

6.2. Conditions precedent

6.2.1. The NCESS Contract will be subject to the following conditions precedent, which must be satisfied by the commencement date under paragraph 2.2.1 or any later date that AEMO determines in its sole discretion:

- (a) the facility or equipment must complete all tests required by AEMO (to AEMO's satisfaction) to demonstrate compliance with the service requirements specified in this document; and
- (b) where the services are to be provided by a Registered Facility, that facility is registered and in Commercial Operation.

6.2.2. The NCESS Contract must not include any Conditions Precedent that are expressed to apply for the NCESS provider's benefit.

6.3. Security

6.3.1. Security is not required for this Minimum Demand Service.

6.4. General

6.4.1. AEMO is contracting this Minimum Demand Service on behalf of the Wholesale Electricity Market and therefore the following do not apply:

- (a) sole remedy clauses in favour of the NCESS provider; and
- (b) NCESS provider rights in respect of default (by AEMO) on the basis that AEMO must comply with the WEM Rules and therefore cannot be in default.

6.4.2. There are no force majeure conditions associated with the Minimum Demand Service.

6.4.3. Clause 5.3.1 of the WEM Rules, which requires AEMO to subtract expected Capacity Credit payments from the NCESS Contract total payment, does not apply to Unregistered Equipment or Registered Facilities providing Withdrawal, other than Demand Side Programmes.

6.5. Extent of liability

6.5.1. Separate liability caps will apply for AEMO and the NCESS provider.

6.5.2. For AEMO:

- (a) Subject to paragraph 6.5.2(b) and other than in respect of any unpaid availability payment or activation payment amounts, AEMO's liability is limited to the prescribed maximum amount for the purposes of section 126 of the Electricity Industry Act and regulation 52 of the WEM Regulations.
- (b) AEMO is not liable for:
 - (i) indirect damages or losses;
 - (ii) loss of market, opportunity or profit (whether direct or indirect); or

- (iii) damages or losses to the extent that they arise from the NCESS provider's failure to act in accordance with the NCESS Contract, a law (including the WEM Rules) or good electricity industry practice.

6.5.3. For the NCESS provider:

- (a) Subject to paragraph 6.5.3(b), the total amount recoverable from the NCESS provider in respect of any and all claims arising out of any one or more events during the contract term with respect to, arising from, or in connection with, the NCESS Contract or the provision of the service is limited to the Maximum NCESS Contract Amount.
- (b) The NCESS provider is not liable for:
 - (i) indirect damages or losses;
 - (ii) loss of market, opportunity or profit (whether direct or indirect); or
 - (iii) damages or losses to the extent that they arise from AEMO's failure to act in accordance with the NCESS Contract, a law (including the WEM Rules) or good electricity industry practice.

6.6. Termination clauses

6.6.1. AEMO may terminate the NCESS Contract by giving notice to the NCESS provider if:

- (a) the NCESS provider fails to satisfy the conditions precedent in paragraph 6.2, before 1 April 2024;
- (b) for any period after the NCESS provider satisfies the conditions precedent:
 - (i) the service is unavailable as determined under paragraph 5.4 for a continuous period of more than 1 month during the contract term; or
 - (ii) the NCESS provider fails to meet the minimum availability requirement under paragraph 5.3 in respect of the service over any 3-month period;
- (c) the NCESS provider materially breaches the NCESS Contract; or
- (d) an insolvency event occurs in relation to the NCESS provider.

6.6.2. The NCESS Contract must not include termination rights for the NCESS provider.

7. Selection criteria

7.1.1. In accordance with clauses 3.11B.9 and 3.11B.11 of the WEM Rules, AEMO must apply the selection criteria summarised in Table 2 for NCESS Submissions:

Table 2 Selection criteria

Criteria	Description	Weighting
Compliance with specification	The service complies with the specification as described in the tender or referenced WEM Procedures.	Pass/Fail (1/0)
Environmental Approvals	As required under clause 3.11B.10(b)(ii) of the WEM Rules, sufficient Environmental Approvals have been granted.	Pass/Fail (1/0)
Value for money	The estimated total cost of the service over the period represents value for money to the WEM when considering the counterfactual approach or outcome.	Pass/Fail (1/0)
Progression	The progress of the project to achieve all conditions precedent and AEMO's assessment of likelihood that the Project will achieve key dates, including with regard to connection feasibility informed by consultation with the Network Operator.	Pass/Fail (1/0)
Provision	The project can provide a net benefit to the SWIS in relation to the SWIS minimum demand	Pass/Fail (1/0)
Size	The ideal service is a larger Service Quantity to provide additional benefit to system reliability and overall costs.	High (40%)
Cost	The estimated cost per MW of the service compared to other proposals.	High (60%)

Appendix A. Baseline Quantity for Unregistered Equipment

AEMO must determine the Baseline Quantity and the Actual Service Quantity (both in MWh per *Trading Interval*) in accordance with this **Appendix**.

Summary

The Baseline Quantity is calculated with respect to each Activation Event.

The Baseline Quantity is calculated by reference to the aggregated electricity demand of all NMIs from the Designated Connection Points. A separate Baseline Quantity is not calculated for individual NMIs forming part of an aggregation.

AEMO must calculate the Baseline Quantity as follows:

- Step 1 – determine a set of Selected Days for each Activation Event;
- Step 2 – determine the Preliminary Quantity for each relevant *Trading Interval* in each Activation Event;
- Step 3 – calculate a Relative Root Mean Squared Error for each Preliminary Quantity (and if the Relative Root Mean Squared Error for any Preliminary Quantity is greater than 20%, then go back to Step 1 or redetermine the Preliminary Quantity using an adjusted *Injection* or *Withdrawal* quantity based on the set of Designated Connection Points that AEMO reasonably considers more accurately reflects the Service Provider's typical demand);
- Step 4 – determine and apply an Adjustment Factor for each Activation Event; and
- Step 5 – calculate the Baseline Quantity for each *Trading Interval* in each Activation Event.

AEMO then uses the Baseline Quantity to determine the Actual Service Quantity for each *Trading Interval* in each Activation Event.

Definitions

The following definitions apply for the purposes of this **Appendix**^{Error! Reference source not found.:}

60-Day Period means the 60 calendar days preceding the calendar day that relates to the first *Trading Interval* for which the calculation is made.

Activated Day means a Selected Day on which the Service was activated.

Activation Event means:

- (before the Commencement Date) the set of *Trading Intervals* indicated by the Service Provider; and
- (after the Commencement Date) the set of *Trading Intervals* specified in an Activation Notice.

Adjustment Factor means the adjustment factor calculated in accordance with Step 4 of this **Appendix**.

Non-Activated Day means a Selected Day on which the Service was not activated.

Preliminary Quantity means a preliminary quantity calculated in accordance with Step 2 of this Error! Reference source not found..

Relative Root Mean Squared Error means a relative root mean squared error calculated in accordance with Step 3 of this **Appendix**.

Selected Day means an Activated Day or a Non-Activated Day in the 60-Day Period selected by AEMO in accordance with Step 1 of this **Appendix**.

Step 1: Determine a set of Selected Days for each Activation Event

The set of Selected Days comprises the 10 Non-Activated Days within the 60-Day Period immediately preceding the calendar day of the Activation Event.

If the 60-Day Period does not contain 10 Non-Activated Days:

- the set of Selected Days comprises the Non-Activated Days where there are more than 5 Non-Activated Days; and
- otherwise, the set of Selected Days comprises the Non-Activated Days in the 60-Day Period plus one or more Activated Days so that the number of Selected Days equals 5. The Activated Days will be selected in order of highest demand of any *Trading Interval* relevant to an Activation Notice. Where 2 or more Activated Days are ranked the same, the Activated Day closest in time to the first *Trading Interval* for which the calculation is being made will be ranked higher.

The Service Provider may request that AEMO exclude a day from the 60-Day Period. AEMO (in its sole discretion) may exclude a day where AEMO reasonably considers that the day is not representative of the Service Provider's *Injection* or *Withdrawal*, having regard to the Service Provider's historical *Injection* or *Withdrawal* quantities.

Step 2: Determine the Preliminary Quantity for each *Trading Interval* in each Activation Event

AEMO must determine the Preliminary Quantity for each *Trading Interval* in each Activation Event as follows:

$$b_t = \frac{1}{S} \sum_{i=1,2,\dots,S} c_{ti}$$

Where:

b_t = the Preliminary Quantity (in MWh) for a given *Trading Interval* (t)

i = a Selected Day

t = a *Trading Interval*

c = the *Injection* or *Withdrawal* quantity (in MWh) for a given *Trading Interval* (t) occurring on Selected Day (i)

S = the number of days in the set of Selected Days.

Step 3: Calculate a Relative Root Mean Squared Error for each Preliminary Quantity

AEMO must determine a Relative Root Mean Squared Error for each Preliminary Quantity (relative to the 60 Non-Activated Days immediately preceding the *Trading Interval* for which the calculation is being made) as follows:

$$RRMSE = \frac{\sqrt{\frac{\sum_{i \in I} (\sum_{t \in T} ((b_t - c_{ti})^2))}{N}}}{\frac{1}{N} \times \sum_{t \in T} b_t}$$

Where:

I is the set of 60 Non-Activated Days (i) immediately preceding the *Trading Interval* for which the calculation is being made

T is the set of *Trading Intervals* (t) from which Interval Meter Data is taken for the Preliminary Quantity

N is the total number of *Trading Intervals* in set (T) across all the days in set (I)

b_t is the Preliminary Quantity associated with *Trading Interval* (t) as calculated in Step 2

c_{ti} is the *Injection* or *Withdrawal* quantity (in MWh) for a given *Trading Interval* (t) on day (i).

If the Relative Root Mean Squared Error is 20% or greater, then AEMO (in its sole discretion) may:

- go back to Step 1; or
- redetermine the Preliminary Quantity using an adjusted *Injection* or *Withdrawal* quantity based on the set of Designated Connection Points that AEMO reasonably considers more accurately reflects the Service Provider's typical demand.

Step 4: Determine and apply an Adjustment Factor for each Activation Event

AEMO must determine and apply an Adjustment Factor for each Activation Event as follows:

$$a = \frac{\sum_{t=s-8}^{t=s-3} (c_t - b_t)}{6}$$

Where:

a = Adjustment Factor (this may be positive or negative)

s = the start of the first *Trading Interval* (t) in the Activation Event, which may be adjusted by AEMO to reflect operational conditions on the day if required

c = the *Injection* or *Withdrawal* quantity (in MWh) for *Trading Interval* (t)

b = the Preliminary Quantity (in MWh) for *Trading Interval* (t)

$s-n$ = the *Trading Intervals* before the activation start time.

Where the Adjustment Factor is a positive amount, the Adjustment Factor must not exceed a quantity equivalent to 20% of the amount of the Maximum Service Quantity (converted to MWh per *Trading Interval*).

If the Service has for two or more Activation Events on the same day, then the Adjustment Factor for each Activation Event is the Adjustment Factor calculated for the first Activation Event on that day.

Step 5: Calculate the Baseline Quantity for each *Trading Interval* in each Activation Event

$$B_t = b_t + a$$

Where:

B = the Baseline Quantity (in MWh) for *Trading Interval* (t)

a = the Adjustment Factor (this may be positive or negative)

b = the Preliminary Quantity (in MWh) for *Trading Interval* (t).

Calculate the Actual Service Quantity for each *Trading Interval* in each Activation Event

$$D_t = (B_t - c_t)/0.5$$

Where:

B = the Baseline Quantity (in MWh) for *Trading Interval* (t)

c = the *Injection* or *Withdrawal* quantity (in MWh) for the *Trading Interval* for which the calculation is being made

D = the Actual Service Quantity (in MW) for *Trading Interval* (t) determined as follows:

- if the Actual Service Quantity is less than zero, the Actual Service Quantity equals zero;
- if the Actual Service Quantity is greater than the quantity specified in the relevant Activation Notice, the Actual Service Quantity is the level specified in the Activation Notice; and
- otherwise, the Actual Service Quantity is as calculated.