WEM Reform Program

Transitional ESS Accreditation

WRIG – 1 October 2020

Agenda

1. Interim Approach
2. Incumbent AS providers
3. Regulation
4. Contingency
5. RoCoF
6. New Facilities
7. New technologies

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Interim Approach

The objective is to ensure sufficient Frequency Co-optimised Essential System Services (FCESS) are accredited at market start, including:

1. Accreditation of all Facilities currently providing “equivalent” services
2. Allowing entry of Facilities capable of providing ESS but not currently providing Ancillary Services

Transitional ESS Rules and Transitional ESS Accreditation WEM Procedure to set-out the framework for both existing and new providers, these are currently being constructed and will be consulted in future TDOWG sessions.

These slides set out the high level approach to accredit Facilities for the new FCESS services.

Incumbent AS Providers

AEMO to work with Participants to transition accredited Ancillary Service providers to the equivalent Frequency Co-optimised Essential System Services (FCESS)

Service	Existing Ancillary Service	Future FCESS
Regulation	Load Following Ancillary Services	Regulation Raise Regulation Lower
Contingency	Spinning Reserve Ancillary Services Load Rejection Reserve Ancillary Services	Contingency Reserve Raise Contingency Reserve Lower
Inertia	NA	Rate of Change of Frequency Control Service

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Regulation

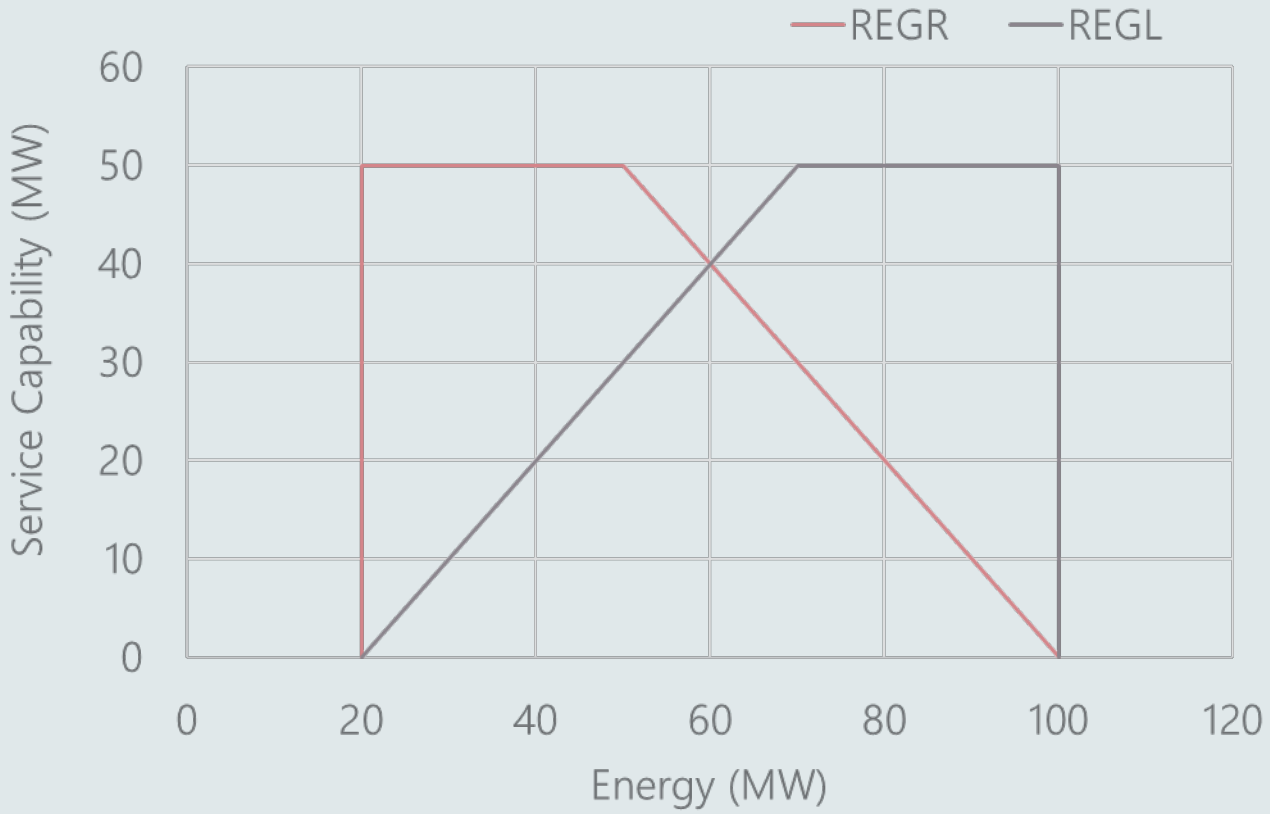
- LFAS Up/Down equivalent to Regulation Raise/Lower
- Accreditation for all currently accredited Facilities
- Current limitation 0.2 MW/min for each MW of accredited capability
  - Consideration of AGC minimum effective quantity to identify minimum offerable quantity
- Accreditation will be to maximum capability
  - Considering fuel/configuration
  - Capped at ramp-rate over 5-minutes
- Accreditation inputs to be taken from Standing Data (max/min/ramp) or AGC setpoints where required

Regulation

Example Facility:

- 100 MW Facility, 20 MW Mingen
- 10 MW/Min ramp (50 MW Max Enablement)

Point	Regulation Raise (REGR)	Regulation Lower (REGL)
Enablement Minimum	20 MW	20 MW
Low Breakpoint	20 MW	70 MW
High Breakpoint	50 MW	100 MW
Enablement Maximum	100 MW	100 MW
Maximum Quantity	50 MW	50 MW



Contingency Reserve

- Spinning Reserve/Load Rejection equivalent to Contingency Raise/Lower
- Accreditation for all current contracted SR Facilities
- Accredited Quantity based on (in order of preference):
  - Event Data
  - Testing
- Accreditation based on configuration/fuel and managed through offers.
- Accreditation can be reassessed
  - Re-accreditation possible following observed response
  - Participant 2.34A.8 / AEMO 2.34A.11

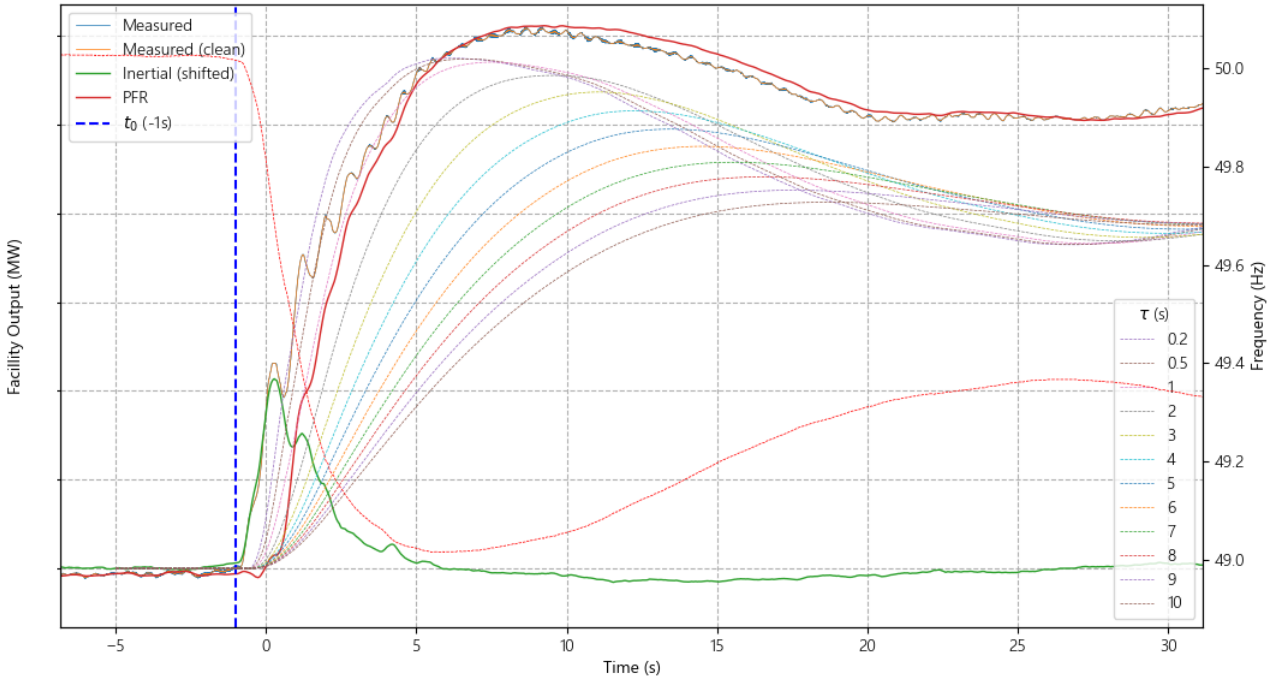
Contingency Reserve

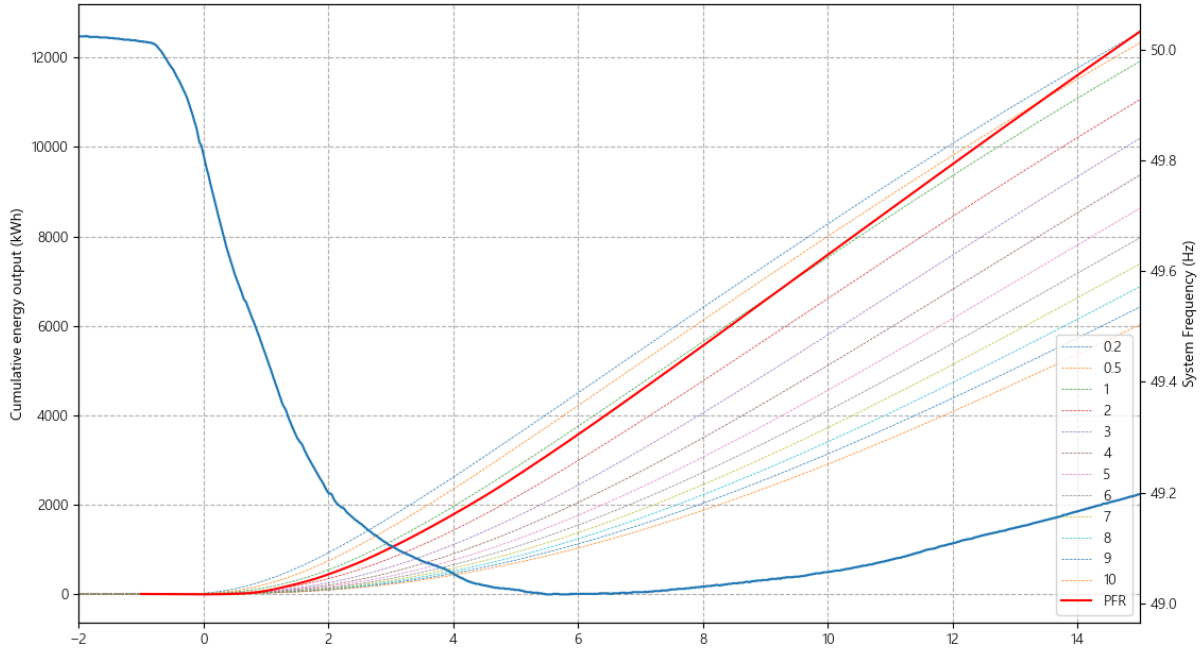
Review of observed responses across multiple-events to identify response quantity and Speed Factor (Τ), likely to result in multiple allowable combinations (quantity/speed factor trade-off)

Largest quantity will be preference in AEMO's assessment

Observed impact of de-rating due to speed factor could trigger a review of accredited quantity/tau

60 MW τ=2s





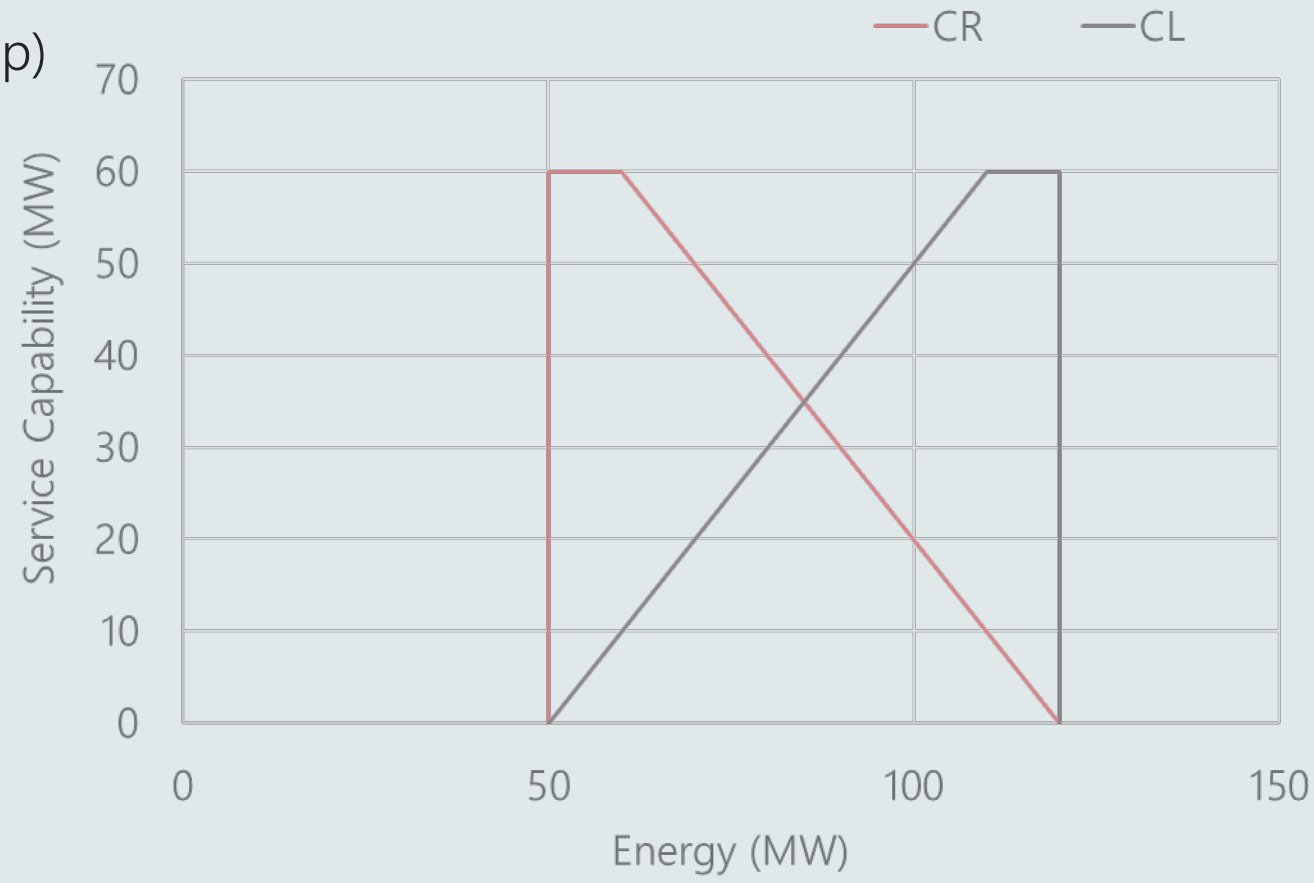
Contingency Reserve

Example Facility:

- 120 MW Facility, 50 MW Mingen
- 60 MW observed response (aligns with 4% droop)

$$\Delta P = \frac{\Delta f}{(f_{nom} * droop)} P_n = \frac{1Hz}{(50Hz * 0.04)} P_n = 0.5 P_n$$

Point	Contingency Raise (CR)	Contingency Raise (CL)
Enablement Minimum	50 MW	50 MW
Low Breakpoint	60 MW	50 MW
High Breakpoint	120 MW	110 MW
Enablement Maximum	120 MW	120 MW
Maximum Quantity	60 MW	60 MW

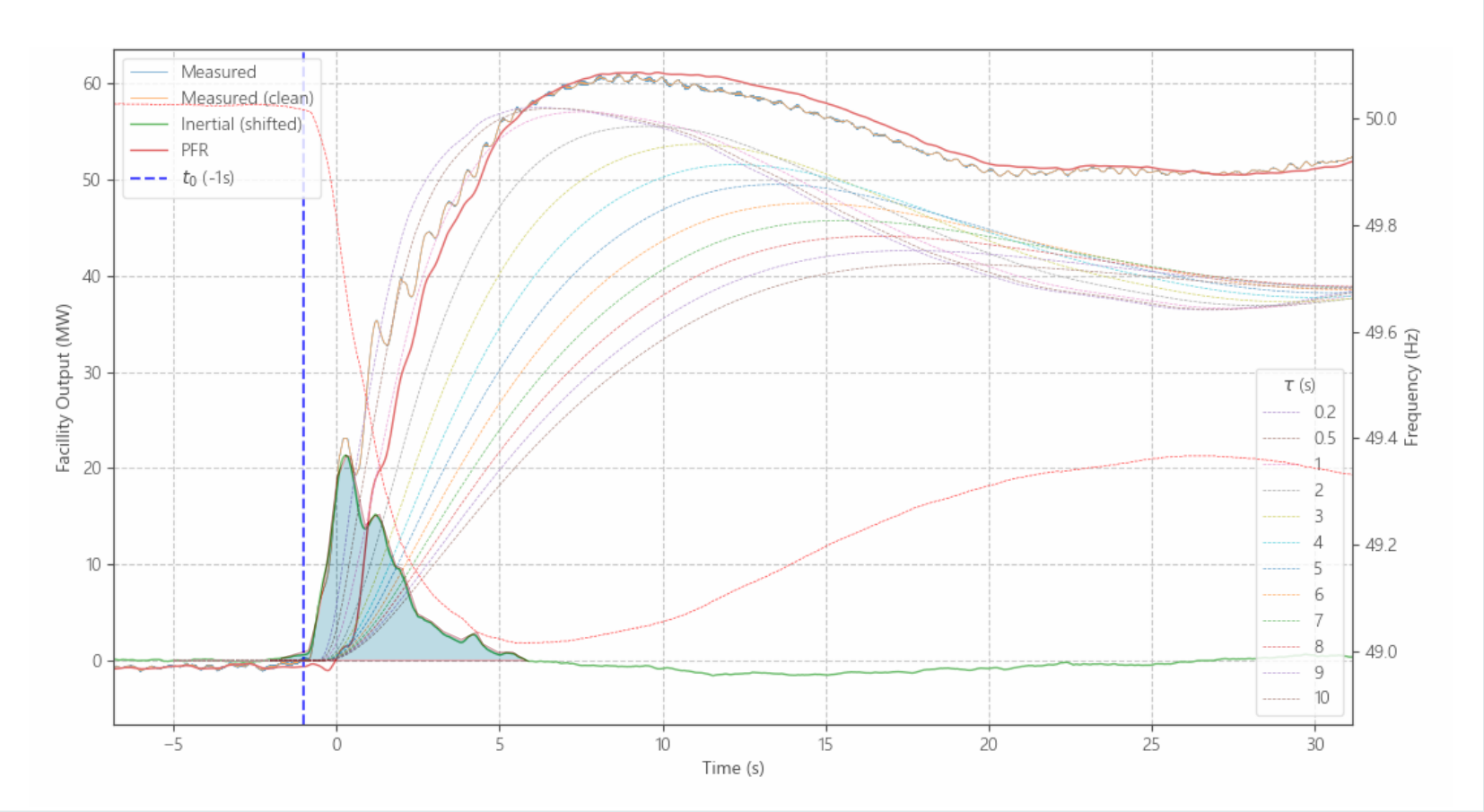


RoCoF Control Service

- Automatic accreditation for existing Facilities
- MWs assigned for each discrete generating unit
  - Based on the values assigned in the Dynamic Frequency Model (informed by power system modelling data)
- Values based on observed performance, where available, and modelling data adjusted to allow for generally observed performance otherwise

RoCoF Control Service

Review of observed responses across multiple-events to confirm quantity

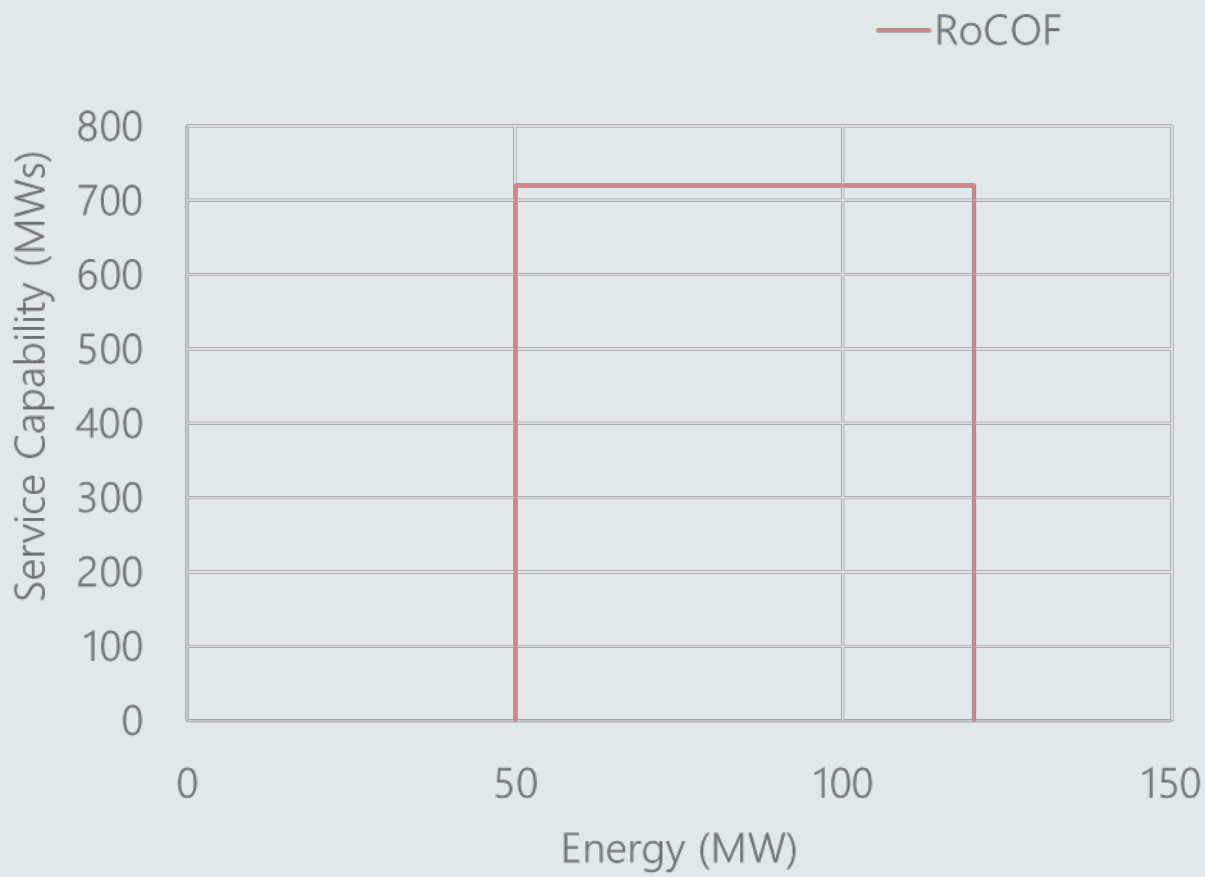


RoCoF Control Service

Example Facility:

- 120 MW Facility, 50 MW Mingen
- 720 MWs inertia

Point	RoCoF
Enablement Minimum	50 MW
Low Breakpoint	50 MW
High Breakpoint	120 MW
Enablement Maximum	120 MW
Maximum Quantity	720 MWs



New Facilities

Facilitating access for new Facilities not currently providing Ancillary Services

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New Facilities

New Facilities (existing/proposed) will be able to accredit ahead of Market Start for the new FCESS services, after demonstrating performance through observation:

- Regulation Raise/Lower
  - New Facilities to demonstrate ability to meet AGC requirements and Quantities
- Contingency Raise/Lower
  - Observe/Test/Infer
  - Capability to sustain output in addition to droop up to 15 minutes
  - Control system verification (AGC interface/data-logging)
- RoCoF
  - Base on “class” of Facility, whether existing in WEM or leveraging data from other jurisdictions
  - Refine Accreditation following observed response

New Technologies

Consideration of the capabilities of new technologies and configurations

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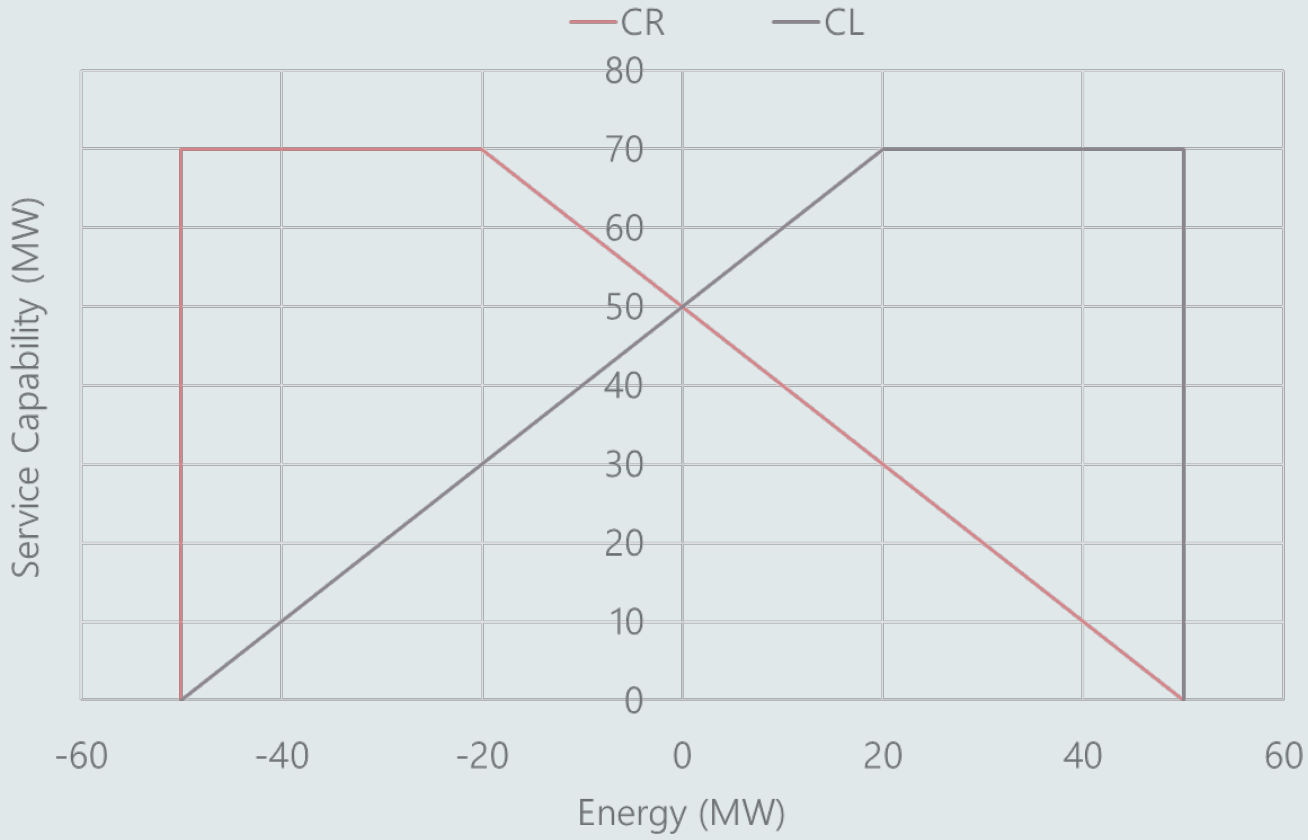
New Technologies

- Electric Storage Resource
  - Expected to include various forms of energy storage
- Multiple Facility Sub-types
  - Allowing for hybrid Facilities of different technologies (eg. intermittent with storage)

Electric Storage Resource

- Services across the zero-point (charge to discharge)
- Special control system settings that may limit response
- Allowance for droop settings beyond those required under the GPS, e.g. minimum droop settings for stability purposes
- Explore capability of technology for provision of RoCoF Control Service

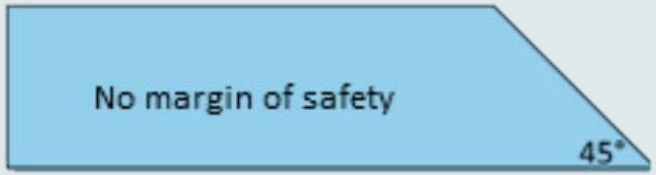
Point	Contingency Raise (CR)	Contingency Raise (CL)
Enablement Minimum	-50 MW	-60 MW
Low Breakpoint	-20 MW	20 MW
High Breakpoint	50 MW	50 MW
Enablement Maximum	50 MW	50 MW
Maximum Quantity	70 MW	70 MW



Multiple Facility Classes

Multiple Facility Sub-types – Allowing for hybrid Facilities of different technologies (eg. intermittent with an ESR).

- Sent-out behaviour
- Managing Intermittent/Storage trapeziums
- Accuracy of forecasting for intermittent component
- Process to identify appropriate ratio of intermittent curtailment to capability accredited



1 MW energy : 1 MW ESS

2 MW energy : 1 MW ESS

Questions

Additional comments or questions can be provided to AEMO:

Specific queries to:

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