DISTRIBUTED ENERGY RESOURCES FCAS SPECIFICATION

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VERSION RELEASE HISTORY

Version	Effective Date	Summary of Changes
1.0	1 June 2018	First issue of the draft specification for DER to provide Contingency FCAS
1.5	25 October 2018	Revised to include location of FCAS metering devices
1.6	2 November 2018	Revised to update type of metering devices

Measurement facilities for DERs in VPPs to provide contingency FCAS

Current telemetry requirements

The provision of Frequency Control Ancillary Services (FCAS) during a contingency is not the only requirement that market participants enabled for this service are obliged to meet under the Market Ancillary Service Specification (MASS). There must be sufficient communication and telemetry capability operated by each registered service provider to record delivery of FCAS for verification purposes. The measurement facilities required to verify delivery of contingency FCAS are detailed in Section 3.6, 4.6 and 5.6 of the MASS.

The current metering and telemetry requirements for verification of ancillary service delivery have been in place since the inception of NEM ancillary service markets and are summarised below:

- To be registered for fast FCAS, each proponent must be able to provide high speed data samples (on a time base less than or equal to 50 milliseconds) to verify delivery of raise or lower services following a frequency disturbance.
- To be registered for slow and delayed services, each proponent must be able to provide sampled measurements of four seconds or less to verify delivery of raise and lower services.

Trial DER telemetry requirements

Traditionally FCAS in the NEM has been provided by utility-scale transmission connected plant that have high-speed data recorders in place as standard to confirm that they are able to meet their registered Generator Performance Standard. These data recorders meet or exceed the telemetry requirements of the MASS listed above.

In recent years, the NEM has witnessed an unprecedented rise in the uptake of Distributed Energy Resources (DER). These facilities, if properly orchestrated, are increasingly capable of providing frequency control services to the market in an economically efficient manner. The existing metering and telemetry requirements of the MASS for *fast services* may be economically infeasible when applied to large aggregations of DER in Virtual Power Plants (VPP).

AEMO is seeking to trial alternative metering and telemetry arrangements that would be manageable within VPP arrangements, but have sufficient capability to meet the need to verify fast FCAS delivery by aggregated DER.

This document lists the metering requirements to trial the use of DER in the fast contingency FCAS market via VPP arrangements. As per Section 7.3 of the MASS, AEMO may allow an Ancillary Service Facility to participate in a trial to test the performance of new technologies.

The trial conditions listed in this document are provided for information purposes only to assist in early stage planning for VPP projects, and are subject to change. Trial conditions 2 – 10 are standards issued by AEMO under rule 3.11.2(f) and apply for the purposes of the trial only. AEMO will provide further information on the terms and conditions of involvement in VPP trials as soon as these are confirmed. Proponents with a credible and demonstrated capability for service delivery may be selected to participate in trials at AEMO's sole discretion. The number and size of VPPs participating in trials will be limited in order to minimise the risk of market or system disruption while their operation is being tested.

AEMO proposes to apply the following minimum conditions to parties that may participate in a future trial of fast contingency FCAS from aggregated DERs:

1. To align with Section 3.8.7a (i) of the rules which states that a MW quantity in each price band in each trading interval must be specified in whole MW, a minimum aggregation amount of 1 MW can be registered.
2. The gross power flow from or to units that form the aggregated response must be directly measured at or close to the relevant connection point.
3. One high speed meter (sampling on a time base less than or equal to 50 milliseconds) must be installed for every aggregated capacity of 1 MW. Participants may need to install more high speed meters to meet conditions 6 and 7.
4. If the DER units are home battery systems, one meter (sampling on a time base less than or equal to 4 seconds) must be installed for every aggregated capacity of 1 MW to measure household load.
5. If the proponent can prove to AEMO that conditions 6 and 7 can be met by installing one high speed meter for aggregated capacity of more than 1 MW, AEMO will consider a request to install fewer high speed meters.
6. Irrespective of the number of units that respond to a frequency disturbance, high speed data must be available from at least one unit that responded.
7. The DER units fitted with high speed metering capabilities must be indicative of the response of the other units that delivered FCAS but do not have the same high-speed metering equipment installed.
8. If different types of inverters are used, the proponent must ensure that condition 7 is met by the installation of additional high speed meters (representative of each inverter type within the VPP).
9. High speed data recorded to confirm the delivery of fast raise or fast lower FCAS must follow the same sampling rate criteria listed in Section 3.6(a) (iii) of the MASS.
10. The aggregated and individual response of units enabled to provide fast FCAS must be captured at intervals of up to 1 second and also meet all the measurement facilities characteristics under MASS Section 4.6 for slow services and Section 5.6 for delayed services.
11. The number of units enabled for FCAS for a dispatch interval must be provided to AEMO via data feed to inform that the number of enabled units can deliver the enablement amount of FCAS if there is a frequency disturbance. AEMO may decide in the future to incorporate this information for dispatch purposes. The proponent is responsible for bidding the amount of FCAS that can be delivered.
12. AEMO will set a minimum period for the trial, which may be extended by AEMO, if deemed necessary or upon the proponent's request.
13. To determine if the trial has been successful, AEMO will verify the performance of the DER based on the aggregated response to deliver contingency FCAS following a frequency disturbance.

It is important to note that this trial specification for delivery of fast FCAS from DER in VPPs is indicative only and may change as part of the 2018 MASS consultation process or subsequent consultation processes. This may result in amendments to telemetry/metering equipment requirements for DER in VPPs.

Nothing in this document should be taken to represent that trials will proceed, that any VPP will be selected to participate in a trial, or that any VPP will be able to participate in the market for FCAS after a trial. Parties installing telemetry and metering equipment on the basis of this trial specification do so at their own risk.