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Matthew Holmes
Australian Energy Market Operator
Submitted online to: mass.consultation@aemo.com.au

Dear Matthew

Submission: Amendment of the Market Ancillary Service Specification – DER and General Consultation

CS Energy welcomes the opportunity to provide a submission to the Australian Energy Market Operator's (**AEMO's**) *Draft Report and Determination: Amendment of the Market Ancillary Services Specification – DER and General Consultation* (**Draft Determination**).

About CS Energy

CS Energy is a Queensland energy company that generates and sells electricity in the National Electricity Market (**NEM**). CS Energy owns and operates the Kogan Creek and Callide B coal-fired power stations and has a 50% share in the Callide C station (which it also operates). CS Energy sells electricity into the NEM from these power stations, as well as electricity generated by other power stations that CS Energy holds the trading rights to.

CS Energy also operates a retail business, offering retail contracts to large commercial and industrial users in Queensland, and is part of the South-East Queensland retail market through our joint venture with Alinta Energy.

CS Energy is 100 percent owned by the Queensland government.

Key recommendations

CS Energy is supportive of Distributed Energy Resources (**DER**) and their participation in the market, as well as the removal of any barriers to this participation where it is appropriate. Market opportunities should not discriminate between supply or demand-side resources, and neither should the associated obligations.

Understanding the behaviour and response of any market participant is crucial to the secure, reliable and efficient operation of the power system and concessions should not be made for any technology or business model. CS Energy considers the approach outlined in the Draft Determination to be prudent, placing the stability of the power system as the priority while outlining a pathway to address the technical concerns of DER participating in Frequency Control Ancillary Services (**FCAS**) markets. Market ancillary services play an

integral role in system security and AEMO needs to have confidence in the performance of all participants as stipulated in the Market Ancillary Service Specification (**MASS**).

CS Energy does, however, maintain concerns related to some of the changes made in the MASS to incorporate Primary Frequency Response (**PFR**):

(a) Definition of Initial Value

The current MASS introduced the following definitions:[1]

- *Contingency Event Time* - the time at which the contingency event occurred. This is a value determined by AEMO in accordance with the process in the MASS section 2.6; and

- *Initial Value* - means the *Generation Amount* or *Load Amount* prior to the *Contingency Event Time* prior to a *Frequency Disturbance*.

Frequency Disturbance was replaced by *Contingency Event Time* to remove disincentives to providing PFR within the Normal Operating Frequency Band (**NOFB**). CS Energy expected this change to capture the previous unaccounted initial response provided by CS Energy units with deadbands set at ± 0.1 Hz, although our earlier submission that the *Initial Value* should be equal to the AGC load demand trajectory at the *Contingency Event Time* was not accepted. However, with the implementation of mandatory PFR, there is potentially significantly more unaccounted PFR from participants that are enabled for contingency FCAS, because with nominal settings of ±15 mHz deadband and 5% droop, PFR provides up to ± 5.4% load response within the NOFB.

In completing CS Energy's response to the Australian Energy Regulator's Contingency FCAS Survey and its reconciliation with the MASS protocol for verification of contingency FCAS performance, it became apparent that the introduction of PFR together with the significant uncertainty of the system frequency at the *Contingency Event Time*, compromises the previous assessments of contingency FCAS response. For example, based on MASS section 2.6 (b), a double contingency where a second larger disturbance occurs after one or more smaller disturbances have already moved frequency significantly within the NOFB, would result in the *Initial Value* not capturing the initial PFR provided before the second larger disturbance. Hence in evaluating available contingency FCAS, participants would now need to discount up to ± 5.4% of PFR response due to the uncertainty of the frequency at the *Contingency Event Time* being anywhere up to ± 0.15 Hz.

The definition of *Contingency Event Time* is itself satisfactory accepting that AEMO has had to deliberately limit the extension of the fast FACS window in the revised methodology so that it conforms to the existing data recording window. However, concerns regarding the *Initial Value* were not adequately addressed by AEMO in the related Draft Determination.[2] *Initial Value* needs to be the AGC load demand at the *Contingency Event Time*, not the load itself, if it is to capture all the PFR already provided. For CS Energy assets, load is tightly controlled by steam turbine governors, and the only normal deviations in load from the AGC load demand are due to either PFR or co-ordinated mode steam pressure error influence. To ensure contingency FCAS response is not compromised by the latter, CS Energy has added a cross-limiting function to remove any co-ordinated mode steam pressure error influence that could attenuate the PFR after frequency deviations exceed the NOFB, until it

[1] AEMO, *Market Ancillary Services Specification V6*, Table 1
[2] AEMO, *Market Ancillary Service Specification and Causer Pays Procedure Draft Determination*, February 2020, Section 3.3

recovers inside ± 0.1 Hz, in order to prioritise contingency FCAS response over steam pressure control. Hence the load deviation from AGC load demand will all be due to frequency response when contingency FCAS response is required.

The present definition of *Initial Value* instead rewards poor initial PFR performance. For example, in the case above, if the co-ordinated mode pressure error influence is initially counteracting the PFR, the measured contingency FCAS response using the verification tool will be greater than if the initial PFR response was unattenuated by the pressure error influence.

(b) Contingency FCAS Response Verification Tool

CS Energy has the following concerns about the FCAS verification tool:

- The linear extrapolation of the basic response to compensate for the difference between the *Local Frequency* and the *Standard Frequency Ramp* to ± 0.5 Hz ignores:
    - The increase in dynamic response attenuation for larger disturbances and for higher initial loads; and
    - Limits to the available response, hence the extrapolation can exceed the available response at 0.5 Hz. CS Energy's contingency FCAS bid trapezium needs to be conservative to allow for normal fluctuations in steam pressure throttle margin and dynamic load response attenuation, which are specific to each asset and are generally not linear. This means the tool cannot be used on historical events to generate an expected response characteristic that could be used to verify that contingency FCAS bids are appropriate. The bid response needs to consider the worst-case scenario of a 0.5 Hz disturbance with appropriate margins;
- As the verification tool requires subtraction of inertial response, this can only be done after fast data is uploaded from the data loggers, not with control system data that is available in real time; and
- The subjectivity of the *Contingency Event Time* may not translate to the verification tool and may expose participants to compliance risks.

If you would like to discuss this submission, please contact Henry Gorniak (Market and Power System Specialist) on 0418 380 432 or hgorniak@csenergy.com.au.

Yours sincerely

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