Mr John Pierce AO
Chairman
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

(Lodged electronically) 27 June 2019

RE: ERC0273 - Monitoring and Reporting on Frequency Control Framework

Delta Electricity operates the Vales Point Power Station situated at the southern end of Lake Macquarie in NSW. The power station consists of two 660MW conventional coal-fired steam turbo-generators.

Delta Electricity has been participating in several of the AEMO run forums investigating power system frequency and welcomes the opportunity to comment on the proposed Rule changes regarding reporting on frequency market performance and system frequency monitoring.

Background of the Proposed Rule Changes

It is understood the Rule change proposal submitted by the AER and AEMO with AEMC reference ERC0273 has directly arisen from the Frequency control frameworks review (AEMC reference EPR0059). Whilst recommendation 2 from the frameworks review required the AER to submit a rule change requiring AEMO to publish weekly and quarterly reports, it appears that AEMO has provided the proposal. As this point appears to be not clarified in either the AER or AEMO proposals, it is brought to the AEMC's attention in case the intention of recommendation 2, i.e. for the AER and not AEMO to propose the reporting that AEMO should provide, has been overlooked or found acceptable through a separate process not shared with market participants.

Whilst the AER is considered the most appropriate organisation to determine the improved reporting on FCAS market outcomes the AEMC envisaged is required, it is suggested that AEMO may not be considered by independent observers to be the most appropriate organisation to propose Rules regarding the content of weekly and quarterly reports that possibly would be used to determine the performance of AEMO in carrying out its responsibility under Rule 4.4.1(b) to operate the system ensuring the FOS is achieved. To avoid any perception of the operator being able to define the measures of its own success, this point is offered for AEMC consideration and it is suggested the Rule change proposed by AEMO be delayed to ensure there is enough time for all participants to further scrutinise the proposal. By inference under any such perception, this proposal could in fact become controversial.

In 2017 and 2018 AEMO proceeded to consult with market participants regarding various initiatives they were undertaking seeking to improve frequency control. At several of these consultation meetings, the matter of reporting on frequency was discussed with those present, feedback was provided verbally and sometimes documented in minutes, and, during the period, AEMO recommenced some reporting. The regular participants at these forums were not, however, provided with the opportunity to comment on the proposed wording of the Rule change prior to its submission to the AEMC.

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Monitoring Objectives

On page 3 of its Rule change proposal, AEMO reports that there are currently no specific requirements on AEMO to report on frequency performance. Whilst such an observation may be a correct interpretation of the existing Rules, Delta Electricity recalls previous reporting on frequency by AEMO (and NEMMCO) and suggests that obligations and responsibilities on AEMO implied under various sections of chapter 4 can lead to expectations that AEMO, as controller of system frequency, would be maintaining rigorous monitoring and internally reporting on system frequency and, where necessary, observing good practice and reporting to participants demonstrating aspects of security and control it employs. In making such reports, good practice may in fact suggest AEMO already maintains archives of records of statistically trended data thoroughly and concisely demonstrating its control is meeting Rule 4.4.1(a) and proving compliance with Rule 4.4.1(b). A company tasked with these obligations could be expected to already be compiling reports and other evidence ready to answer a query from any regulator requesting that they demonstrate how they are compliant with these existing Rules.

The proposal does not detail the current frequency performance monitoring regime that, presumably, AEMO already employs internally. It is an expectation of market participants that the market operator tasked with the responsibility of maintaining system frequency is, or should be, the industry authority on the subject of frequency control and already makes use of in-house developed rigorous statistics, data evidence and has employed specialists to demonstrate using trends measured against the frequency operating standards, the need for significant change in market process or direction. The need for mandatory change to technical control mechanisms to correct observed conditions of system frequency should be drawn from comparisons of trends of existing conditions measured against the objectives of the Frequency Operating Standards and be pursued only after it is clearly demonstrated that attempts to find market solutions have been exhausted. If these are proven unsuccessful by reference to the trended data it may be acceptable to implement direct technical solutions from all or select market participants by agreement and after thorough consultation.

The fact that the AEMC has found it necessary to make recommendations requiring AEMO to report weekly and quarterly is concerning but it is agreed that if a Rule Change is required to encourage AEMO to report data demonstrating how AEMO is performing under Rule 4.4.1(a) and (b) then any result will be an improvement and therefore Delta Electricity generally agrees the Rule changes as worded support the National Electricity Objective.

Clear Definitions and Detailed Procedures regarding Rule Implementation

Adequate control of system frequency and ensuring system frequency is contained according to the FOS is fundamental to power system security.

The measurement of frequency in the NEM is provided by instrumentation that possibly varies remarkably in design and metrological technique. The AEMO proposed Rule change is probably necessarily silent on these aspects but to ensure that all participants are clearly able to clarify details in the AEMO reports, information describing the metering equipment generating the frequency data being reported should be included in the report as should calibration details (dates, results, accuracy, next scheduled test date etc.), measurement locations and maintenance practices.

To correctly report statistics relating to a signal that is by definition the number of complete sinusoidal cycles of electricity found occurring in a single second and by the nature of the power system can be measured, under normal steady state conditions, to be almost identical at extremities of an interconnected system, AEMOs reporting process probably needs to provide details of (or make reference to) the measurement methodology, metrology and support practices AEMO will employ to

ensure credibility is maintained and encourage comparable measurements by other participants that may choose to do so.

It is suggested that the final determination include recommendations for AEMO to produce a supporting document describing the proposed technical and procedural details for how AEMO will observe the proposed Rules. It is also recommended that the procedure recommended above be subject to consultation with the industry as the proposed Rule has been drafted by the participant expected to comply with the Rule.

Whilst not expecting the following comments to necessarily be incorporated into the final determination and Rule wording, please find below comments specifically regarding AEMOs proposed Rules regarding weekly reports:

AEMO proposed Rule	**Delta Electricity Comments for the proposed Rule or a supporting procedure**
(1)(i) "proportion of time spent inside the normal operating frequency band"	Reverse the inference to be the time spent outside the normal operating frequency band (NOFB). i.e. "proportion of time spent outside the normal operating frequency band after subtracting the time associated with *contingency events*"
	Tabulate each contingency event in each week and report possible causation for each event as determined from short, simple analysis of 4s (or 5minute if 4s data is considered too complex) data identifying power (in MW) change quantities of loads, generation types, dispatched regulation, estimated demand -side solar generation, transmission lines, interconnector flows, regional demands considered possible as having contributed to event causation.
	Drawn from the tabulation of contingency events, report the total time related to contingency events. (see notes below regarding recovery duration)
	Remove the time associated with contingency events from the time utilised in the calculations for the reported percentage.
	Nominate significant figures for the reported percentage so that, for example, 0.6 is or is not rounded to 1% as may be the preference of the AEMC and/or the Reliability Panel, or those other than AEMO, in interpreting the intent of the FOS.
(1)(ii) "recovery times where frequency has left the normal operating frequency band"	Alter the proposed wording to "recovery duration being the time from where frequency has left the normal operating frequency band until frequency recovery as specified in the Market Ancillary Services Specification has occurred".
	Recovery time should specifically draw upon definitions that match the expectation of Market Ancillary Services Specification for recovery time. The recovery time should commence when the frequency as measured leaves the NOFB and continue until frequency is considered to have recovered and not exclude any periods where frequency may be found inside the NOFB prior to frequency recovery being considered to have occurred.
	Collate events in terms of the relevant FOS table A.3 to A.7 and compare each event category to the FOS recovery bands expectations.
(1)(iii)"time error requirements"	No comment;

Not included	Measure the system frequency at extremities of the system and compare to jurisdictional central node measurements. Make comparisons to report on system resilience and variations detected between extremities and across interconnected regions or sub-regions.
(2) “the regulation services dispatched by AEMO per region”.	Some level of time of day comparison may be worth considering in this Rule. There is evidence to suggest that periods of energy ramping suffer from less effective FCAS regulation support than periods of stable loading do. This metric should be explored and could be considered in the wording chosen for the Rule or in a supporting procedure if the recommendation suggested in this letter is adopted.
(3) “measures indicating the average utilisation of the regulation services dispatched”	The Rule wording or a supporting procedure should clearly define what is meant by utilisation.

Similarly, please find below comments specifically regarding AEMOs proposed Rules regarding three-monthly reports:

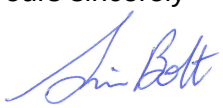
AEMO proposed Rule	**Delta Electricity Comments for a supporting procedure**
(1) “impact of any actions taken by AEMO to improve power system frequency control outcomes”	Outcomes should directly reference the FOS expectation they are improving upon or otherwise be reasonably considered necessary from trended information displaying the possibility, by reasonable extrapolation of trended information, that FOS expectations will not be met in a future period.
(2) “AEMO’s assessment of achievement of the frequency operating standard, including (if applicable) analysis of how and why the frequency operating standard was not met”.	This proposal unintentionally suggests AEMO considers the National Electricity Market already experiences, or AEMO expects it will in future experience, conditions where AEMO, using reasonable endeavours, will not be able to meet the FOS. Delta Electricity is concerned that some “generation-like” events may now be taking place that do not represent as generation events according to the FOS but involve large clusters of small individual generators installed on the traditional demand side of the market collectively reducing or increasing generation due to atmospheric conditions or due to frequency conditions experienced during contingent or non-contingent events. This possibility occurring during contingent events is considered to be a significant risk to system security. It is hoped that AEMOs Rule change and supporting procedures on this point will shine light on events of this nature.
(3) “the rate of change of power system frequency associated with the largest frequency deviation in each month”	Clearly define the methodology to be used for calculating the rate of change so that market participants can prepare comparable data.
(4) “AGC estimates of the additional electrical power (in MW) required to be produced or consumed to correct a given power system frequency deviation (commonly referred to as ‘area control error’ or ‘ACE’)”	No comment.

(5) “a list of any reviewable operating incidents that affected power system frequency”	This may be a summarised and updated version of the weekly report comment made above.
Not included in the Rule Change proposal.	It is suggested that the tabulation of contingency events recommended in the table commenting on weekly reports be summarised in the three-monthly report categorising the events into conditions described in the FOS tables A.3 to A.7.

Good system frequency control depends upon effective operational processes developed by the operator and communicated to all relevant participants to ensure all participants understand the measuring systems, expectations, definitions, capability and performance of the system as measured and compared against the AEMC/Reliability Panel’s published frequency operating standard.

Delta Electricity would be happy to participate further with regards to the determination and if the AEMC wishes to discuss this submission please contact Simon Bolt on (02) 4352 6315 or simon.bolt@de.com.au.

Yours sincerely



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