

Mr Matthew Holmes
Australian Energy Market Operator
GPO Box 2008
Melbourne
VIC 3001
(Lodged electronically)

6 December 2019

AEMO Consultation on FCAS Contribution Factor Procedures and the Market Ancillary Services Specification

Dear Matthew,

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 appreciates the opportunity to comment on the proposed AEMO amendments to its Regulation FCAS Contribution Factor Procedure version 6 2 December 2018 (CFP) and its Market Ancillary Services Specification version 5 30 July 2017 (MASS) and hopes that comments within add value to the consultation process.

Delta Electricity recently responded to the AEMC about the proposed Rule changes on Primary Frequency Response (PFR) and considers that market redesign, AEMO procedural changes and compensatory market outcomes are possible and would deliver a superior solution to Rules advocating mandatory PFR delivery. Delta Electricity also believes market solutions ought to be pursued until efforts are exhausted and proven to be unable to deliver adequate PFR before mandatory Rules are proposed and determined. The greatest improvement to frequency performance in 2019 has resulted from the increased minimum FCAS regulation amounts in March, April and May and Delta Electricity believes that further increases are warranted. Delta Electricity has determined that as intermittent sources reach 20% of the volume of the NEM dispatch the apparent causation suggests FCAS regulation volumes need to be 1.8 times the regulation that exists when there is 0% intermittent generation dispatch for similar network demand conditions.

Delta Electricity considers that the AEMO proposed Rules to remove disincentives to PFR will damage the purpose and relevance of contribution factors, and stresses that AEMO ought not to progress with changes to the CFP that reduce to zero a participant's resultant factor unless the amendments align in purpose and intent with the eventual determination made by the AEMC. If the currently proposed CFP amendments are not in alignment with the eventual PFR Rules determination, Delta Electricity requests AEMO assurances that the proposed amendments to the CFP will be modified to suit or completely withdrawn.

Delta Electricity previously communicated with AEMO engineers describing the process by which the AEMO AGC "Frequency Influence" factor (FI) and the Regulation process were regularly out of phase with local frequency and hence mechanical-hydraulic governor reactions. AEMO has already corrected the CPF relating to this matter a year ago. It is now expected that Units with tighter deadbands and suitable supporting actions and energy will generally provide positive support except when plant failures or other inaccuracies in prime moving energy or predicted output cause them to be off target. Delta Electricity considers that in these circumstances it remains totally appropriate for contribution factors to accumulate and be considered at the end of the four weeks as having required generation adjustments by others and therefore represent warranted causation in the Contribution factor a result of which such participants should be required to compensate the market. Hence it is not considered relief from contribution factors is warranted on correctly operating machines.



Delta Electricity also notes that AEMO states on page 3 of the MASS issues paper that “while this consultation (presumed to be exclusively referring to the MASS revisions) may have been prompted by potential new rules for the provision of PFR, the matter contemplated by this consultation does not depend on the making of those rules.” Delta Electricity agrees with this opinion in respect of the proposed review of the MASS only. The changes being considered for the MASS that intend to include for supportive energy that occurs prior to frequency leaving the Normal Operating Frequency Band (NOFB) ought to be made regardless of the Rule changes because many FCAS providers already have governors and maintained stored energy which currently provides rapid supporting PFR energy prior to the frequency disturbance time in the 6s FCAS service delivery and the employment of this energy is agreed by Delta Electricity to warrant recognition in the MASS. Delta Electricity also believes the service warrants incorporation of the service into the FCAS regulation market.

Regarding methodology, Delta Electricity believes an approach based on Method 3 and utilising FCAS recorded information is appropriate but should have two separate objectives:

1. Adjustments to all values of Initial Power i.e. values described in clause 3.7.1.(a)(v), 4.7.1.(a)(iv) and 5.7.1.(a)(iv) of the MASS being the value of power prior to PFR support relevant to the event that is considered to have commenced at the frequency disturbance time,

AND

2. Inclusion in the response determination for the fast service (as described in AEMOs FCAS Verification Tool User Guide version 2 30 July 2017) affecting the wordings of 3.7.1.(a)(i),(iii) and (v). Instead of commencing from the frequency disturbance time, this assessment should be extended to include the period time between the relevant PFR commencement and the frequency disturbance time.

In terms of the FCAS Verification Tool User Guide, this means consideration of delivered PFR in the determination of each of the values of FA, SA and DA and also in each of the 50ms (or faster) response calculations for the factor FB which would also extend in application to include the period of time from the relevant PFR commencement until 6s after the frequency disturbance time.

The values of FA, SA and DA represent the initial load point relevant to each FCAS service category used as the starting load point from which the service provision is considered to have added or subtracted MWs to or from. It is appropriate that the initial load point be selected from the period just prior to any PFR action that is specifically attributed to the event being assessed.

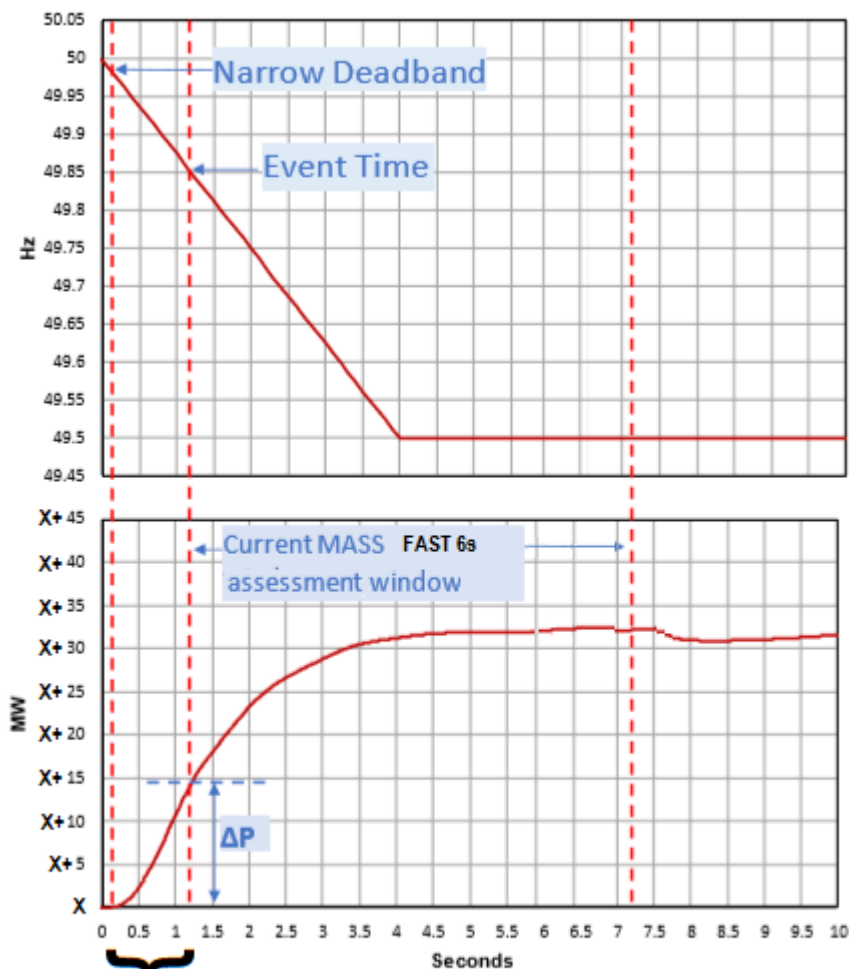
Instead of calculating the response measurements between zero and six seconds after the frequency disturbance time, FB amounts should be compiled from the time the frequency is considered to have left the deadband, relevant to the full event, continue until 6s after the frequency disturbance time and then be averaged across the total experienced time instead of the 6s currently assumed. As the FCAS tool user guide equations already bias the Fast result to be the least of twice the average 0 to 6s response compared to twice the average 6-60s response as measured from the 50Hz data, this revised method will generally realise a larger average response in the 0 to 6s period of the Fast service calculations than currently. The value FB, becoming a higher value for contingency events will therefore increase the Fast assessment result on average. Obviously, this methodology will extend the amount of 50ms (or less) sampled data participants are required to collect but this would not present a problem to Delta Electricity (or many other participants that utilise similar recorders). The Delta Electricity recorders maintain a two-week continuous record of 50Hz sampled data which is routinely and easily accessed for FCAS event analysis. Delta Electricity has performed this analysis for over a decade on every event > 0.2Hz



deviation that has been detected by the recorder and considers variations to calculations for FA, SA, DA and FB will be simple in application.

With reference to the MASS issues paper diagram (in which we extend the assessment window to be a full 6s from frequency disturbance time which was not represented in the paper) the assessment window is relabeled as being representative of the FAST response assessment under FB in the FCAS Tool:

Figure 1 Fast FCAS ΔP with narrow deadband response (under frequency event)



Include the response for this period of time in the FAST response assessment calculations

X is representative of the Initial load of relevance to Clause 3.7.1.(a)(v), 4.7.1.(a)(iv) and 5.7.1.(a)(iv) of the MASS.

Delta Electricity provides comments on the amendments proposed by AEMO to its CPF in Attachment 1.

Delta Electricity provides answers to the questions posed by AEMO in its MASS issues paper in Attachment 2.



Delta Electricity remains eager to understand AEMOs viewpoints and be understood regarding these procedure amendments and if AEMO wishes to discuss this submission please contact Simon Bolt on (02) 4352 6315 or simon.bolt@de.com.au.

Yours sincerely

Simon Bolt
Marketing – Technical Compliance

Attachments:

- 1. Proposed changes to the CPF – Delta Comments**
- 2. AEMO MASS Issues Paper Questions – Delta Electricity answers**

ATTACHMENT 1 – AEMO proposed CPF amendments – Delta Electricity comments

page	AEMO amendment	Delta Electricity Comments
1.	Various	No comments.
2.	Version Release	No comments.
3.	Index	No comments.
4.	AAD	No comment
	ADRF	Removal has not occurred in other places in the document on page 23(e) EQ.28, (g) figure 1 and AFRF and AFF remain in the document also and haven't been proposed to be deleted from the glossary table.
5.	Appropriately Metered.	Suggest a separate definition or changing the wording to use the same defined term "appropriate metering"
	Glossary terms G and GB	The terms remain utilised in the procedure on pages 12 but GB may be meant to be described as GS and include the word "required" to reflect that it represents the dispatch target signal as determined by straight-line trajectory between the DI targets of consecutive 5minute DIs.
6.	IL	The term appears to be interchanged with inter-regional loss. IRL but wording in the document continues to refer to some IRL references as interconnector loss rather than inter-regional loss.
	Maximum Operating Level	As NER applications of S5.2.5.11 are Rules version specific, the term may either need a definition specific to the MASS or

page	AEMO amendment	Delta Electricity Comments
		<p>acknowledgement of variations depending on how the S5.2.5.11 definition has changed over the years.</p>
	PFR	<p>Delta Electricity does not agree with AEMOs definition. Primary Frequency Response must be rapidly delivered in order to be PFR. Raise responses may not be PFR on plants that maintain no stored energy and the AEMO PFRR does not require stored energy headroom contradicting the required response.</p>
	PFRR	<p>If the proposed Rule seeking the introduction of AEMOs drafted PFRR is not determined, this amendment should be deleted.</p>
7.	Region Demand Forecast error	<p>The use of terms “forecast error”, “demand forecast error”, “regional demand” and similar phrases remain used in the document and the definition may apply if the additional words region demand are added to the various entries.</p>
8.	(f) – Flag for PFR conformance	<p>Delta Electricity does not support this approach even if the PFR Rules are determined. If a plant is operating with tight deadbands it should not be required to have the flag. If the PFRR is met by a participant, the Rules should require the delivery to remain in place and AEMO should develop systems to confirm compliance and consult with non-compliant participants rather than just turn on or off a flag in an FCAS contribution process. Delta Electricity considers this process flawed and too difficult to apply and achieve a sensible outcome.</p>
9.		<p>No comments.</p>

page	AEMO amendment	Delta Electricity Comments
10.		No comments.
11.		No comments.
12.	PFR Flags	Delta Electricity does not support the use of PFR flags in the procedure. AEMO should determine whether Units comply or not in consultation with participants suspected of being non-compliant and not seek to change flags on the basis of its own unilateral decision.
13.	4.1.6	Problematic implementation and subjective to a AEMO unilateral viewpoint that PFRR is or is not met.
	(d) More information on the exclusion of data is provided in section 6.2.	The sentence does not need to be deleted. Section 6.2 does contain details of exclusions of data extending the previous points that also discuss the verifications required on corrupt data or data of questionable quality.
14.		No comments.
15.		No comments.
16.		No comments.
17.		No comments.
18.		No comments.

page	AEMO amendment	Delta Electricity Comments
19.		No comments.
20.	6.2 (a) (iv)	4.2.214(c) does not make sense as a reference. The reference may be meant to be referencing 4.1.5(c) on page 13 and 4.2.2(b), (c) and (d) on page 14.
	6.4	<p>Delta Electricity does not support the removal of PFRR compliant participants from assessment under the FCAS contribution factor as it will distort the contribution factors. Units that trip, regularly fail to follow close to target are causing the need for correction by other participants and ought to continue to amass contribution impacts especially if the same participants have not preserved stored energy to rapidly provide raise PFR. The systems AEMO are proposing will weaken FCAS markets.</p> <p>Delta Electricity does not support the flagging approach. If the PFRR gets adopted, a consultative approach should apply and the flag only utilised if the participant does not meet reasonable response times to correct proven PFRR non-compliance.</p>
21.	6.4	As above.
22.		No comments.
23.		No comments.

page	AEMO amendment	Delta Electricity Comments
24.		No comments.
25.		No comments.
26.		No comments.

ATTACHMENT 2 – AEMO MASS ISSUES PAPER Nov 2019 Questions – Delta Electricity answers

	AEMO Question	Delta Electricity Comments
1.	Why do you support/not support the general concept of recognising PFR within the NOFB as Contingency FCAS?	<p>Delta Electricity agrees that PFR should be recognised in the assessment of Contingency FCAS. However, unlike the expectations of Contingency FCAS delivery, PFR is not a service prepared for infrequent delivery. With tighter deadbands of PFRR conditions, PFR utilisation of prepared stored energy will be continuous suggesting it should be market dispatched and settled separate to Contingency FCAS and generate appropriate compensation to suppliers for the necessary storage or throttling back of energy to provide rapid PFR.</p> <p>Without stored energy headroom, Contingency 6s FCAS provisions, scheduled by AEMO to cover contingency events, will be utilised by PFR on a continuous basis corrupting both the scheduling process and the delivery process for Fast Contingency FCAS. Delta Electricity favours a process of incorporating PFR into regulation FCAS which, like PFR, is regularly dispatched and utilised in each DI unlike Contingency FCAS which, although prepared for in each DI, is much more infrequently required to be delivered. For the NEM, PFR has different purposes to the 6s Fast Response.</p>
2.	Should the recognition of Contingency FCAS provided inside the NOFB apply to all Contingency FCAS (ie. Fast, Slow and Delayed), or only to some services? Why?	The assignment of initial MWs to periods prior to the PFR support before the frequency disturbance time, will apply recognition to all services by adjusting the MW reference point for fast, slow and delayed delivery. The resultant service is compared to an initial MWs pre-event and if this is pre-PFR, the support will be more compliant and better

	AEMO Question	Delta Electricity Comments
		<p>reflect actual delivery than the current MASS which sometimes is assigning initial MWs after PFR has been delivered.</p> <p>However, as genuine PFR is rapidly delivered in the first moments of an event and depends on the size of frequency deviation, it is also appropriate to consider the PFR in the data point by data point response calculations for the fast Raise and Lower services.</p>
3.	<p>Is an increased pre-event recording window easily achieved? Are there thresholds above which this would become problematic?</p>	<p>Delta Electricity considers that it is easily achieved.</p> <p>Spreadsheets that Delta Electricity has used for more than a decade consider a 4-minute portion of 20ms sampled data and there is no complexity in doing so. Period beyond 4 minutes could also be considered because non-contingent events exist that sometimes involve a slow draw upon PFR then followed by a later contingent event. Even with the 4 minutes of 20ms data, Delta Electricity still records events in the current NEM where frequency drops outside the NOFB, doesn't return to 50 +/- 0.100 Hz and then moves outside the MASS range trigger at a time exceeding 4 minutes after frequency first left the NOFB. These events probably number around 5-10 each year.</p>
4.	<p>What kind of measurement approach do you believe should be applied to assessing the total volume of Contingency FCAS delivered?</p>	<p>As mentioned in the letter and above, a method like that suggested in AEMO's Method 3 is preferred. High speed recorded data from accurate instruments is the most appropriate measurement data rather than predicted expectations. Delta Electricity likens the use of high speed actual data to the comparison of R2 test results used to confirm modelling predictions. Sometimes the plant will not function optimally</p>

	AEMO Question	Delta Electricity Comments
		<p>and in investigating and assessing contingency event response, recorded data is considered superior to modelled expectations.</p> <p>The method should consider initial MWs prior to PFR action and include the period of time of the PFR response in the FAST service calculations.</p>
5.	<p>Is the approach of recognising PFR within the NOFB only for verification of response, rather than for dispatch purposes, appropriate?</p>	<p>No. AEMO has now realised that PFR is essential for system security. Delta Electricity believes that rapid PFR is an expensive product to deliver which either requires storage of energy at a cost of around \$1M p.a. in fuel alone on each 660MW coal-fired Unit for raise services or throttling of energy resulting in significant energy losses across throttling mechanisms for lower services. To adequately compensate suppliers for this energy service and to efficiently dispatch only the energy and throttling required to suit market conditions and maintain a designed system standard, a market process would be superior.</p>