

Mr Mark Stedwell
Australian Energy Market Operator
GPO Box 2008
Melbourne
VIC 3001
(Lodged electronically via pfr@aemo.com.au)

1 May 2020

Dear Mark,

re: AEMO Consultation on Interim Primary Frequency Response Requirements (PFRR)

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. The opportunity to provide comment on the draft Interim PFRR is appreciated.

Delta Electricity understands the PFRR has been written to be applied to new connections as well as to prescribe specifications for existing controllers. Delta supports the application of the draft Interim PFRR on new connections where designers can reasonably consider all the required parameters.

In application of PFRR on existing controllers, in general, Delta Electricity recommends that AEMO concentrate primarily on deadband and droop having due consideration for variability of operating conditions.

Cautious adjustments towards tighter deadbands required for a Unit are recommended particularly on Units such as Vales Point where the overall governing system is made up of control sub-systems. Deadbands of sub-systems that provide optimum stability of a Unit and the Network should be favoured over deliberate and strict matching of deadbands of a sub-system of a Unit to the equivalent of the PFCB. The pursuit of a common overall governing deadband on Units with interconnected governing sub-systems that must coordinate to avoid instability is not just a simple matter of setting deadbands of the subsystems to the equivalent of the PFCB.

Delta Electricity also recommends staged and coordinated implementation of tighter dead bands so that the PFR delivery is evenly shared between participants. Generators in the NEM should not be required to control frequency more sensitively than a competitor without being compensated for it. As part of mandatory PFR Rules implementation, the development by AEMO of a system that recognises superior PFR delivery and compensates superior performance is recommended. An eventual market solution that includes this recognition but also procures only the minimum amount required to produce the quality of frequency control the NEM requires at any given moment remains Delta Electricity's preferred long-term system.

Delta Electricity maintains a present viewpoint that PFRR delivery required by the new Rule does not authorise the PFRR to specify droop response beyond NOFB limits. The NOFB limits are the defined widest initiation limits for commencement of market services i.e. contingency FCAS. It is Delta Electricity's opinion that contingency FCAS delivery, which makes use of energy stored for its purpose, the same energy to be used for PFR on Vales Point Units, ought to already include PFR required beyond the NOFB. If not already being prepared for by AEMO, further adjustments for pre-dispatch volumes for 6/60s FCAS are recommended. Whilst Delta Electricity also considers that PFR delivery is more similar in concept to regulation FCAS, the present FCAS regulation system dispatched by AEMO to Vales Point cannot deliver "fast-acting" PFR because of its delivery with the energy dispatch as a single combined target and only reflective of slower time-error corrections as the AGC determines. An additional regulation response delivered as a separate signal to a power station DCS could make use of



the stored energy used for contingency services and provide “fast-acting” PFR. However, this change would need FCAS controller redesigns in Unit DCS not catered for in the PFRR rule change.

As evidence of the potential for variability in response times during real system events, attachment 3 includes a table of results from recent deadband testing (February and March 2020) of Vales Point Unit 5. The amount of stored energy on a Unit, fuel conditions, ambient conditions, interactions between interconnected control systems of a single Unit, interactions between Units across the NEM and the electrical dynamic response of the NEM at different times of the day and the year all impact on Units being able to consistently deliver on parameters such as response time if too precisely defined. The capability may exist but due to system variability only be demonstrated in 50% of responses, for example. A Units response can also be affected by the AGC dispatch delivery and the timing of dispatch intervals relative to when a frequency response is required. Units will be capable of delivering the specified PFRR response time but, due to many variables in the Unit, the Network and AEMOs dispatch systems should not be expected to consistently deliver it.

The imperative of implementation of mandatory PFRR should be on urgently addressing AEMOs system security concerns regarding existing frequency quality. Where an existing controller can simply be adjusted to deliver PFRR droop and an overall Unit governing deadband approaching the PFCB, great flexibility in accepting other PFRR parameters is recommended over specific detailed and strict compliance expectation.

Delta Electricity recommends and encourages AEMO to maintain focus on other actions that improve frequency conditions. Adjustment to FCAS dispatch volumes made by AEMO in 2019 and early 2020 have demonstrably (see attachment 4) retarded the deterioration first identified in 2017 as being concerning to AEMO and lower demand conditions currently occurring appear also to be increasing the time frequency remains within the NOFB. Delta Electricity continues to believe that deterioration has much to do with factors, not related to PFR reduction, that are evidently influencing the day to day frequency performance.

Attachment 1 addresses relevant clauses of the draft PFRR with detailed comments and recommendations for AEMO to consider in its final determination. Attachment 2 provides a marked-up version of the draft Interim PFRR with suggested amendments.

Delta Electricity would like AEMO to give Delta’s recommendations due consideration and if AEMO wishes to discuss this submission I can be contacted on (02) 4352 6315 or simon.bolt@de.com.au.

Yours sincerely

Simon Bolt
Marketing – Technical Compliance

Attachments:

- 1. PFRR – Delta Comments on various clauses**
- 2. Suggested PFRR amendments**
- 3. Specific Table of results – Deadbands and response times of a complex governing system**
- 4. Trends of NEM Frequency Event Counts outside NOFB – Jan 2012 to Apr 2020**