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Australian Energy Market Operator  
20 Bond Street  
SYDNEY, NSW 2000  
Submitted electronically via: [pfr@aemo.com.au](mailto:pfr@aemo.com.au)

### **Primary Frequency Response Requirement Consultation**

Alinta Energy welcomes the opportunity to provide a submission to AEMO's Primary Frequency Response Requirement consultation.

Alinta Energy is an active investor in energy markets across Australia with an owned and contracted generation portfolio of nearly 3,000MW, including 1,700MW of gas-fired generation facilities and 1,070MW of thermal generation facilities. As several of Alinta Energy's generation assets currently provide frequency response in the NEM Alinta Energy is directly impacted by the draft determination.

This submission supplements information provided to AEMO at various public PFRR information sessions held during the week of 20<sup>th</sup> – 24<sup>th</sup> April.

#### ***Impact of Covid-19 on implementation timeframes***

The impact of COVID-19 has introduced extraordinary changes to Australia's communities and economy. In response, Alinta Energy has ramped up our resourcing capabilities to deliver and provide support for homes and businesses.

The implementation of the mandatory frequency control rule change is currently requiring significant time and resources from Alinta Energy and key operational staff on site at power stations. Scheduling engineering feasibility studies, undertaking risk assessments, doing testing and physically making any required changes to generation plant takes significant time.

From a resourcing perspective, many key experts required to consult on and implement dead-band setting changes can only be sourced from overseas or interstate. With the current Government imposed international/domestic travel restrictions and site restrictions limiting contractors on site, this is an extremely challenging rule change to implement.

Alinta Energy urges AEMO to consider delaying the rule change implementation schedule to allow for industry to plan and provide appropriate operational flexibility to be built into individual generator's PFRR forward work plans.

### **Transparency of aggregate PFRR performance**

The provision of frequency control involves costs on plant and general wear and tear. The provision of these services deteriorates the operating life of units and requires an additional level of maintenance costs. For example, in regards to a gas fired generator, since the load gradient in frequency response mode is higher than during normal operation the thermal stress on the gas turbine is also higher. Therefore, operating hours beyond the frequency deadband are weighed with a factor greater than 1 in order to calculate the equivalent operating hours. This will reduce the interval time between regular inspections which are due after a given amount of equivalent operating hours defined by the original equipment manufacturer have passed. These costs vary greatly depending on the dead band frequency ultimately set as well as the order in which individual generators tighten their dead band settings.

Alinta Energy is concerned that first movers could face significant disadvantages as the PFRR is rolled out across the NEM. As generators over 200MW adhere to the PFRR requirement, this exposes the first enabled units to a greater share of the frequency burden such as oscillatory interactions between different governors or hunting oscillations. The same is true for the first individual generators in certain regions or states whom are enabled. Thus, there is a high likelihood that the burden of costs will shift to predominantly to larger dispatchable technologies.

This not only has equity implications; it also has implications for the generator self-assessment process. The internal risk assessments and generator self-assessment process currently being considered by participants are being made on the assumption that there is a “hard cutover” time where all generators over 200MW are tightening their dead bands. If generators are switching to the new PFRR requirement at different times, or even at different dead band settings, this will have direct implications for the performance of individual units and the generator self-assessment results.

Given this, Alinta Energy supports AEMO constructing both live and forecasting reports that should be presented as part of the PFRR obligation. Whilst this may not be possible due to privacy at the individual generator level, in aggregate it should be possible to provide broad data to industry on aggregate MW dead band settings, droop settings, response times and stored head room by regions. Such reports should also include both national and state current aggregated dead band or expected dead band data.

The provision of such data would assist plant operators across the NEM in understanding the frequency performance of the market and how their individual generators will safely operate and perform within that. This will assist generators in performing their own stability analysis as well as completing the generator self-assessment.

### **Progressive Reduction in Dead band Setting**

As outlined in past submissions, the decision to mandate frequency control to a ( $\pm 0.015$ ) Hz dead band setting is physically untested in the NEM and implementing such a narrow dead

band setting requirement rapidly would likely introduce several risks that may have unintended implications on the NEM's operating state.

As such, Alinta Energy supports AEMO's prudent decision to include the progressive step change allowance as outlined in section 5.1(b), allowing for a reduction in dead band settings commencing with ( $\pm 0.050$ ) Hz.

This approach will allow participants and AEMO to progressively monitor the performance of frequency of the NEM as it adheres to the new dead band setting requirement. Upon close consideration of what impact the initial step change has on the network, it may be found that the proposed second step change requirement to ( $\pm 0.015$ ) Hz actually not required.

### ***Frequency Signal Conditioning – further clarifications required***

Alinta Energy is seeking more clarification or guidance respectively with regards to the requirements for filtering (e.g. low pass filtering) and conditioning of the frequency signal measured at the connection point. The intention is to avoid any unnecessary load cycles - which are detrimental to the gas turbine's service life - that may be caused by the frequency crossing the limit of the deadband for a fraction of a second only or noise superimposed to the frequency signal. These are load cycles that would not contribute to grid stability but adversely affect the performance of the gas turbine.

### ***PFRR response when receiving greater than zero dispatch target – further operational clarifications required***

As currently drafted in section 2 of the PFRR, the obligation applies to generators only when they have a dispatch target greater than zero (rules clause 4.4.2(c1)).

However, if a generator receives dispatch targets across several intervals to meet a maximum dispatch target load, and mid-way through ramping up to meet such a target, simultaneously begins providing primary frequency response due to the PFRR obligation, how is the generator to be treated in relation to its obligations to follow dispatch targets? Alinta Energy seeks further clarification in section 2 of the PFRR in terms of how AEMO intends to operationalise this requirement and the interaction between other NER obligations.

In addition, if a generator is prevented from ramping up to maximum load as a result of providing PFRR response for a lengthy period of time (potentially hours) while responding to a frequency disturbance, how is it to be treated? It is unclear to Alinta Energy whether its normal bidding profile will be respected or whether a generator may be disproportionately required to provide PFRR response whilst commercial considerations are set aside. Alinta Energy encourages AEMO to provide some worked examples in the final PFRR document as a means to assisting participants understanding of how the PFRR will be operationalised.

### Conclusion

Alinta looks forward to participating in the ongoing PFRR consultation process and encourages consideration of the points raised above.

If you have any queries in relation to this submission, please contact me via email: [anders.sangkuhl@alintaenergy.com.au](mailto:anders.sangkuhl@alintaenergy.com.au) or by phone 02 9375 0992.

Yours sincerely,

**Anders Sangkuhl**  
Wholesale Regulation Manager