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(Lodged electronically) 28 October 2021

re: ERC0263 - Primary frequency response incentive arrangements – Draft Determination 16 September 2021

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 turbogenerators. Delta Electricity appreciates the opportunity to comment on the Draft Determination and work with the AEMC officers in technical working group meetings on the proposed PFR Incentivisation Rule Change.

Delta Electricity has previously stated that it did not support maintaining Mandatory PFR rules indefinitely. The present conditions for frequency and, in the present quarter, complete absence of frequency being so far found outside the present NOFB, even in response to contingency events, ought to now be providing operators with a clear indication from trended data that the amount of mandatory PFR now being provided is in disproportionate quantities and control performance necessary to secure risks to system security that AEMO claim would occur if Mandatory PFR was not continued. In terms of experienced frequency extremes, present conditions seem better than in the last 15 years or longer. However, the risk that, as synchronous fleets retire, Mandatory PFR controls will have less effect, is very real and a failure to motivate the support energy and controllers that deliver rapid raise and lower PFR remains a priority. It is fair to say that Mandatory PFR is now providing a strong frequency control foundation upon which suitable market mechanisms to incentivise PFR delivery can be introduced, tested and developed. However, unless as part of that testing and adoption, aspects of the present Mandatory PFR regime is loosened, either by way of a relaxing the IPFRR PFCB deadband or by relaxation of total compulsory delivery by all scheduled semi-scheduled generators, the market may never obtain the information essential to determine the true market value of PFR. In the effort to reduce costs to consumers maybe this is what is considered necessary by the AEMC. Delta Electricity still considers that a market solution would produce the more efficient and optimum motivator for all. Lowest costs to consumers may not motivate service providers enough.

Delta Electricity does not yet consider the proposed solution, which was proposed late in the Rule change review process and has not yet demonstrated how AEMO and revisions to the FCAS contribution factor procedures will drive suitable incentivisation, will be successful as currently proposed. Unless the eventual mechanism that, as guided by the draft determination, AEMO will design in further revisions to the FCAS contribution factor, results in substantial financial impacts upon participants that will, otherwise, continue to seek financial outcomes in the interrelated energy market, participants will continue to trade even at the incurred expense of costs or negative settlement results from the costs and payments scheme associated with Regulation and proposed incentivised PFR FCAS. The missing link in the proposed solution seems to be the acknowledgement of the quantity in MWs of PFR that is actually required to effect the good control and, from an understanding of this quantity, linking to methods that suitably reward participants financially, and in simple ways that compare equally with energy outcomes, for what the lost opportunity of these large MW quantities represent to life-time economic evaluations produced with a understandings based on predicted energy and FCAS prices in the existing markets.

In order to deliver suitable PFR, the delivered contribution factor calculation system must ensure participants find it unfavourably expensive and uneconomic to sacrifice headroom that can deliver rapid PFR (not required by mandatory PFR) to serve energy even at times of high energy prices. The successful system will need to find a way to do this and, at present, Delta Electricity cannot see how reforms to the Regulation FCAS contribution factor can or can do so fairly to all affected parties. Not all participants trade in the same way. Some participants seem willing to sacrifice and even ignore the existing FCAS systems and markets and have failed to have been motivated by the markets for them, even when at high prices, to always participate in providing the services. The return from energy is perhaps too interrelated to allow for FCAS

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prices and market outcomes to provide substantial motivation. Perhaps the complexity of understanding and reacting quickly to changes in the multiple and individually dynamic 5-minute markets is also an impediment but if the overall monthly energy and FCAS settlements produce an overall net favourable margin, perhaps many participants do not bother trying to understand how to optimise their portfolio in the complex FCAS markets. Their losses simply are not often substantial enough when compared to the more regular and simpler to focus on rewards from energy sales. PFR left to this sort of strategy will never truly be served. The values in PFR, and the way it is interrelated to energy prices and co-optimised with some aspects of energy dispatch, are simply never expected in the proposed Rule change to ever be large enough to individually motivate all participants to deliver it. This, Delta Electricity considers, highlights the difficulty in finding the right motivating position in dollars, without which it seems, mandatory PFR will have to remain in operation and, when headroom withers, perhaps mandatory headroom will also then be required. These sorts of solutions simply do not do justice to the basic purpose and intent of an electricity market.

The Frequency Operating Standard

This standard, supported by economic and engineering arguments and factors demonstrating the risks the standard seeks to protect the market from, ought to be the target for all frequency control objectives.

According to AEMO, and possibly accepted by the AEMC, the existing standard must presently be considered inadequate and to have failed to describe complete requirements. If the Frequency Standard was revised and then unanimously agreed as being representative of the correct market-determined balance between conflicting priorities of engineering technical perfection and economic rationalism, AEMO ought to be required to drive FCAS systems to only deliver frequency outcomes that meet that standard and nothing far in excess of the standard as could now be argued is the case by observation of the present conditions driven by Mandatory PFR. Delta Electricity remains optimistic that the next revision to the standard can address the inadequacies and fundamentally document the economic and engineering risks the market is prepared to wear in setting the levels in the standard that energy and FCAS dispatch, and adequate frequency monitoring and reporting, must be driven to uphold the conditions prescribed by the standard.

In order to do this, the standards should document and link the proposed conditions to all risks to the market from conditions if found, by real time trended data and monitoring, and not from predicted hypothesis of possibilities from overly conservative caution or from observations of systems reactions arising from multiple failures of other designs not related to frequency, to have breached the standards. To address uncertainties in the reactions of real machines to real events, the standard should also include conservative estimation of inaccuracy but, once defined with such buffers, it should then provide the trustworthy target representing what is reasonable conditions the operator has to meet and be transparently judged by for the choices the operator makes, outside of the influence of other participants, in procuring sufficient quantities of services to achieve that standard.

Unless the standard is accepted as being correct by all participants, no market system will work and the market process might as well be removed and replaced by technocratic mandated enforcement and control designs. The latter approach has historically been proven to stifle innovation, produce large barriers to market entry and, hence, be inefficient even if it secures a system from the inevitable multiple contingency event that cannot ever be discounted as being possible and that which could threaten even the most conservative of standards. Catastrophes can and will happen and standards cannot be reasonably set to prevent every single possibility.

As with previous statements made to the AEMC, Mandatory PFR has reportedly not addressed all the frequency conditions that were previously of concern to market participants other than AEMO and the continued presence of a ±50mHz peak to peak variation with a short time period in frequency continues to suggest to Delta Electricity that other factors remain uncontrolled and these factors remain of concern especially if, as the energy transition to renewables continues, the peak to peak variations increase in rapidity and strength should offending sources increase in capacity, uncoordinated controllers sustaining the variations propagate and/or the controllers that currently suppress the full impact of them retire. The observations that Mandatory PFR, whilst tightening overall normal operating frequency containment has not addressed the variability suggests further to Delta Electricity that other factors are causing continuous unwanted variations reducing the quality and micro-stability of system frequency. Without pinpointing these causes, it seems the PFCB and Mandatory PFR, however motivated, may not be addressing the full impact on frequency of the energy transition currently taking place. This represents an emerging risk warranting further efforts to investigate the overall coordination of all frequency control. Motivation provided via the existing mandatory PFR has not addressed these observations. Perhaps the redesign of the frequency operating standards needs to also consider this point.

Frequency Control – General

Delta Electricity continues to seek to discuss in the frequency control workspace, the important distinctions between delivery of Contingency Frequency Control Ancillary Services (FCAS) in contrast to Regulation FCAS and Primary Frequency Response (PFR). Decision makers are encouraged to continue to approach each grouping with slightly altered viewpoints. Contingency FCAS is more like an insurance product, whilst PFR and Regulation FCAS are essential continuously utilised services in large MW volumes and therefore need to be recognised as fundamentally more expensive to correctly procure and maintain. Both groupings have an important similarity though, which is, if there is no energy/capability stored, prepared and/or preserved, to deliver the procured raise or lower service, the overall system delivery will be ineffective at controlling frequency. Hence it remains very important that the effectiveness of all services is monitored and transparently reported against Industry standards that balance the risks and costs associated with poor performance against the costs of lost energy sale opportunities and impacted plant costs.

Frequency Control – Regulation FCAS and PFR

The connection between Regulation FCAS, as currently dispatched and priced, and the measurement of a participant's individual contribution to the need for it over a period of four weeks remains appropriate, in the opinion of Delta Electricity, to determine the portion of the contribution factor expected to continue to be calculated for performance issues relevant to slower time energy trajectory adherence and the small quantity of Regulation FCAS prepared by AEMO to be dispatched particularly in the manner it is dispatched which, as previously discussed in responses to these Rules changes, is inherently delayed in its effect by the way AEMO presently dispatches it.

The quantity of PFR required to effect fast frequency control that AEMO is seeking is a much larger quantity and should never be linked to energy trajectories over 5 minutes but, instead, should be considered over very much shorter time frames, possibly as short as 4s but perhaps shorter, which is possibly beyond AEMOs capability using existing systems. It also needs to be connected to the measured local frequency and not at all linked or determined by the slow time Frequency Influence signal used for dispatching existing regulation FCAS. Mechanical governor reactions are rapid and are continuously taking place in less than 4s. DCS reactions with supporting PFR sustain these reactions over 10-20s. The amount of PFR delivery in MWs is considered to be tenfold (or more) of that of dispatched Regulation FCAS and of far greater importance at correcting frequency in a much faster time-frame. Measuring PFR reaction performance using close to real-time data is supported by Delta Electricity for the proposed Rules but combining the performance in anyway with the existing Regulation FCAS contribution factor is not. It is not easy to see that the systems are similar or that a collective resultant factor would produce the correct motivation. A separated calculation and assessment and separated factors (or sub-factors) is considered essential in the opinion of Delta Electricity. Allocation and transference into a combined factor could work as long as the subfactors are clear and separate and weighting of the two acknowledges the importance of MWs in each system. Repeating previous comments however, unless the financial disincentive to ignore the factor related to PFR is substantial as realised in overall settlements, Delta Electricity considers that the resultant factor(s) will not motivate a participants to deliver PFR. It is for this reason that Delta Electricity continues to believe that the best PFR motivation would be a separate market, with substantial prepared volumes and real rewards based on a price that values the delivery. A lucrative market will entice energy suppliers that possess limited capability to sustain energy for hours in the energy market, to set up energy delivery exclusively for PFR and, in the correctly constructed market, be adequately rewarded to do so.

Regulation FCAS and PFR are required continuously for reasons other than simply ensuring the system reacts adequately to larger contingency events. Smaller imbalance events are almost continuously occurring. Incorrect approaches to these systems will be immediately apparent or ought to be when compared to an appropriately reformed frequency operating standard. Real-time monitoring systems are probably best suited at observing the effectiveness of the PFR portion of these two systems. It was hoped that innovative calculation systems such as double-side causer monitoring and arithmetic being developed with ARENA and the AEC would demonstrate suitable real-time monitoring tools but it should also be remembered that a high resolution recording of the system frequency signal itself and its stability is critical data to refer to as to whether system dispatch and overall frequency coordinated control is securing a balanced result.

Frequency Control – Contingency FCAS

Mandatory PFR is presently providing narrower frequency control than that delivered prior to September 2020, but it is important to remember that for many existing plants, PFR delivery is from the same systems that deliver Contingency 6s FCAS. Essentially, contingency 6s FCAS,

both the amounts that are enabled by AEMO **and** the additional amounts that non-enabled contingency 6s FCAS systems deliver to provide Mandatory PFR reactions, are presently collectively more than the enabled quantities of 6s Contingency FCAS services. These systems collectively deliver Mandatory PFR at the PFCB deadbands in much greater excess that simply meeting the AEMO dispatched enabled amounts delivered to the FCAS expectations of the MASS.

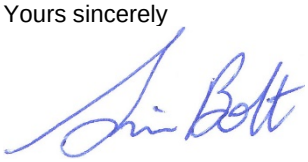
This deployment, whilst effective, awaits a significant interruption event before it is realised that having Contingency FCAS system delivering excessively for Mandatory PFR will possibly be found to hamper the full expected dispatched Fast Contingency FCAS response in a large future event.

Time Frame for Implementation

Delta Electricity considers that mandatory PFR and the observable improvement it has had on narrowing the extremes of the normal frequency experience, as was concerning AEMO, warrants a consideration to relax the urgency previously considered to exist to deliver this particular reform to incentivise PFR. The AEMC and AEMO could consider the timing again collectively and, whilst continuing to consult on proposed Contribution factor mechanisms that they hope will eventually shape participant behaviour in the manner desired whilst also maintaining minimised costs to consumers, could also trial various arrangements with the reliance upon Mandatory PFR foundations to minimise the extreme ranges that frequency will extend to. However, perfect solutions, in Delta Electricity's opinion, would aim to relax aspects of the Mandated PFR to determine the optimum efficient regionally diverse dispatch point for PFR quantities. Future work in the frequency control work program also recommended is to further investigate the unchecked and rapid variations that are not being addressed by PFR control or by this Rule change Determination.

If the AEMC wishes to discuss any aspect of this letter, please contact Simon Bolt on (02) 4352 6315 or simon.bolt@de.com.au.

Yours sincerely



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