

04 February 2021

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Dear Rajat

SUBMISSION ON ISSUES PAPER: ANCILLARY SERVICE COSTS - SPINNING RESERVE, LOAD REJECTION RESERVE, AND SYSTEM RESTART (MARGIN VALUES COST_LR) FOR 2021/22

The Australian Energy Market Operator (AEMO) welcomes the opportunity to provide this submission in response to the Issues Paper: Ancillary Service Costs - Spinning Reserve, Load Rejection Reserve, and System Restart (Margin Values Cost_LR) for 2021/22 (Issues Paper) to the Economic Regulation Authority (ERA).

BACKGROUND

On 30 June 2020, in accordance with the Wholesale Electricity Market Rules (WEM Rules), AEMO provided the ERA with its proposals¹ for:

- the Margin Peak and Margin Off-Peak values (margin values) to apply during the 2021/22 Financial Year [clause 3.13.3A(a)]; and
- the updated Cost_LR value to apply during the 2021/22 Financial Year [clause 3.13.3C(a)].

AEMO proposed that the margin values and Load Rejection Reserve Service component (i.e. the L component) of the Cost_LR parameter determined for 2020/21 be retained for 2021/22. At the time of submission and for the reasons outlined in its proposal, AEMO considered that this approach was reasonable, and that continuing the 2020/21 parameters into 2021/22 would result in values that reflect the margin Synergy could reasonably have been expected to earn in forgone sales due to the provision of Spinning Reserve Services and to cover the cost for providing Load Rejection Reserve Services.

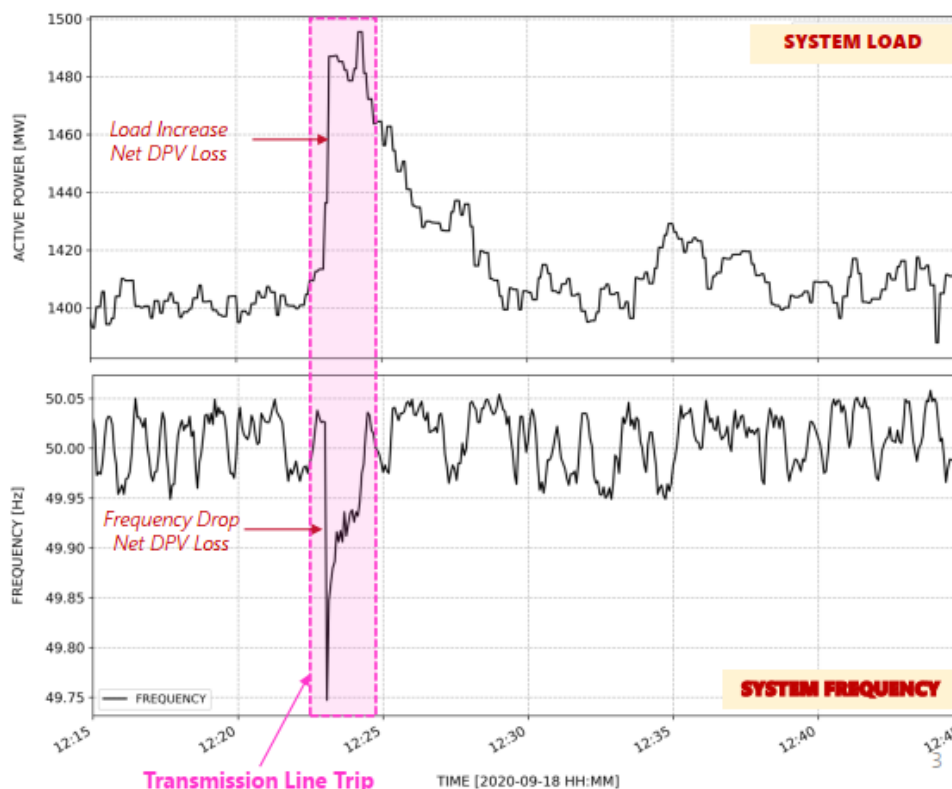
On 30 November 2020 in line with AEMO's June 2020 letter, AEMO proposed an update to the proposed Cost_LR value to take into account more up to date information in relation to System Restart costs.

INCREASE IN TRADING INTERVAL SPINNING RESERVE REQUIREMENT

AEMO has analysed power system outcomes following a number of contingency events and concluded that, in specific circumstances, the frequency decline due to the loss of a generator or network contingency is further exacerbated by disconnection of distributed photovoltaics (DPV). That is, immediately after the loss of the largest contingency, a consequential impact occurs which removes further generation from the SWIS putting Power System Security at further risk, the extent of which is dependent upon operational conditions and materiality of the combined loss of generation.

¹ Published here: https://www.erawa.com.au/electricity/wholesale-electricity-market/ancillary-services-parameters/spinning-reserve-margin_peak-and-margin_off-peak

DPV tripping occurs as a result of disturbances in local voltages and frequency, seen at the PV inverter level². Widespread disturbances are commonly observed after transmission network faults. An example of the impacts to system load and system frequency from DPV tripping due to a transmission line fault in September 2020 can be seen in the following figure.³



AEMO’s preliminary analysis of past events shows that, following a contingency on the transmission system, a proportion of DPV will disconnect. This has resulted in the consequential disconnection of DPV and a net loss of generation of between 70-130 MW. A net loss of generation is not new but, due to the increased penetration of DPV, is increasing in significance. Moreover, the type and location of a contingency will impact the amount of DPV that is relevant and there is now heightened risk of a transmission fault resulting in loss of utility scale generation (i.e. Yandin and Warradarge Windfarm on radial 330kV line) and DPV.

To ensure Power System Security, and with improved models, actual contingency events and additional analysis in recent months, AEMO now considers it necessary to treat the contingency and the consequential impact as one, as past events have shown that this risk is credible. That is, the definition of the largest contingency, and the Spinning Reserve required to mitigate that contingency, must now include the consequential disconnection of DPV.

As an immediate step to account for the consequential disconnection of DPV, AEMO has included an estimate of the net loss of generation from DPV in the Spinning Reserve Requirement during the times this

² For example, refer to the results of UNSW’s bench testing of rooftop PV inverters (<http://pvinverters.ee.unsw.edu.au/>)

³ See WAECF 29 – Meeting Pack at <https://aemo.com.au/en/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/wa-electricity-consultative-forum-waecf>

risk is present. This has initially been set at 10% of the real-time estimate of DPV output based on empirical evidence from past events. This took effect on 08/01/2021.

AEMO continues to investigate and model such events to better understand the risks and impacts of DPV tripping to the power system and is leveraging the significant work that has been done in the National Electricity Market (NEM) in areas such as South Australia with very high DPV penetration. The results of this analysis will be shared with the ERA and Market Participants in due course. The current approach, including the quantity of additional Spinning Reserve, is subject to change pending the results of this detailed analysis. This detailed analysis will establish a more accurate measure for mitigating this risk in different times of the day and different load and generation dispatch conditions. Should AEMO be unable to adequately manage this risk through increase in Spinning Reserve, other measures such as limiting the size of the largest contingency may be required.

In the interests of transparency, AEMO advised the ERA of this matter in a letter dated 14 January 2021 and provided a detailed overview of this matter for Market Participants at the WA Electricity Consultative Forum on 10 February 2021³. Due to the timeframes associated with the margin values and Cost_LR review, the ERA has not had the opportunity to consider the additional Spinning Reserve required in the modelling presented in the Issues Paper. Given ERA has developed a model to assist with its determination of Cost_LR, AEMO encourages the ERA to consider the information provided in relation to this matter in its determination of the margin values and Cost_LR value for 2021/22.

ALLOCATION OF COSTS

The Issues Paper noted that the modelling indicated substantial changes to the cost of Spinning Reserve and Load Rejection Reserve. The Issues Paper asked what alternatives could ensure correct compensation is paid in 2021/22.

AEMO notes that the correct allocation of costs between Spinning Reserve and Load Rejection Reserve is important for the following reasons:

1. The costs for these services are recovered from different parties under the WEM Rules. Specifically, the costs of Spinning Reserve are recovered from Market Generators in accordance with clause 9.9.2(l) of the WEM Rules whereas the costs of Load Rejection Reserve Service, System Restart Service and Dispatch Support Service are recovered from Market Customers in accordance with clause 9.9.1 of the WEM Rules.
2. AEMO may enter into an Ancillary Service Contract with a Rule Participant other than Synergy for Spinning Reserve Ancillary Services, provided it provides a less expensive alternative to Ancillary Services provided by Synergy's Registered Facilities (clause 3.11.8 of the WEM Rules). Entering into an Ancillary Service Contract for Spinning Reserve Service with a Rule Participant other than Synergy becomes impracticable with margin values of zero as the contract will always be a more expensive alternative compared to Synergy. This may lead to inefficient market outcomes if the actual cost to provide Spinning Reserve is higher than the costs determined by the ERA.

Spinning Reserve and Load Rejection Reserve are opposite, but equivalent services. Accordingly, some generators contribute to both Spinning Reserve and Load Rejection Reserve depending on their operating level. In reviewing the ERA's analysis, it appears that the incurred costs for generating 'out of merit'⁴ may

⁴ An incurred cost may occur when AEMO dispatches a Synergy facility 'out-of-merit' in relation to the Standard Dispatch Order in the Synergy Dispatch Guidelines to meet the Spinning Reserve and/or Load Rejection Requirements. The incurred cost of the facility being committed could be calculated as the sum of the fixed heat rate costs, start-up cost, and the costs associated with any energy production, less the energy and LFAS revenues for that facility.

have been assigned to Load Rejection Reserve only, despite some Facilities providing both Spinning Reserve and Load Rejection Reserve. This may have contributed to the increased cost for Load Rejection Reserve.

An alternate approach could be an approach similar to the approach used by AEMO in the margin values and Cost_LR review undertaken in 2019.⁵ In summary, when a Facility was dispatched to minimum stable generation (indicating it is only providing Spinning Reserve) the costs of generating 'out of merit' were allocated entirely to Spinning Reserve. When a Facility was dispatched above the minimum stable generation (indicating it is providing Load Rejection Reserve and Spinning Reserve) the 'out of merit' cost was apportioned between Load Rejection Reserve and Spinning Reserve. When a Facility was dispatched to maximum generation (indicating it is only providing Load Rejection Reserve) the 'out of merit' cost was allocated entirely to Load Rejection Reserve.

SYSTEM RESTART CONTRACT PROCESS

AEMO welcomes the opportunity to meet with the ERA to provide further update on the System Restart procurement process and discuss any other matters related to System Restart prior to the ERA's determination on 31 March 2021.

AEMO would like to acknowledge the significant effort made by the ERA in developing a model of the WEM to undertake this review. In the Issues Paper, the ERA has discussed the changes in market landscape between the previous review for 2020-21 and this review for 2021-22. AEMO notes that the change in model from the model used by AEMO to the ERA's in-house model may also contribute to changes to outcomes.

Please contact Mark Katsikandarakis on (08) 9469 9932 or Teresa Smit on (08) 9469 9992 if you have any queries or would like to discuss further.

Yours sincerely



Cameron Parrotte
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⁵ Ancillary Service parameter review 2019 final report, Section 6.4.2. Available at https://www.erawa.com.au/cproot/20867/2/AEMO-2019-Ancillary-Services-Review_Ernst-and-Young_Final-report.PDF