

30 November 2017

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Dear Ms Cusworth

WESTERN POWER'S SUBMISSION OF PROPOSED REVISIONS TO ACCESS ARRANGEMENT FOR THE AA4 PERIOD

The Australian Energy Market Operator (AEMO) appreciates the opportunity to respond to the Issues Paper on Proposed Revisions to the Western Power Network Access Arrangement (2017/18 to 2021/22 – AA4), dated 31 October 2017 (amended 14 November 2017).

AEMO operates and develops energy markets and systems, and delivers planning advice, in eastern, south-eastern and western Australia, with the objective of ensuring that markets are responsive to energy sector needs while supporting long-term investment in Australia.

In Western Australia, AEMO has functions in regard to system operation and market operation for the Wholesale Electricity Market (WEM). This includes ensuring that the power system achieves reliability and security levels that customers value now and in future as the energy system transitions to a more dispersed variable supply.

It is noted that the issues paper published by the Economic Regulation Authority (ERA) is seeking views on the following four matters in particular:

- Whether the approach Western Power has taken to develop its network investment plan, particularly its consideration of future uncertainties and possible effects of new technologies, is consistent with the Access Code objectives and capital expenditure tests.
- How effective the AA3 mechanisms have been in encouraging Western Power to become more efficient and meet customer expectations for service standards.
- The practical experience customers have had in connecting to the network and obtaining the services they require.
- Whether the proposed investment in advanced meters meets the capital expenditure tests under the Access Code and whether the proposed new tariffs are consistent with the pricing principles in the Access Code.

In view of its objectives as the system operator and market operator of the WEM, AEMO has prepared this response, with a focus on the matters stated in dot points one and four above.

AEMO SUBMISSION TO ERA ISSUES PAPER ON WP AA4 PROPOSAL - 30 NOV 2017

Western Power's network investment plan for AA4

Asset replacement – AEMO notes that Western Power proposes to invest \$245 million for transmission asset replacement during the AA4 period, including \$36 million for replacement of static VAR compensators (SVCs). AEMO supports Western Power's proposal to replace the West Kalgoorlie and Merredin Terminal SVCs during the AA4 period (2017/18 and 2020/21 respectively). These assets, which are critical to delivery of reliable power and power quality to customers in West Kalgoorlie and Merredin, have been determined by Western Power to be at end of life.

Dispatch Support Services – On 4 May 2017, the Minister for Energy confirmed the State Government's decision to retire 436 MW of Synergy's generating capacity, which included the closure of Muja AB in Collie, Mungarra's three gas turbines near Geraldton, West Kalgoorlie's two gas turbines and a single generator at Kwinana. The retirements are planned to progressively occur by September 2018.

AEMO notes that Western Power is currently considering the effect of retiring generation facilities including those at West Kalgoorlie and Mungarra, which are currently used for security of supply and network reliability, in its investment plan. Western Power anticipates the retirements will have a significant impact on its transmission measures.

Following the expiry of the Dispatch Support Service contract for the West Kalgoorlie and Mungarra gas turbines on 1 July 2018, supply outcomes may be unsatisfactory and some requirements of the Technical Rules (network) planning criteria may not be satisfied. The N-0 criterion that applies to the 220 kV interconnection supplying the Eastern Goldfields region means that the ability to transfer power into that region will be lost following the loss of a transmission element. If the two West Kalgoorlie gas turbines are retired and no alternative arrangement is put in place, the loss of the 220 kV line may potentially lead to lengthy blackouts in Kalgoorlie.

AEMO's operational experience with the reliability of the North Country area also suggests that, without other strategies, the retirement of the three Mungarra gas turbines may potentially expose the North Country area to long blackouts. This situation is exacerbated by the fact that the Mungarra Power Station does not currently have the capability to start without external electrical supply from the network. At present, where System Management considers there is a credible risk of loss of supply from both transmission lines between Three Springs and Mungarra, the Mungarra Power Station is dispatched pre-emptively to maintain continuity and security of supply to the Geraldton area. At least one transmission line would need to be brought back into service to restore supply.

AEMO acknowledges the work Western Power has undertaken to date in collaboration with AEMO, the ERA and the Public Utilities Office for a cost-efficient solution for Eastern Goldfields and Geraldton customers in particular. As each location poses its own challenges in achieving secure and reliable supply, AEMO is supportive of the continued collaborative effort to resolve potential network and/or energy options.

Emerging technologies – While the majority of investment proposed by Western Power for the AA4 period is 'poles and wires' network capex to maintain service levels, safety and compliance, Western Power's customers have indicated that emerging technologies should be used to deliver improved customer outcomes. Accordingly, Western Power will continue to trial non-network solutions and technology initiatives commenced during the AA3 period, such as battery storage trials in Perenjori and testing of a standalone power system in Ravensthorpe, and, where safe and more efficient to do so, implement new technology.

The implementation of a constrained network requires supporting changes to the design of the WEM. Western Power and AEMO must continue to work together to ensure the power system minimises any impacts on wholesale market operation, that is, to ensure that network constraints on generation resulting from the operation of a constrained network are minimised to efficient levels.

It is worth noting that AEMO will also incur additional expenditure to deliver changes to its dispatch and other systems, operational procedures and market processes, and to otherwise fulfil new requirements under amended WEM Rules to give practical effect to new market arrangements. Some of these changes must be implemented in advance of the effective 'go live' date of the new market arrangements.

Western Power's proposal to introduce advanced metering infrastructure

AEMO notes that Western Power is proposing to install 355,000 advanced meters and associated infrastructure as the default meter to enable remote metering, as well as introducing time-of-use tariffs. While AEMO supports these two metering initiatives, the advanced meters need to be of sufficient functionality to allow the evolution of the energy market through the take-up of new technology and to facilitate system security.

In recent years, consumers have come under increasing pressure from steep rises in household electricity prices, of which network cost components are a major price driver. Information published by the ERA shows that transmission and distribution costs combined comprise around 45% of household electricity prices, which is on par with the cost of electricity generation.

In Australia there has been a significant shift in demand due to consumers' uptake of energy efficiency measures and of roof-top PV systems. Advances in metering and smart appliance technology that give consumers quick and easy access to real-time information can also be used to motivate energy consumers to actively manage their energy consumption.

System operators around the world are facing operational challenges due to the high level of roof-top PV generation that manifests as very low minimum daytime load. To ensure security and reliability of the power system in the future, AEMO favours a type of advanced meter which can facilitate the visibility, predictability and controllability of generation at the household level.

The uptake of electric vehicles and battery storage is now on the horizon. Should these technologies follow a similar trajectory to that of roof-top PV, there will likely be a fundamental change in the nature of electricity markets and traditional relationships between consumers, retailers and network businesses. The operation of the future power system will require greater visibility of market information, and potentially, greater levels of control.

In the context of distributed energy resources, energy consumers could and should play a more active role in meeting supply and demand. Advanced metering can create opportunities for businesses to offer new products and services, and provide the means for consumers to make decisions on how they use energy.

AEMO notes that Western Power's \$318 million efficient recurring operating costs in 2016/17 comprised \$15 million at the connection initiation stage to develop annual load forecasts, explore emerging technologies, non-network solutions and to create new standards and policies for high level solutions to network issues. This expenditure highlights the significant role that new technology is expected to have in Western Australia's electricity system.

AEMO is conscious of the impact that the rapid adoption of battery storage systems, microgrids and advanced distributed generation systems will likely have on system security and supply reliability as the energy market transitions. So that customers may be afforded cost savings and greater choice, AEMO welcomes the opportunity to work with Western Power to resolve matters that are becoming increasingly critical to the effective and efficient operation of the network and market. This is likely to include revising or developing, and implementing:

- Measures to address the effect of non-synchronous generation on inertia, the rate of change of frequency and voltage control, to ensure the network and connected facilities are safely operated within their design parameters under system normal conditions and when events arise.
- Measures to address the retirement of fossil-fuelled generators, which will impact load flows and, as a consequence, transmission requirements. This may include addressing system strength issues that affect the protection of network elements designed or operated in ways that may no longer be relevant.
- Processes to deal with the uncertainty caused by new technologies such as electric vehicles, photovoltaic (PV) systems and battery storage systems in regard to forecasting peak demand.
- Ongoing enhancements to processes to support the collection and flow of data (static and real time) needed at the distribution level to improve planning and forecasting for system and network operations.

The information provided as part of Western Power's proposed plans and investment in AA4 does not specifically call out the four areas of concern highlighted above. As such, they are raised here. AEMO considers it critical that costs incurred by Western Power in addressing these four areas as part of delivering improved consumer outcomes can be recovered.

Constrained network – The transfer of the System Management function from Western Power has not obviated the need for Western Power in its role as the Network Operator to continue to work closely with System Management (a role for which AEMO took responsibility in July 2016). Collaboration between the two bodies remains crucial under the current network connection and market arrangements.

On 23 August 2017, the Minister for Energy reaffirmed the implementation of a constrained network access model for Western Power's electricity network in the South West Interconnected System. AEMO acknowledges that this change to the network connection model will impact Western Power's expenditure. For example, additional work will need to be undertaken to develop limit equations necessary to support constrained network design and inform the development of constraints for security-constrained market dispatch.

AEMO appreciates the importance of continuing to work closely with Western Power to ensure network connection is undertaken in a safe and secure manner in a constrained access environment. This may require a revision of the technical and data requirements for network access and facility performance.

Supplementary matters

AEMO supports Western Power's proposal to amend the current access arrangement in regard to supplementary matters defined in clause 5.27 of the Access Code. The amendments, which are proposed to be taken up for AA4, reflect that market-related functions previously undertaken by Western Power have been transferred to AEMO. Western Power will continue to fulfil its obligations as a Network Operator and Metering Data Agent.

Yours sincerely

Martin Maticka
Group Manager WA Markets

