



Our Ref: D20018091

Mr John Pierce  
Chairman  
AUSTRALIAN ENERGY MARKET COMMISSION  
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Dear Mr Pierce

**EPR0076 – SYSTEM STRENGTH INVESTIGATION DISCUSSION PAPER**

The Energy and Technical Regulation Division (the Division) of the Department for Energy and Mining welcomes the opportunity to comment on the Australian Energy Market Commission's (the Commission) *System Strength Investigation* discussion paper.

The Division supports the Commission's continued examination of how the frameworks for system strength are operating today, and how they can be developed further to ensure system strength is provided in the most timely and efficient manner to support the current and future power system. As has been shown in South Australia, power system patterns can change quickly, revealing deficiencies in existing frameworks. There is a clear need for regulatory and market frameworks to continue to evolve to support the de-carbonisation of the National Electricity Market (NEM), while ensuring a reliable, secure and affordable energy supply.

Better integration of system strength provision within these frameworks is an essential element of this work. We are now witnessing the emergence of system strength shortfalls in other parts of the mainland NEM, whereas this was an issue confined previously to South Australia and Tasmania. This highlights the pace of the transition and brings to life the declines in system strength forecast by the Australian Energy Market Operator (AEMO) in recent years through the National Transmission Network Development Plan and the Integrated System Plan (ISP).

The Division considers that the discussion paper sets out the main issues with the current minimum system strength and 'do no harm' frameworks and presents a logical approach for considering what a new framework could entail.

As a region, South Australia has experienced the decline in system strength translate into the need for frequent and sometimes prolonged duration market interventions to maintain system security for more than three years. AEMO has had to rely on directions to ensure a minimum number of synchronous generating units is online as well as constraints on wind generation output to maintain security in South Australia, despite the system strength gap being identified in 2016. This situation, which is expected to persist until the commissioning of synchronous condensers is complete, illustrates several of the challenges with the current framework, at least in its initial application: that it is reactive, and can be protracted and complex.

This period has been challenging for various stakeholders, not least South Australian consumers exposed to significant intervention costs but also AEMO as it manages the operational dimension. In

theory, these challenges should dissipate for South Australia once the system strength services are available to AEMO.

However, the Division is concerned that, in the period while these services are being procured to meet the minimum system strength requirements, the current frameworks are not operating to incentivise investment in the provision of any additional system strength. While the amount of time on direction has trended upwards over the period and has been the major focus, the curtailment of wind generation output has also been a feature. Since 2016, AEMO has worked constantly to refine the minimum generating unit combinations and thresholds for constraining down of wind output, allowing for many more permutations. Once the minimum system strength services are enabled, the need for directions may be alleviated but the curtailment of renewable energy may persist unless new contributions that bring system strength above the minimum level have been brought forward.

The Discussion Paper highlights various issues that are combining to create a higher hurdle for generators seeking to connect in weaker parts of the grid. These are manifest particularly in time delays and cost imposts associated with system strength remediation works. The Division considers that generators should contribute to the costs of system strength provision and, arguably, these hurdles are the correct outcomes of a framework that should be signalling to generation developers where to locate new projects.

Ensuring developers have access to reliable and detailed information about the prevailing system strength conditions and the cost implications of remediation works would assist to gauge feasibility of connecting non-synchronous generation at particular parts of the network.

The Division considers that timeframes and costs of connecting a generator at a certain location are not, in and of themselves, reasons for adjusting the 'do no harm' framework. To some extent, these are a consequence of choosing to locate in a certain area of the network. However, where these are being driven by investors having limited visibility during the planning and financing stages of the project, then this should be remedied. Given the complexity and intensive nature of the modelling required, there may be an opportunity to have this function more centralised rather than having all new entrants seek to replicate these highly specialised models. Improving the information and coordination to help investors make more informed investment decisions would be consistent with other initiatives being progressed.

The Division believes that generators, rather than consumers, need to contribute to system strength costs and that the 'do no harm' framework should provide the signal to locate in strong parts of the network. The discussion paper has set out issues that are being raised by stakeholders as to some potential challenges and complexities of the 'do no harm' framework. These need to be carefully evaluated to ascertain which can be sustained. As the paper notes, investment in non-synchronous generation has been strong, and AEMO continues to receive connection applications even in areas publicised as having system strength issues affecting connections, such as West Murray.

The more material issues relate to the inefficiency and increased operational complexity arising from individual, discrete remediation solutions being implemented. The prospect that the Transmission Network Service Provider may not be able to rely on the operation of generators' synchronous condenser is a concern, while the complexity of managing the interactions and enablement of many discrete solutions presents new challenges. The Division agrees the framework should ensure mitigation works can be located, tuned and maintained appropriately, and can be optimised for more than one connection to limit these challenges.

The Division agrees with the Commission's assessment that "the ideal cost recovery mechanism would provide locational signals to new connections while protecting consumers from inefficient expenditure". Consumers should not be asked to fund system strength works through transmission use of system charges, which would obscure the locational signal. More centralised planning and coordination of shared assets would be preferable in conjunction with a model that preserves the

obligation on generators to pay for their share of system strength required to facilitate their connection and operation.

The Division is concerned that any framework should properly account for the locational requirements of system strength and address the risk of market concentration issues. As the Energy Security Board has set out in its *System Services and Ahead Markets* paper, a system strength service is ill-suited to marginal pricing due to its inherent attributes of being locational and 'lumpy', while effective competition for system strength services may be limited at times. South Australia has experienced how the limited number of suppliers of regulation Frequency Control Ancillary Services translated into high prices when a local procurement requirement was applied. This type of outcome could be exaggerated in the context of system strength, where no new sources are being developed above the minimum levels.

South Australia supports the development of renewable energy zones (REZs) and the significant role that the ISP will play in transmission planning and investment in the NEM. It is important that the system strength frameworks and the ISP together facilitate the transition to a power system with the inevitable high levels of new non-synchronous generation. REZs should signal the need for transmission capacity and this infrastructure would logically need to be designed for a future power system that does not rely on synchronous generation to meet all system security needs. Furthermore, in the context of REZs, the individual remediation obligation seems particularly ill-suited when compared with a coordinated, shared contribution to system strength solutions.

The pace and scale of change that is underway indicates that declines in system strength will continue to spread to more areas of the NEM. The outlook, for a large portion of the current synchronous generation capacity to exit by the 2040s, replaced overwhelmingly by inverter-connected renewable generation, confirms this trend will persist as the new 'normal'. The Division encourages the Commission to continue its work to improve the locational signals for new generation connections and ensure the system strength frameworks are suited for the current and future generation fleet of diverse technologies and capabilities.

If you have any further queries, please contact Sally Gartelmann on 08 8429 3296.

Yours sincerely



Vince Duffy

**EXECUTIVE DIRECTOR, ENERGY AND TECHNICAL REGULATION DIVISION**

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