13 August 2020

Mr James Hyatt
Project Leader
Australian Energy Market Commission

Submitted via website. www.aemc.gov.au/contact-us/lodge-submission

Dear Mr Hyatt

Stanwell response to System service rule changes (ERC0290) consultation paper

Stanwell Corporation Limited (Stanwell) welcomes the opportunity to provide feedback on the Australian Energy Market Commission (AEMC) system service rule change consultation paper.

This submission contains the views of Stanwell in relation to the system services rule changes information provided to date and should not be construed as being indicative or representative of Queensland Government policy.

The AEMC consultation pack amalgamates a number of participant-submitted rule changes relating to system services. Stanwell supports the consideration of the various proposals as a package as there is a significant risk that the efficient solution for one element contradicts the efficient solution for other elements, potentially increasing costs overall.

While Stanwell is supportive of potential improvements being considered, we believe that the problem definition aspect of the rule changes has not been adequately addressed.

We acknowledge that the Energy Security Board (ESB) has been undertaking a review of the market design for a number of years and our view is that any considerations for new or evolved markets must complement that review, given the implementation lead time and cost. We anticipate that proper and considered problem definition will provide a fundamental basis for the ESB's recommendation.

As a result, we consider that the information gained through this consultation should be considered in the ESB's post-2025 market design process, rather than being seen as an actionable rule change(s). This may involve expanding the ESB workstreams to include Fast Frequency Response (FFR) and Primary Frequency Response (PFR) which do not appear to fit within the current ESB framework. A possible exception to this approach is the Transgrid rule change which alters an existing arrangement rather than creating a new one, and Stanwell's view is work on this proposal should proceed separately from the ESB work program.

Stanwell considers it fundamental that a suite of complementary services is defined and consistently valued (even if that value is at times low or even negligible). The continued provision of uncompensated system services by a decreasing proportion of the market is not sustainable, as observed by increasing out-of-market interventions[1].

1 Reliability Panel, 2019 Annual Market Performance Review, Final report, 12 March 2020, p. 147.

Our submission has been made in two parts. The first provides our perspective on system services, the evolution of the definition and the system service objective. The second part at Attachment A addresses the individual rule changes.

1. Overview of System Service

The Renewable Impact Study (RIS)[2] and the 2020 Integrated System Plan (ISP)[3] identify current and forecast inertia and system strength shortfalls across the NEM. In addition to the publicised issues in South Australia and western Victoria, shortfalls of system services are currently being observed and forecast in North Queensland. Due to the sizeable number of variable renewable energy (VRE) connections made in a part of the North Queensland network that has poor system strength, the risks of grid performance and operational stability issues in that area are rising.

The ability of North Queensland to access system services from existing generation based in central and southern Queensland has been a mitigating factor until recently. However, we are now seeing invoked network constraints hobbling North Queensland VRE generation when synchronous generators as far south as Gladstone and Callide, are offline.

As a major provider of electricity to Queensland, Stanwell provides reliable electricity through the dispatch of our synchronous generators. The energy and associated system services that our generators provide to the market will remain important as the energy industry transitions to a lower carbon future. Without market mechanisms that explicitly value all system services, market participants are unable to take into account the value of the provision of these services, and the importance of them to the broader market, when making operational and capital planning decisions. Effectively, a synchronous generator is only able to make operational and capital decisions, including retirement based on the energy price. This is despite the importance, and therefore implied value of the other system services provided to the network and system operators.

Economic fundamentals of the energy market have changed significantly over the last years requiring all participants (synchronous and asynchronous) to re-evaluate capital and operational decisions including financial contracting, maintenance cycles, fuel contracts and dispatch profiles in the spot market intra-day and on a long-term basis. Stanwell is concerned that the provision of system services has been assumed as being continuously and freely available at historical volumes until the retirement date of generators.

The continued uncompensated provision of system services is not sustainable. In order to operate the energy grid effectively and efficiently technology neutral market mechanisms must be developed for these services so they can be planned, priced, procured and paid for.

Stanwell acknowledges that the AEMC is working closely with the Energy Security Board (ESB) and other market bodies on these rule change requests, particularly as they "are interdependent"[4] with the post-2025 design initiative.

The rule changes related to operational reserve (ERC0295), commitment of capacity (ERC0306) and ramping services (ERC0307) are particularly heavily linked to Scheduling and Ahead Markets, and the rule change related to synchronous market services

[2] AEMO, Renewable Impact Study, pp 29.
[3] AEMO, 2020 Integrated System Plan, Appendix 7, pp 16.
[4] AEMC, Consultation Paper System Service Rule Changes, page ii.

(ERC0290) has considerable overlap with the ESB's Essential System Services work. Given the significant overlap in focus and timelines, Stanwell recommends that these rule changes should be integrated with these ESB workstreams as indicated in the table below, rather than continue to be progressed as separate rule changes.

If it was the intention of the AEMC to consult on PFR Incentive Arrangements Rule Change through the system services consultation pack, it has not been adequately addressed. Stanwell recognises that PFR is a valuable contributor to maintaining a secure and reliable power system and considers that the ESB's post-2025 market design scope should be expanded to include both FFR and PFR to ensure resources across market bodies and market participants are not wasted on divergent or interim solutions.

As the Transgrid rule change alters an existing arrangement rather than creating a new one, Stanwell's view is work on this proposal should proceed separately from the ESB work program.

System services rule change	Stanwell's recommendation
Operating market reserve (ERC0295)	ESB's Scheduling and Ahead Markets
Capacity commitment mechanism (ERC0306)	ESB's Scheduling and Ahead Markets
Ramping services (ERC0307)	ESB's Scheduling and Ahead Markets
Synchronous services markets (ERC0290)	ESB's Essential System Services
Fast Frequency Response (ERC0296)	ESB's Scheduling and Ahead Markets
Efficient management of system strength (ERC0300)	Progressed individually

2. *Evolving the regulatory definition of system strength*

Stanwell agrees with the AEMC that ambiguity exists about the term "system strength" and that the definition needs to be evolved further.

The 2020 ISP defines system strength as a "measure of the ability of a power system to maintain and control the voltage waveform under normal conditions and to return to a steady state condition following a system disturbance"[5]. Transgrid considers a broader definition; "system strength is a term used to describe a number of factors that together contribute to power system stability, particularly as it relates to the control of voltage"[6]. The AEMC consultation paper (under ERC0290) notes "these synchronous services include inertia, voltage control and fault level (system strength)"[7].

Stanwell notes that ambiguity also exists as to what is considered a system service. Figure 1 below produced by AEMO identifies multiple services, ERC0306[8] considers *high ramping capability as a system service* which is stated as being broadly in line with the ESB's identification of Essential System Services[9].

[5] AEMO, 2020 Integrated System Plan, Appendix 7, page 16.
[6] ERC0300, Efficient Management of system strength on the power system. Transgrid, page 5.
[7] AEMC, Consultation Paper System Service Rule Changes, page 41.
[8] ERC0306, Rule Change Request - Capacity Commitment Mechanism for Operational Reserve and Other System Security Services. Delta Electricity, page 4.
[9] ESB, System Services and Ahead Markets paper, page 3.

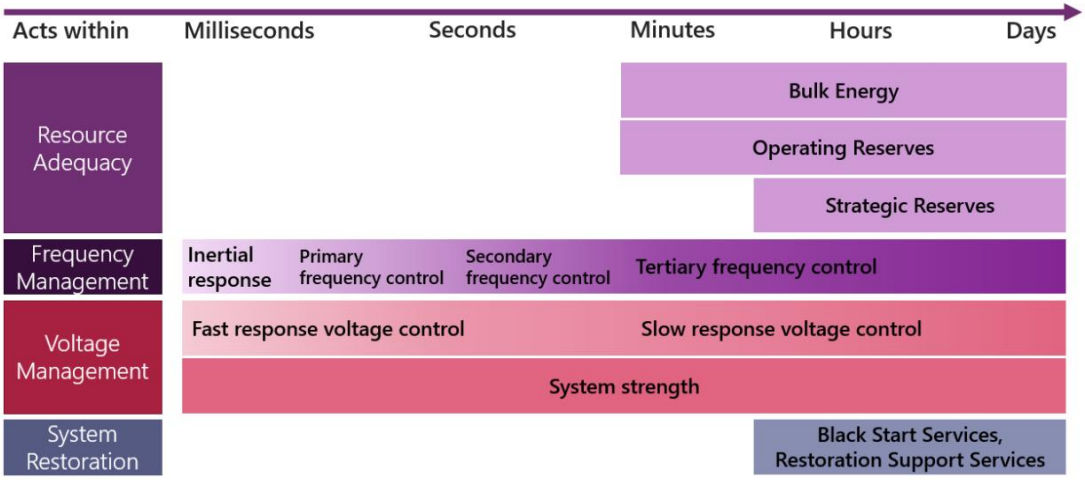

Figure 1 Operation timescales for essential system services, Source: AEMO, Power System Requirements.

Stanwell strongly recommends that the AEMC and ESB continue to work with industry to clarify what is and is not considered a system service and develop a comprehensive system strength definition.

3. *System Service Objectives*

Stanwell does not support the development of an *additional* objective that must be met in order to assess implications of rule changes within the National Energy Objective (NEO)[10]. We recommend developing specific and measurable criteria that system service solutions must meet. For example, development of a (1) transparent, (2) technology neutral mechanism whereby the systems services are (3) valued fairly and (4) accessible when and where needed.

Stanwell considers that the AEMC's current role "to establish market frameworks that allow the most cost-effective technologies to be deployed to minimise costs to consumers, while maintaining the reliability and security of the NEM power system"[11], in addition to specific and measurable criteria will be sufficient without the development of an additional objective.

4. *Conclusion*

All system services are valuable as they are essential for the continued operation of our energy network, and recognising these services is becoming even more vital as the NEM transitions from a synchronous, dispatchable past to an inverter-connected low carbon future. The continued provision of uncompensated system services by a decreasing proportion of the market is not sustainable, and a transparent and technology neutral market mechanism(s) must be implemented to ensure their continued provision at least cost to consumers. Stanwell considers it fundamental that a suite of complementary services is defined and valued at all times, even when demand for these services is low.

[10] To promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity with respect to: price, quality, safety and reliability and security of supply of electricity, and the reliability, safety and security of the national electricity system.
[11] AEMC, System Services Rule Changes Consultation Paper, page 23.

Stanwell recommends that the rule changes related to operational reserve, commitment of capacity, ramping services, fast frequency response and synchronous market services be integrated into existing ESB workstreams rather than continue to be progressed as separate rule changes. The remaining proposed rule change relating to efficient management of system strength should progress individually.

Appendix A identifies aspects of the individual rule change proposals that raise concerns or have merit in being investigated further by the AEMC.

Stanwell appreciates the work that has been conducted to date and looks forward to continuing to engage with market bodies in order find the most efficient and effective system services solutions.

Stanwell welcomes the opportunity to further discuss this submission. Please contact Jennifer Nielsen on (07) 3228 4155.

Yours sincerely

Ian Chapman
Manager Market Policy and Regulatory Strategy

Appendix A: Stanwell's evaluation of the individual proposed rule changes

Stanwell's evaluation of the rule changes detailed in the consultation paper are provided below. Unless stated otherwise, these views should not be construed as implicit support for the proposed rule changes.

The table below reiterates Stanwell's recommendation of how these rule changes should progress.

System services rule change	Stanwell's recommendation
Operating market reserve (ERC0295)	ESB's Scheduling and Ahead Markets
Capacity commitment mechanism (ERC0306)	ESB's Scheduling and Ahead Markets
Ramping services (ERC0307)	ESB's Scheduling and Ahead Markets
Synchronous services markets (ERC0290)	ESB's Essential System Services
Fast Frequency Response (ERC0296)	ESB's Scheduling and Ahead Markets
Efficient management of system strength (ERC0300)	Progressed individually

Efficient management of system strength on the power system (ERC0300 - TransGrid)

Transmission network service providers (TNSPs) play an extremely important role in the management of system services and network operation and Stanwell believes that TNSPs could have a greater role in the provision of these services.

Stanwell supports elements of the proposal that are aimed at enhancing existing planning processes such as:

- Requiring AEMO to identify system strength nodes in each region of the power system, taking into account the forecast entry and exit of generation on the power system, and set a minimum fault level for each node;
- Providing for an independent body (such as the Reliability Panel) to define a fault level standard for the NEM, a probabilistic standard requiring the fault level at the relevant node to be maintained above the minimum fault level for most of the time; and,
- Requiring TNSPs to plan and operate their networks to meet the fault level standard, taking into account recent dispatch patterns of current generation, in conjunction with exit and entry of generation within the 42 month statutory notice of closure period.

Within the current market design, Stanwell is concerned about the removal of the 'do no harm' provision, as it is one of the few locational signals available to potential project proponents. As per the Managing Power System Fault Levels Final Determination, the intention of the 'do no harm' provision was to "incentivise new connecting generators to be able to operate at lower levels of system strength and to connect to the network where there is sufficient system strength. As a result, new connecting generators will be able to consider the costs of remediating adverse system strength impacts when making investment decisions".[12] AEMO has also noted that the requirement for new generators to manage the impact of their connection on existing users "provides a strong locational signal for new generators to connect to stronger parts of the network".[13]

[12] AEMC, Rule Determination, National Electricity Amendment (Managing power system fault levels) Rule 2017, page iv

[13] AEMO, Submission to Managing Power System Fault Levels draft determination, page 7.

Outside of AEMO's Marginal Loss Factor analysis for new projects, the 'do no harm' provision is the only pre-commissioning locational signal that disincentivises deployment of large-scale generation in weakly connected areas of the network. Rather than removing this important locational signal within the current market design, 'do no harm' should be retained and supported with additional locational signals. In our submission to the Coordination of Generation and Transmission Infrastructure discussion paper, Stanwell suggested that "NEMDE already produces information about local congestion from which a locational price could be derived. This local congestion information could and should be published [now], providing an immediate signal to potential projects".[14]

'Do no harm' also ensures that new projects are solely responsible for the costs associated with maintaining system strength at the relevant connection point and neighbouring network upon their connection. Removing 'do no harm' means new projects would no longer be responsible for the entirety of these costs, diluting the locational signals and increasing costs to market participants who have not adversely affected system strength.

Furthermore, Stanwell is concerned that forced renegotiation of generator performance standards (GPS) could have significant implications for the long-term strategies and operational decisions of existing participants. There is a significant risk that the renegotiation of GPS could place generators into a position of non-compliance with regulation. For example, forcing technological upgrades may place participants in a position whereby it is more commercial to permanently withdraw from the market. Renegotiation of GPS may also adversely affect participants existing contracts (e.g. hedging, fuel). Stanwell supports voluntary renegotiation of GPS with appropriate compensation for any harm stemming from any resulting changes to the GPS.

Fast Frequency Response market ancillary service (ERC0296 – Infigen Energy)

Stanwell considers there is merit in developing a fast frequency response (FFR) market that includes inertia within the current FCAS market framework.

In 2017, AEMO identified that new services are likely to be needed that would complement existing mechanisms and that fast frequency response (FFR) could provide an efficient way to assist in the management of power system security by delivering faster frequency control and lower cost and reducing constraints imposed by risk of high rates of change of frequency[15]. AEMO also noted that it was useful to view FFR as a complement for inertia. "Inertia from synchronous units provides an inherent response to slow the RoCoF but cannot act to restore power system frequency. FFR can inject active power to correct the imbalance and restore system frequency but does not inherently slow RoCoF in the same manner". At the time of the paper, AEMO noted that simulated inertia (illustrated in **Error! Reference source not found.**) was not commercially available to the market.[16] However, today both natural (from synchronous generators) and simulated (from asynchronous generators) inertia is available.

[14] Stanwell, Submission to Coordination of Generation and Transmission Infrastructure discussion paper, page 5.
[15] AEMO, Fast Frequency Response Working Paper 2017, page 3.
[16] AEMO, Fast Frequency Response Working Paper 2017, page 31.

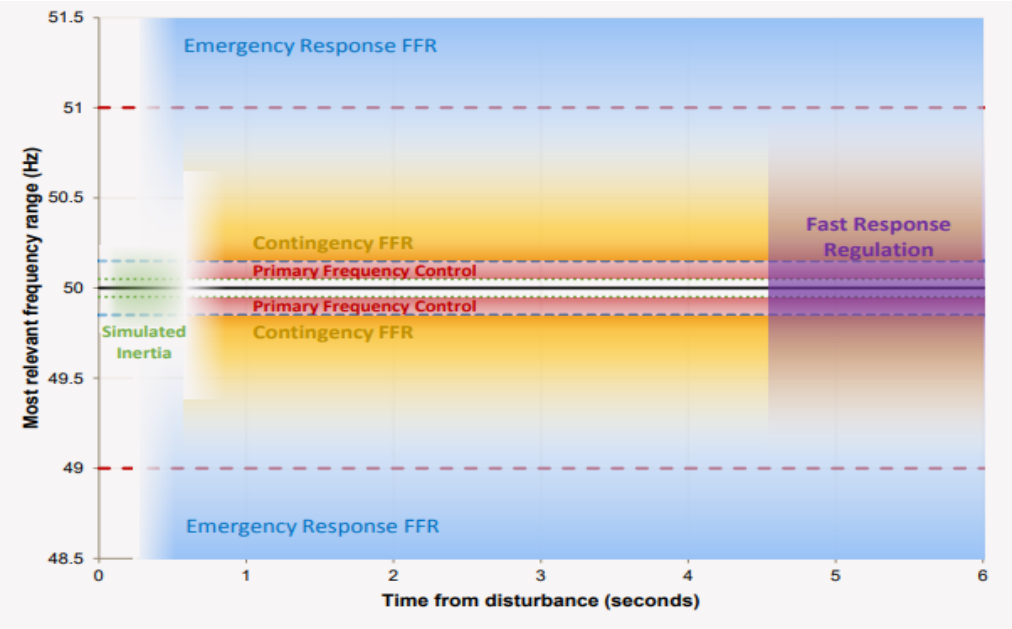

Figure 2 Mapping of FFR service. Source: AEMO.

As it stands, section 3.3, 3.4, 4.3 and 4.4 of the FCAS Market Ancillary Services Specification (MASS) explicitly excludes inertial response from being rewarded by the existing fast service mechanism.[17] This premise may have been made given the type of technology assumed to be available at the time, or under the incorrect assumption that most if not all generators would be synchronous, and synchronous generators will continue to operate as they have done in the past. Stanwell suggests that in the absence of mechanisms for the provision of inertia, the services procured in an FFR market should include inertial response. This would increase the number of sources for fast response (potentially lowering costs to consumers) and partially offset losses in the wholesale market when the regional reference price is lower than synchronous generators' short-run marginal costs.

Noting that the mandatory PFR mechanism includes a sunset clause dated, 4 June 2023, Stanwell suggests solutions that address fast frequency response should be considered through the ESB post-2025 work stream.

Introduction of ramping services (ERC0307 – Delta Electricity)

Stanwell acknowledges that the Rate of Change (ROC) is increasing together with VRE but considers that energy prices are currently providing the right incentives, and disincentives to participants about when and when not to ramp up or down. The current incentives are also sufficient in highlighting where investment in new technological capabilities should and should not be placed.

It is unclear from the proposed rule change how valuable ramping will be distinguished from non-valuable ramping. For instance, will existing participants receive extra payment for ramping up and down in response to high or low energy prices, or solar generators receive a payment in addition to the energy price for ramping up when the sun rises?

In addition to the above points, there is insufficient analysis in the proposal and consultation as to why high-speed ramping services would be considered as a system service. However, Stanwell acknowledges that the provision of "additional" ramping could be valuable for the market operator and recommends that ramping services be examined as part of the ESB's Scheduling and Ahead Markets workstream.

[17] AEMO, Market Ancillary Service Specifications, July 2020, page 13.

Hydro Tasmania* — Synchronous services markets *(ERC0290 – Hydro Tasmania)

Stanwell acknowledges Hydro Tasmania for aiming to address multiple system service challenges and recommending a solution that could, at face value, integrate easily within pre-dispatch and dispatch of existing Energy and FCAS markets and reduce AEMO's interventions in the market via system security directions.

However, Stanwell is concerned the proposed market mechanism would see Synchronous Services Generator (SSG) dispatched for the benefit the market, but only units that were not online in the preceding dispatch interval would receive payment for those services. Stanwell's specific concerns are:

- Not valuing all SSG: The proposed mechanism does not compensate all SSG, only the "additional" SSG provided by a unit that was not online in the previous dispatch interval. If SSG is being dispatched for the benefit of the market, providers should be compensated regardless of the unit's status in the preceding dispatch interval.
- SSG 'on-off' oscillations: The stipulation that only units offline in the previous dispatch interval would be compensated does not incentivise the continued provision of SSG. The proposed mechanism could create SSG 'on-off' oscillations, potentially increasing volatility. After a plant(s) has been dispatched for the provision of system services (possibly for one dispatch interval) it may actively withdraw from the market, or be dispatched down, after that dispatch interval as it may no longer be receiving payment for those services. Therefore, the on-off oscillations may exacerbate system services challenges that the proposed rule change is purported to address.
- Perverse incentives: Beyond the on-off oscillations, there is the potential that the proposed system market design would affect the short (i.e. daily) and long-term operational decisions of both generators providing SSG and consumers. Further analysis is required to determine whether it would incentivize changes in behaviour, what changes in behaviour were incentivised and whether there is a net benefit stemming from these changes.

Stanwell considers that this proposal could be improved by removing the requirement that units must be offline to participate. Stanwell contends that all system services are valuable and that by broadening this market to compensate all dispatched SSG, it would establish a path for existing SSG and provide the incentives for new and existing participants to identify innovative ways to install synchronous technology.

Operating reserves market (ERC0295 – Infigen Energy) *and*
Capacity commitment mechanism for system security and reliability services (ERC0306 – Delta Electricity)

The operating reserve market and capacity commitment mechanism are heavily linked to the Scheduling & Ahead Market and the Essential System Services initiatives being undertaken by the ESB. As noted previously, Stanwell recommends that outcomes from this consultation be integrated with these ESB initiatives rather than continue to progress them as separate rule changes.

Stanwell would like to emphasise that the introduction of day ahead, hourly, trading interval or dispatch interval reserve markets (operational or commitment) would not change a generator's long-term decision of whether to withdraw or decommit from the market. Compensation for system services will need to consider losses across low-priced periods and for maintenance programs that are brought forward to meet reserve requirements. When reserve concepts are progressed by the various market bodies, the investment and operational timeframes that existing dispatchable synchronous generators need to make these decisions should be considered through long-term contractual mechanisms.