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Attn: Dora Guzeleva
Director, Wholesale Markets
Energy Policy WA
Level 1, 66 St Georges Terrace
Perth WA 6000

By email: energymarkets@deed.wa.gov.au

Dear Ms Guzeleva,

Power System Security and Reliability Standards Review – Consultation Paper

Thank you for the opportunity to comment on Energy Policy WA's Consultation Paper on the Power System Security and Reliability (**PSSR**) Standards Review released on 19 June 2025.

APA appreciates the work undertaken to date to consolidate and update the PSSR frameworks and technical standards applicable to the South West Interconnected System (**SWIS**) in Western Australia.

APA supports the proposed changes to clarify and streamline user categories, as well as the efforts to define performance standards for new and emerging technologies. We also welcome the adoption of the proposed Western Power Technical Rule changes from the September 2023 submission.

APA suggests further work and assessment is required to ensure that measures adopted from the National Electricity Market (NEM), such as Short Circuit Ratio (**SCR**) standards, are suitable in a SWIS context. Further, APA recommends that consideration be given to how the proposed network planning standards will support the development of new transmission infrastructure required to connect generation while balancing both cost and power system security objectives.

The attachment to this letter provides APA's response to each of the proposals put forward by Energy Policy WA.

Should you have any questions or wish to discuss our submission please contact me on [redacted] or [redacted]

Yours sincerely,

Lizzie O'Brien
Senior Regulatory Manager
Strategy and Corporate Development

Network planning standards for PSSR

Energy Policy WA proposal	APA response
Proposal 1 The planning standard for the Network Operator to include both customer outcome standards and deterministic standards such that: – The customer outcome standards be implemented as obligatory standards in the ESM Rules, with effective incentive mechanisms determined as part of the access arrangement process, and the deterministic standards be included to continue to provide guidance to the network design process. – The customer outcome standards to be set on a locational basis. – Specific measures for customer outcome standards will be consulted on a later date. – The customer outcome standards will be reviewed by government on a regular basis (3-5 yearly).	APA supports the proposal to continue using both customer outcome standards and deterministic planning standards for the network operator. However, further information is needed to understand the rationale for removing the network operator's ability to deviate from these standards. While such a change may enhance transparency and clarity, it risks being short-sighted given the scale and long-term nature of network investments, as well as the evolving nature of power system development. APA's experience with Renewable Energy Zones in the NEM suggests that a degree of flexibility in transmission planning—such as the rationalisation of requirements to efficiently connect renewable hubs—may be necessary. In some cases, mechanisms like runback schemes may also be required to maintain power system security. APA would also welcome further detail on how the costs associated with the proposed planning standards will interact with non-reference service connections that do not include firm access.

User Facility Standards Framework

Energy Policy WA proposal	APA response
Proposal 2 – User categorisation framework A revised facility categorisation framework will be implemented in the ESM Rules, comprising of: – Large User Technical Standards: (Energy Producing Systems (incl. Electric Storage Resources (ESR)) >10MVA, Synchronous Condensers); – Medium User Technical Standards (Energy Producing Systems (incl. ESR) ≤10MVA); – Loads (other than stand-alone ESR); and – Small User Technical Standards (equipment connected to the low voltage network).	APA supports the adoption of the proposed User categorisation, which represents a more customer focused, practical and cost-effective solution.
Proposal 3 – Application of standards to each category of users The Ideal Generator Performance Standard will be renamed the "Automatic User Performance Standard". The Common Requirements for all users will be based on the section 3.2 of the 2023 proposed Technical Rules. The following user facility standards will apply to each category of user: – **Large User Facility Standards:** Current ESM Rules Appendix 12 standards will apply (subject to proposals 6-11), with a framework to negotiate between Automatic User Performance Standards and Minimum User Performance Standards, as per the current Chapter 3A and Appendix 12 negotiation framework; – **Medium User Facility Standards:** Common Requirements and Minimum User Performance Standards (as per the 2023 proposed Technical Rules) would apply with no ability to negotiate; – **Loads:** requirements aligned with section 3.4 of the 2023 proposed Technical Rules would apply with no ability to negotiate; and – **Small User Facility Standards:** requirements aligned with sections 3.7 and 3.8 of the 2023 proposed Technical Rules will apply.	APA supports this proposal. The technical requirements, commercial feasibility and benefits of technical oversight differ broadly across and inline with these categories.

Energy Policy WA proposal	APA response
Proposal 4 – Point of compliance with user facility standards and hybrid facilities The Network Operator will be required to document in a WEM Procedure, in accordance with principles set out in the ESM Rules, the circumstances in which compliance at a point other than the Connection Point will be required. Compliance will only be permitted to be assessed at either the Connection point(s) or the alternative point(s) for facility i.e. not at both. Hybrid facilities that have the control and protection systems in place at all times to ensure their operation will not have a PSSR impact on the rest of the system will be treated as loads under the new User Facility Standards categorisation framework.	APA supports the proposed change to enable compliance to be assessed at points other than the Connection Point and for this process to be clearly documented. This concept is particularly practical in scenarios where assessing performance at the Connection Point is challenging - such as in hybrid generating systems comprising both wind and solar farms that each have their own technological limitations.

Proposal 5 – Governance of the user facility standards framework
 	
The existing governance framework will remain primarily the same, some modifications will be made to:
 	
– ensure guidance on which facilities ≥10MVA are captured by the Large User Technical Standards framework;
– ensure AEMO is consulted on the Performance Standards for such facilities in the way it is currently consulted under Chapter 3A of the ESM Rules for Transmission Connected Generating Systems;
– require AEMO to engage directly with proponents to resolve issues if the Network Operator agrees to a negotiated position but AEMO does not and the Network Operator requests that AEMO do so; and
– expand the number of facilities who are required to have a monitoring plan registered with AEMO to include facilities that:
  ○ are not currently captured by the ESM Rules GPS framework; and
  ○ will be captured by the Large User Technical Standards under the revised framework.
 	
For future connections, where connection standards are negotiated between participants and the Network Operator, these negotiated standards will be made public.
	APA supports the proposed change to treat facilities ≥10MVA consistently, regardless of if these are distribution or transmission connected, where the potential effect on the power system is the same. There the facilities are distribution connected and the net effect on the power system is limited by the network connection arrangements to <10MVA, these facilities should not be captured by default and should be considered under a point of compliance approach (as per proposal 4).
	
	APA supports a requirement for AEMO to engage directly with proponents to resolve issues. The network operator, AEMO and proponents' technical personal should be able to discuss the connection arrangements collectively to resolve matters promptly and with a shared understanding. The circumstances under which AEMO engages should not be limited to those outlined in the proposal. To further bolster this arrangement, a formal escalation and dispute resolution pathway should be provided where the network operate agrees a position, but AEMO does not agree.
	
	APA does **not** support negotiated connection standards being public. Publication of these negotiated connection standards – including the performance standards – is unlikely to promote the State Electricity Objective and risks exposing commercial and market sensitive arrangements.

Suitability of Technical Requirements (connection standards) for new technologies

Energy Policy WA proposal	APA response
Proposal 6 – Withstand Short Circuit Ratio (SCR) Include the following in the ESM Rules with regard to withstand SCR – A Minimum User Performance Standard for withstand SCR of 2.0 (grid-forming IBR) and 3.0 (grid-following IBR) – An Automatic User Performance Standard for withstand SCR of 1.2 for grid-forming IBR. No Automatic User Performance Standard for grid-following inverters. – A provision for grid-following inverters that allows for a facility that is not capable of meeting the Minimum User Performance Standard to connect if there are legally binding commitments to make additional investment in the facility or for the supply to it of services to remedy, at the proponent's cost, the shortfall in capability, either on connection or in agreed circumstances, together with operational arrangements agreed with the Network Operator that apply when the investment or services have not yet been made or are not available. – A requirement that settings used must not be different to the setting required for compliance with other Technical Requirements unless otherwise agreed with AEMO and the Network Operator. – Clarification that continuous uninterrupted operation is not required when the SCR falls below the withstand SCR.	APA generally supports the inclusion of SCR requirements. However, we recommend an assessment be undertaken for the SWIS to better inform the SCR requirements for both grid-following and grid-forming IBR. Both technologies have inherent limitations in their ability to operate under or withstand certain SCR conditions. The proposed SCRs, which are based on the NEM requirements, may not be achievable in a SWIS context due to the smaller size of the power system and the system demand functions. For existing generators, tuning or upgrading IBRs to comply with proposed SCR thresholds could impose a significant financial burden in the SWIS context. In some cases, it may not be commercially or technically feasible to meet these requirements. These constraints should be explicitly acknowledged and addressed in the proposal to avoid placing unnecessary or unrealistic compliance obligations on existing generating units.
Proposal 7 – Voltage phase angle jump Require: – Grid-following inverters to withstand an angle jump of less than 25 degrees. – A Minimum User Performance Standard for grid-forming inverters to withstand an angle jump of less than 60 degrees and supress the phase angle jump with a response time of 20ms or lower. – All inverter-based Generating Systems and each of their Asynchronous Generating Units to remain in operation for any change in the phase angle of individual phases caused by occurrence and clearance of balanced and	APA recommends a voltage phase angle jump assessment be undertaken to determine the withstand capabilities of both grid-following and grid-forming IBR technologies within the SWIS region. This investigation is required to determine whether a uniform standard can be applied across the network or if a location-specific approach is more appropriate. Additionally, an assessment should be carried out to evaluate the potential impact on existing plant performance, protection scheme operation, and the broader system's ability to withstand such events.

Energy Policy WA proposal	APA response
unbalanced faults, provided that the positive sequence angle change does not exceed the Minimum User Performance Standard.	The proposal should also provide clear guidance for existing generating units, as applying these requirements retrospectively may introduce commercial and technical challenges. Clear differentiation between new and existing facilities would help ensure that existing assets are not subject to infeasible compliance expectations.
Proposal 8 – Active and reactive current response during and after contingencies – **Introduce new definitions for:** • Sustainment Time; • Adequately Controlled; and • Commencement Time – **Behaviour at current limitation:** Specify the behaviour of grid-forming IBR when operating above its maximum continuous current. – **Injection ratio:** Revise Minimum User Performance Standard for IBR from 2% to 0%. – **Speed of response:** Amend clauses A12.9.2.7 and A12.9.3.7 to remove the term 'Settling Time' and replace with 'Commencement Time' and specify new values for Commencement Time and Rise Time in each clause. – **Total current:** replace the current term 'reactive current' in clause A12.9.1.6(a) and introduce a new requirement on 'total current' contribution for both grid-following and grid-forming IBR. – **Negative Sequence Current Control:** Remove sub-clause A12.9.1.6(c) and add new criteria to the Minimum and Automatic User Performance Standards requiring grid-following and grid-forming IBR to inject negative sequence current during unbalanced faults leading the negative sequence voltage by at least 90° and specify prioritisation between positive and negative sequence currents during faults. – **Frequency of current injection:** Amend clause A12.9.1.6 to add a new requirement under the Minimum and Automatic Performance Standards requiring that, during the fault, injection of active and reactive current from the Generating System and each of its Asynchronous Generating Units must have a fundamental frequency component same as the fundamental frequency of the terminal voltage.	APA considers it beneficial to incorporate clear technical specifications that define expected performance levels for both grid-following and grid-forming technologies. At this time, it is premature for APA to comment on this level of technical detail including the proposed definitions as it there is an ongoing interaction between the technical requirements and what OEMs can and will provide on the market that could meet these requirements.

Energy Policy WA proposal	APA response
– **Fault ride through activation threshold** The objective of the revised Technical Requirements for active and reactive current is to: • ensure that sufficient reactive current injection/absorption can be provided during contingency events (faults) commensurate with system needs at the specific Connection Point to aid system voltage recovery; and • to ensure a fast recovery of active current/power following disturbance clearance. • Amend clauses A12.9.2.5 (Automatic User Performance Standard) and A12.9.3.5 (Minimum User Performance Standard) to use voltage activation thresholds of 85% and 115% for Automatic User Performance Standard as opposed to 80% and 120% for the Minimum User Performance Standards. • Amend clauses A12.9.2.5 and A12.9.3.5 to replace the term 'voltage at the Connection Point' with 'positive sequence voltage at the Connection Point'. – **Long duration faults** • Amend clause A12.9.3.7 to lower the fault duration for which the response must be sustained and held near constant from 2 seconds to 450 ms. • Replace the term 'adequately damped' with 'adequately controlled' in clauses A12.9.3.7 and A12.9.3.8. – **Active Current Response During and After Contingencies** • Replace the term '' after clearance of the fault'' with '' after the end of the disturbance'' in subclauses A12.9.2.5(b) and A12.9.3.5(b) for both grid-following and grid-forming inverters. • Amend subclause A12.9.2.5(b) for grid-forming inverters to specify a different level of active power that must be supplied to or absorbed from the network from 100 ms after the end of the disturbance (see consultation questions below). – **Oppose fast changes in voltage magnitude:** Amend clause A12.9.2.5(a) for grid-forming IBR to add a requirement for equipment covered in that clause to be capable of reducing the sensitivity of voltage magnitude to a given change in current within 20ms after the disturbance, as compared to when the facility was not connected.	

Energy Policy WA proposal	APA response
Proposal 9 – Disturbance ride through for multiple disturbances Amend the following clauses as follows to improve clarity on disturbance ride through for multiple disturbances as follows: – Amend clause A12.9.1.4 to include a definition of when individual deviations end for use in assessing multiple disturbances. – Amend clauses A12.9.2.3 and A12.9.3.3 (the Automatic and Minimum User Performance Standards) to provide more clarity on the circumstances in which a facility must remain in continuous uninterrupted operation; – Introduce a new clause A12.9.4.2, that allows for a negotiated Performance Standard to include the required response of a Generating System for each combination of power system disturbances or conditions specified in Appendix 12 (which should be as close to continuous uninterrupted operation as is reasonably practicable); and – Add a definition for 'end of the disturbance'.	APA supports this proposal. A clear definition of continuous uninterrupted operation is essential, taking into account plant capabilities and technological limitations. It should be explicitly stated under which circumstances a generating unit or generating system is required to remain in continuous uninterrupted operation.
Proposal 10 – Damping of power system oscillations With regard to grid-forming inverters, add a new clause A12.4.3.8 which states that the Minimum User Performance Standard is as follows: The Generating System must have Equipment capabilities and Control Systems, including, if necessary, a power system stabiliser, sufficient to ensure that: – operation of the Generating System does not degrade the damping of power system oscillations; and – operation of the Generating System does not cause instability or poorly damped oscillations that would adversely impact the SWIS power system or other Equipment connected to the SWIS. AEMO and the Network Operator will specify a frequency range of oscillations consistent with the bandwidth of control systems for which the above requirements will apply. An upper frequency limit of 300 Hz will be applied unless sufficient evidence is provided to AEMO and the Network Operator regarding the actual bandwidth of the converter control.	APA supports this proposal. IBRs often interact with one another and can reduce the damping of power system oscillations. This issue becomes increasingly important in regions with high penetration of renewable energy sources and a mix of different IBR technologies.

Energy Policy WA proposal	APA response
Proposal 11 - Partial load rejection Adopt changes to the definition of continuous uninterrupted operation and clause A12.6.1.5 to recognise potential beneficial responses, such as active power response opposing phase angle jumps and primary frequency response, including inertial response opposing frequency changes.	APA supports this proposal. The requirements for IBRs should be clearly distinguished and explicitly defined within the partial load rejection section.
Proposal 12 – Revised system strength definition The following definition of system strength will be implemented in the ESM Rules: System Strength: Relates to the ability of the power system to resist changes to the voltage waveform in a particular location, both during steady state operation and following a disturbance, including, but not limited to, a sudden change in a Load or an Energy Producing System, the switching of a Network element, tapping of transformers and faults.	APA supports this proposal. In this case, consistency in the definition across markets, along with the recognition of locational considerations, should help provide greater clarity.
Proposal 13 – A future fleet outlook for use in fault level assessments AEMO, EPWA and the Network Operator to align on a forecasting approach, in consultation with interested stakeholders through public consultation. This approach should include the methodology, inputs, assumptions, and scenarios necessary for the determination of an expected 10-year generation and ESR capacity outlook on an annual basis. This fleet mix should reflect capacity (i.e. MW), technologies (e.g. gas/wind/solar) and broad locations (e.g. regions).	APA supports the alignment on forecasting approach assuming this relates only to inputs required for fault level assessments. The need for alignment on other forecasting assumptions, inputs, and approaches is unclear. The objectives and purposes of forecasts developed for different documents (e.g. PASA, TSP, and WOSP) often differ and may warrant the use of varying assumptions, particularly where forecasts are testing system boundaries rather than aiming to reflect a most likely development scenario.

Energy Policy WA proposal	APA response
Proposal 14 – Maintaining minimum fault levels required for network protection The Network Operator will be required to: – develop and publish a methodology for calculating minimum fault level requirements at each transmission node; – compare the minimum fault level requirements with the expected fault level at each node as part of the TSP each year, using the fleet outlook and the demand forecast, as part of the System Strength calculation; and – resolve any forecast shortfalls through network reinforcement or non-network solutions (e.g. competitive NCESS procurement), as necessary.	APA supports this proposal as the minimum fault levels are essential for protection scheme operation and network stability and reliability. The network operator is best placed to determine the minimum base line, monitor fault levels at nodes and then resolve any shortfalls.
Proposal 15 – A centralised planning/investment function for system strength to facilitate new connections The Network Operator will be required to forecast shortfalls in system strength required to host the expected portfolio of inverter-based resources on the system, and to take steps to procure services that can address these shortfalls through competitive mechanisms (using the NCESS framework). Provisions will be incorporated into the ESM Rules to determine whether generator settings continue to meet a test for ongoing suitability, and allow the Network Operator and/or AEMO to request that settings are retuned as appropriate through a streamlined process.	APA supports the network operator being required to forecast shortfalls in system strength and the procurement of services to address these shortfalls through competitive mechanisms. Regarding the proposal to enable the network operator and/or AEMO to request generator settings changes, APA considers it appropriate that: – The generator to be provided with evidence and data to support the request. – The generator should not be required to make changes that go outside of its existing performance and technical capabilities. – Should changes be required that cause direct or indirect costs to the generator, these costs should be recoverable through an appropriate mechanism in recognition of the wider-market benefit. – Further, it would be appropriate to make use of the Technical Experts in the instance there is a disagreement between Western Power and/or AEMO and the generator, consistent with GPS provisions. APA supports a streamlined approach to be available for changes to GPS that involve providing system strength or inertia without the need for a full re-registration or the wider GPS settings being subject to re-assessment.

Coordinating assumptions and inputs for forecasting

Energy Policy WA proposal	APA response
Proposal 16 To achieve a coordinated approach to forecasting inputs and assumptions, a collaborative process between the parties responsible for forecasting (EPWA, AEMO and the Network Operator) should be established, with general rules included in the ESM Rules to guide the parties towards effective collaboration.	As per proposal 13, APA supports the alignment on forecasting approach assuming this relates only to inputs required for fault level assessments. The need for alignment on other forecasting assumptions, inputs, and approaches is unclear. The objectives and purposes of forecasts developed for different documents (e.g. PASA, TSP, and WOSP) often differ and may warrant the use of varying assumptions, particularly where forecasts are testing system boundaries rather than aiming to reflect a most likely development scenario.

Ride through requirements for network elements

Energy Policy WA proposal	APA response
Proposal 17 Apply the facility ride through requirements, for the definitions relating to disturbances of the current ESM Rules Appendix 12.7- 12.9, on network elements with appropriate supporting text to clarify that this standard does not apply to: – Faulted primary equipment disconnected under the requirements of the current Technical Rule section 2.9. – The operation of the Load Shedding requirements of the current Technical Rule clause 2.3.2 and section 2.4. – elements of the network that are designed to trip as part of a scheme (e.g. protection scheme or generation runback scheme).	APA supports this proposal on the basis the change would apply the same ride through requirements for all facilities with the same risk profile. In considering the application of the changes to historic network equipment, consideration of the cost and safety impacts should be given, consistent with concerns raised by Western Power in the PSSRSWG.

Customers' ability to negotiate or change their level of reliability through non-reference services

Energy Policy WA proposal	APA response
Proposal 18 The ESM Rules will provide clarity on which customer outcome standards can be modified as part of a non-reference service, and any agreed modifications will be published. Should conditions change such that the customer can be provided the reference level of reliability as per the customer outcome standards, the register will be adjusted to reflect this.	APA supports the proposal to retain customer's ability to negotiate or change their level of reliability through non-reference services. The guiding principle for technical aspects of a negotiated service should be that it aligns with good electricity industry practice and does not adversely impact power system security or reliability. Flexibility to negotiate non-reference service is an important mechanism to achieving commercially sensible outcomes for all parties, particularly where it is not feasible to resolve deep connection costs incurred for a firm reference service. APA welcomes further information in the next stages of the review as to how the proposed clarified non-reference service provisions will work with Proposal 1 (network planning standards for PSSR), which appear to remove some of the discretion of the network operator that might be needed to align network developments with a less reliable (i.e. non-firm) but market preferred outcome.

Governance of PSSR Standards

Energy Policy WA proposal	APA response
Proposal 19 Governance arrangements that reflect the relevant recommendations in the Energy Transformation Taskforce PSSR Standards Framework Information Paper will be implemented.	APA generally support the proposed governance frameworks for PSSR Standards in the ESM Rules. We understand this included the establishment of a Reliability and Security Advisory Panel as a standing working group under the MAC. Consideration should be given in the next stage of the review as to the appropriate membership and any membership conditions that would apply to this group. In particular, given the importance of the group and the standing nature, it may be appropriate to use similar membership provisions as those that apply to the MAC to ensure the group is suitably qualified and meetings are productive.

Adopting Western Power September 2023 Proposal Technical Rules Amendments

Energy Policy WA proposal	APA response
Proposal 20 Adopt the Western Power proposed solutions from the September 2023 Submission to the ERA for PSSR related matters not already considered under other proposals in this Review.	APA supports the adoption of PSSR-related matters in the proposed Western Power September 2023 submission. The adoption of these changes is urgently needed to bring clarity to industry and to reduce the cost and time delays for large network connections, which are currently impacted by outdated and inconsistent provisions under the still-recognised 2016 version of the Technical Rules.

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