



RELIABILITY PANEL AEMC

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23 April 2025
Merryn York
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Melbourne, Victoria, 3000

By email: Merryn.York@aemo.com.au

Dear Merryn,

Reliability Panel comments on AEMO's *Transition Plan for System Security*

This letter provides the Reliability Panel's feedback on AEMO's first *Transition Plan for System Security* (TPSS or *Transition Plan*).

The AEMC's *Improving security frameworks for the energy transition rule* introduced the obligation for AEMO to publish a TPSS on an annual basis.¹ The TPSS provides information to market participants on:

- how AEMO is planning to maintain system security as we transition to a low- or zero-emissions system
- AEMO's current technical understanding of what is needed to maintain power system security in a low- or zero-emissions power system and the work AEMO is undertaking to improve this understanding and specify the range of security services that will be required.

Under clause 5.20.8(d) of the National Electricity Rules (NER), the Panel may provide written commentary to AEMO within 6 months of the TPSS's publication. The Rules provide that the next iteration of the TPSS must publish and respond to the Panel's comments.² We will also publish this letter on our website in the meantime for transparency.

The Panel recognises AEMO's work in the inaugural TPSS to support a secure energy transition

The Reliability Panel recognises AEMO's work in the Transition Plan and other planning documents, including the system security reports, to support a secure transition to a renewables-based system. We note that AEMO is proactively seeking feedback from market participants on this first Transition Plan. The Panel appreciates the opportunity to provide feedback.

The TPSS plays a significant role in guiding the transition of the power system to one that can securely operate on variable renewable energy (VRE). Together, we need to be prepared for the system to operate on 100% VRE within a few short years. We consider this work critical to avoiding market interventions or delays in the energy transition.

The Panel emphasises the urgency of system security investment to keep pace with the transition

The NEM's transition to a system dominated by VRE is underway and will continue to accelerate, as AEMO's 2024 *Integrated System Plan* (ISP) shows. It is critical that the system can operate within its technical operating envelope as synchronous generators continue to retire. The Panel recognises the work AEMO is undertaking to identify the key milestones required to securely transition the power system.

However, the Panel is of the view that to keep pace with the energy transition, security needs must be identified earlier so that timely investment can occur. Security risks are emerging faster than expected. For example, system strength and minimum system load have become critical risks earlier than expected, and market interventions have been needed to maintain system security.

It is critical that the Transition Plan identify the critical investments or operational measures needed to support security as far in advance as possible. Ample notice of specific security needs is important for three reasons:

- First, investors need **enough lead time to make the necessary investment decisions**, and then to procure and install the required equipment.

¹ Clause 5.20.8(a) & 5.20.8(b) of the NER.

² Clause 5.20.8(c)(10) & 5.20.8(e) of the NER.

- Second, procurement must factor in **lead times to mitigate timing risks**. Some equipment, such as synchronous condensers, have long lead times due to supply chain constraints. There is also uncertainty surrounding the exact timing of generator entry and exit. Given the rapid deployment of capacity at consumer and utility scale, there is a high risk of security requirements changing faster than expected.
- Third, the **risks of over- and under-investment are asymmetric**. The risk of over-investment in security services, or investment earlier than needed, comes with much lower costs than under-investment or investment that is too late. Under-investment could lead to periods when the NEM cannot be securely operated. This means that proactive planning and identification of needs is required.

The Panel recognises that there is a trade-off between timeliness and accuracy when identifying specific security needs. But given the time it takes for investment, the need to factor in lead times and risk asymmetry, the Panel recommends that in the next TPSS, AEMO should work with TNSPs to identify specific system security investments as far ahead into the transition as practicable. The Panel recognises that TNSPs have an important role to play in helping determine specific investments needed to meet the system-level security requirements defined by AEMO.

Early, specific information is critical so that networks, market participants, governments and others can plan and make investment decisions.

The Panel reinforces the need for the TPSS to provide a detailed plan to manage coal plant retirements, for specific investments in resources or services, and the actions AEMO will need to take if needs are not delivered

The retirement of major thermal generation assets over the next decade presents a pressing system security challenge. The TPSS should aim to ensure that all potential system security shortfalls as thermal generators retire are identified and resolved in the planning timeframe. Interventions in dispatch should not be relied upon or required except in rare and unforeseeable circumstances.

To achieve that outcome, the Panel reinforces the need for a detailed plan that specifies what resources are needed to prepare for the expected closure of all remaining coal-fired generators in each NEM region. It should:

- **Specify the actions, investments in resources, or services needed** to meet each system security need (voltage, system restart, frequency control, etc) when a thermal plant closes. This could include specific needs in identified locations (for example, a level of system strength is required in the Hunter Valley region to meet voltage requirements). In identifying these requirements, it should consider security needs at times of:
 - maximum demand
 - minimum system load
 - system restart (noting that the Panel is currently reviewing the system restart standard)
 - any other challenging dispatch intervals observed or expected in the ISP and Electricity Statement of Opportunities (ESOO).
- **Align the identified needs with the time required** for the market, networks, market bodies or jurisdictions to deliver the required investment or capability. In doing this, the plan should be informed by the 'last time to act' – that is, the latest time by which an active decision can be made to prepare for any event that impacts security.
- **Identify any system security barriers to the closure of coal-fired power stations**, and how they are being addressed.
- **Specify what actions AEMO will take**, and the consequences, if the investment or capability cannot be delivered on time.

The Transition Plan needs to be sufficiently granular for market participants to invest in the required mix of technologies and provide AEMO as market operator with the confidence to avoid reliance on market interventions to maintain stability. This may include modelling network stability for individual future dispatch intervals as large-scale thermal units retire.

The Panel suggests the TPSS identify the post-transition state of the power system and the resulting security needs (a 'future back' approach)

Recognising uncertainty about the precise timing of the retirement of major thermal plants, the Panel recommends that the TPSS should plan for the likely 'post-transition' state of the power system and 'work back' to major transition points in the interim period. In particular, the TPSS should specifically identify how system security will be managed with no remaining coal-fired generation.

In planning for the post-transition state, the TPSS should identify:

- how current resources could meet security needs and/or
- what new resources would be required to manage system security.

For example, to plan for the post-transition state of no coal-fired thermal generation in the NEM, system studies and modelling and AEMO's ISP analysis should be conducted with no coal generation (or other plant expected to retire). This exercise should then identify what specific new resources are needed in what locations for the system to operate securely.

If AEMO or TNSPs are already taking this approach, the Panel encourages that the analysis be published.

The Panel encourages AEMO to reconsider the current 'horizons' approach and extend its detailed recommendations into the planning timeframe, to support timely investment

The Panel appreciates AEMO's reasons for dividing the TPSS outlook into 'horizons' and understands that its initial focus has been on short-term measures to maintain system security and inform AEMO's use of the transitional services framework to procure security services.

To support planning for the post-transition system and provide certainty for longer-term investment decisions, the Panel encourages AEMO to build on this approach in the next TPSS and provide further detail on system security needs in the planning timeframe.

To provide market participants with enough time to act, the Panel considers it important for the Transition Plan to:

- provide more detail on security needs over a rolling 3 to 6 year investment timeframe as well as the near-term 'Horizon 1' timeframe, and
- indicate needs and actions expected up to 10 years in the future.

In particular, network modelling should assess system stability in scenarios without any large-scale thermal generation operating in order to identify what additional security resources will be required.

Making sure that the system can operate with the expected future generation mix ensures that there is no delay in the retirement of older units or the need for expensive and distortionary intervention. It would also improve resilience and simplify system operation by reducing the number of unprepared for events that could result in the network straying outside its secure technical operating envelope and requiring last-minute operator intervention.

The Panel considers that the TPSS should identify areas where AEMO cannot address a security issue, and where actions from others—jurisdictions, the Reliability Panel, market bodies, networks, technology providers, and regulators—are needed

The Panel recognises that ensuring system security through the transition will require action by many parties. The market bodies, the Reliability Panel, networks, market participants and jurisdictions all have roles to play. The Panel recommends that AEMO aim to identify in the TPSS measures that other parties should take to address a security vulnerability. For example, it could identify:

- any changes to the National Energy Rules that are necessary to improve security frameworks
- updates required to guidelines and operational procedures, including those that are the responsibility of the Reliability Panel
- any missing service definitions
- actions required by investors, networks, market bodies, jurisdictions, and other relevant parties.

Importantly, the TPSS should also identify any concerns AEMO may have—or significant risks AEMO sees—in the timely and effective delivery of existing security obligations by others, including networks and market participants. If AEMO holds these concerns, the TPSS should also highlight the actions AEMO will otherwise have to take to resolve the risk in the absence of any change, such as the market interventions related to minimum system load.

The Panel recommends that AEMO consolidate its system security publications

Effective communication of AEMO’s work is critical to ensuring that the information is understood and acted upon. To provide authoritative points of reference, the Panel recommends AEMO streamline its suite of security reports—the TPSS and the system security reports for inertia, system strength and NSCAS—by consolidating them as much as practicable while taking into account their different purposes and audiences. Regional summaries could be published to highlight critical needs for region-level action. Reports focused on reliability outcomes, such as the ESOO, should remain separate.

The Panel recognises that with a consolidated approach to security reporting, it would be necessary for AEMO to continue satisfying its reporting obligations under the Rules. If consolidated, the system strength, inertia and NSCAS report components would need to set out the direct requirements for TNSP or AEMO procurement of services, with the TPSS component providing an overall plan and vision for how the power system of the future can securely operate.

The Panel appreciates the continued collaboration with AEMO on the Transition Plan and acknowledges the scale of the efforts it is making to deliver a net zero power system that is reliable and secure.

If you would like to discuss the Reliability Panel’s feedback, please contact Victoria Mollard on 02 8296 7800 or Victoria.Mollard@aemc.gov.au.

Yours sincerely

Tim Jordan
AEMC Commissioner and Chair of the Reliability Panel