Review of the system restart standard public forum – summary of questions and answers

This document provides responses to questions received at the Reliability Panel's review of the system restart standard draft determination virtual public forum, held on 22 September 2025. We received a number of similar questions from stakeholders, and we have therefore grouped these by theme. Our responses are offered below by theme to avoid repetition. These responses should be read alongside the draft determination and the slides for the public forum.

Topic area	Question	Answer
AEMO's technical advice		
Co-investment in new system restart ancillary service (SRAS) capability	Can you provide more information on the "consider co-investment decisions" dot point in the regulatory reform section?	AEMO's recommendation to consider co-investment decisions relates to how best to value and support the provision of new services needed for system restart, along with other security services. The inclusion of system restart capability is best considered at the early stages of plant design. SRAS capability is not an inherent capability in newly connecting plant and therefore providers need to consider what capability is required and its potential reward when setting up their plant. Opportunities to co-invest could support investment decisions to include the required capabilities prior to connecting into the grid.
Role of battery energy storage systems (BESS) and	AEMO's technical advice includes a role for BESS to support restoration. How would AEMO plan for instances	Batteries are likely to contribute to system restart as a restoration support service, or potentially for black start initiation where ongoing energy supply can be provided by other sources however

consideration for future system restart	when there is insufficient storage capacity during a system restart event?	this has not yet been demonstrated at scale in the National Electricity Market (NEM). Batteries are limited by the state of charge available and are unlikely to provide bulk energy supply for the full restoration process, which typically takes over 8 hours.
	How has AEMO considered the following in developing future system restart scenarios: • Number and location of synchronisation points on the network • Management of harmonics and thresholds for inverter-based resource (IBR) correction • Considerations on how liability would be managed for enhanced testing requirements • Considerations related to the use of minimum stable operating levels (MSOL) for synchronous plant	It is becoming increasingly difficult to restart the system, particularly during day light hours, due to minimum load conditions. A diversity of SRAS sources is needed to prepare for a range of restoration scenarios, including for black start events occurring at different times of day and to manage retiring thermal fleet in areas in which trip to house load is currently depended upon. The number and location of synchronisation points throughout the network are crucial considerations as the network and restart pathways change. The management of harmonics, IBR correction, testing requirements and considerations related to MSOL for synchronous plant are currently open-ended questions that are being considered. Collaboration between AEMO and transmission network service providers (TNSPs) is essential to ensure these factors are appropriately catered for.
Draft Standard		
Sensitive loads	*Questions related to how AEMO will consider the advice of jurisdictional system security coordinators (JSSCs)*	The Panel revised its Guidelines for the strategic location of services (Section 10 draft system restart standard) to include the following guidance:

	on sensitive loads in developing the system restart plan • Does a requirement for AEMO to "consider advice" provided by JSSC with respect to SRAS and impact on sensitive loads such as aluminium smelters result in any requirement to act if SRAS cannot support restart in time for the smelter not to freeze? • The draft determination notes AEMO will be required to consult with the JSSC on the priority of sensitive loads across jurisdictions. However, the Panel seems to have decided against specific restoration targets for specific sensitive loads. Could you provide some more information/transparency as to how the JSSC's advice will be considered by AEMO in determining strategic location of SRAS sources?	AEMO must consult with the relevant jurisdictional system security coordinator (JSSC) in relation to the strategic location of SRAS for each electrical sub-network and the existence of any sensitive loads and/or related energy support arrangements. The JSSC may provide advice to AEMO in relation to the strategic location of SRAS, based on its assessment of the implications for priority loads and any sensitive loads. AEMO must consider any such advice when determining the strategic locations of SRAS, and report to the Panel in writing how it has considered the advice. The revised guidance under the draft Standard requires AEMO to: • seek JSSC's advice on the strategic location of SRAS and the existence of sensitive loads within the respective jurisdiction. • consider the advice and report to the Panel in writing as to how it has considered any advice the JSSC has provided, based on the JSSC's assessment of the implications for priority loads and sensitive loads. The system restart standard is a procurement standard and does not set out operational requirements on how AEMO responds following a black system event. Therefore, the revised guidelines do not set out specific requirements for how AEMO should act during an actual black system event. For further information on the Panel's consideration of sensitive loads, please refer to Section 3.6 of the Panel's draft determination.

	Treatment of prioritised and consumer loads • The priority load shedding schedules treat declared sensitive loads as high priority loads, last on and first on subject to network availability/capability. As customer load is restored and then sensitive load is ready to return, does the restored customer load effectively become sacrificial load and turned off in preference to the sensitive load?	The Panel did not consider it appropriate to set out specific supply restoration targets in the Standard to account for and prioritise the restoration of sensitive loads. This position is supported by the Panel's view that it would be inequitable for other electricity customers to be disadvantaged through additional costs or otherwise on account of providing a service that is intended to primarily benefit one specific electricity customer.
	Alternative arrangements to support energisation of sensitive loads • How are energy support arrangements considered in system restart planning? • In order for sensitive loads to be supported for rapid restoration, and to avoid impacting the standard population, would they need to fund any additional support services themselves?	The Panel notes that, in the event that an individual customer or customers require an increased level of protection from major supply disruptions over and above that provided to them under the Standard, they may make standalone arrangements for the provision of such a service, either through onsite backup generation or by entering into a contract with a third party for energy support. These arrangements are referred to as energy support arrangements. If an energy support arrangement is entered into, the participant would need to notify AEMO through an update to its local black system procedure (LBSP).

Interpreting elements of draft Standard	*Revised target timeframes* • Regarding the targets within the Standard, is it interpreted as 2 hours to establish the restoration island, and then there is 8 hours from this point to restore the percentage equivalent supply (total of 10 hours)?	The two draft restoration targets work in parallel. Under the draft Standard, AEMO is required to procure SRAS such that following a black system event, a stable restoration island is formed in 2 hours, and 50% of equivalent supply is restored in 8 hours (6 hours following the formation of a restoration island).
	Consideration targets for the restoration of load • Has the Panel considered having multiple restoration targets rather than just one? E.g. could there be targets for 1. Restoration of specific restart islands by X hours, 2. restoration of 50% of load by 8 hours 3. restoration of 85% of load by Y hours. • Is there something in the NEL/NER that would prevent the system restart planning standard having more than one target?	Yes, the draft Standard sets two restoration targets as follows: • form one or more restoration islands within 2 hours. • use those restoration islands to restore generation and transmission in that electrical subnetwork equivalent to the capacity to supply 50% of the forecast average annual underlying demand in that electrical sub-network within 8 hours The Rules do not restrict the Panel in considering additional targets; however, the Panel is required to determine a Standard that sets out the maximum time within which SRASs are required to **restore supply** within an electrical sub-network to a specified level. The Panel is not currently required under the Rules to prescribe requirements for the restoration of load, noting that in practice load is restored as supply is energised.

	Aggregate reliability Is the availability of SRAS considered within the aggregate reliability measure?	Yes, availability of SRAS is considered within the aggregate reliability measure. In determining the Standard, the Panel is required to set the aggregate required reliability of SRAS for each electrical sub-network. The SRAS Guideline (developed by AEMO) outlines the process for meeting the aggregate required reliability of SRAS as set out in the Standard. In the current version of the SRAS Guideline, AEMO considers individual plant availability and equipment and network component reliability when assessing this metric. For further information on how AEMO determines aggregate reliability, refer to Section 3.6 of the SRAS Guideline 2020.
	Restoration of smaller islands or sub-sets of the grid In addition to smelters, was there any consideration to include capability to create restoration islands to cater for restoration of large regional load centres in particular in areas where it is conceivable that the current electrical subnetwork could be split by severe weather events? Would this be based on input from the JSSC?	The Panel sets the Standard on the advice of AEMO. And AEMO is responsible for determining electrical sub-network boundaries. AEMO's advice has not recommended changes to the sub-electrical network boundaries. However, the Panel notes the revisions in the draft Standard improve the ability for AEMO to consider services and implementations that support the restoration of smaller islands or sub-sets of the grid. At the same time, as the draft standard would apply equally for all electrical sub-networks, AEMO would be able to change the sub-network boundaries in the future and a standard would apply without the need for the Panel to undertake a further review.

	Economic assessment results Does the $81m-$1.5b in value for an SRAS capability describe the incremental benefit between a scenario where there is no SRAS capability versus one with SRAS?	For each electrical subnetwork in the NEM, the Panel conducted two distinct assessments: • an assessment of the marginal value of additional SRAS based on the reliability benefit of additional redundancy within an SRAS portfolio. • an estimate of the total value of procuring SRAS in supporting an ideal restoration outcome, relative to a potentially prolonged outage. The numbers referred to in this question relate to the second analysis. This analysis estimates the total value of SRAS procurement by comparing expected unserved energy outcomes between an ideal restoration pathway and a worst case prolonged restoration. The benefit range arises from the sensitivities that were applied to this analysis. The Panel applied a wide range of sensitivities to represent a range of potential system restart outcomes, for both analyses. The Panel assessed that uncertainty was likely asymmetric given the changing nature of the electricity system. This means that the Panel assumed scenarios that increased costs of an outage, length of an outage, or probability of an outage were more probable. As such, the following sensitivities were considered: • variations to the benchmark delayed outage, including: ○ a 10 hour delay to system restoration - aligned with the assumed “benchmark outage” from the 2016 economic assessment. This approach to setting a default - worst case outage length assumes that a minimum level of energisation occurs within the

		timeframe for transmission sub-station battery backup power ○ a 36 hour delay to system restoration. This more conservative approach to setting the default outage time is informed by the AER's approach to the 2024 Value of Resilience analysis, which noted that customers tended to take 'mitigating' actions for power outages exceeding 36 hours. • variation for the 2024 value of customer reliability (VCR) value including a base case VCR based on the 2024 regional values published by the AER and a sensitivity of 150% of the 2024 regional VCR values. • a range of outage probabilities, including a base case that applied the 2016 outage probabilities unchanged as well as an upper bound with a 150% of the base case outage probabilities. For further information on the quantitative assessment please refer to Appendix C of the Panel's draft determination.
Applicability of the draft Standard	In an interjurisdictional black system event, how is the two-hour restoration timeframe for each electrical sub-network upheld, given that AEMO is only permitted to procure SRAS for one sub-network at a time? Which jurisdiction is prioritised first, particularly if state emergency powers are activated? Does this limitation hinder an effective black start	The Standard is designed to guide procurement and planning and is not intended to set operational targets. The Rules require the Panel to determine the Standard such that each electrical sub-network would be capable of re-energising independently of one another. In the event of an interjurisdictional black system event, AEMO would determine how best to utilise the services available at the time to re-energise the parts of the grid impacted by the event.

	response, noting that restoration is time-sensitive (and delays can prolong restarts?	
Implementation timeframes	On the timelines for this work, when could AEMO start going out to proponents for procurement to be ready to meet this standard in July 2027?	Following publication of a final revised standard in December 2025, it is anticipated that AEMO would commence its procurement processes to meet the draft Standard from mid 2026. Slide 29 of the Public Forum slide pack proves an overview of implementation timeframes for the revised system restart standard and related actions.
Draft recommendations		
Local black system procedure (LBSP) framework	What were the perceived gaps in the current LBSP information template given the questions in the template are very encompassing? Important that we don't confuse information requirements with trying to impose a requirement that could be considered a restart or support service imposing additional costs but no payment provision	There were two broad issues that AEMO identified in relation to the current LBSP process: • Updates to an LBSP during a previous SRAS contracting period, posed a challenge in meeting the Standard. • There have been challenges in seeking timely updates to LSBPs from some participants. AEMO has highlighted in its technical advice that due to the importance of LBSPs to the System Restart Plan, it is critical that accurate and comprehensive LBSPs are provided for all plant and network providers. Additionally, to maintain accuracy of LBSPs, plant and network providers should provide updates as changes occur which may affect their LBSP. For further information on AEMO's consideration of the LBSP framework please refer to section 4.1.9 of AEMO's technical advice.

		For further information on the Panel's recommendations related to the LBSP framework, please refer to section 4.3 of the draft determination.
Remuneration of restoration support services	If a resource is more critical to the restart objective, should they be a restart or restart support service? It's important that a resource should not be required to do a service by use of the information provision to undertake a task they would otherwise not	The Rules support the procurement of restoration support services as a remunerated service; however, these services have not been procured to date. The revisions to the draft Standard are aimed to support AEMO's consideration of restoration support services. The issues AEMO has flagged in relation to LBSPs relate to information that may be out of date, or updates to LBSPs that undermine the existing restoration process. The trade-off between notifying people of the capability and procuring a service for remuneration should continue to be monitored.