SUBMISSION

RELIABILITY PANEL: REVIEW OF THE SYSTEM RESTART STANDARD ISSUES PAPER (REL0091)

30 JANUARY 2025

INTRODUCTION

The Energy Users' Association of Australia (EUAA) is the peak body representing Australian commercial and industrial energy users. Our membership covers a broad cross section of the Australian economy including significant retail, manufacturing, building materials and food processing industries. Combined our members employ over 1 million Australians, pay billions in energy bills every year and in many cases are exposed to the fluctuations and challenges of international trade.

Thank you for the opportunity to make a submission under the Reliability Panel's Review of the System Restart Standard Issues Paper.

As our members utilize a significant quantity of electricity, it was disappointing to recently hear from members that they are not considered as part of the system restart procedures. This is a critical issue for many of our members as a system black event will be costly to all, however for some ofour members it would result in total destruction of their plant with the current grid restoration timelines. This is incredible given that many of those plants that would be destroyed are considered critical loads, they actively participate in the NEM through frequency response and/or the Reliability and Emergency Trader (RERT) mechanisms along with producing enormous economic benefits to Australia.

The EUAA supports the design of rules, standards and procedures that achieve efficient, cost effective and equitable outcomes for networks, generators and consumers. If a rule, standard or procedure is no longer working, the EUAA encourages a review and re-design so that they function as they were intended. With a changing NEM, this may require regular reviews, particularly through the messy middle of the transition.

We consider it timely that the Reliability Panel is now reviewing the System Restart Standard. Given the above example of the lack of consumer consideration in the current system restart procedures, and that they were written at a time when the NEM looked vastly different, we welcome discussion on expanding the review's terms of reference to include all system restart frameworks, procedures and the list of participants, to achieve an efficient and equitable system restart standard and procedures that do not place the viability of any generator, network or consumer in doubt.

ISSUES WITH THE CURRENT SYSTEM RESTART RULES AND PROCEDURES

As we understand it, there are many issues with the current rules and procedures for system restart. We consider that all of these issues should be included in the Reliability Panel's terms of reference for the system restart review. Issues include:

- A lack of available System Restart Ancillary Services (SRAS) resources in all sub-networks leading to low competition, and in the case of Northern Queensland, insufficient SRAS for night-time system restart. With the closures of coal, gas and diesel fired power stations throughout the NEM, and impending closure of most of the rest, the availability of traditional SRAS is reducing. This is exacerbated by the current System Restart Standard being developed to reflect the current (at the time it was written) power system capabilities, and acted as a quasi-investment attraction mechanism for more of the same.
    - With the introduction of many environmental and renewable legislations throughout Australia, this circular reliance of the technology and system defining the Standard needs to change.
    - EUAA supports a technology neutral, engineering led approach where the outcome is that the most efficient blend of system restart technologies is contracted for SRAS.
- The engineering modelling and pathways for system restart were supplied by the generators. While this was an effective methodology with large synchronous generators dominating the NEM, in today's environment with many smaller distributed generation systems, and most of those plants being semi-scheduled, the concept of having a centralised modelling capability would be a prudent way forward. This role probably lies within AEMO.
- In this way, there is potential for renewable energy and renewable energy zones (REZs) to be considered for system restart, including batteries.
    - However, we are not aware of renewable energy nor battery capabilities to perform system restart. It would be prudent for a centralised organisation to investigate and perform testing of this capability, as if it can be done, the methodology and pathways will likely look different to a system restart from a synchronous generation system.
    - It is also likely that performing a system restart using predominantly inverter-based generation will likely require other system security ancillary equipment to provide, among other things, frequency control, inertia etc as load is gradually added back to the NEM.
- There is also the possibility for system restart of a region to come via an AC or DC interconnector, although again, this ability needs to be investigated.
- As was experienced in the recent Broken Hill outage, rooftop solar is problematic during periods of system restart. On the rare occasions that Australia has experienced system black events, the penetration of solar was not as high as it is now, and a very high proportion of generation was controlled through the AEMO dispatch engine, allowing coordination of generator restarts while distribution businesses slowly brought loads back online.
    - These problems, if unresolvable, suggest that
        - System restart may not be able to occur during daylight hours, and
        - an initial transmission system restart might be the preferred system restart methodology in the future, bringing transmission connected generation and load online simultaneously.
    - Further, many distribution connected large loads have either dedicated 22kV feeders, or utilise most of the capacity of a single feeder, making these ideal candidates for system restart using parts of the distribution network,
    - From these perspectives, we consider that AEMO and the NEM would benefit from coordinating system restarts with the large loads that our members have.
    - Through expanding the definition of SRAS to include large loads, the large loads directly connected to the transmission network could be the beginning of re-energisation of the entire black region.
    - With sufficiently large enough large load, and generation to match (and assuming ramp up rates could be matched), a transmission-based NEM could be brought online first, and once stable and secure, more generation and the distribution networks could be brought online with the large load

providing a system "stabilising" function as the frequency fluctuates from generation and loads being brought online.
    - This coordinated process could occur much quicker than the current 4 hours in some regions.
- We believe that the current lack of load being considered as SRAS, while it may have worked in the past, is not an appropriate approach in the future renewable dominated NEM.
- Additionally, consideration of the "average" impact to consumers in developing the current procedures, including the level of SRAS contracted, while useful, does not consider the impact to individual consumers. While the average cost impact per connection of a 4 hour restart may be low, and the level of procured SRAS seems reasonable in light of the avoided outage costs, these methods do not consider the total destruction and flow on economic impacts, including job losses, that may occur from a drawn-out system restart procedure that does not consider the timing requirements of system restart for critical loads.

RESTART PREPAREDNESS

As discussed above, we believe the entire system restart rules, standards and procedures are overdue for an overhaul. Changes that should be considered in the Reliability Panel's review include the addition of large loads as an SRAS provider with responsibilities for system restart, primarily as the foundation load, ramping up at the same rate as generation. This evolution will provide AEMO, generators and networks with further load availability information, including ramping rates and the ability to better coordinate network services to bring a stable core of the NEM region back online. The *quid pro quo* being that the large load, if critical and has a time limitation for system black, will avoid destruction of plant and equipment.

Given the location of REZ's throughout the NEM, many are located near large loads either transmission connected or on distribution feeders where they take up all or most of the capacity on that feeder. Assuming REZ's will have the capability to perform SRAS, linking them to the large load consumers makes sense.

In order for this to be considered as a capability of REZ's, an investment signal needs to be sent early, consistently and loud, with sections of reports (not just paragraphs) dedicated to system restart capability in all planning documents, including but not limited to the Integrated System Plan (ISP), Electricity Statement of Opportunities (ESOO), General Power System Risk Review (GPSRR) etc

In addition, with households, communities and businesses (of varying size) implement their own Consumer Energy Resources, with the potential ability to "island" during blackouts or system black events, these resources need to be re-synchronised as they reconnect. This may require a change to the connection standards for CER that outputs energy in the event of blackouts and/or system black events to better manage the reconnection and synchronization process..

RESTART CAPABILITY

With almost all synchronous generation due to retire by 2040-2045 under the most likely ISP scenario, and the general lack of major investment in synchronous generation, we suspect that the next round of SRAS contracting by AEMO will see general shortfalls of SRAS, and the following contracting having broad shortfalls of SRAS. The timing of the current review is essential for the future ability of the NEM and its regions being able to restart after a system black in an adequate time period.

Even with the 2024 ISP's 16GW of additional gas fired generation, and the resources of all hydro powered generation, we see potential issues with relying solely on these for system restart. Not least of which is a general lack of competition and having supply of fuel (gas or water) at the point in time that it is required.

As mentioned in the Introduction, we believe that all processes and procedures associated with system restart need to be reviewed and made "85% renewable ready" now.

To achieve a system restart that is renewable ready, the Reliability Panel will need have performed:

- Engineering modelling for system restart of the NEM today, investigating potential pathways for each sub-region and region to recover from a system black including re-synchronisation and a top-down identification of the necessary resources required in each region/sub-region by location. These engineering studies need to be from the perspective of what the system needs, not what is available (as previous system restart processes were written).
- An engineering technical review of the capability of different technologies to perform SRAS, including renewable energy, batteries, REZ's etc.
- An engineering technical review of whether the system can be restarted during the day without coordination of rooftop solar. Our suggested large load-based restart pathway may provide a solution to this issue by providing a significant percentage of the grid's utilisation as a buffer to the fluctuation caused by reconnecting rooftop solar.
- Procedures that enable practical testing and demonstration of these methodologies, pathways and inverter-based technologies (i.e. a dress rehearsal).

While we are suggesting that the Reliability Panel perform these tasks, we would assume AEMO would perform or manage consultants to do much of the actual work on behalf of the Reliability Panel.

TRANSPARENCY AND REPORTING

Investigation has revealed that the risk of long system restart procedures that are misaligned with the needs of critical large loads has been known for over 20 years by past and present stakeholders responsible for system restart. In the last decade, public submissions have been made to the Reliability Panel from the Electricity Networks Association (ENA), ERM Power, Russ Skelton & Associates, Snowy Hydro, TransGrid and others supporting this concern, yet no action has been taken.

We support creating efficient, transparent markets and supportive, well-targeted mechanisms and incentives. The above example demonstrates the lack of historical transparency for system restart.

The EUAA encourages the Reliability Panel to introduce reporting and monitoring requirements on AEMO for system restart, including an obligation to consult with large loads on the development of operational procedures and inclusion of large loads as SRAS suppliers.

CONCLUDING REMARKS

The system restart standard must ensure that restart plans are practical and can restore power to sensitive loads within their critical timeframe and with a high degree of probability to avoid large business losses. Changes to the regulatory framework to address this gap would not only avoid catastrophic disaster for businesses but could also provide a wider NEM benefit through leveraging large loads to coordinate bringing NEM generators back online as quickly as possible following a system black event.

Large loads can play a vital role in securing the system restart efforts in the NEM by mitigating risks associated with uncontrolled solar generation and damaged transmission infrastructure caused by bushfires or other natural disasters. We are seeking that these considerations be incorporated into the Reliability Panel's work to assess fit-for-purpose pathways that should be reflected in future SRAS procurement.

We are concerned that consumers have not been adequately consulted in the formulation of restart plans in the past and encourage the Reliability Panel to correct this oversight in the future through mandatory obligations

There is also a need for appropriate funding to be allocated for technical engineering modelling that reflects the real world today and the future status of the grid. This modelling should also include a review of what technologies in which locations are needed for SRAS going forward to avoid one or more sub-regions being at risk of being black for unacceptable periods of time. This modelling should then be used for economic modelling to determine what regulatory changes are needed to support having fit-for-purpose SRAS available. The output of these studies may lead to infrastructure upgrades, new standards/obligations for certain technologies/generators and large loads to require them to provide SRAS

The EUAA welcomes further discussions with us and our members around the issues raised in this submission.

Do not hesitate to be in contact with EUAA Policy Manager Dr Leigh Clemow, should you have any questions.

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