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Reliability Panel
Australian Energy Market Commission
Level 15, 60 Castlereagh Street
Sydney NSW 2000

Submitted electronically

Review of the System Restart Standard

Snowy Hydro welcomes the opportunity to comment on matters raised in the Review of the System Restart Standard Issues Paper (Issues Paper).

It is timely to review the System Restart Standard. As identified in the Issues Paper, the structural changes in the National Electricity Market (NEM) as well as the broader effects of climate change are increasing system vulnerability. Traditional sources of system strength are becoming scarcer as coal assets retire, the growth of grid-scale renewables and rooftop solar is increasing system volatility and the risk of extreme weather events is increasing the vulnerability of network infrastructure. It is important that the System Restart Standard takes account of these trends.

In the long term, adequate system restart capability will depend upon the existence of appropriate commercial incentives. We recognise that there is a trade-off between maintaining incentives for system restart capability and cost for consumers, and we support using competitive processes to ensure value for money and exploring the use of new sources of system restart. However, there needs to be a realistic assessment of the capability of new technologies before they are preferred over existing, proven asset types.

Currently, the System Restart Standard states that "*the aggregate reliability of the procured SRAS in each electrical sub-network shall be determined by AEMO, considering the combination of the individual reliabilities of the SRAS procured in that electrical sub-network, together with an assessment of the impact of the points of failure set out in the guidelines for diversity in section 8 of the standard.*" (cl. 4).

In determining the aggregate reliability system restart procurement, AEMO should critically evaluate not only the capabilities of individual assets but also the risks in relying on a diverse set of assets to provide a system restart path. By definition, system strength is at its weakest when attempting to re-energise the system, and disaggregated technology types, such as inverter-based resources (IBR) and batteries, tend to perform less well in weak systems or when attempting to provide a restart path with other providers. Relying on a diverse set of aggregated resources will increase the time and complexity of a restart, and may produce a less reliable service compared to relying on traditional providers.

With this in mind, it is important that:

- the SRAS definition is absolutely clear on a minimum standard that needs to be satisfied by a particular technology type in order for that technology to be considered a system restart service; and

- the SRAS service provider is fully tested and proven prior to acceptance.

Hydro and gas-fired generation have demonstrated their system restart capability over a long period of time and offer several advantages over other technology types:

- **Established Technology**: Gas-fired turbines and hydro generators are mature technologies with well-understood characteristics and capabilities. They have a proven track record in providing system restart services,

- **Synchronous Generation**: Both gas-fired turbines and hydro generators are synchronous generators, and therefore provide inertia, which is crucial for maintaining grid stability during disturbances and is particularly important during system restart. IBRs and batteries, on the other hand, do not inherently provide inertia and may require additional support services to maintain stability. Grid-forming technologies are relatively immature compared to gas and hydro assets.

- **Black Start Capability:** Gas-fired turbines and hydro generators can start without drawing power from the grid and therefore represent true a black start capability. This is essential for initiating the system restart process after a blackout. While some IBRs may be able to provide black start capability, it often requires additional equipment and complex control systems.

- **Controllability**: Gas-fired turbines and hydro generators offer fast and precise control of active and reactive power, which is vital for managing voltage and frequency during system restart. While IBRs can provide fast control, their ability to provide reactive power support may be limited depending on their design and the grid conditions.

- **Fuel Availability:** Gas-fired turbines and hydro generators typically have access to stored fuel, ensuring they can operate even during disruptions in fuel supply. In contrast, batteries tend to have limited duration, making them less suited to extended restoration or where multiple restart attempts are required. The possibility that the NEM will need extended restoration is likely to increase given structural changes in the generation fleet. The need for fuel availability is more difficult for batteries, which have much smaller energy reserves than hydro or gas. Batteries typically need to be at a high state of charge at the start of an event, which can be difficult to forecast.

Previous updates to the system restart standard to expand the definition of SRAS were appropriate. However, as stated above, gas-fired turbines and hydro generators offer a combination of synchronous generation, black start capability and proven reliability that make them well-suited for providing system restart services. They should continue to form the backbone of system restart procurement, until new technology types are able to offer comparable capabilities.

Finally, we consider the current method of procuring system restart, through long-term bilateral contracting with AEMO, remains appropriate, and we consider that AEMO remains best placed to fulfil this role.

About Snowy Hydro

Snowy Hydro Limited is a producer, supplier, trader and retailer of energy in the National Electricity Market ('NEM') and a leading provider of risk management financial hedge contracts. We are an integrated energy company with more than 5,500 megawatts (MW) of generating capacity. We are one of Australia's largest renewable generators, the third largest generator by capacity and the fourth largest retailer in the NEM through our award-winning retail energy companies - Red Energy and Lumo Energy.

Snowy Hydro appreciates the opportunity to respond to the Issues Paper.