

17<sup>th</sup> December 2015

Reliability Panel  
PO Box A2449  
Sydney South NSW 1235

Submission lodged online at: [www.aemc.gov.au](http://www.aemc.gov.au)

Project Number: REL0057

Dear Mr Henderson

### **Review of the System Restart Standard – Issues Paper**

Snowy Hydro Limited welcomes the opportunity to make a submission to the review of the system restart standard.

The National Electricity Market (NEM) is characterised as a market with few barriers to entry. Existing generators without system restart capability and new entrant generators can easily assess whether it would be economic for them to equip their generator plant with system restart capability.

It has been clear that AEMO's primary focus in the 2015 procurement of restart services has been immediate costs without due consideration and analysis on the economic benefit System Restart Ancillary Services (SRAS) provides in the event of a system black by restoring electricity supply.

The fact that there has only been one black system event in the NEM since market start does not mean that this historical level of performance would continue into the future. In fact, the wholesale market has experienced in recent years sub economic returns in investment and some Market Participants have suggested that this would lead to deterioration in generator reliability which may then increase the probability of a major black system event. Our point is that there needs to be an appropriate balance on objectively assessing the costs and benefits of SRAS in the future.

AEMO's power system modelling and studies for assessing black start generators<sup>1</sup> do not provide sufficient detail for Market Participants and other Stakeholders to determine whether AEMO has acquired sufficient SRAS to minimise the economic cost of a major supply disruption.

We also note that the 2015 procurement of SRAS was based on desktop technical studies. The results from these technical studies were reliant on inputs and assumptions used in the modelling. Given AEMO's bias on the immediate costs of SRAS, Snowy Hydro has concerns

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<sup>1</sup> AEMO, Power system modelling and studies for assessing black start generators, <http://www.aemo.com.au/Electricity/Market-Operations/Ancillary-Services/Process-Documentation/System-Restart-Ancillary-Services-SRAS>

on the objectivity of the technical studies. We therefore believe that any technical studies that could be used to inform this review must be independently undertaken.

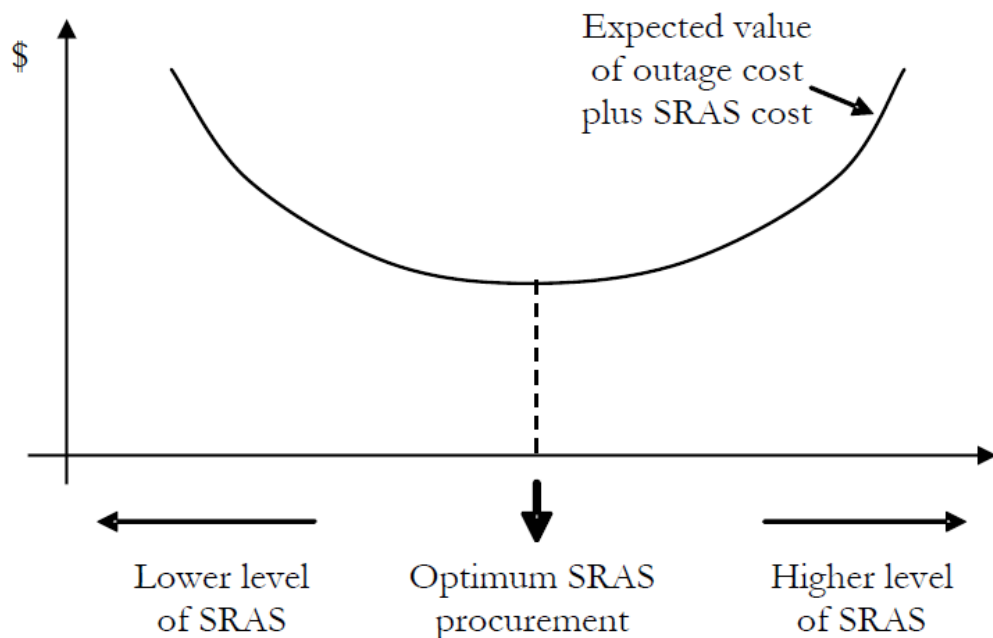
### Time and level of restoration

The Restart Standard must be determined by the Reliability Panel to meet the SRAS Objective, which is:

*The objective for system restart ancillary services is to minimise the expected costs of a major supply disruption, to the extent appropriate having regard to the national electricity objective.*

The SRAS objective is succinctly shown in Figure 1 of the Firecone<sup>2</sup> report.

Figure 1: Optimum procurement of SRAS



From Figure 1, there is an optimum level of SRAS which minimises the total expected cost of a black system event and the immediate cost of SRAS procurement.

Snowy Hydro sees no fundamental issue with the current form of the Standard. The issue we have is insufficient analysis has been done on the practical and operational issues with restarting the system. In our opinion AEMO is relying on a Goldilocks set of scenarios by solely relying on:

- a) Desktop studies which assumes all transmission circuits are available and the restart service providers are 100% reliable;
- b) Load blocks that can be progressively energised with no operational difficulties which would have the effect of extending the restoration timeframe; and

<sup>2</sup> Firecone, Review for AEMC of the Proposed NEMMCO Rule for System Restart Ancillary Services, Final Report, December 2005, page 6.

- c) No redundancy in SRAS has been catered for to factor in the inevitable reliability and contingency issues that will arise in the event of a system black.

We believe these assumptions are unrealistic. This lowers the confidence of the market that sufficient SRAS would be available to minimise the economic harm of a major supply disruption. Hence we agree with the Reliability Panel that the System Restart Standard incorporate a measure of expectations (ie. levels of confidence that the economic costs of a major supply disruption is minimised).

### **The SRAS Objective and Cost/Benefit Analysis**

It is in the interest of all Market Participants and Stakeholders in the NEM that the Reliability Panel develops an objective set of criteria to ascertain whether AEMO has procured the optimal level of SRAS.

For the SRAS Objective to be satisfied an efficient level amount of SRAS must be procured to minimise total expected cost of a major black system event and the immediate cost of the SRAS service.

While we recognise deriving a practical approach to a cost/benefit analysis which would allow an assessment on whether the quantum of SRAS procured meets the SRAS Objective is a difficult task, Snowy Hydro considers that Roam Consulting<sup>3</sup> approach should form the basis of an objective, transparent, and robust methodology for cost/benefit assessment.

ROAM surveyed the available literature on the probability of large blackouts in power systems around the world which had comparable characteristics to the NEM. From this literature review ROAM estimated the probability of blackouts of varying magnitudes for the NEM. One way to represent the probability of particular event is the “return period”, which refers to the number of years between events, on average. The estimated return period for the NEM for various blackout magnitudes (i.e. demand in MWs affected) is noted in the table 1 below.

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<sup>3</sup> Roam Consulting, Report to the NGF & PGG - Review of System Restart Ancillary Services (SRAS) Requirements in the NEM, 7 May 2014

Blackout Size	Estimated Return Period (Years)	Observed Return Period (Years)
≥ 500 MW	1.6	1.25
≥ 1,000 MW	2.7	2.5
≥ 1,800 MW	4.5	5
≥ 5,000 MW	12.1	N/A
≥ 10,000 MW	24.6	N/A
≥ 15,000 MW	37.3	N/A
≥ 20,000 MW	50.3	N/A
≥ 25,000 MW	63.4	N/A

Table 1 - Estimated NEM blackout return periods

From Table 1 coupled with the Value of Customer reliability values both the Reliability Panel and AEMO could use this data to ascertain for each electrical sub-network whether sufficient SRAS have been procured to meet the SRAS objective.

The Roam Consulting methodology has provided a sound fundamental method for cost/benefit analysis of SRAS to see if the SRAS Objective is met. We encourage the Reliability Panel to expand on this work and customise the statistics and methodology to the NEM as part of the review of the System Restart Standard.

### Conclusion

In conclusion, Snowy Hydro believes the review of the system restart standard is timely. We believe there are material risks to the market because AEMO has focused predominantly on the immediate procurement costs and as a result have just procured the bear minimum amount of SRAS. The SRAS services are expected to be available and operate as expected in the event of a black system event. Clearly these are unrealistic expectations and if there was a major black system event, AEMO would effectively put the economy and society's dependence on electricity at peril. On this basis all Stakeholders in the NEM require an objective cost/benefit methodology to ascertain whether sufficient SRAS has been procured.

Snowy Hydro appreciates the opportunity to respond to this review issues paper. I can be contacted on (02) 9278 1862 if you would like to discuss any issue associated with this submission.

Yours sincerely,



Kevin Ly  
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