SYSTEM RESTART AND ANCILLARY SERVICES - DRAFT REPORT

PREPARED BY: Market Development

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Contents

1 Executive Summary

This Draft Report sets out AEMO's key recommendations to improve the System Restart Ancillary Services (SRAS) arrangements in the National Electricity Market (NEM).

In the event of a major supply disruption, SRAS provides the capability to restart generating units to restore the power system. The ability to restart the NEM, or a portion of it, in a reasonable period of time is considered important because of the significant economic and health and safety consequences that a black system condition might cause.

The National Electricity Rules (NER) currently require AEMO to conduct a competitive tender process for the procurement of SRAS. In the past two tenders, SRAS costs increased from approximately $15 million in the 2007-08 financial year to $30 million in the 2008-09 financial year, and from $35 million in the 2011-12 financial year to $55 million in the 2012-13 financial year. In the light of these significant cost increases, AEMO decided to review the SRAS arrangements to ensure they deliver value to energy consumers through an appropriate price and service balance.

On 25 January 2013, AEMO published an Issues and Options Paper to commence its review of SRAS in the NEM (the SRAS Review). This paper outlined the changes in SRAS costs and quantities over time, considered the NEM and international experiences, and presented a number of options to better meet the SRAS objective. The Issues and Options Paper also sought stakeholder feedback on the value delivered by the SRAS arrangements, the reasons for the SRAS cost increases and the proposed improvement options.

Most of the submissions to the Issues and Options Paper generally fell into one of two categories – those supporting the status quo (mainly current or potential SRAS providers), or those supporting changes designed to reduce the cost of SRAS (mainly major users and consumer representatives).

After considering the submissions, AEMO proposes to take forward a number of identified improvements, with an immediate focus on revising the SRAS quantities needed to meet the System Restart Standard (SRS). AEMO's technical analysis reveals that the SRS can continue to be met using less SRAS than is currently procured. Based on services and prices offered in the 2012 SRAS tender process, a corresponding reduction in the quantity of SRAS procured by AEMO could result in an estimated $24 million reduction in annual SRAS costs.

While AEMO believes that the proposed change to the number of electrical sub-networks and SRAS procured should tend to increase competition in the provision of SRAS, it remains concerned that there may not be effective competition in the provision of SRAS in some sub-networks. It therefore proposes that rule changes be considered along the lines of those in effect under clauses 3.11.5 (h)-(i) of the NER for the Network Support and Control Ancillary Services (NSCAS) tender process. AEMO also proposes to benchmark SRAS costs to assist its next SRAS tender assessment.

To improve cost reflectivity, AEMO also proposes that the costs of any SRAS that benefit only one NEM region should be recovered on a regional basis.

The key recommendations for improvement outlined in this Draft Report are:

a) To reduce the quantity of SRAS procured to meet the SRS by a combination of the following measures:

- Procuring SRAS on the basis of a regional, rather than NEM-wide, black system condition, while still meeting the SRS.
- Re-defining the electrical sub-networks, reducing their number from ten to seven.
- Procuring one SRAS in each electrical sub-network except Tasmania, where two would be required to provide sufficient diversity and contingency. On the mainland, supply from adjacent regions can be used to support SRAS sourced within a region, providing sufficient diversity and contingency to meet the requirements of the SRS.
- Creating one SRAS definition to replace the current definitions of primary and secondary restart services.

b) Developing proposed rule changes to identify and manage non-competitive outcomes in the SRAS tender process, along similar lines to those in effect under clauses 3.11.5 (h)-(i) of the NER for the NSCAS tender process.

c) To improve cost-reflective recovery for SRAS with respect to the benefits of a service, by allowing the costs of SRAS to be recovered on a regional basis.

d) To monitor and review the effectiveness of the current procurement process in relation to the SRAS objective in the NER by reviewing outcomes from the next tender process, after the implementation of SRAS quantity reductions, against comparable international benchmarks.

The further development and implementation of the proposed changes will require AEMO to undertake the following processes:

- For recommended changes to SRAS quantities, consultation in accordance with the Rules consultation procedure under the NER on amendments to the Boundaries of Electrical Sub-networks and SRAS Quantity Guidelines, and any consequential changes to the SRAS Description and SRAS Assessment Guidelines. AEMO would seek to implement any changes resulting from that consultation prior to the next tender process. Current SRAS contracts generally expire on 30 June 2014, but AEMO may extend the term of any of them by up to a further year.
- For AEMO's recommended change to the SRAS definition and reliability level (set out in the SRS), the development of a rule change proposal for consultation by the AEMC, and an amendment to the SRS, to be determined by the Reliability Panel. If implemented, consequential changes to the SRAS Description and SRAS Assessment Guidelines would also be required, subject to the Rules consultation procedure.
- For AEMO's recommended rule changes to the treatment of non-competitive offers for SRAS and the basis for SRAS cost recovery, the development of a rule change proposal for consideration by the AEMC.
- In relation to the SRAS procurement process, further consultation as required following a review of the outcomes of the next tender process.

Making a submission

AEMO encourages stakeholders to provide comments on the recommendations in this report. Provision of detailed information to support submissions, particularly from current and potential SRAS providers, would assist AEMO in developing its recommendations in the Final Report.

The AEMO contact for any queries or further information in respect of the SRAS Review is Taryn Maroney, telephone 02 8884 5609, e-mail taryn.maroney@aemo.com.au.

For the purpose of informing the Final Report, stakeholders are invited to submit written responses to this Draft Report **by no later than close of business Friday, 7 June 2013**.

AEMO prefers that submissions be forwarded in electronic format as submissions will be published on AEMO's website. These should be emailed to SRAS.review@aemo.com.au.

2 Introduction

2.1 Purpose and scope of SRAS Review

The purpose of the SRAS Review is to identify whether improvements are necessary to the SRAS arrangements to deliver an appropriate price and service balance.

The scope of the SRAS Review includes:

- Identifying reasons driving cost increases.
- The appropriateness of the SRAS objective.
- SRAS quantities.
- SRAS procurement.
- Other improvements to the SRAS arrangements.

2.2 Stakeholder consultation process

On 17 December 2012, AEMO held a public forum and on 25 January 2013 AEMO published its Issues and Options Paper.

AEMO has met with a broad range of stakeholders to explain the reasons and options covered by the SRAS Review, including members and representatives from generator groups, consumer groups, transmission network service providers (TNSPs), the AEMC and Reliability Panel, and NEM jurisdictions.

Submissions to the Issues and Options Paper closed on 8 March 2013; 14 submissions were received. The following table includes a list of respondents:

RESPONDENT	PARTICIPANT TYPE OR OTHER ROLE	REGION(S) PARTICIPATING
AGL Energy Limited (AGL)	SRAS provider Generator – market scheduled and non-scheduled, market semi-scheduled non-market non-scheduled Market Customer	Victoria Queensland, South Australia, Victoria, New South Wales
Alinta Energy (Alinta)	SRAS provider Generator – market scheduled Market Customer	South Australia Queensland, South Australia, Victoria
CS Energy Ltd (CS Energy)	SRAS provider Generator – market scheduled, non – scheduled	Queensland
Delta Electricity (Delta)	SRAS provider Generator – market scheduled, non-scheduled Market Customer	New South Wales
Energy Australia Pty Ltd (Energy Australia)	Generator – market scheduled, non-scheduled, semi-scheduled, Market Customer	South Australia, Victoria, New South Wales
GDF Suez Australian Energy (GDFSAE)	SRAS provider Generator – market scheduled	Victoria South Australia, Victoria
Hydro Tasmania (Hydro Tasmania)	SRAS provider Generator – market scheduled and non-scheduled Market Customer	Tasmania
Macquarie Generation (Macquarie)	SRAS provider Market Generator	New South Wales
Major Energy Users Inc. (MEU)	Represents large end-use consumers	n/a
National Generators Forum (NGF)	Represents generators	n/a
Origin Energy Limited (Origin)	SRAS provider Generator – market scheduled and non-scheduled Market Customer	New South Wales, South Australia Queensland, South Australia, Victoria, New South Wales
Snowy Hydro Limited (Snowy Hydro)	SRAS provider Generator – market scheduled and non-scheduled	New South Wales
St Vincent de Paul Society Victoria (St Vincent de Paul)	Represents small end-use consumers	Victoria
Stanwell Corporation Limited (Stanwell)	SRAS provider Generator – market scheduled and non-scheduled Market Customer	Queensland

AEMO appreciates stakeholders' interest and response to the Issues and Options Paper. A number of stakeholders have raised concerns over the SRAS Review's process and timelines due to the broad range of issues. AEMO considers it important to undertake changes in a timely fashion to support regulatory certainty, particularly for the next SRAS contract period. In particular, recommended changes cannot be made to the SRAS arrangements without further consultation on relevant AEMO SRAS procedures and guidelines, and where applicable, the NER and the SRS.

This Draft Report sets out recommendations for change, but does not include any detailed procedural or rule changes. The Final Report will outline how recommendations would be implemented; this will include the process and sequence of any changes.

2.3 Structure of the Draft Report

The structure of this report follows:

- Section 3: Background – information on the key concepts and relevant standard and guidelines for the SRAS arrangements.
- Section 4: Context – summary of the 2006 SRAS rule change and AEMO's analysis of changes in SRAS costs and quantities, the degree of competitiveness in SRAS tenders and an international comparison of black start costs.

Note: Sections 3 and 4 are reproduced from the Issues and Options Paper issued on 25 January 2013. They contain no new information but are replicated here for the convenience of the reader.

- Section 5: AEMO's scope to undertake the SRAS Review – in light of stakeholder submissions to the Options and Issues paper, this section discusses AEMO's role and scope in undertaking this review, and the effectiveness of the current competitive tendering approach to SRAS procurement.
- Section 6: SRAS improvement options – identifies AEMO's consideration and recommendations of the areas of improvement for the SRAS arrangements, including the SRAS objective, SRAS quantities, procurement arrangements, SRAS recovery, and further areas of improvement.
- Appendix 1 – Summary of Submissions to the Issues and Options Paper.

3 Background

3.1 What is SRAS?

SRAS is provided by Generators that have black start capability that can be used to restore the power system in the unlikely event that a region or a significant portion of it loses power or has collapsed into a black system. Generating facilities with black start capability are capable of being re-started, or of remaining in service without electricity being supplied from the national grid. They must be capable of reconnecting to the national grid within 60 minutes after a request from AEMO and be able to control frequency and voltage. SRAS is commonly provided by:

- Generating units that can restart without being connected to the national grid, for example, hydro or gas turbine generating units.
- Trip to house load (TTHL) schemes, which include large generating units that can automatically disconnect from the national grid and continue to supply their own auxiliaries.
- Combination system restart sources, which are large generating units that can be started from a nearby small power station, such as a thermal power station with an adjacent black start gas turbine generating unit.

If a significant part of the NEM needed to be restored, SRAS can be used to achieve this. Once connected, the electricity supplied from a black start facility would primarily be used to start-up other significant generating units to provide the capacity to restore load. This process would be co-ordinated and managed by AEMO and relevant TNSPs. In managing this process, AEMO co-ordinates restoration of generation and load to ensure voltage is maintained within acceptable limits, and the power system is secure, to avoid the possibility of loss of generating facilities that have been reconnected.

The NER recognises two types of SRAS, primary and secondary. The differences between the two are related to their contracted output and restart timeframes.[1] A primary restart service must be capable of restarting itself and demonstrate the ability to restart a specified generating unit. A secondary restart service is required to restart itself and energise its local busbar. In procuring SRAS for an electrical sub-network, AEMO prioritises primary restart services over secondary restart services.

3.2 What events could cause a black system condition?

A black system condition is a rare event. Possible causes include:

- Protection failures.
- Natural disasters, for example a cyclone, flood, solar storm, or an earthquake.
- Terrorist strikes or other deliberate damage to significant infrastructure.
- Cyber attacks.

Estimating the probability of rare events is difficult and imprecise due to insufficient data being collected and techniques available to measure these events. It is even more difficult to predict the likelihood and consequence of rare events interacting.

AEMO considers that the probability of a black system condition occurring in the NEM is better understood in light of experience to date and by reviewing international events. In recent years the NEM has experienced a number of natural disasters, including the 2012 Victorian earthquakes and, in 2011, the Queensland floods, Cyclone Yasi and the Victorian bushfires. In each of these incidents protection systems operated effectively and the NEM did not experience a black system condition. In some of these cases, there was significant damage to infrastructure that prevented all load being restored immediately.

In the NEM's history there has been only one black system condition; it occurred on 22 January 2009 in Far North Queensland. In this instance, a multiple contingency event occurred on the 275kV network between Ross and Strathmore substations resulting in the shutdown of the power system north of Ross.[2] More than 60% of North Queensland demand was interrupted and the black system condition in North Queensland continued for almost 2.5 hours. In consultation with Powerlink, AEMO restored North Queensland from the Strathmore and Clare substations and did not dispatch contracted SRAS in North Queensland.

Since the NEM's experience of black system conditions is limited to one event in an area of the network that is long and stringy (low meshed system), AEMO has reviewed some major international blackouts to identify the types of events that could cause a black system condition. Table 1 sets out some of the major international blackouts and identifies the key underlying causes for each event.

[1] For further information, see the SRAS Description at: http://www.aemo.com.au/Electricity/Market-Operations/Ancillary-Services/Process-Documentation/System-Restart-Ancillary-Services-SRAS.
[2] For further information refer to AEMO's Power System Incident Report: Black System Condition in North Queensland on Jan 22.

It is very unlikely that any of these rare events would cause a NEM-wide black system condition because the design and operation of the NEM significantly reduces the likelihood of a black system occurring across the entire NEM.[3]

Table 1: Key non-NEM/international blackouts

EVENT	NON-CREDIBLE CONTINGENCY	LINE OR PLANT FAILURES	CONTROL SCHEME OR PROTECTION FAILURE	LACK OF SITUATIONAL AWARENESS	SWITCHING ERROR	IT FAILURES	MARKET RELATED
2012 – USA	X						
2012 – India	X	X	X	X			X
2010 – Northern Territory	X				X		
2009 – Brazil and Paraguay	X	X					
2007 – Columbia			X		X		
2005 – Java (Bali)		X					
2003 – USA and Canada		X		X		X	
2003 – Italy				X			X
1999 – Southern Brazil	X						

3.3 Why do we procure SRAS?

In developed countries, electricity is considered an "essential service", since widespread and protracted loss of electricity supplies could lead to significant national and individual economic hardship, and serious public health and safety issues. Therefore, in the public interest, it is considered essential that system operators can demonstrate to policy makers and the broader community that there is capability to restart the power system in a reasonable period of time in the event of catastrophic failure. When considering why SRAS is procured and the value derived by beneficiaries, it is useful to bear in mind the 'value' derived by beneficiaries of the restoration process, this is set out in Table 2. Importantly, consumers are not the only beneficiaries.

It could be argued that Generators participating in the NEM have a self-interest to ensure they have a black start capability, since in the event of a system failure they will be unable to earn (or, at least, maximise) revenue until the system is restarted and load restored. However, without some enforceable requirement for generators to provide a restart capability, there can be no basis to require testing of performance against required standards and, hence, enable the system operator to demonstrate the capability to restart from a black system condition.

Most developed countries ensure that there is a demonstrable black start capability, either by mandating generators provide specified services, or by procuring the services. In either case the generators' restart capability is required to be demonstrated periodically through testing, and there are regulatory or contractual remedies for failure to meet specified standards of service.

[3] Adjacent NEM regions blacking out is unlikely because the network is not heavily meshed and has distinct weak points that are readily identifiable at the regional boundary points.

Since it is not necessary for all generators to have black start capability to enable the system to be restarted adequately, procurement of adequate services from those able to provide the service most cost effectively might be preferred, if the cost of procuring the service are equitably recovered from all beneficiaries, including those generators who do not provide the service.

This is the current approach in the NEM. The required SRAS in the various regions and sub-networks is procured through competitive tender, with the costs of the service provision then recovered across all NEM Market Generators and Market Customers nationally, pro-rated on annual energy quantities, without any differentiation based on the level of service provided to, or benefit perceived by, individual regions, sub-networks or individuals.

Table 2: SRAS beneficiaries

	HOW DO THEY BENEFIT?	FACTORS AFFECTING THE 'VALUE'
Generators	Generators who initially consume and benefit from the auxiliary supply from a black start provider, in turn, are able to generate electricity and earn a return for that output	Commercial positions, reliance on the SRAS arrangements, impact of restart timeframes and the technology of the generating unit, political or company Board pressures
Market Customers	Market Customers consume and benefit from having electricity to use for their own production/manufacturing or for retailing purposes	Commercial positions, production losses, restoration timeframes, costs involved in managing the blackout, perception of the availability of the network
Consumers	Consumers benefit from the restoration of electricity and use of all the services and goods that make up modern living.	Impact on health, safety, loss of production, perishables

3.4 Current regulatory arrangements

The key elements of the regulatory arrangements regarding SRAS are set out in Figure 1.

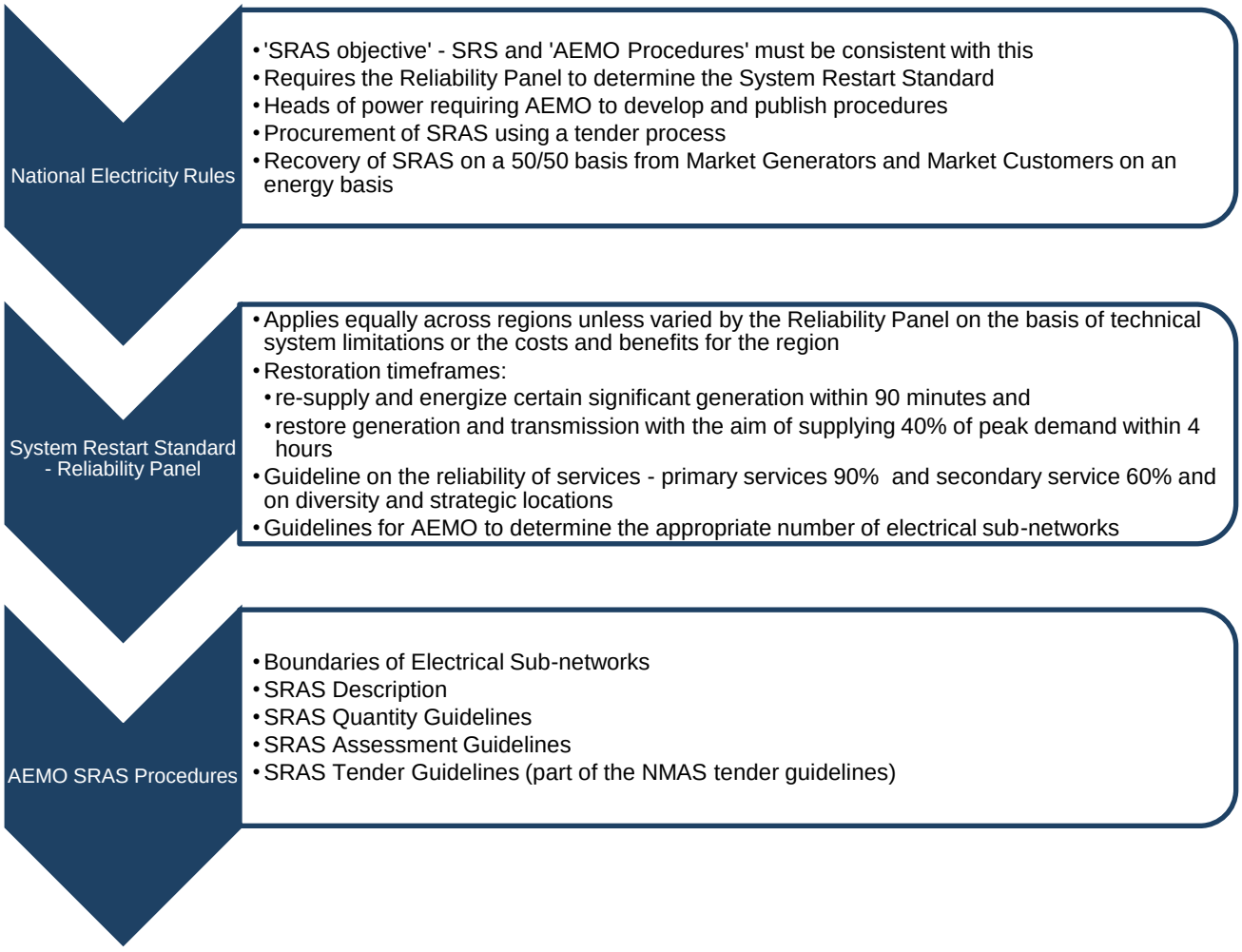
The NER states that the SRAS objective "…is to minimise the expected economic costs to the market in the long term and in the short term, of a major supply disruption, taking into account the cost of supplying system restart ancillary services, consistent with the national electricity objective".[4]

In requiring AEMO to procure SRAS to meet the SRAS objective, the NER also imposes requirements for a number of documents and procedures to be developed to determine how much SRAS is required, and how it is to be procured. These arrangements include the SRS, which is set by the Reliability Panel, to determine and benchmark the services AEMO should procure[5], and a number of AEMO procedures and guidelines.

[4] Refer to clause 3.11.4A(a) of the NER.

[5] It should be noted that the Interim Restart Standard determined by NEMMCO applies to the current SRAS tenders and the SRS applies from 1 August 2013. There are minor differences between these and this does not change the current SRAS arrangements.

Figure 1: SRAS regulatory arrangements



The NER also requires AEMO to develop and publish the Boundaries of Electrical Sub-networks, SRAS Description, SRAS Quantity Guidelines, SRAS Assessment Guidelines, and the SRAS Tender Guidelines (AEMO Procedures). These must also be consistent with the SRAS objective.

Additionally, the NER requires AEMO procedures to be designed to ensure the SRS is met. Table 3 sets out the relevant NER clauses and a summary of AEMO procedures, which have been consulted on in accordance with the Rules consultation procedures.

Table 3: Relevant NER clauses for AEMO SRAS procedures

CLAUSE(S)	PROCEDURE	OBJECTIVE
3.11.4A(d)	SRAS Description	• identifies the difference between a primary and secondary restart service • details the technical and availability requirements of each service
3.11.4A(e)	SRAS Assessment Guidelines	Sets out the process used by AEMO to assess offered SRAS including: • modelling and assessment of technical capabilities • physical testing • anything AEMO considers relevant
3.11.4A(f)	SRAS Quantity Guidelines	Provides guidelines for determining the number, type and location of SRAS procured for each electrical sub-network

CLAUSE(S)	PROCEDURE	OBJECTIVE
3.11.4B	Boundaries of Electrical Sub-networks	Determines electrical sub-network boundaries taking into account: • The number and strength of transmission corridors • The electrical distance between generation centres • The quantity of generation and load in an area
3.11.5(b)	SRAS Tender Guidelines	Provides guidelines on the SRAS tender process and requires SRAS providers' facilities to be tested in accordance with the SRAS Assessment Guidelines and the timeframes for physical testing

The NER requires AEMO to procure SRAS using a competitive tender process, and sets out the payment and recovery mechanism in clause 3.15.6A of the NER. AEMO pays SRAS providers in accordance with the terms of their SRAS agreement. Fees may comprise an availability payment for each trading interval the SRAS is available, a testing charge paid once per year on completion of a successful test and a usage charge if AEMO instructs the SRAS to be delivered.[6] SRAS payments are recovered on a 50/50 basis from Market Generators and Market Customers on a NEM-wide basis pro-rated to energy consumed and generated.

Additionally, clause 3.14.3 of the NER allows AEMO to suspend the spot market in a region where a black system condition has occurred.[7] If this occurs, the spot market price and ancillary service prices would be suspended in that region. The market suspension price would be set at AEMO's forecast prices, which are determined two weeks in advance and are based on three-week rolling averages.[8]

3.5 How are SRAS quantities determined?

SRAS quantities are determined by AEMO applying the SRAS Quantity Guidelines, which must:

- Be consistent with the SRAS objective.
- Meet the SRS.[9]
- Be designed to ensure the need for SRAS in each electrical sub-network is met.

The SRAS Quantity Guidelines specify that AEMO should procure at least two SRAS for each of the ten electrical sub-network if practicable. This assumes that at any time one SRAS might be unavailable to restart the electrical sub-network. Other factors affecting the SRAS quantities procured are detailed in the SRS and include the type of service (primary or secondary), its location, the electrical, geographic and technological diversity of each SRAS, all of which are applied through the SRAS Quantity Guidelines.

3.6 What factors could increase the potential requirement for SRAS?

Certain economic, environmental or political conditions could increase the risk of occurrence of a black system condition if control mechanisms are not in place or inadequate. Table 4 sets out examples of these factors.

Table 4: AEMO's assessment of factors that increase the risk of a black system condition

RISK	FACTORS AFFECTING LIKELIHOOD	CONTROL MECHANISMS

[6] To date no usage payments have been made.
[7] For the black system condition in North Queensland in 2009 AEMO did not suspend the spot market in the Queensland region.
[8] For further information on market suspension pricing refer to clause 3.14.5 of the NER and http://www.nemweb.com.au/REPORTS/CURRENT/MKTSUSP_PRICING/.
[9] The System Reliability Standard can be found at: http://www.aemc.gov.au/market-reviews/completed/system-restart-standard.html.

RISK	FACTORS AFFECTING LIKELIHOOD	CONTROL MECHANISMS
Protection failures leading to cascade failure	A decrease in investment in equipment could increase the likelihood of cascade failure.	AEMO could monitor the number of trips and the number that lead to cascade failures over time
Natural disasters, for example a cyclone, flood, geomagnetic disturbances caused by a solar storm, or an earthquake	Geographic location and climate change	• Disaster management practices in place as these are uncontrollable events • Further investment in safeguarding equipment for changes in climate change environment
Terrorism strikes or deliberate damage	Numerous cited reasons include involvement in international politics and wars, economic instability and poverty, political freedom and ideological beliefs	• Security practices for identified likely targets • Disaster management practices in place as these are uncontrollable events
Cyber attacks	Numerous cited reasons include frivolous actions to create economic and social instability, ideological beliefs, involvement in international politics and wars	• Information security practices • Disaster management practices in place as these are uncontrollable events

3.7 What factors could influence the level of SRAS quantity?

The level of SRAS will be determined by a number of factors including:

- Perceived likelihood and consequence of an extreme event occurring and the risk appetite.
- Costs.
- Required or mandated restoration timeframes.
- Perceived likelihood that significant infrastructure is available.
- Reliability and availability of contracted black start units.
- Interconnectedness of the NEM.
- Political sensitivities.

These factors are interdependent. For example, the willingness to pay a certain price for SRAS might be influenced by the perceived likelihood and consequence of an extreme event occurring and the predicted restoration timeframes.

4 Context for Improvements to the SRAS Arrangements

4.1 2006 Rule change

NEMMCO (now AEMO) previously reviewed the SRAS arrangements, culminating in a proposed rule change submitted to the National Electricity Code Administrator (now the AEMC) in April 2005. This proposed technical and procedural changes to increase the effectiveness of SRAS procurement and included, among other things, the following:

- Specification: in light of offers received, determine the quantity and type of SRAS to be procured, including primary and secondary restart services.
- Recovery of SRAS on a NEM-wide basis.

- A cost-based procurement model using the following principles to ensure reasonable terms and conditions in procuring SRAS:
    - Tender prices should be based on efficiently incurred long run incremental costs of providing service, while providing a return on risk-adjusted capital close to its opportunity cost.
    - Tenderers must confidentially provide to NEMMCO the information necessary to properly inform good faith negotiations.
    - Access to dispute adviser to ensure prices close to outcome that would be obtained in a competitive market.

In April 2006, the AEMC published its final determination and rule. Although it adopted the majority of NEMMCO's proposed changes, the AEMC decided on a competitive procurement model instead of the cost-based procurement approach proposed by NEMMCO. The AEMC's determination was informed by a report compiled by consultants, Firecone Economics, and rejected the proposed cost-based procurement model on the basis that:

- The current inefficiencies in the tendering process did not justify the proposed interventionist approach.
- A competitive tendering process for SRAS procurement was more appropriate.
- A regulated approach in an apparently competitive market is inappropriate unless there is demonstrated market failure.
- NEMMCO had not demonstrated there was a market failure.

Firecone's report also noted that high prices do not necessarily create a loss in economic efficiency and wealth transfers from consumers to service providers does not show that their magnitude is sufficient to justify a regulatory response.

4.2 Changes in SRAS costs and quantities procured

Figure 2 demonstrates that nominal SRAS costs have trended upwards and more than quadrupled since the start of the NEM, with significant increases occurring as a result of the 2008 and 2012 tenders; for example, nominal SRAS costs increased from approximately $35 million for the 2011-12 financial year, to approximately $55 million for the 2012-13 financial year. Some of this increase can be explained by an increase in the number of SRAS being procured by AEMO to meet the SRS and requirements included in AEMO Procedures.

Figure 3 sets out the nominal SRAS costs on a regional basis and shows that all regions' costs have trended upwards, with notable increases occurring in New South Wales, Tasmania and Victoria. To understand some contributing factors to the increase in SRAS costs it is necessary to take into account the changes in the quantity of SRAS procured and these are set out in Table 5.

The percentage changes in costs shown in the right hand column of Table 5 relate only to the change in costs for the same services provided in 2011-12 and 2012-13, and do not reflect cost changes attributable to the number of services procured.

For the SRAS offered in the two SRAS tenders since 2006, AEMO has compared the nominal prices and calculated the percentage change in price to provide an indication of the SRAS cost changes.

Figure 2: NEM SRAS Costs

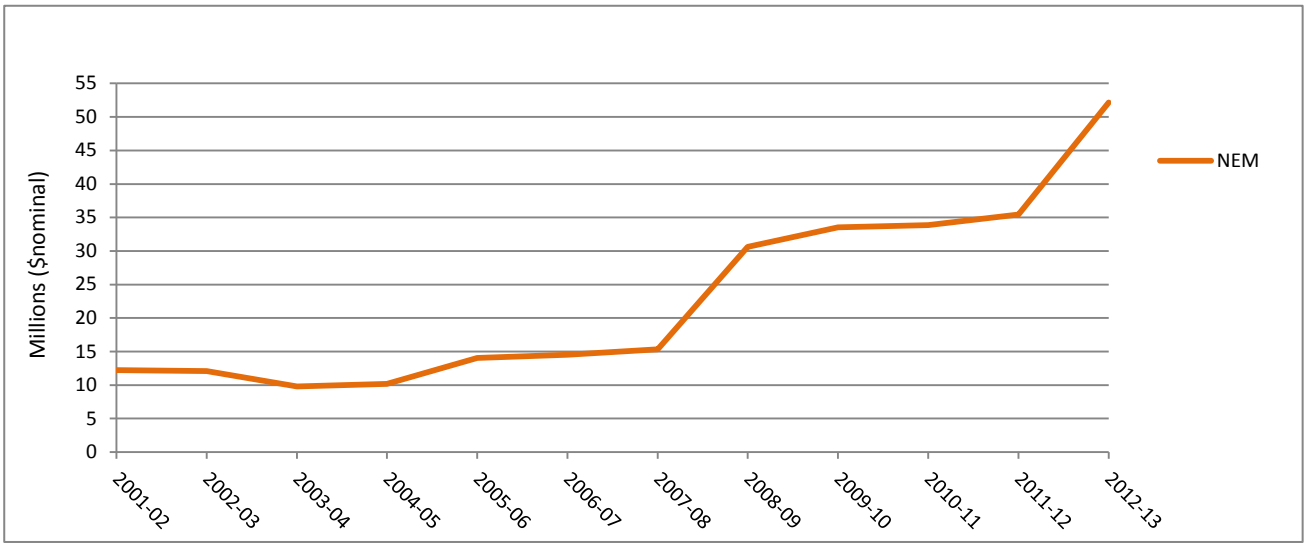


Figure 3 NEM Region SRAS Costs

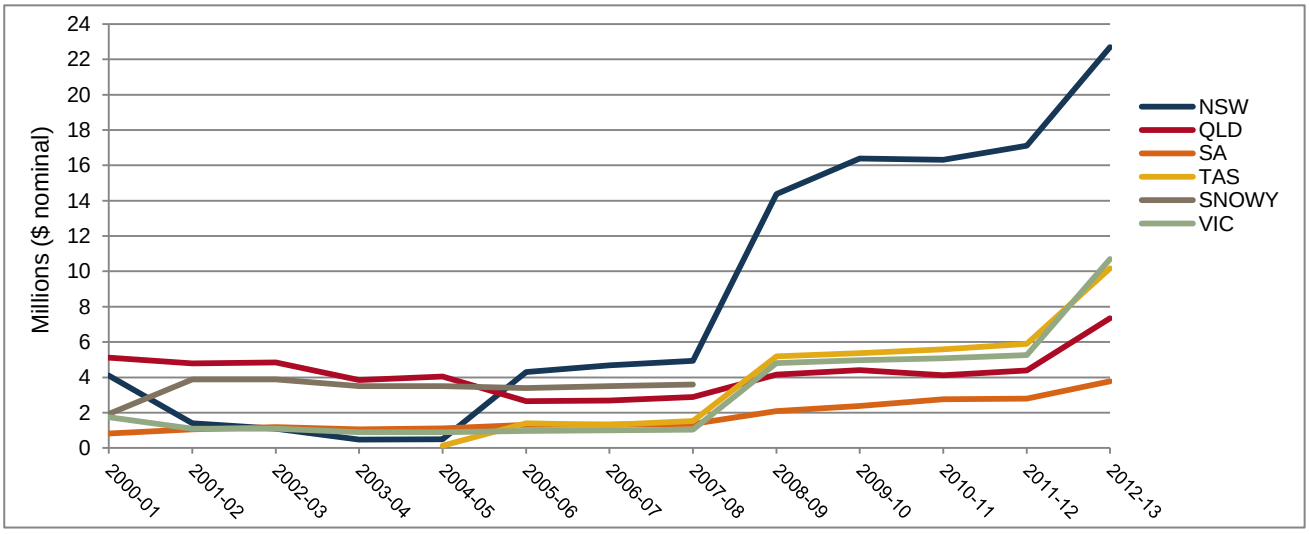


Table 5: Changes in SRAS Quantities and costs of contracted SRAS in 2008 and 2012

ELECTRICAL SUB-NETWORK	No. of SRAS (2008-12)	No. of SRAS (2012-14)	CHANGE IN NO. OF SRAS	2008-09 ($M, NOMINAL)	2012-13 ($M, NOMINAL)	% CHANGE IN COST
Queensland – North	2	1	↓ 1	.88	1.37	↑ 55
Queensland – Central	2	3	↑ 1	2.50	2.78	↑ 11
Queensland – South	2	2	-	1.15	2.38	↑ 107
New South Wales – North	3	3	-	9.54	11.91	↑ 25
New South Wales – South	3	2	↓ 1	9.90	10.78	↑ 9
Victoria - Latrobe Valley	1	2	↑ 1	1.57	2.63	↑ 67
Victoria - North and West*	0	2	↑ 2			
South Australia	3	3	-	2.99	3.78	↑ 28
Tasmania – North and South**	3	3	-	5.44	10.16	↑ 87

Note:
* For Victoria – North and West, no figures are recorded for the change in costs because the same SRAS was procured for this electrical sub-network and for South New South Wales in the 2008 tender process. The SRAS costs were included in South New South Wales SRAS costs.

** For the purpose of this table, no distinction has been made between Tasmania's electrical sub-networks. These are treated as one because, although combinations of SRAS have changed, the number of contracted SRAS is the same between the contract periods and is provided by one SRAS provider.

A number of observations can be drawn by comparing the data in Figure 2, Figure 3 and Table 5. These include:

- Overall nominal SRAS costs have increased significantly since the NEM started.
- There has been a net increase in the quantity of SRAS procured to meet the standards over the two SRAS contract periods. Table 5 shows that three extra SRAS were procured in Victoria, one extra in Central Queensland, and one fewer in both North Queensland and New South Wales–South in the 2012 financial year.
- In Queensland, nominal SRAS costs increased in the 2012 period, with AEMO procuring one less SRAS in North Queensland and one more in Central Queensland. Table 5 also compares costs for the same SRAS offered in 2008 and 2012, with the costs in North and South Queensland increasing by approximately 55% and 107%, respectively.
- In New South Wales, nominal SRAS costs increased significantly in the 2008 and 2012 periods. In 2008, a small portion of the cost increase is explained by Snowy region's SRAS costs being apportioned to New South Wales and Victoria, however the total amount that was apportioned from Snowy to these regions was approximately $3.6 million and the total increase in NSW was approximately $9.4 million. SRAS costs in New South Wales are significantly higher than in other electrical sub-networks.
- In Victoria, nominal SRAS costs increased significantly in the 2008 and 2012 periods. In 2008, and similar to New South Wales, a small portion of the increase can be explained by some of the previous SRAS costs from the Snowy region being included in the 2008 Victorian SRAS costs. The increase in costs in 2012 are partly explained by the three new SRAS procured to meet the SRAS requirement, but it should also be noted that the costs of the same SRAS previously offered in 2008 increased by approximately 67%.[10]
- In South Australia, nominal SRAS costs have increased by 28% over the SRAS contract periods and the same SRAS quantities were procured in 2008 and 2012.
- In Tasmania, nominal SRAS costs have increased significantly in the 2008 and 2012 SRAS contract periods by approximately 87% in the North and South electrical sub-networks. There have been no changes to the quantity of SRAS being procured in Tasmania.

4.3 The degree of competitiveness in SRAS tenders

Since the April 2006 rule change, there have been two SRAS tender processes, one in 2008 and another in 2012. Table 6 sets out for each sub-network and tender process the number of tenders received, number of tenderers, and whether AEMO considered the tenders were competitive. AEMO generally classified a tender for an electrical sub-network as competitive if it received at least one more tender than the number of SRAS required from different providers.[11]

Table 6: Changes in SRAS tenders

REGION	SUB-NETWORK	NUMBER OF TENDERS RECEIVED			NUMBER OF UNIQUE TENDERERS*			COMPETITIVE TENDER		
		2003	2008	2012	2003	2008	2012	2003	2008	2012
QLD	North	2	2	1	1	1	1	N	N	N
	Central	4	3	3	3	2	2	Y	N	N
	South	3	5	3	2	1	2	N	N	N

[10] One of the SRAS included in Victoria's 2012 SRAS tenders and costs was previously included in NSW's 2008 SRAS tenders and costs.

[11] This classification of competitive tenders for each electrical sub-network is consistent with clause 3.11.5(h) of the NER which is applicable to network support and control ancillary services.

REGION	SUB-NETWORK	NUMBER OF TENDERS RECEIVED			NUMBER OF UNIQUE TENDERERS*			COMPETITIVE TENDER		
		2003	2008	2012	2003	2008	2012	2003	2008	2012
NSW	North	3	8	7	3	3	3	Y	N	N
	South	-	2	3	-	2	2	-	N	N
VIC	Latrobe Valley	6	3	4	4	1	3	Y	N	Y
	North and West	-	1	4	-	1	2	-	N	N
SA		4	4	4	2	3	3	N	N	N
TAS**	North	-	3	8	-	1	1	-	N	N
	South	-	2	3	-	1	1	-	N	N
TOTAL	10	22	33	40						

Note: * The number of unique tenderers is per electrical sub-network and it is invalid to total them.
** Tasmania became a part of the NEM in 2005.

A number of observations can be made about the previous three tender processes from the information set out in Table 6:

- The number of unique tenderers has remained relatively stable over the three tender periods.
- The number of tenders received has increased, but the competitiveness of offers must be considered in the light of the number of providers in an electrical sub-network.
- For the 2008 and 2012 tenders, AEMO considers that insufficient tenders were received for the process to be considered competitive in a significant number of sub-networks. This is particularly obvious for the 2012 period where only one out of the ten electrical sub-networks was considered to be competitive. In this instance, two SRAS were being procured and four tenders were received from three providers.

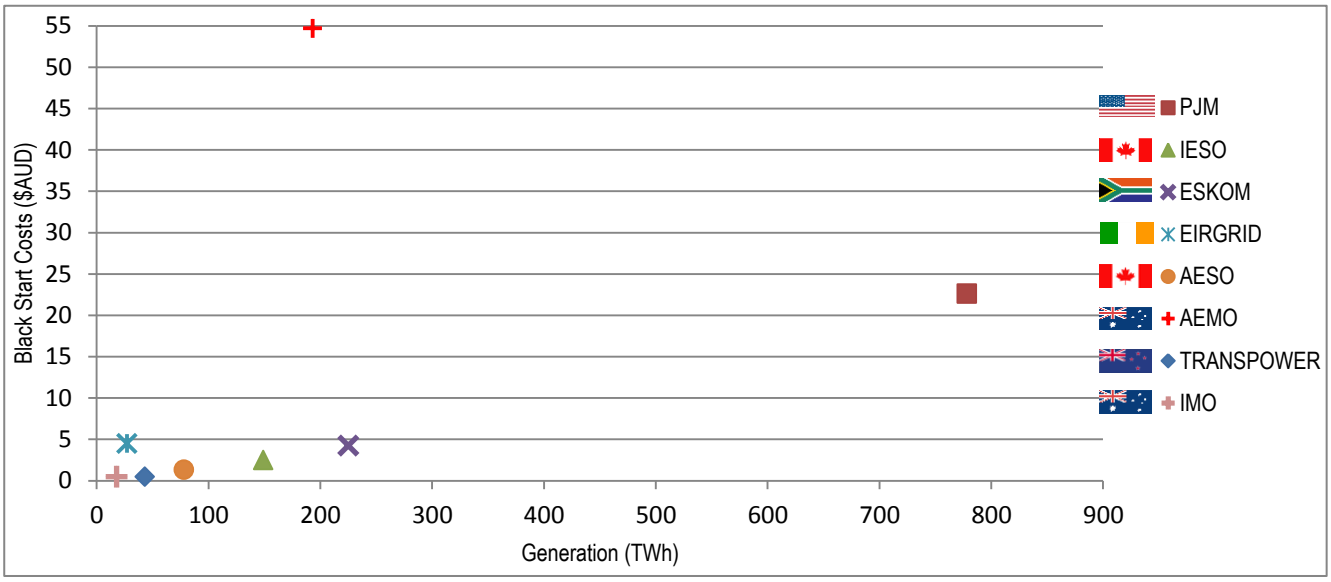
4.4 International approaches

By way of comparison, AEMO has investigated the practices of a number of international markets and, of those reviewed, it appears that the majority have institutional arrangements governing black start capability. It is acknowledged that there are many differences between these markets and the NEM, which might include different market designs, reliability and capacity of the power systems and political systems.

Irrespective, and for all markets, black start capability is a control mechanism to address the risk of a black system condition and procurement costs are effectively the 'risk premium' for these services. In this light, how much is paid annually in comparison to the quantity of generation and the quantity of black start capability for each electrical sub-network is relevant. This allows us to compare the value each market assigns to covering the risk of a black system condition and the trade-offs these markets have made in deciding how much black start capability to procure.

Figure 4 provides information on black start costs compared to the annual generation of the markets AEMO has information about. This does not take into account other market variables. Although a relatively small statistical sample, the costs AEMO pays for black start capability far exceeds those of other markets with similar generation capacities. It should also be noted that the dollar figures do not always correspond to the 2012-13 financial year that the NEM figures are calculated for, because other markets report these figures over different calendar dates although a 12 month period has been used for all. Further, some markets do not appear in Figure 4 but are included in Appendix 1 of the Issues and Options Paper. Markets such as Japan do not procure black start capability but require generating companies to provide this capability, which means that the cost of black start capability is not visible. Further details of international black start standards and the exchange rates used in Figure 4 are set out in Appendix 1 of the Issues and Options Paper.

Figure 4: International comparison - generation and black start costs



5 AEMO's Scope to Undertake the SRAS Review

This section addresses queries raised in some stakeholder submissions as to whether the SRAS Review appropriately fell within AEMO's roles and responsibilities, or whether there was adequate demonstration of a market failure in delivering cost-effective SRAS.

5.1 AEMO's responsibilities

5.1.1 Current requirements

On the advice of AEMO, the Reliability Panel determines the SRS under clause 8.8.1(1a) and must review its performance annually under clause 8.8.3(b) of the NER.

Under the NER, AEMO is responsible for:

- Determining the SRAS procedures to meet the SRS and the SRAS objective, including the SRAS quantities to be procured for the NEM.
- Procuring SRAS through a competitive tender in accordance with SRAS procedures.
- Settling SRAS payments and SRAS costs from Market Customers and Market Generators on a weekly basis.

5.1.2 Stakeholder submissions

Submissions from Origin and CS Energy suggested that in undertaking this review, AEMO was acting outside its remit. Further, in submissions and meetings, a number of stakeholders questioned why AEMO is undertaking the SRAS Review and expressed concern that AEMO was overly focused on SRAS costs.

Origin suggested that the options presented in the Issues and Options Paper are outside the scope of AEMO's jurisdiction. These include:

- Changing the SRS from a national to regional basis.
- The different treatment of electrical sub-networks and merging of electrical sub-networks in NEM regions.
- Whether a competitive SRAS procurement process is appropriate.

Origin stated that "AEMO's role is then to determine the technical and operational parameters to meet these objectives and principles."[12] and suggested that the scope of changes proposed by AEMO should instead be referred to the Reliability Panel to progress.

CS Energy also expressed concern that "AEMO, in running this review and extending its powers in regulatory reform is forgetting its remit, which is to be responsible for power system security for the NEM. AEMO is not an economic regulator: this is the AEMC's role."[13]

5.1.3 AEMO's considerations

AEMO is satisfied that the SRAS Review is consistent with AEMO's powers and functions and, in particular, is consistent with the national electricity objective (NEO). As the SRAS procurer, AEMO understands that it is responsible for assessing and determining SRAS Procedures in accordance with the SRS and the SRAS objective. Effectively, application of the SRAS Procedures determines the quantities (or demand) to meet the SRS. In light of rising SRAS costs, AEMO considers that it is acting responsibly by reviewing whether the SRAS Procedures and the broader SRAS arrangements are appropriate.

Given AEMO's technical and operational expertise, AEMO is well positioned to identify and suggest improvements to the SRAS arrangements. AEMO's objective in reviewing the SRAS arrangements is to ensure they are fit for purpose and, in terms of quantity and price, deliver value to consumers.

Origin suggested that the "…scope of changes proposed by AEMO should instead be referred to the Reliability Panel…"[14] because it is responsible for determining and annually reviewing the performance of the SRS. The majority of AEMO's recommendations affect matters for which AEMO has direct responsibility. [15] For other matters, it is within AEMO's power to make proposals and recommendations for examination by the Reliability Panel or the AEMC as appropriate.

AEMO has also discussed the scope of the SRAS Review and the contents of the Issues and Options Paper with the Reliability Panel and the AEMC. The Reliability Panel's Annual Market Performance Review Final Report highlighted that AEMO was reviewing the SRAS arrangements, and if AEMO identified amendments to the SRS it could raise these with the Reliability Panel.[16]

5.2 Competitiveness of the SRAS market

5.2.1 Issue identified

In the Issues and Options Paper, AEMO expressed a view that the current SRAS market does not exhibit the characteristics of a competitive market. AEMO's view was predicated on changes it identified across successive tender processes to date, including:

- Significant increases in SRAS costs.
- Changes to the SRAS quantities procured.
- The number of SRAS providers in each electrical sub-network.

AEMO is concerned that the SRAS arrangements might not meet the SRAS objective, which incorporates the NEO and reflects the need to take into account the cost of providing SRAS when determining how to minimise the impact of a black system condition.

Over the last three SRAS tenders the NEM has seen significant increases in SRAS costs. Annual SRAS costs in 2004 were $10 million, compared with $55 million in 2012. Based on Australian inflation rates over the same period, this represents more than a four-fold increase in costs in real

[12] *Origin*, Submission, 8 March 2013, p. 2.
[13] *CS Energy*, Submission, 8 March 2013, p. 5.
[14] *Origin*, Submission, 8 March 2013, p. 2.
[15] All SRAS Procedures require AEMO to consult in accordance with the Rules consultation procedures.
[16] *Reliability Panel AEMC*, Annual Market Performance Review, 27 March 2013, p. 15.

terms. In the 2012-13 financial year AEMO will pay about $55 million for SRAS in comparison to about $37 million for the previous financial year.[17] Based on the 2012-13 SRAS tender prices, the total estimated SRAS cost to be recovered from electricity consumers over a two-year contract period will be $110 million.[18] This equates to:

- More than a 54% increase in annualised SRAS costs compared to 2011-12.
- An overall 47% increase in the cost per SRAS contracted compared to 2011-12. Note also that the actual annual per SRAS costs for the 2008 tender increased by around 60% compared with the 2003 tender.

Further information explaining the changes in SRAS costs and quantities procured, and the degree of competitiveness in electrical sub-networks is provided in Sections 4.2 and 4.3.

Even though the number of SRAS procured increased by two as a result of the 2012 tender, there are insufficient tenderers offering SRAS in some electrical sub-networks and competitive pressure between SRAS providers is minimal (Section 4.2 discusses this further). SRAS tenderers have sufficient market knowledge to understand the SRAS quantities that AEMO will tender for due to the transparent regulatory processes and the potential number of tenderers in each electrical sub-network. AEMO considers that the lack of competitive pressure has contributed to the increases in tender costs.

The Issues and Options Paper requested stakeholder input on the factors that have led to the increase in SRAS costs. The information presented indicated changes in prices and quantities across the NEM and highlights that certain regions are less competitive than others. AEMO also included an international comparison of SRAS costs, noting the differences in market design between those markets and with the NEM. The results are summarised in Section 4.4 of this Draft Report.

5.2.2 Stakeholder submissions

In submissions to the Issues and Options Paper, stakeholders expressed divergent views on whether the SRAS market was 'competitive'. The MEU and St Vincent de Paul expressed concern over increasing SRAS costs and whether the current SRAS tender process delivers efficient outcomes. St Vincent de Paul noted "…we do not believe that it would be possible to classify the current tendering process as one that is reflective of a competitive market, which is giving the best value to AEMO and hence to broader energy consumers."[19]

Energy Australia and Origin stated that rising prices do not necessarily indicate that the SRAS market is inefficient or is uncompetitive. On the basis of work undertaken by Firecone Economics to the 2006 rule change, AGL, Alinta and CS Energy suggested that AEMO had not demonstrated a market failure for the SRAS market.

Alinta and CS Energy considered AEMO's presentation of international comparison of SRAS costs misleading. Alinta and Energy Australia suggested that AEMO should have benchmarked SRAS costs against the length of transmission lines instead of generation; Alinta argued that "…SRAS is a physical, not energy service, Alinta considered network characteristics as valid, if not more valid, than capacity alone."[20]

CS Energy also indicated that SRAS costs are below new entrant pricing and "AEMO has the option of entering into a new contract with a new entrant service provider, yet has failed to do so because it appears unable to administer tenders of a sufficient duration to attract new entrants and cannot accept that it should pay the prices equivalent to the cost of new entry."[21]

[17] The majority of SRAS contracts commenced on 1 July 2012.
[18] Includes availability and testing charges, and excludes usage charges and annual CPI escalation.
[19] *St Vincent*, Submission, 26 February 2013, p. 1.
[20] *Alinta*, 8 March 2013, Submission, p. 2.
[21] *CS Energy*, 8 March 2013, Submission, p. 2.

5.2.3 AEMO's considerations

AEMO does not consider the current SRAS market exhibits the characteristics of a competitive market. In competitive markets, price is set by the interaction of demand and supply. In the SRAS market, regulatory arrangements require AEMO to set the demand which is met by SRAS providers. The accepted price is an outcome of a tender process, which has seen significant price increases and no competing offers for some electrical sub-networks. Therefore, in the SRAS Review, AEMO has not only considered the drivers for SRAS cost increases but has also reconsidered the quantities required to meet the SRS and the validity of assumptions driving SRAS quantities. This is explained further in Section 6.2.

Many generators considered SRAS to be a 'public good', with the ultimate beneficiary being the end-use consumer. AEMO views both generators and Market Customers as beneficiaries but acknowledge the end-use consumer ultimately pays for the SRAS arrangements. Generally 'public goods' are provided on the basis that the conditions for a competitive market are not being met and inefficient allocative outcomes might be produced – that is, a market failure has occurred. In effect, regulatory arrangements seek to replicate competitive outcomes; therefore the best measure of success is whether the regulated market replicates outcomes similar to a competitive market. This requires the consideration of factors affecting the interaction of demand and supply. AEMO's assessment of the applicability of these characteristics to the SRAS market is set out in Table 7.

Table 7: Assessment of SRAS market with key characteristics of a competitive market

CHARACTERISTICS OF A COMPETITIVE MARKET	APPLICABLE TO SRAS MARKET	CURRENT CHARACTERISTICS OF THE SRAS MARKET
Large number of buyers and sellers – who are price takers	No	One buyer who is effectively a price taker across all electrical sub-networks, the SRAS arrangements require a single buyer (procurer). A small number of sellers (SRAS providers) in each sub-market (electrical sub-network) that have the conditions to set the price due to the lack of tenderers in a region.
No barriers to entry and exit	No	Up-front capital costs and recovery of capital costs. Transaction costs and regulatory risk – participation in tender process. Scale and technology – size of the generating unit because SRAS description has acceptability criteria. Perceived risk to the generating unit. Pricing strategies that reduce the ability of a new entrant to participate.[22] Information asymmetries – lack of expertise to identify how to participate.
Buyers and sellers have perfect information on the price	No	AEMO does not have access to information on SRAS prices, only costs. Suppliers have knowledge of the demand in an electrical sub-network and are likely to have significant information on the number of potential suppliers.
Zero transaction costs	No	There are transaction costs involved in setting up black start capability and participating in SRAS tenders.
Undifferentiated and homogenous product or service	Yes	SRAS would deliver a homogenous product, however the SRAS is currently differentiated as a primary and secondary restart service.

Some generators noted that AEMO does not have information on efficient SRAS costs and had not demonstrated market failure, and considered that AEMO's analysis of rising SRAS costs, few tenderers in each electrical sub-network, and the international comparison to be misleading.[23] Alinta stated that "…AEMO's analytical approach has been the least objective and generated additional uncertainty…"[24] Stanwell commented that it "…did not consider the current outcomes reflect market inefficiencies or are the result of overly costly provision of SRAS…" and was "…not

[22] Noting CS Energy's comments on SRAS pricing needs to be below that of a new entrant.
[23] *Alinta*, Submission, 8 March 2013, p. 2 and *CS Energy*, Submission, 8 March 2013, p. 2.
[24] *Alinta*, Submission, 8 March 2013, p. 2.

aware of any evidence to suggest the current SRAS arrangements are failing to deliver efficiently priced SRAS in Queensland."[25] Only further investigation of SRAS providers' costs would unequivocally identify this. AEMO does not have powers to require this information from SRAS providers as part of its procurement process and is, therefore, only in a position to identify the increases in costs, the limited number of tenderers in each electrical sub-network and areas of improvement with its procurement approach.

Further, AGL, Alinta, CS Energy and the NGF questioned the value of AEMO's international comparison because of the different characteristics of the markets. Alinta and CS Energy stated that the comparative information was misleading. Alinta provided analysis of international costs using the length of transmission lines as the comparable point, whereas AEMO's analysis used the amount of generation. Alinta stated that it "…considered network characteristics as valid, if not more valid, than capacity alone."[26] AEMO's Issues and Options Paper acknowledged that there are significant differences between markets that could influence cost differences. In terms of Alinta's analysis that presented SRAS costs by length of transmission lines, AEMO does not consider this analysis has greater validity, and is not aware of there being any direct relationship between SRAS costs and the length of transmission lines. Although this feature is often cited to explain cost differences between the NEM and other markets, in the case of SRAS it is only relevant to the number of electrical sub-networks identified by AEMO.[27] Alinta's analysis also seeks to compare regional SRAS costs in the NEM with the total SRAS costs for other markets, although AEMO notes that even the NEM regional costs exceed the total costs for some international markets.

Nevertheless, AEMO does not seek to justify its review of SRAS in the NEM, or its draft recommendations, on the basis of the international comparison presented in the Issues and Options Paper. The comparison undertaken merely provides additional context and indicates that, in terms of SRAS costs paid relative to the capacity of the system, the NEM is a significantly distant outlier compared to other countries and worthy of further investigation. AEMO considers that further benchmarking analysis of international SRAS costs against those in the NEM would be worthwhile.

In contrast to the views expressed by a number of SRAS providers, St Vincent de Paul and the MEU agreed with AEMO's analysis of the SRAS market. These stakeholders stated that significant changes were justified to the SRAS arrangements due to increasing SRAS costs and the small number of tenderers in electrical sub-networks.[28, 29]

6 SRAS Improvement Options

6.1 The SRAS objective

6.1.1 Potential improvement

The NER states that the SRAS objective "…is to minimise the expected economic costs to the market in the long term and in the short term, of a major supply disruption, taking into account the cost of supplying system restart ancillary services, consistent with the national electricity objective."[30]

Given the importance of the SRAS objective in determining SRAS Procedures and in AEMO procuring SRAS, AEMO considered it relevant to examine whether the current methods of assessing and procuring SRAS remain appropriate.

[25] *Stanwell*, Submission, 8 March 2013, p. 1.
[26] *Alinta*, Submission, 8 March 2013, p. 2.
[27] Geographic distance and length of transmission lines between generation and load centres impacts the number of electrical sub-networks.
[28] *MEU*, Submission, 8 March 2013, pp. 1 – 2.
[29] *St Vincent*, Submission, 8 March 2013, pp. 1– 2.
[30] Refer to clause 3.11.4A(a) of the NER.

The Issues and Options Paper indicated that the value of SRAS accrues to Market Customers, Market Generators and end-use consumers. AEMO acknowledged that the procurement of SRAS provides a degree of certainty that main generating facilities would be restarted and, in turn, load would be restored in the timeframes specified in the SRS. If a black system condition occurred, the benefit of this restoration process would be a reduction in the economic and social consequences associated with a black system condition. The longer a black system condition prevailed, the greater the economic and social consequences.

The Issues and Options Paper requested stakeholder comment on whether the SRAS objective is fit for purpose and raised a number of questions for AEMO to gain a better understanding of how SRAS providers interpret this objective and how this impacts SRAS pricing. AEMO also requested stakeholders provide input on the value of SRAS because it wished to consider this in light of the SRAS price and service balance.

6.1.2 Submissions

CS Energy, Energy Australia, Macquarie, and Stanwell commented that the SRAS objective was fit for purpose and expressed support that it did not require review. CS Energy stated that "… this seems a reasonable objective as it mentions the losses accruing from a system black event, discusses the long and short term and includes consideration of the cost of supplying SRAS."[1]

The following responses were received to AEMO's questions regarding the SRAS objective and the impact on pricing:

- The NGF – AEMO's concept of the value of SRAS is misleading because it has not quantified the economic benefit of SRAS.
- CS Energy – AEMO had failed to understand "…costs for supplying SRAS should be near new entrant pricing to allow providers to recover their costs." CS Energy suggested the "SRAS objective need not be "clarified", especially if AEMO is asserting these "direct costs" to be marginal or avoidable costs in providing the service."[31]
- Stanwell – "…the SRAS objective is appropriate and does not consider the wording has contributed to SRAS tenderers offering prices based on value rather than the marginal costs of providing the service." Stanwell also suggested that AEMO consult with stakeholders on how financial and plant risk is incorporated into SRAS pricing.[32]
- Origin stated that "…an efficient cost of SRAS is determined by the economic cost from unserved energy and uncertainty over the restoration of supply. The reliability, speed, location and megawatts available for SRAS will, however, determine the direct and indirect cost of unserved energy through a system black event."[33]

6.1.3 AEMO's considerations

AEMO considers that the SRAS objective is fit for purpose, and indicates that there is a balance to be struck between the potential short-term and long-term economic costs of a major supply disruption, and the cost of providing SRAS as a means of restarting the system, which is ultimately recovered from consumers. The objective does not imply that the value and cost of SRAS should be equal, or even that they are directly comparable. Further, the requirement for consistency with the NEO reflects the significance of efficiency criteria in meeting the SRAS objective, for the long-term benefit of electricity consumers.

For SRAS, AEMO considers that willingness to pay measures should only be used to indicate the value, not determine the price. This is not an unusual concept for goods or services deemed as 'public goods'. For example, Generators, Market Customers and, ultimately, end-use consumers do not pay the value network assets provide; instead a regulated return is paid for these assets.

[31] *CS Energy*, Submission, 8 March 2013, p. 3.
[32] *Stanwell*, Submission, 8 March 2013, p. 2.
[33] *Origin*, Submission, 8 March 2013, p. 4.

AEMO considers that the value of SRAS (if ever required and depending on the whether the load could be resupplied) is that the power system can be restarted and this would significantly reduce disruption to the economy and increase the well-being of affected consumers. However, in determining the value, there are a number of factors that need to be considered, including the likelihood of the event and potential consequences that may be heavily impacted by the duration of the event.

Generators suggested that AEMO has not adequately considered the value of SRAS. AEMO does not dispute that there is value in procuring sufficient SRAS to meet the SRS and SRAS objective. AEMO has undertaken similar analysis to that presented by Alinta however going further, by taking into account time and probability. This analysis was not presented in the Issues and Options Paper because its value is questionable due to the uncertainty of factors that might affect the value of SRAS. AEMO notes that Alinta itself cautioned "…against the use of this form of rudimentary analysis."[34]

AEMO notes Stanwell's comment on clarifying how financial and plant risk are incorporated into SRAS pricing. Given the significant differences in regional SRAS costs between similar technologies, AEMO understands why this has been raised but considers that it does not directly relate to the SRAS objective. Given that SRAS is procured through a tender process, how SRAS is priced is the responsibility of the SRAS tenderer.

Recommendation 1

No change recommended to the SRAS objective.

6.2 SRAS quantities

AEMO has objectively re-evaluated the SRAS quantities it needs to procure to ensure it meets the SRS and the SRAS objective. This has included reviewing the validity of key assumptions underlying the quantities procured, as detailed in this section of the Draft Report.

6.2.1 NEM-wide versus region black system

6.2.1.1 Potential improvement

In determining SRAS quantities, AEMO currently assumes the existence of a NEM-wide black system condition, although the SRS and the NER do not require AEMO to assume this. The Issues and Options Paper identified that AEMO considers the NEM-wide black system condition assumption as too conservative and that it is highly unlikely that the entire national grid would be affected by a black system condition.

The national grid is very likely to separate at the weak points; the regional boundaries. To date, experience of major events on the network has not resulted in NEM-wide disturbances. Examples include the major loss of generation in NSW in 2009, major bushfire events in NSW and Victoria and the 2012 earthquake in Victoria.

6.2.1.2 Submissions

St Vincent de Paul and the MEU supported AEMO's position that a region-wide black system condition was appropriate and would better reflect the need for SRAS.[35, 36] The MEU also highlighted that a region-wide black system condition was the standard prior to deregulation and that the SRS "…seem to [be] more applicable to a regional recovery rather than a national grid

[34] *Alinta*, Submission, 8 March 2013, p. 7.
[35] *St Vincent de Paul*, Submission, 26 February 2013, p. 2.
[36] *MEU*, Submission, 8 March 2013, p. 2

wide basis."[37] Some generators also recognised that a NEM-wide black system condition was an overly conservative assumption. For example, CS Energy agreed a NEM-wide black system condition is unlikely, with only a remote possibility of a black system condition occurring in multiple sub-networks. Energy Australia stated that, while the risk of a NEM-wide shutdown can never be eliminated, a major disruption in one electrical sub-network is significantly more likely.

However, the majority of generator submissions preferred the current conservative assumption of a NEM-wide black system condition. Generators were concerned that changing this assumption (and other suggested changes affecting quantities procured) relaxed the existing standards being delivered by the SRAS arrangements and would reduce the NEM's insurance coverage for restart.

GDFSAE also noted that the likelihood of a black system is increasing rather than diminishing but provided no evidence to support this assumption.[38] Some generator submissions indicated that reducing the current standard that mitigates black system conditions was inappropriate and these arrangements have significant benefits to consumers.

6.2.1.3 AEMO's considerations

While a NEM-wide black system condition is possible, AEMO considers it is so remote a possibility that it is unnecessary to procure SRAS to cover that eventuality. Further, even if there were a NEM-wide black system condition, the level of SRAS being proposed by AEMO would enable the power system to be restarted, although potentially over a longer timeframe, depending on the cause of the disruption.

AEMO recognises that its current procurement approach provides NEM-wide coverage, but considers this provides a higher level of coverage than is required to meet the SRS and insures to a higher standard than is (at current costs) economically justified by the risk. AEMO has reviewed the SRS and the NER, and neither specifies a NEM-wide or a region-wide standard. On this basis it could be argued that no SRAS is required as supply from adjoining areas or regions could be used to restart the affected network, similar to the North Queensland event in 2009. However, AEMO considers that this would not be prudent since there would be no contingency arrangements where inter/intra-regional connections are not available. AEMO therefore recommends that sufficient SRAS be procured within each electrical sub-network to cover a region-wide black system condition in accordance with the timeframes set out in the SRS.

In considering this recommendation, AEMO has taken into account that the structure of the NEM is based on strong regional networks (or States) connected by relatively weak interconnections. The probability of a major disturbance spreading past these weak links is extremely low because of the physical characteristics of the network, operating practices and the control and protection schemes in place. For example, dedicated control schemes are in place on the Victoria – South Australia interconnector to open the interconnector under conditions of major disturbance. The MEU suggested that further investment in these types of control schemes might be warranted to ensure major disturbances cannot cascade across regions.[39]

AEMO is unaware of any evidence or conditions, including conditions relating to wind and solar generation, which might increase the risk of a black system condition as submitted by GDFSAE. AEMO encourages stakeholders to submit detailed evidence of any factors that might increase this risk.

The assumption of a NEM-wide black system condition and acceptance of a combination of failures (generator or transmission lines) leads to procurement of more SRAS. There are many combinations of unlikely events that could lead to a black system condition and the sensitivity of this type of analysis makes it extremely difficult to assess. To assess the SRAS quantities required to meet the SRAS objective, AEMO must hold some inputs constant (for example, transmission lines are available) and make reasonable assumptions about the likelihood of conditions (or a combination of conditions) occurring. If a NEM-wide or region-wide black system condition

[37] Ibid.
[38] *GDFSAE*, Submission, 8 March 2013, p. 1.
[39] *MEU*, Submission, 8 March 2013, p. 2.

occurred it is likely that there would be a myriad of problems to deal with prior to the network being restored – for example, critical transmission lines or the distribution network being unavailable.

Recommendation 2

AEMO recommends it assumes a region-wide black system condition occurs, instead of a NEM-wide black system condition, to determine SRAS quantities.

To effect this change, the SRAS Quantity Guidelines will need to be consulted on. AEMO plans to commence this at the completion of the SRAS Review.

6.2.2 The number of SRAS and electrical sub-networks

6.2.2.1 Potential improvement

In determining SRAS quantities, AEMO currently assumes no support is available from adjoining regions. As discussed in Section 6.2.1, AEMO has reassessed its key procurement assumptions, and considers it is appropriate to assume a region-wide black system condition and that support is available from an adjoining region to restart a region or electrical sub-network in a black system condition. AEMO's Issues and Options Paper proposed that only one SRAS should be procured from each electrical sub-network. Under these conditions a regional restart could be achieved using SRAS in each electrical sub-network or supply from an adjoining region, or a combination of both.

The determination of the number of electrical sub-networks affects SRAS quantities. Therefore AEMO reviewed whether all the current electrical sub-networks remain appropriate to meet the requirements of the SRS and SRAS objective. The NER requires AEMO to determine the boundaries of electrical sub-networks in accordance with certain guidelines specified in the SRS. AEMO considered these requirements when it assessed changes to the number of electrical sub-networks required to determine and implement the system restart plan. The Issues and Options Paper proposed to combine the following electrical sub-networks:

- North and Central Queensland electrical sub-networks.
- North and West Victorian and La Trobe Valley electrical sub-networks.
- North and South Tasmanian electrical sub-networks.

AEMO conducted a number of technical studies to understand what impact changes to the size of electrical sub-networks would have on the timeframes set out by the SRS. Using one SRAS and assuming the adjoining region is available, these studies showed that the SRS timeframes could be met. Further details of these technical studies are set out in Appendix 2 of the Issues and Options Paper.

6.2.2.2 Submissions

Generators expressed divergent views on re-determining the number of electrical sub-networks. Generally, generators did not support AEMO's proposed changes to the number of electrical sub-networks, with the exception of Alinta, which supported changes to the size of electrical sub-networks where it does not compromise restart under black system conditions.[40] Hydro Tasmania recommended that two electrical sub-networks remain in Tasmania because of the length of the transmission corridors and, if one SRAS is procured, the potential isolation between the north and south areas of Tasmania has the potential for prolonged outage periods.[41] Origin Energy did not support the merging of electrical sub-networks in Victoria and Queensland because it understood this would lower the standard in those regions, particularly for Queensland because

[40] *Alinta*, Submission, 8 March 2013, p. 12.
[41] *Hydro Tasmania*, Submission, 8 March 2013, pp. 4 – 5.

of its size, long transmission lines and extreme localised weather events.[42] CS Energy also suggested that the assumption of whether the network would be intact should be questioned.[43]

CS Energy and Macquarie strongly supported multiple SRAS being procured within an electrical sub-network and considered there was a need for redundancy in the network. Many of the remaining generators indicated that AEMO had not provided sufficient information to make a decision. Nonetheless, most generators expressed concern over the SRS being met with a single SRAS procured in each electrical sub-network and the impact if the SRAS was unavailable during a black system condition event. Further, a number of generators were concerned that AEMO's driver for the proposed reduction was too focused on SRAS costs without due consideration of the value of SRAS.

The NGF and Snowy Hydro suggested that AEMO's analysis of changes to the boundaries of electrical sub-networks, NEM-wide versus region-wide black system condition and one SRAS being procured in each electrical sub-network should be independently assessed.

6.2.2.3 AEMO's considerations

Since the implementation of its original SRAS Procedures, AEMO has not specifically reassessed these boundaries and the impact of changes in network, generation and load.[44] AEMO has now conducted a reassessment and considers that it is reasonable to determine seven electrical sub-networks for the purpose of procuring SRAS and determining and implementing the system restart plan.[45] Further, for the majority of electrical sub-networks, AEMO considers that it is appropriate to procure one SRAS because it is reasonable to assume that supply will be available from an adjoining region or electrical sub-network. AEMO considers that this provides sufficient diversity and contingency.

Some generators suggested that AEMO should have this work independently assessed. The analysis undertaken by AEMO was reviewed by TNSPs in affected regions and assessed as being technically feasible. AEMO and TNSPs are independent of each other and technically best placed to assess the requirements in these areas. Additionally, neither benefits from the SRAS arrangements.

Generators also questioned AEMO's objectivity in undertaking the SRAS Review. AEMO is seeking to ensure it fulfils its responsibilities and delivers value to consumers. It has no incentive to misrepresent findings or favour any particular subset of stakeholders.

Tasmania

For Tasmania, AEMO is recommending a slightly different approach to the option canvassed in the Issues and Options Paper, after considering the issues raised by Hydro Tasmania. While AEMO considers Tasmania should be treated as one electrical sub-network, it proposes to procure two SRAS for that electrical sub-network to ensure sufficient diversity if there were a single point of electrical or physical failure and to best meet the SRS. Due to the technical characteristics of Basslink, supply is not available from the mainland to assist in restarting the Tasmania region. AEMO would apply the geographic and electrical diversity requirements in the SRAS Quantities Guideline to ensure SRAS is sourced from different parts of the Tasmanian electrical sub-network and the SRS is met.

Queensland

CS Energy raised concerns about AEMO's recommendation to combine the existing North and Central Queensland electrical sub-networks and the impact that would have on the restoration times for far North Queensland. Origin also indicated that Queensland's long transmission lines and extreme weather events might require additional SRAS to be procured. AEMO notes that Queensland is characterised by large generation and load centres in both the south and central

[42] *Origin*, Submission, 8 March 2013, pp. 2 – 3.
[43] *CS Energy*, Submission, 8 March 2013, p. 4.
[44] AEMO notes that the consultation in 2011 did not reassess whether the boundaries were appropriate.
[45] Refer to clause 3.11.4B of the NER.

areas. While there is a smaller load centre and a small amount of generation in the north, this part of the network is strongly connected to the central area by a number of transmission lines. Recent additions to the transmission network have strengthened the transmission links from the central area to the north. Recent changes to the lower voltage transmission network in the north have also reduced the potential for cascade failures in this network.

While AEMO agrees that the northern part of Queensland has historically experienced more frequent severe weather events than other parts of the NEM, these events tend to be localised. Coupled with the small amount of generation in the area, they pose little risk of line overload or system stability issues that would be reflected further south in the network. Any black system condition in the north is highly likely to be isolated to the north and consequently able to be restored from the central region. While it is acknowledged that an incident in the central region might also result in a black system condition in the north, the entire area can be restarted from the south or suitable SRAS in the central area.

It should be noted that the critical component of the SRS is the provision of auxiliary or start-up supply to major generating units within 90 minutes. A suitable SRAS situated in the combined central and north Queensland area will be capable of meeting this timeframe. The limiting factor is the ability of generating facilities to restart within the four-hour requirement as determined by the SRS; additional SRAS will not impact this. Southern Queensland can be restarted from an adjoining sub-network or a suitable SRAS within the area.

Victoria

AEMO considers that Victoria should be one electrical sub-network because it is characterised by a large generation centre (in the Latrobe Valley) and a large load centre (the Melbourne area) with strong interconnections to both South Australia and New South Wales. This facilitates access to generation located at Murray or the Victoria region hydro generating units. SRAS located in either this area or the Latrobe Valley is capable of providing start-up supply to the majority of Victorian generating units within the 90-minute timeframe. The limiting factor is the ability of generating units to restart within the four-hour requirement as determined by the SRS, and additional SRAS will not impact this.

Recommendation 3

AEMO recommends that the number of electrical sub-networks be re-determined and one SRAS be procured in each electrical sub-network, except for Tasmania where two SRAS should be procured. The following electrical sub-networks should be combined into one electrical sub-network:

- North and Central Queensland
- North and West Victoria and La Trobe Valley
- North and South Tasmania.

At the completion of the SRAS Review, AEMO will progress these recommendations by consulting with stakeholders on the Boundaries of Electrical Sub-networks and the SRAS Quantity Guidelines.

6.2.3 Primary and secondary services definition

6.2.3.1 Potential improvement

In accordance with the requirements of the NER and SRS, the SRAS Description Guideline describes two types of SRAS; primary and secondary. In simple terms, a primary SRAS provides black start capability to restart a specified generating unit of at least 100MW capacity. Restart can be achieved in a number of ways, including from:

- TTHL from thermal generating units.
- A single or multiple hydro or gas turbine units.

- A small gas turbine or diesel to restart a generating unit of greater than 100MW capacity.

A secondary service is only required to provide a black start capability and supply energy to the local transmission bus. Currently there are two secondary SRAS contracted by AEMO, the remainder being primary services. For SRAS procurement, AEMO prioritises primary services above secondary services.

In the Issues and Options Paper, AEMO stated that the distinction between primary and secondary services has led to some perverse outcomes for contracting and testing purposes and provided a number of examples where that had occurred.[46] AEMO was unable to provide further details of the examples because of the confidential nature of the information.

To ensure the SRS's timeframes are met and to simplify procurement and testing requirements, AEMO considers that a single SRAS definition is appropriate. AEMO suggested the following definition:

> "An SRAS is the ability to restart generating units without external supply from the national grid, re-energise the local busbar and supply at least 100MW of capacity within 60 minutes."

6.2.3.2 Submissions

Energy Australia supported the change to the definition on the basis that "…the distinction between primary and secondary restart services in the rules may have led to unnecessary distortions and perverse outcomes in the SRAS process, without contributing significantly to meeting the SRAS standard."[47] Alinta also commented that these changes should be considered if it is possible to start a sub-network using SRAS engaged under a single definition without a reduction in risk management.

Most other submissions from generators did not support changes to the definitions of primary and secondary services suggested by AEMO. Their reasons included the following:

- NGF:
  - A single definition based on capacity does not differentiate between availability and reliability differences among SRAS providers.
  - If a SRAS has technical capabilities that fall outside AEMO's contract requirements but could be offered at a much lower price, it would be inefficient for AEMO to exclude it.
  - There are no specific examples where the definitions have led to perverse outcomes.[48]
- Macquarie:
  - The proposed definition would exclude many existing SRAS providers.
  - Macquarie would not qualify to participate in the tender process.[49]
- CS Energy:
  - Any definition that degrades CS Energy units should be resisted as they are strategically important to the restoration of power in Queensland.
  - There are no specific examples where the definitions have led to perverse outcomes.[50]

6.2.3.3 AEMO considerations

To ensure the SRS timeframes are met and to simplify the procurement and testing requirements, AEMO considers that the description of SRAS should be simplified by removing the primary and

[46] These procedures can be found at: http://www.aemo.com.au/Electricity/Market-Operations/Ancillary-Services/Process-Documentation/System-Restart-Ancillary-Services-SRAS.
[47] *Energy Australia*, Submission, 8 March 2013, pp. 2-3.
[48] *NGF*, Submission, 8 March 2013, p. 12.
[49] *Macquarie*, Submission, 8 March 2013, p. 6.
[50] *CS Energy*, Submission, 8 March 2013, p. 8.

secondary definitions. Instead, SRAS should be described as the ability to supply energy to the local transmission bus within a defined timeframe. The proposed definition more closely reflects the current secondary service rather than the primary service. AEMO's primary driver for this change is to ensure the SRAS arrangements allow it to contract only with SRAS that has the capability to assist in meeting the SRS timeframes. In light of the recommended changes to SRAS quantities discussed in Section 6.2.2, AEMO also considers that SRAS should meet at least a 90% reliability level as defined in the SRS.

The recommended change to the description of SRAS would allow AEMO to contract only for the capacity which is needed to meet the SRS timeframes for each region, namely:

- Re-supply and energise certain significant generation within 90 minutes.
- Restoration of generation and transmission with the aim of supplying 40% of peak demand within four hours.

Under the current primary and secondary definitions, in limited cases, AEMO contracts SRAS that only allows re-supply and energisation to the SRAS provider's generating facility, but does not contribute to the restoration of generation and transmission in that region within four hours. This is a perverse outcome. To address this issue, AEMO proposed a simplified SRAS description based on the ability to re-energise the local bus and supply at least 100MW of capacity within 60 minutes. AEMO considers this description is significantly clearer than the current definitions and more accurately reflects the intent of the SRS, because both timeframes could be achieved using a service that meets this description.

AEMO agrees with generators that, under its proposed definition, some generating facilities with black start capability might not be eligible to provide SRAS; this was acknowledged by Macquarie in its submission. AEMO also notes that this recommendation might result in fewer SRAS providers in certain electrical sub-networks and, in theory, less competition between SRAS providers. In AEMO's view, none of these outcomes presents a valid reason to continue procuring SRAS that does not contribute to the restoration of other supply facilities, and can therefore only benefit the generator who is being paid to provide the SRAS.

Recommendation 4
AEMO recommends the definition of primary and secondary restart service be replaced by a definition of SRAS reflecting the following requirements:

"the capability to restart generating units without external supply from the national grid, re-energise the local busbar and supply at least 100MW of capacity within 60 minutes."

This would replace the definitions of primary and secondary restart service in the SRS and the NER. AEMO also recommends SRAS meets a minimum 90% reliability level in the SRS. These changes would require amendment to the SRS, and corresponding changes to the SRAS Description and SRAS Assessment Guidelines.

6.3 Procurement arrangements

6.3.1 Potential improvement

The Issues and Options Paper discussed alternative procurement arrangements that could increase the efficiency of the current SRAS arrangements, if it could be determined that the SRAS market is not delivering value for the prices paid. These options included:

- No procurement of SRAS.
- Mandating provision of black start capability from generating facilities over a certain size.
- A cost of service-based approach.

- Amendments to the NER to allow AEMO to negotiate terms and conditions with tenderers or for AEMO to have powers to access SRAS tenderers' costs and enter into binding arbitration.

6.3.2 Stakeholder submissions

The majority of generators did not support changes to the SRAS procurement arrangements, while customer representatives did support changes. A number of generators argued that the competitive tender process yielded efficient outcomes. For example AGL noted that: "… the existing SRAS procurement process provides an efficient outcome – the number of tenders elicits competition…" and therefore changes to the SRAS procurement arrangements were not justified.

St Vincent de Paul supported mandating black start capability and argued that "As generators are the providers of an essential social and economic service, we believe they should be required to, as a condition of licence, provide the black start generating facility."[51] The MEU implied that SRAS costs are too high and a number of approaches might drive down SRAS costs.[52]

The main concerns raised by the stakeholders advocating the status quo include:

- Not procuring SRAS suggests private property is not adequately respected and black start capability would not be maintained to the appropriate level without SRAS payments.
- Mandating black start capability would increase inefficiencies and increase costs to the NEM. Further, this would be difficult to enforce and provide SRAS providers with little incentive to maintain effective black start capability.
- Regulating prices does not deliver the economic benefits that a competitive tender process delivers.[53]
- Regularly reviewing the SRAS arrangements and AEMO changing the SRAS contract period from that tendered for should be avoided, as it has increased regulatory uncertainty and undermined investor confidence in otherwise stable arrangements. Introducing additional regulatory mechanisms would adversely impact investor confidence and deter new investment, which is inconsistent with the NEO.
- AEMO being granted powers to 'open books' and tenderers entering into binding arbitration would be counterproductive. For example, Macquarie argued that "The threat of being coerced into a regulatory negotiation and possible under-payment would dissuade many existing providers from offering a service."[54]
- A cost of service approach for SRAS procurement is inefficient. For example, Stanwell argued that "… moving to a cost-based approach is likely to increase overall costs…"[55] and therefore the cost to consumers.

The majority of generators considered that the following changes would encourage competition in the SRAS market:

- AEMO committing to longer-term SRAS contracts.
- Greater lead times prior to the SRAS contract commencement.
- Removal of AEMO's discretion to 'arbitrarily amend SRAS contract terms and conditions following the issue of AEMO's ITT'.[56]

[51] *St Vincent de Paul*, Submission, 8 March 2013, p. 2.
[52] *MEU*, Submission, 8 March 2013.
[53] *Alinta*, Submission, 8 March 2013, p. 5.
[54] *Macquarie*, Submission, 8 March 2013, p. 9.
[55] *Stanwell*, Submission, 8 March 2013, p. 5.
[56] *Hydro Tasmania*, Submission, 8 March 2013, p. 5.

6.3.3 AEMO's considerations

AEMO notes that there are divergent views on whether changes to SRAS procurement arrangements are justified and, if they are deemed necessary, what approach should be pursued. The majority of generators supported competitive procurement and initiatives to encourage competition in electrical sub-networks. Origin supported "… the continued use of a competitive SRAS procurement process, with extended tender periods and longer contract duration."[57] It was also suggested that AEMO should focus on improving the tender process to encourage competition within the SRAS market.

AEMO is willing to undertake initiatives to encourage competition in the SRAS market , however is unconvinced that this would have a material impact on competition in the SRAS market and produce more efficient outcomes. As noted by some generators, the absence of procurement arrangements could result in inefficiencies, including too much or too little capital investment. Encouraging new SRAS providers could theoretically increase competition, but could also increase inefficiencies. If there is more black start capability than is needed to restart a portion of the NEM, ultimately consumers will bear the costs associated with investment inefficiencies.

St Vincent de Paul suggested that generators provide and maintain black start capability as a licence condition. AEMO does not consider this to be a feasible solution as it is likely that this could only apply prospectively, which might leave the NEM with insufficient black start capability. Further, since this could only be applied to generating facilities over a certain size, this would result in an unequal treatment of generators.

One of the key improvements supported by generators is for SRAS contracts to be offered for longer contract periods to allow increased regulatory certainty and sufficient time to recover associated SRAS costs. Where tender prices are considered reasonable, AEMO is willing to enter into SRAS contracts for longer periods or, where practical, enter into SRAS contracts with longer lead times to allow investment to occur prior to the commencement date.

AEMO understands that longer SRAS contracts provide more certainty for SRAS providers and therefore may provide sufficient certainty for new entrants to recover the capital expenditure required for new investment, potentially resulting in lower SRAS costs. However, in the 2012 tender process, SRAS prices offered increased significantly overall, even though AEMO originally invited tenders for a five-year contract period.[58] The longer contract period also had little impact on the number of tenderers in most electrical sub-networks.[59] In the absence of evidence to fully explain these outcomes, AEMO questions whether longer-term SRAS contracts would in fact achieve their assumed objectives of providing sufficient certainty for new entrants to invest, thereby increasing competition, or longer periods for cost recovery of capital expenditure.

As a general principle, AEMO agrees that market processes should provide the most efficient outcomes because the interaction of the market's demand and supply sets the price. As discussed and identified by a number of stakeholders, under the SRAS arrangements AEMO sets the demand through SRAS procedures, and SRAS providers respond by meeting the demand. For this process to be competitive and result in efficient outcomes, however, there must be sufficient sellers competing in each electrical sub-network. Instead, and based on comments made by CS Energy, it appears to AEMO that some offers may be priced marginally below new entrant pricing to maximise the return on generator assets, resulting in SRAS costs increasing, not reducing, over the long term. Generators have not sufficiently explained SRAS cost increases and why there are large differences in SRAS costs for similar technologies across the NEM.

Hydro Tasmania suggested that AEMO's discretion to amend the terms and conditions of SRAS contracts after inviting tenders should be removed. Ultimately, AEMO is responsible for acquiring

[57] *Origin*, Submission, 8 March 2013, p. 1.
[58] Due to these increases, AEMO decided to enter into contracts for two plus one year contract period to allow time to investigate the drivers of these cost increases.
[59] Only one of the SRAS tenderers in the 2012 tender process did not enter into an SRAS contract for the two plus one year contract period. This tenderer would have needed to invest capital expenditure to provide SRAS.

SRAS in accordance with AEMO's assessment of how the SRAS objective can be met. It would be an irrational outcome to remove the responsible party's ability to negotiate terms and conditions.

At this stage, AEMO considers that the benefits of the identified alternatives to a market procurement process cannot be sufficiently established to recommend any material change. In particular:

- No procurement of SRAS could result in insufficient investment in black start capability, leaving the NEM incapable of restarting following a black system condition. In the long term, AEMO understands that generators, end-use consumers and governments want to be assured that the NEM can be restarted.
- Mandating provision of black start capability from generating facilities over a certain size could lead to an oversupply of restart resources and greater costs to end-use consumers.
- Generators have raised concerns that a cost of service-based approach might introduce further inefficiencies. AEMO proposes to seek further information, including cost benchmarking for different black start technologies in Australia, to enable it to further investigate the issues raised and provide a basis for evaluation of the relative merits of a cost of service approach or some form of arbitrated resolution should commercial negotiations fail.

AEMO currently faces a significant information asymmetry problem in relation to SRAS costs, making it difficult for AEMO to negotiate effectively, particularly where unexplained price increases indicate that a competitive tender process might have failed to deliver efficient outcomes. AEMO recommends the NER be amended to allow AEMO to manage non-competitive outcomes in the SRAS tender process. To inform its position on reasonable terms and conditions, AEMO would use independent benchmarking information.

Finally, AEMO considers that SRAS should continue to be procured by a single body that is able to coordinate the acquisition of SRAS across the NEM. It is more efficient to continue with a centralised procurer and AEMO is best placed to technically assess the requirements and manage the process on a NEM-wide basis.

Recommendation 5

AEMO recommends the NER be amended to allow AEMO to manage non-competitive outcomes in the SRAS tender process, similar to the process for network control and ancillary services included in clauses 3.11.5 (h) and (i) of the NER. AEMO would use independent benchmarking information to inform its position on reasonable terms and conditions.

At the completion of the SRAS Review, AEMO would develop a rule change to address this recommendation and submit this to the AEMC.

6.4 Incentives to encourage a market based response

6.4.1 Potential improvements

In the Issues and Options Paper, AEMO suggested that SRAS benefits Generators, Market Customers and end-use consumers. Most generators have an incentive to generate electricity as soon as physically possible, and generators with black start capability would have installed and maintained that capability for commercial reasons, or as a result of government or company policy.

AEMO recognises that the SRS reflects the level of risk to be mitigated on behalf of all potentially affected parties. AEMO also suggested that where Market Customers, Generators or jurisdictions perceived their individual exposure not to be adequately covered by AEMO's procurement of SRAS to that standard, there is potential for them to manage their perceived level of risk through a market-based response. This could include (as relevant) these parties investing in and maintaining their own black start capability, contracting that capability from suitably located existing facilities or negotiating contract positions such as *force majeure* clauses.

AEMO is not required to assess the individual risk profiles of participants and other stakeholders; that is their responsibility to manage. However, AEMO identified that there may be other incentives to encourage a market-based response in the unlikely event of a black system condition. In particular, the Issues and Options Paper suggested that the market suspension price could be increased.

6.4.2 Submissions

CS Energy did not agree that increasing the market suspension price would encourage generating facilities with black start capability to respond. Instead CS Energy stated "…our service is insurance against system black, the premiums need to be paid in advance. Participants cannot wait for the payments from the market suspension price as they have to pay recurrent bills."[60] Macquarie commented that the market suspension price provides generators with little financial incentive for faster restoration because the market suspension price is likely to be below the production costs of individual generators.[61]

6.4.3 AEMO's considerations

As only one submission (CS Energy) commented directly on this proposal, AEMO considers that it should not pursue this proposal, or any other options designed to encourage a market-based response, at this time.

Recommendation 6

AEMO does not propose to pursue, at this stage, any changes to market pricing or other energy market mechanisms in order to encourage a market-based response to SRAS.

6.5 SRAS Recovery

6.5.1 SRAS recovery from Market Customers and Market Generators

6.5.1.1 Issue identified

Currently, SRAS is recovered on a 50/50 basis from Market Customers and Market Generators on the basis of energy consumed and produced.[21] SRAS has been treated as a public good and this treatment has led to SRAS cost recovery being socialised across Market Generators and Market Customers who ultimately pass these costs through to consumers.

In the Issues and Options Paper, AEMO expressed the view that it is reasonable to recover SRAS costs in this proportion at an agreed minimum SRAS level. However, if a high SRAS level is procured to meet the marginal benefit of individuals or groups of participants, AEMO considers that the proportion they pay should reflect the relative benefits derived.

6.5.1.2 Submissions

The majority of SRAS providers suggested that SRAS should be recovered from Market Customers or TNSPs, based on considerations of efficiency. The following comments were made in submissions to support this position:

- Alinta:
  - SRAS costs should not be smeared between energy costs and levied directly, as it ensures the true costs of the service are not revealed.
  - All costs incurred by generators are passed on to consumers, so SRAS should be levied directly from consumers.

[60] *CS Energy*, Submission, 8 March 2013, p. 7.
[61] *Macquarie*, Submission, 8 March 2013, p. 11.

    - Including generators is arbitrary. The case for including TNSPs is stronger than for generators and retailers as their systems are central to a black start condition.
- CS Energy: costs should be recovered from TNSPs. CS Energy stated that "Tenderers have to offer firm prices when they don't know their costs. The cost allocated to CS from other regions has resulted in the company regretting the prices it offered AEMO."[62]
- Macquarie:
    - A reliable supply of electricity is highly valued by customers, with studies of consumer willingness to pay supporting this view.
    - SRAS allows AEMO some greater control and planning in the steps necessary to manage such a situation, and reducing restoration time would avoid extreme costs.
    - The financial benefit to generators of faster restoration is relatively small, noting the market suspension price is unlikely to be well above the production costs of generators.[63]
- NGF: the costs of SRAS should be recovered from Market Customers. Recovering SRAS costs from SRAS providers serves little economic benefit because these costs might be inefficiently recovered from generators through their energy or ancillary services costs.[64]
- Stanwell: based on the international comparison, the NEM appears to be the only market that recovers costs from generators. Noting public good characteristics, partial allocation of costs to generators is an inefficient outcome. Costs should be to end users via network service charges.

Consumer representatives made the following comments on this issue:

- MEU: generators should pay 100% of the SRAS costs because this would increase the incentive to manage these costs.
- St Vincent de Paul did not comment on the appropriateness of the recovery split between Market Generators and Market Customers because it argued that black start capability should be a part of generators' licencing arrangements. Under this arrangement there would be no need for SRAS and its recovery.

6.5.1.3 AEMO's considerations

AEMO does not recommend a change to the existing 50/50 recovery from Market Generators and Market Customers. This reflects a beneficiary pays approach where those who benefit from SRAS contribute to the cost of providing it. AEMO agrees with this principle.

Most generators argued that customers should pay 100% of SRAS costs; likewise, consumer representatives argued that generators should pay 100% of SRAS costs. Given these opposing positions, and noting that no specific information has been provided to suggest that the current cost recovery ratio is inappropriate, AEMO considers that Market Generators and Market Customers should continue to pay these costs to provide a small incentive to manage costs or expectations.

Recommendation 7

AEMO will not pursue any change to the 50/50 basis for recovery of SRAS costs from Market Generators and Market Customers.

[62] *CS Energy*, Submission, 8 March 2013, p. 7.
[63] *Macquarie*, Submission, 8 March 2013, p. 11.
[64] *NGF*, Submission, 8 March 2013, p. 11.

6.5.2 SRAS recovery on a NEM-wide or regional basis

6.5.2.1 Issue identified

SRAS payments are currently recovered on a NEM-wide basis. The Issues and Options Paper identified that the current cost sharing methodology has resulted in SRAS costs being smeared across regions. Tables 8 and 9 provide examples of this occurring. In the 2011-12 financial year, costs recovered from participants in respect of activities in Queensland and Victoria effectively cross-subsidised SRAS payments for the remaining regions. In the 2012-13 financial year, based on AEMO's forecast of regional energy generation and consumption, Queensland and South Australia will cross-subsidise the remaining regions.

Currently, the price a Market Generator or Market Customer pays for SRAS due to market activities undertaken in a region does not necessarily reflect the price or the level of service provided in that region. It is a product of overall NEM SRAS costs and their generation or consumption in a given year.

Table 8: 2011-12 Differences between NEM SRAS recovery and payment

REGION	SRAS RECOVERED ($M, NOMINAL)	SRAS PAYMENT ($M, NOMINAL)	DIFFERENCE ($M, NOMINAL)
NSW	13.3	17.1	(3.8)
QLD	9.1	4.4	4.7
SA	2.5	2.8	(0.3)
TAS	2.0	5.9	(3.9)
VIC	8.5	5.3	3.2
Total	35.4	35.4	-

Table 9: 2012-13 Differences between NEM SRAS recovery and payment

REGION	SRAS RECOVERED ($M, NOMINAL)	SRAS PAYMENT ($M, NOMINAL)	DIFFERENCE ($M, NOMINAL)
NSW	20.5	22.7	(2.1)
QLD	14.1	7.3	6.7
SA	3.9	3.8	0.1
TAS	3.1	10.2	(7.1)
VIC	13.1	10.7	(2.4)
Total	54.7	54.7	-

Where SRAS costs increase in one region and not comparatively in other regions, the extent of the cross-subsidisation increases. This is particularly obvious for Tasmania where the difference between SRAS recovery and payment in the 2011-12 financial year was about $3.9 million, forecast to increase to $7.1 million in the 2012-13 financial year.

The Issues and Options Paper identified that a regionally-based approach to cost recovery may provide regions with an incentive to accept a minimum level of service (provided by the SRS), with higher levels of SRAS being procured independently by stakeholders in the region if required. Alternatively, if AEMO were to procure higher SRAS for specific regions, a change to the SRS would be required.

In considering the relative benefits and costs of either approach, it is relevant to note that, if SRAS is procured on a regional basis, with no prospect of SRAS in one region providing a benefit to a neighbouring region, the rationale to recover SRAS on a NEM-wide basis diminishes. In particular, there is no rationale for smearing SRAS costs between Tasmania and mainland regions, because the Basslink interconnector is a DC link and cannot be used to assist in a restart. Therefore, SRAS from Tasmania cannot be used to restart Victoria and vice versa.

6.5.2.2 Submissions

The majority of generators suggested SRAS costs be recovered on a region-wide basis if SRAS is to be procured on a region-wide basis, and on a NEM-wide basis if SRAS is procured on that basis, except for the Tasmanian region due to the technical constraints of Basslink. The following comments were raised in submissions to support these positions:

- Alinta: if SRAS is to be a NEM-wide service then benefits accrue to each market customer and the difference in costs is a representation of where services are located and cost recovery should remain NEM-wide. If regional-based, then it would be appropriate for costs to be levied at a regional level. Tasmania can and should be isolated on a cost recovery basis.
- Stanwell: SRAS recovered from Queensland was $14.1 million and total SRAS payments were $7.3 million. While the AEMC previously considered this issue in detail and decided on NEM-wide recovery, this issue warrants further examination to determine if there is inequitable allocation of costs.
- St Vincent de Paul: if AEMO moves to a regional-based black start system, cost recovery should reflect costs in that region rather than on a NEM-wide basis.
- GDFSAE: where SRAS can be shared across regional boundaries NEM-wide cost recovery has more legitimacy.

6.5.2.3 AEMO's considerations

Generally, there was broad support for a change to region-wide recovery of SRAS on the basis of the changes recommended by AEMO in Section 6.2.[65] AEMO recommends that SRAS costs be recovered on a regional basis. There is no rationale to recover Tasmania's SRAS costs from mainland regions because the Basslink interconnector is a DC link and cannot be used to assist in a restart. Therefore, SRAS from Tasmania cannot be used to restart Victoria and vice versa. For mainland regions, AEMO has recommended SRAS costs be recovered on a regional basis, rather than smeared across mainland regions, because it is being procured to restart that region within the SRS timeframes.

This approach would remove the current cross-subsidisation between regions and improve the price signal to Market Customers and Market Generators within regions.

This recommendation requires a change to the NER which AEMO would develop and submit to the AEMC after the SRAS Review concludes and by December 2013.

Recommendation 8

AEMO recommends SRAS costs be recovered on a regional basis.

[65] AEMO has recommended that the number of electrical sub-networks be re-determined, one SRAS be procured in each electrical sub-network, except for in Tasmania.

At the completion of the SRAS Review, AEMO would develop a rule change to address this recommendation and submit this to the AEMC.

6.6 Further Improvements

6.6.1 Generator liability issue

6.6.1.1 Potential improvement

Some existing SRAS providers have informed AEMO that their offers factor in the risk of potential liability if, in a black system condition, they were unable to perform their obligations under the SRAS contract. AEMO understands that Generators' evaluation of that risk can lead to:

- Increased offer prices for SRAS.
- Conservative estimates of restart timeframes provided as part of their Local Black System Procedures (LBSP) provided to AEMO, which in turn may result in the procurement of unnecessary SRAS.

In its Issues and Options Paper, AEMO asked for submissions on the impact of liability concerns on the costs of SRAS.

6.6.1.2 Submissions

Alinta, CS Energy and the NGF specifically addressed the question of liability. The submissions indicated three key factors that influence SRAS providers pricing, including:

- Maximum contractual exposure to AEMO under the SRAS contracts ($5 million in the current contracts).
- Nature of the obligation to provide SRAS, being an absolute obligation rather than a 'best endeavours' basis.
- Reputational risk arising out of failure to provide the services to the contracted standard.

None of the submissions provided specific details about the extent to which liability concerns affect SRAS pricing.

6.6.1.3 AEMO's considerations

AEMO is concerned to ensure that:

- The cost associated with any such risk is proportionate to the probability and extent of any potential liability and does not unnecessarily increase prices.
- There is no incentive to allow for contingencies in the stated restart timeframes, so that the LBSP provide an accurate picture of expected restart timeframes on which AEMO can base its determination of SRAS requirements.

None of the submissions suggests that section 120 of the National Electricity Law does not provide adequate immunity for both SRAS providers and AEMO in respect of liability to third parties in regard to supply failure. On that basis, AEMO assumes that no 'risk premium' in relation to third party liabilities should be factored into SRAS prices.

AEMO's consideration of liability issues in the context of the SRAS Review is therefore focused on the potential contractual liability of Generators to AEMO under the SRAS agreement.

Services under SRAS contracts are currently provided on a commercial basis. AEMO procures SRAS to meet specific reliability standards which are dependent on the ability of the facilities to restart within a defined time. As with other technical parameters that relate to system security, reliability and performance under the NER, AEMO operates the system on the basis that those requirements will be met. The restart time is a critical parameter. In these circumstances, a 'best endeavours' obligation to achieve restart times is not appropriate. SRAS providers are paid to provide a very specific service, and time is a key parameter.

AEMO therefore considers it appropriate that financial consequences may follow any failure to provide SRAS to an agreed standard. Alinta's submission acknowledged the correlation between liability and performance in its comment that "… a best endeavours approach is likely to be more favourable than one that creates a $5 million exposure for generators. Conversely, where the financial penalty exists it is apparent that there is greater certainty around estimates of restart timeframes."

As noted in submissions, the SRAS contracts provide for a liability cap of $5 million. No evidence has been presented in submissions to indicate that this level of liability represents a risk that cannot be reasonably priced, or indeed gives rise to additional costs exceeding those for which generators would currently insure their business. Therefore, AEMO is currently unable to consider whether the existing liability cap should be revised.

The NGF submission notes that Generators also consider reputational risk as a factor in deriving SRAS prices. No information has been provided in relation to the pricing of this risk as it may apply to SRAS. AEMO considers that reputational risk is a general business risk that applies to all aspects of a Generator's operations, in any circumstances where the Generator fails to comply with applicable obligations or standards, including in relation to 'best endeavours' obligations. The correlation between considerations of reputational risk and the cost of providing SRAS is therefore unclear.

6.6.2 Regular review of the SRAS arrangements

St Vincent de Paul suggested that the SRAS Review should "…establish a time line for future review to assess the effectiveness and cost of the SRAS, in regards to efficacy of recommendations adopted though this current process."[66]

AEMO notes that the Reliability Panel is responsible for annually reviewing the SRS. In future reviews, AEMO expects to be able to provide further information to the Reliability Panel on SRAS costs and the effectiveness of the SRAS arrangements. Alternatively, AEMO could undertake a further review of the SRAS arrangements after key changes arising from the current SRAS Review have been implemented and there has been sufficient time for the impacts to be assessed.

Recommendation 9

AEMO recommends greater transparency of SRAS costs and effectiveness of the SRAS arrangements. AEMO will consider the way in which it reports SRAS information to ensure it is useful and discuss with the AEMC the appropriateness of including information on SRAS in the Reliability Panel's Annual Market Performance Report.

[66] *St Vincent de Paul*, Submission, 8 March 2013, p. 3.