Australian Energy Market Commission

RULE CHANGE

DRAFT RULE DETERMINATION

National Electricity Amendment (System Restart Ancillary Services) Rule 2014

Rule Proponents

Proponent 1: AEMO
Proponent 2: National Generators Forum, AGL, Alinta Energy, Energy Brix, GDF Suez, Intergen, Origin Energy

18 December 2014

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About the AEMC

The Council of Australian Governments, through its Ministerial Council on Energy (MCE), established the Australian Energy Market Commission (AEMC) in July 2005. The AEMC has two principal functions. We make and amend the national electricity and gas rules, and we conduct independent reviews of the energy markets for the MCE.

Executive Summary

The Australian Energy Market Commission (AEMC or Commission) has made a draft more preferable rule to improve the frameworks for system restart ancillary services (SRAS, or restart services) in the National Electricity Market (NEM). This draft more preferable rule has been made following two rule change proposals received from:

1. a group of stakeholders including the National Generators Forum (NGF), AGL, Alinta Energy, Energy Brix, GDF Suez, Intergen and Origin Energy (the Group of Generators); and
2. the Australian Energy Market Operator (AEMO).

The Commission considers that its draft more preferable rule is likely to contribute to the achievement of the national electricity objective (NEO) by promoting more efficient operation of and investment in electricity services, through:

1. clarifying the responsibilities and accountabilities of different bodies within the SRAS frameworks;
2. clarifying the nature of the event that SRAS is procured to mitigate;
3. promoting more competitive outcomes in SRAS markets; and
4. increasing the cost reflectivity of SRAS charges.

These changes will help to meet the long term interests of consumers by maintaining the ongoing reliability of electricity supply, at an efficient price.

The Commission's draft more preferable rule

Restart services enable the restoration of electricity supply following a complete shut-down of all, or a substantial part of, the power system. These are extremely rare events that can create significant economic costs for consumers. To minimise these economic costs, it is necessary to procure in advance a sufficient number of restart services to enable the reliable restoration of the power system. However, as there are also costs associated with providing these restart services, it is important that a sufficient quantity is procured at an efficient price.

Within the current SRAS frameworks, the Reliability Panel is responsible for determining the parameters that define the quantity of SRAS that is sufficient to enable the reliable restoration of the power system following a major supply disruption.[1] The Reliability Panel develops the System Restart Standard (SRS), which establishes the target timeframes for restoration and the reliability of SRAS.[2] AEMO has responsibility for procuring SRAS to meet the requirements established in the SRS, as well as

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1 A major supply disruption is currently defined in the NER as "The unplanned absence of *voltage* on a part of the *transmission system* affecting one or more *power stations*." Such events can cause the loss of supply of electricity to a large number of consumers, potentially affecting a region, multiple regions or the entire NEM. The definition of the size of such events - i.e., whether they affect a single region, multiple regions or the entire NEM - is a key issue addressed in this draft determination.

2 The SRS also establishes a number of other parameters, including the strategic, geographic, technology and fuel diversity of SRAS, as well as the principles that AEMO must consider when developing the boundaries of electrical subnetworks.

developing a number of SRAS guidelines that establish the technical and operational parameters of SRAS.

The Commission considers that to meet the NEO, the SRAS frameworks must deliver sufficient quantities of reliable restart services to enable the restoration of the power system. The draft more preferable rule proposes a number of changes to the SRAS frameworks that are designed to meet this general principle, which can be grouped into the three following areas:

1. **Effective governance arrangements:** Good governance involves a clear definition of organisational roles and responsibilities, allowing different market bodies to exercise their functions efficiently subject to clear accountability through transparent reporting.
2. **Efficient SRAS market outcomes:** Competitive markets are the best way to deliver sufficient quantities of SRAS to maintain the reliable supply of energy, at an efficient cost.
3. **Efficient cost recovery:** The SRAS charges paid by participants should broadly reflect the benefits provided by that service.

These three areas, and the related changes proposed in the draft more preferable rule, are discussed in further detail below.

Developing effective governance arrangements

In their rule change proposal, the Group of Generators argued that the current SRAS frameworks provide insufficient functional separation between AEMO and the Reliability Panel and do not adequately define the size of the major supply disruption event that SRAS is procured to mitigate.

The Commission has decided to make a draft more preferable rule to address the issues raised by the Group of Generators.

The Commission considers that good governance arrangements will provide clear functional separation of the roles of different bodies within the SRAS frameworks, while providing these bodies with adequate flexibility to fulfil their responsibilities efficiently. These different bodies must then be held accountable for how they fulfil their responsibilities through transparent reporting processes.

The two main market bodies with responsibilities within the SRAS frameworks are the Reliability Panel and AEMO. The draft more preferable rule clarifies the functional separation of these two bodies by introducing separate objectives for the Reliability Panel and AEMO. These objectives clarify that:

- the Reliability Panel's key function is to develop the SRS in order to meet the SRAS Objective. The SRAS Objective has been amended and is to minimise the expected economic costs of a major supply disruption, to the extent appropriate having regard to the national electricity objective (NEO); and
- AEMO's key function is to use reasonable endeavours to procure sufficient SRAS to meet the requirements of the SRS at lowest cost.

The draft more preferable rule also clarifies that SRAS should be procured to mitigate the scenario of a NEM-wide major supply disruption, by requiring the Panel to include

a restoration timeframe in the SRS for the independent restoration of each subnetwork. This means that AEMO would be required to procure sufficient SRAS to enable each subnetwork to be restored within the timeframes of the SRS, under the assumption that energy (other than energy provided by contracted restart services) was not available from a neighbouring, energised subnetwork to assist in restoration.

The Commission has also amended the definition of major supply disruption to clarify that its key impacts relate to both generators and consumers, via the loss of supply to connection points. This is to clarify that the provision of restart capability provides benefits to both generators and consumers.

The draft more preferable rule also requires the Reliability Panel to determine aggregate reliability requirements for each electrical subnetwork. This will allow AEMO to procure SRAS to meet a reliability requirement that applies at the level of the subnetwork, which may expand the range of restart services available to AEMO.

To improve transparency and accountability regarding AEMO's processes, the draft more preferable rule also includes a number of new reporting and consultation requirements. These changes require AEMO to report annually on:

- whether it has met the SRS in each subnetwork and, if not, the reasons why the SRS was not met;
- what processes it has followed to procure SRAS in each subnetwork; and
- what processes it has followed for testing and assessing the ability of SRAS to meet the SRS.

The Commission also considers that network businesses possess substantial information and experience that could be utilised by AEMO during the procurement and assessment of restart services. The draft more preferable rule therefore requires AEMO to consult with network businesses to resolve any issues relating to potential prospective restart services and requires network businesses to provide to AEMO any information necessary to assess the capability of prospective restart services to meet the SRS.

Efficient SRAS market outcomes

In its rule change proposal, AEMO argued that a lack of competition in SRAS markets has driven inefficient increases in SRAS prices. AEMO therefore proposed the introduction of a price arbitration option in the SRAS procurement process.

The Commission has decided not to introduce a price arbitration option into the SRAS procurement process. While SRAS markets may not be strongly competitive at present, this does not warrant the introduction of any form of price regulation, such as AEMO's proposed price arbitration option. The Commission's decision was based on the significant costs and risks associated with the introduction of a regulatory approach, particularly the potential for dampening signals for participants to invest in restart services as well as the risk that SRAS providers may withdraw from SRAS markets. There are also likely to be substantial regulatory costs associated with administering a price arbitration approach.

Instead, the Commission considers that competition in SRAS markets can be enhanced by increasing AEMO's flexibility to procure SRAS, changing the amount of information

published by AEMO to reduce the probability of anti-competitive bidding and broadening the potential scope of services available to AEMO.

1. **Enhancing AEMO's flexibility in SRAS procurement:** The draft more preferable rule removes the current requirement on AEMO to procure SRAS through a prescribed SRAS tender process. This will allow AEMO to procure SRAS through whatever process it considers to be most appropriate, potentially expanding the range of restart services available to meet the requirements of the SRS.
2. **Changing the amount of information published to reduce the probability of anti-competitive bidding:** The Commission considers that the current level of reporting on quantities of SRAS procured in each subnetwork may reduce the extent of competitive pressure faced by SRAS providers. The draft more preferable rule therefore removes the requirement on AEMO to publish the quantity of SRAS it has procured in each subnetwork.
3. **Broadening the scope of restart services available to AEMO:** The Commission has decided to remove the definitions of primary and secondary restart services. Removal of these definitions may help to expand the range of potential restart services, by allowing AEMO to select from a larger number of restart services with different levels of reliability in order to meet an aggregate subnetwork level reliability requirement. The Commission considers that this will maintain adequate levels of reliability while helping to drive more efficient outcomes in SRAS markets.

Efficient cost recovery

In its rule change proposal, AEMO argued that current SRAS cost recovery processes had caused non-cost reflective SRAS charges to be levied on participants in several regions, resulting in transfers between those regions. To address this, AEMO proposed that SRAS charges should reflect the regional benefits provided by specific restart services.

The Commission agrees that SRAS costs should be recovered on the basis of regional benefits. This will result in a better alignment of SRAS charges with the cost of providing restart services. The Commission considers that this alignment is particularly important if the cost of providing SRAS varies between regions.

Regional cost recovery may also create stronger incentives for participants to offer restart services. Given that generators bear half of the total cost of SRAS, higher regional SRAS charges may create incentives for generators to invest in SRAS facilities, and to offer SRAS at a competitive price. The Commission considers that this may help deliver more competitive outcomes in SRAS markets, particularly in those regions where SRAS charges may not currently reflect costs.

Transitional arrangements

If this draft more preferable rule is confirmed in the final rule determination, both the Reliability Panel and AEMO will undertake a number of consultations to incorporate the changes made in the final rule determination.

- The Reliability Panel will be issued a terms of reference from the AEMC to review the SRS, to reflect the changes made to the SRAS frameworks.

- AEMO may undertake a rules consultation process to amend:
  - the Regional benefits ancillary services procedures, to reflect the changes made to the SRAS cost recovery processes; and
  - the SRAS Guideline, to reflect the changes made to AEMO's Guideline processes.

The Commission has included draft transitional rules that will enable AEMO and the Reliability Panel to commence these consultations, prior to the date of commencement of the final rule, if each market body chooses to do so.

The Commission will also consider whether other transitional arrangements are required to delay commencement of the final rule, or parts of the final rule, to account for completion of the consultations described above. Any such transitional rules will be included in the final determination.

Next steps

The Commission welcomes submissions on this draft determination, including its draft more preferable rule, by **19 February 2015**.

Contents

1 The Group of Generators' and AEMO's rule change proposals

1.1 The Rule change proposals

The AEMC received two rule change proposals related to the arrangements for System Restart Ancillary Services (SRAS or restart services).

The first rule change proposal was received from the National Generators Forum (NGF) and a number of individual generator/retailer businesses including AGL, Alinta Energy, Energy Brix, GDF Suez, Intergen and Origin Energy (the Group of Generators) on 11 November 2013. This rule change proposal included a number of changes to the SRAS governance frameworks regarding the organisational responsibilities and functions of the Reliability Panel and AEMO, the definition of major supply disruption and the ability of procured SRAS to meet the SRS.

The second rule change proposal was received from the Australian Energy Market Operator (AEMO) on 20 December 2013. This rule change proposal included the introduction of a regulatory option into the SRAS procurement process, the regionalisation of SRAS cost recovery and changes to the definition of SRAS.

Given that both of these rule change proposals relate to the SRAS frameworks, the Commission decided to consolidate them under section 93(1) of the National Electricity Law (NEL).

1.2 Current arrangements

This section provides a high level overview of SRAS arrangements in the NEM. A more detailed summary is provided in Appendix E.

System restart ancillary services (SRAS or restart services) are procured by AEMO in order to mitigate the economic costs of a major supply disruption. SRAS provides the capability to restart the power system if there has been a major loss of power in the system, or if the system has collapsed to a "black system" condition.[3]

SRAS is provided by generators with the capability to start, or remain in service, without electricity being provided from the grid. These generators must be capable of delivering electricity to a connection point within specified timeframes and be able to control frequency and voltage.

SRAS is procured on the basis of the restoration of power in a specific electrical sub-network. Electrical sub-networks are defined by AEMO in accordance with the system restart standard (SRS),[4] that reflects factors including the concentration of load and generation as well as the structure of the network.

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3 A black system is defined in Chapter 10 as "the absence of *voltage* on all or a significant part of the *transmission system* or within a *region* during a *major supply disruption* affecting a significant number of customers".

4 The System Restart Standard is established by the Reliability Panel and defines a number of aspects of SRAS, including maximum timeframes for restoration, the reliability of restart services, guidance on boundaries of electrical subnetworks and the diversity requirements for SRAS. The SRS is described in further detail below.

The current regulatory frameworks for SRAS are established in the NER, the SRS and in AEMO's SRAS guideline documents.

National Electricity Rules

The current SRAS frameworks are established through a number of NER clauses.[5] At the highest level, the SRAS Objective sets out the purpose of SRAS. Currently, the SRAS Objective is:

> ""The objective for *system restart ancillary services* 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* (**the *SRAS* objective**)."

The SRAS Objective refers to a "major supply disruption" as the key event that SRAS is procured to mitigate. In Chapter 10 of the NER, major supply disruption is defined as:

> "the unplanned absence of *voltage* on a part of the *transmission system* affecting one or more *power stations*."

Importantly, this definition does not indicate the extent of the major supply disruption, such as whether it includes a regional, multi-regional or NEM-wide event.

The NER requires AEMO to develop a number of SRAS guidelines that set out various operational and technical details of SRAS.[6] The NER describes the processes to be followed by AEMO when procuring SRAS, including a requirement for AEMO to procure SRAS through a defined tender process.[7]

System Restart Standard

The Reliability Panel's key responsibility within the SRAS frameworks is to review and determine the SRS. The SRS is the key document that guides AEMO's procurement of SRAS. NER clause 8.8.3(aa) sets out the matters that must be included in the SRS, which currently includes the maximum timeframes for restoration of a given level of supply in each subnetwork, the reliability of restart services, and guidance on boundaries of electrical subnetworks and the diversity requirements for SRAS.

Given these requirements established in clause 8.8.3(aa), the current SRS includes the following:

- **Restoration timeframes**: The SRS requires AEMO to procure SRAS sufficient to:
  - re-supply and energise the auxiliaries of power stations within 1.5 hours of a major supply disruption occurring to provide sufficient capacity to meet 40 per cent of peak demand in that sub-network; and
  - restore generation and transmission such that 40 per cent of peak demand in that sub-network could be supplied within four hours of a major supply disruption occurring.

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5 Note that some of these NER clauses have been amended or deleted as part of the draft more preferable rule

6 NER clause 3.11.4A.

7 NER clause 3.11.5(b).

- **Reliability of services:** The SRS provides detail regarding the reliability standards that must be met by primary and secondary SRAS. Specifically, primary SRAS are defined as those services with a reliability of 90 per cent, while secondary services are defined as those services with a reliability of 60 per cent. Services may be considered in combination to deliver higher levels of reliability. AEMO is responsible for defining the manner in which reliability will be assessed and how services may be combined.[8]
- **Guidance for the determination of electrical sub-networks:** The SRS defines the matters that AEMO must consider when establishing electrical sub-networks, including the length and strength of transmission corridors between areas and generation centres as well as quantities of generation and load within an area.
- **Guidance for specifying diversity and strategic location of services:** The SRS defines the matters that AEMO must consider in order to maintain a degree of independence between the various restart services that it procures, including electrical, technological, geographical and fuel diversity in procured SRAS.

AEMO is required to procure SRAS and develop its SRAS guidelines on the basis of meeting the requirements of the SRS and the NER. A copy of the current SRS is provided in Appendix F.

AEMO's SRAS guidelines, procurement processes, reporting and cost recovery

AEMO has a number of functions under the existing SRAS frameworks, including developing the SRAS guidelines, procuring SRAS, reporting on SRAS costs and recovering the costs of SRAS from market participants.

SRAS Guidelines: Subject to the NER and the SRS, AEMO is responsible for developing the SRAS guidelines. These guidelines establish the operational detail of SRAS, including the technical descriptions of SRAS, testing and assessment requirements and how AEMO procures SRAS. AEMO is also required to publish a guideline that sets out its processes for tendering for SRAS. AEMO may amend these guidelines when it chooses, in accordance with the rules consultation procedures.

Development of subnetwork boundaries: AEMO is required to determine the boundaries of electrical subnetworks, in accordance with the SRS. AEMO is required to consult on the establishment of these boundaries and to publish a report setting out how it has complied with the requirements of the SRS in accordance with the rules consultation procedures.

SRAS procurement: The NER currently require AEMO to procure SRAS through a prescribed tender process, the details of which are currently set out in NER clause 3.11.5.[9] The most recent tender processes took place in 2008 and 2012, with the tender process for SRAS contracts to begin in July 2015 currently underway. The NER

8 AEMO is responsible for developing an approach for measuring the reliability of restart services. This approach is currently included in the SRAS Guidelines. For more information see: AEMO, *SRAS Guidelines*, September 2014, p.8.

9 Note that the Commission's draft more preferable rule proposes the removal of this requirement for AEMO to procure SRAS through a defined tender process.

explicitly excludes matters related to the price of SRAS from being referred to the Dispute Resolution Adviser, under chapter 8 of the NEL.

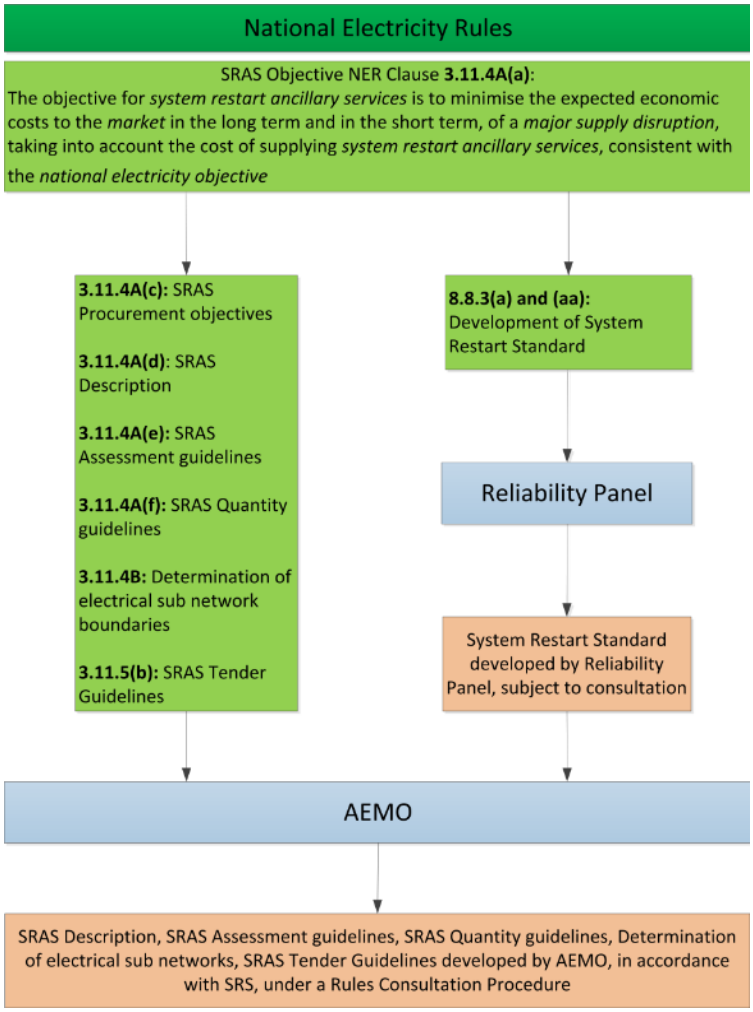
SRAS reporting requirements: At the conclusion of each SRAS tender, AEMO is required to publish information on the cost and quantities of SRAS procured in each subnetwork area. This information includes:

- the total estimated annual SRAS costs, broken down into availability and usage charges, for each subnetwork; and
- the number of SRAS acquired for each subnetwork.

SRAS cost recovery: AEMO is responsible for the recovery of SRAS costs through the wholesale market settlements process. AEMO recovers the total, NEM-wide costs of SRAS equally from all regions of the NEM, on a 50/50 basis from generators and customers.[10] These charges reflect the respective energy generation or consumption of each participant.

A summary of the current SRAS regulatory arrangements is provided in Figure 1.1.

Figure 1.1 Current regulatory arrangements



10 In full, the NER requires half of all SRAS costs to be recovered from market generators and small generation aggregators, and the other half from market customers.

1.3 Issues raised and solutions proposed in the rule change proposals

The two rule change proposals raised a number of issues with the current SRAS frameworks and proposed various changes to address these issues. A brief summary is provided below.

1.3.1 AEMO's rule change proposal

AEMO's rule change proposal identified the following key issues and proposed solutions.

SRAS procurement and competition in SRAS markets: AEMO argued that SRAS markets are currently non-competitive and that this lack of competition has resulted in substantial increases in the price of SRAS in recent years.

To address this perceived lack of competition, AEMO proposed the introduction of a price arbitration option in the SRAS procurement process. This would generally align the SRAS procurement process with the NSCAS (Network Support and Control Ancillary Services) procurement processes.

SRAS cost recovery processes: AEMO argued that the current approach to SRAS cost recovery results in non-cost reflective SRAS charges as well as transfers between regions.

AEMO proposed to recover SRAS costs on the basis of the regional benefit they provide. To allow regional benefit recovery, AEMO would develop regional benefit factors that allocate the costs of each restart service to different regions, based on the benefit provided by that service to each region.

Removal of the definitions of primary and secondary SRAS: AEMO argued that the current definitions of primary and secondary SRAS provide no benefit to any party and should be removed from the NER. The Group of Generators supported this proposed change to the NER.

Minor amendments: AEMO identified a number of apparent inconsistencies or referencing errors in the NER and proposed amendments to rectify these including:

- clarifying the definition of non-market ancillary services (NMAS);
- amending some apparent cross referencing errors; and
- removing "catch all" provisions that allow AEMO to consider "any other relevant matters".

1.3.2 The Group of Generators' rule change proposal

The Group of Generators rule change proposal identified the following key issues and proposed solutions.

Definition of major supply disruption, economic costs and SRAS costs in the NER: The Group of Generators argued that the current SRAS frameworks provide insufficient guidance regarding the nature of the event that SRAS is procured to mitigate, the economic costs of that event and the costs of procuring SRAS.

To address this, the Group of Generators proposed to redefine a major supply disruption event as a multi-region or NEM-wide event.[11] Other changes were proposed to the definition of economic costs and cost of supply, to guide how AEMO should interpret these terms.

Define the SRS as an operational standard and increase AEMO's reporting / consultation requirements: The Group of Generators argued that there is a lack of certainty in the market regarding the ability of procured SRAS to meet the restoration timeframes of the SRS.

To address this, the Group of Generators proposed that the SRS be changed from a target that guides AEMO's procurement of SRAS, to an operational standard that AEMO would be required to meet. The Group of Generators also proposed increased reporting and consultation requirements for AEMO to provide evidence to the market as to the ability of procured SRAS to restore the system within the timeframes of the SRS.

Define the role of the Reliability Panel: The Group of Generators argued that AEMO should be subject to an approval process when it seeks to make changes to its SRAS guidelines. The Group of Generators therefore proposed that the Panel be required to approve any changes made by AEMO to several of the SRAS guideline documents, including the SRAS quantity guidelines, SRAS assessment guidelines, SRAS description and the Boundaries of electrical subnetworks document.

The Group of Generators also argued that the Panel could benefit from increased guidance in the NER regarding its functions and consultative processes. The Group of Generators therefore proposed that the SRS would explicitly state that it remains current until amended by the Panel; as well as a requirement for the Panel to consult with multiple stakeholders in addition to AEMO when developing the SRS.[12]

1.4 The Commission's rule making process to date

On 27 March 2014 the Commission published both rule change proposals from AEMO and the Group of Generators, as well as a Consultation Paper.

On the same date, the Commission also published a notice under:

- section 93(1) of the NEL advising that it was consolidating the two rule change proposals;
- section 95 of the NEL advising that the rule change process had commenced; and
- section 107 of the NEL advising the extension of the date for making the draft determination to 28 August 2014.

Submissions on this first round of consultation closed on 8 May 2014. The Commission received 9 submissions which are available on the Commission's website.

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11 The Commission notes that the Group of Generators have actually proposed to change the term major supply disruption through proposed amendments to the SRAS Objective and SRS, rather than to the Chapter 10 definition of major supply disruption.

12 The Commission notes that the SRS is reviewed and determined by the Reliability Panel, separately to the rule change process. The Commission cannot make changes directly to the SRS.

On 28 August 2014, the Commission published a notice under section 107 of the NEL extending the time for making the draft determination to 18 December 2014.

1.5 Consultation on the draft determination

The Commission invites submissions on this draft determination, including its draft more preferable rule, by **19 February 2015**.

Any person or body may request that the Commission hold a hearing in relation to the draft determination. Any request for a hearing must be made in writing and must be received by the Commission no later than **29 December 2014**.[13]

Submissions and requests for a hearing should quote project number "ERC0168" and may be lodged online at www.aemc.gov.au or by mail to:

Australian Energy Market Commission

PO Box A2449

SYDNEY SOUTH NSW 1235

13 Under section 101(1a) of the NEL a request for a hearing in relation to a draft rule determination must be made within one week of publication of the draft determination. As the date one week after publication of this draft determination is the Christmas Day public holiday, section 28(3) of Schedule 2 of the NEL applies and the date by which a request for a hearing must be made is 29 December 2014, being the next business day after Christmas Day.

2 Draft more preferable rule determination

The Commission has made a draft more preferable rule that will improve the operation of the SRAS frameworks, including the distribution of roles and responsibilities of different bodies within the SRAS frameworks, and the nature of the major supply disruption that SRAS is procured to mitigate. The draft more preferable rule also makes a number of changes to the SRAS cost recovery processes as well as AEMO's reporting and procurement processes.

The draft more preferable rule incorporates some of the proposals made by AEMO and the Group of Generators and the Commission considers that its draft more preferable rule will also address some of the other key issues raised by the proponents.

This Chapter provides an overview of how the draft more preferable rule meets the NEO and the assessment framework used in developing this rule change. It provides an overview of how the Commission expects the new SRAS frameworks set out in its draft more preferable rule will operate. It also provides an overview of transitional and implementation arrangements.

2.1 Rule making test

The Commission may only make a rule if it is satisfied that the rule will, or is likely to, contribute to the achievement of the National Electricity Objective (NEO).[14]

The NEO states:[15]

> "The objective of this Law is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:
>
> (a) price, quality, safety, reliability and security of supply of electricity; and
>
> (b) the reliability, safety and security of the national electricity system."

The Commission may make a rule that is different from the proposed rule if it is satisfied that, having regard to the relevant issues raised in the proposed rule, the more preferable rule will or is likely to better contribute to the NEO.[16]

2.2 Assessment framework

The Commission considers that the SRAS frameworks included in the draft more preferable rule meet the following principles, and therefore promote the NEO.

Maintaining reliable SRAS arrangements in the NEM

There are likely to be significant costs associated with a potential black system event. Given the extent of these costs, reliable restart services must be available to restore supply. The SRAS frameworks must therefore promote the reliability of existing restart

14 See section 88 of the NEL.

15 See section 7 of the NEL.

16 See section 91A of the NEL.

services. They must also provide sufficient signals and incentives to drive investment in new restart services where they are needed.

Delivering SRAS at an efficient price

Restart capability should be provided to consumers at an efficient price. These prices should reflect the costs of providing the service. They should also be recovered from participants on the basis of how each participant benefits from the provision of the service. Effectively competitive markets are the optimal way to deliver SRAS prices that reflect underlying costs, while cost reflective pricing recovers the costs of SRAS from those parties who benefit most.

Developing effective SRAS governance arrangements

Effective governance arrangements provide clear functional separation between different market bodies, while allowing each body sufficient scope to meet its obligations efficiently. This is enabled by providing each market body with clear objectives, which also helps to reduce the risk of overlap or duplication. Transparent reporting processes are necessary to maintain accountability and to provide the market with sufficient information to enable efficient decision making.

2.3 Commission's draft more preferable rule determination

This section explains how the draft more preferable rule is likely to contribute to the achievement of the NEO, in accordance with the principles set out above.

SRAS governance arrangements

The draft more preferable rule provides clear functional separation within the SRAS frameworks. The draft more preferable rule provides the Reliability Panel and AEMO with separate, clearly defined objectives. These objectives identify that the Reliability Panel's key purpose is to develop the SRS in accordance with the SRAS Objective, while AEMO's is to focus on procuring SRAS to meet the SRS at lowest cost. The Commission considers that the provision of clear objectives for the Reliability Panel and for AEMO will reduce the prospect of duplication and overlap within the SRAS frameworks, while allowing each body to fulfil its role more efficiently.

The draft more preferable rule also provides the Reliability Panel with improved guidance regarding the form of the SRS, including the form of the restoration timeframes and reliability requirements. The draft more preferable rule also clarifies the conditions in which the Panel may vary the SRS between regions. This improved guidance will allow the Reliability Panel to fulfil its role more efficiently.

The draft more preferable rule also requires AEMO to report annually on whether it has met the SRS in each subnetwork, the total cost of SRAS in each subnetwork, and the processes it followed to test, assess and procure SRAS. The Commission considers that these transparent reporting processes will provide the market with necessary information to inform investment decisions. They will also help to quickly identify any areas of the SRAS frameworks that may not be operating effectively.

SRAS procurement processes

The draft more preferable rule provides AEMO with increased flexibility to fulfil its primary function of procuring SRAS at lowest cost. The draft more preferable rule

removes the obligation on AEMO to procure SRAS solely through a tender process. This will allow AEMO to procure SRAS more efficiently, by procuring SRAS whenever necessary, through whichever process it considers will enable it to meet the SRS at the lowest cost.

The draft more preferable rule also simplifies AEMO's reporting of SRAS costs. The current requirement for AEMO to report on both the cost and quantity of SRAS has been removed, with AEMO required to report only on the cost of SRAS in each subnetwork. This is designed to reduce the potential for non-competitive bidding by increasing the degree of competitive pressure in SRAS markets, driving more efficient SRAS cost outcomes for consumers.

SRAS cost recovery processes

The draft more preferable rule introduces a regional benefits approach to the recovery of SRAS costs. This approach allocates the cost of each restart service on the basis of the benefit it provides to each region. This approach to cost recovery will increase the cost reflectivity of SRAS charges (prices) and will align the charges paid by participants for restart services with the benefit they receive from those services. This may drive more efficient operational and investment decisions, particularly for generators, who will now face price signals that more accurately reflect the costs of providing SRAS in each region.

2.4 How the SRAS frameworks will operate

The draft more preferable rule includes a number of changes to the SRAS frameworks. This section describes the new NER clauses, as well as providing an overview of the various roles, responsibilities and relationships that exist within the SRAS frameworks.

Figure 2.1 provides a visual representation of how the SRAS frameworks will now operate. The numbers of each operation of the SRAS frameworks described below correspond to the numbers included in Figure 2.1.

SRAS Procurement

1. **SRAS Objective:** The Commission's draft more preferable rule clarifies the SRAS Objective in a new Chapter 10 definition. The Reliability Panel will be required to consider the SRAS Objective when determining the SRS. The new SRAS Objective is as follows:

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

2. **Redefine major supply disruption:** The Commission's draft more preferable rule clarifies the Chapter 10 definition of major supply disruption, to explicitly refer to loss of supply to one or more connection points. This is to clarify that SRAS is procured to mitigate the loss of supply to market participants, including market generators, market small generation aggregators and market customers, who are the parties that bear the costs of SRAS.

3. **Form of the SRS:** The Commission's draft more preferable rule makes five main changes to NER clause 8.8.3(aa), which establishes the matters that the Reliability Panel must consider when developing the SRS:

   (a) Firstly, the Reliability Panel will be required to include in the SRS "standalone restoration timeframes" for each subnetwork, being the maximum amount of time for restoration of power to a given level in each subnetwork, under the assumption that supply is unavailable from any other subnetwork (other than energy provided by contracted restart services) to assist in restoration. Specifically, the SRS must:

   > "identify the maximum amount of time within which *system restart ancillary services* are required to restore *supply* in an *electrical sub-network* to a specified level, under the assumption that *supply* (other than that provided under a *system restart ancillary services agreement* acquired by *AEMO* for that *electrical sub-network*) is not available from any neighbouring *electrical sub-network*."

   (b) Secondly, the Reliability Panel will also be required to include in the SRS an aggregate reliability requirement for each subnetwork. This reliability requirement will allow AEMO to procure a range of different restart services with different levels of reliability, in order to meet a single reliability requirement for each subnetwork. Specifically, the SRS must:

   > "include the aggregate required reliability of *system restart ancillary services* for each *electrical sub-network*."

   (c) Thirdly, the draft more preferable rule clarifies that the Reliability Panel may vary the SRS between subnetworks to reflect any specific technical issues or the specific economic circumstances of that subnetwork. Specifically, the SRS will:

   > "apply equally across all *regions*, unless the *Reliability Panel* varies the *system restart standard* between *electrical sub-networks* to the extent necessary:
   >
   > 1. to reflect any technical system limitations or requirements; or
   > 2. to reflect any specific economic circumstances in an *electrical sub-network*, including but not limited to the existence of one or more *sensitive loads*."

   (d) Fourth, the draft more preferable rule requires the SRS to specify that a restart service can only be acquired by AEMO under an SRAS contract for one electrical subnetwork at any one time.

   (d) Finally, the draft more preferable rule removes the definitions of primary and secondary restart services from the SRS.

4. **Reliability Panel determines the SRS:** Given the SRAS Objective **(1)** and the requirements established under NER clause 8.8.3(aa)**(3)**, the Reliability Panel will determine the SRS, via a consultative process. The SRS provides the restoration

timeframes and the reliability requirements that AEMO must aim to meet when procuring SRAS. The SRS also sets out other matters that AEMO must consider, including SRAS diversity requirements and guidance on the boundaries of electrical subnetworks.

5. **AEMO procurement objective:** The Commission's draft more preferable rule establishes a new SRAS procurement objective for AEMO:

> "AEMO must use reasonable endeavours to acquire *system restart ancillary services* to meet the *system restart standard* at the lowest cost."

6. **AEMO / network business consultation:** The Commission's draft more preferable rule requires AEMO to consult with network businesses when procuring SRAS, in order to identify and resolve issues in relation to the capability of any restart service to meet the SRS. Specifically, AEMO is required to:

> "consult with the relevant *Network Service Provider* to identify and resolve issues in relation to the capability of any *system restart ancillary service* proposed to be provided by an *SRAS Provider* in an *electrical sub-network* to meet the *system restart standard*."

7. **Network business provision of information to AEMO:** The Commission's draft more preferable rule requires network businesses to provide any information to AEMO that is reasonably required for AEMO to assess the capability of a restart service to meet the SRS. Specifically, network businesses must:

> "provide any information to *AEMO* which *AEMO* reasonably requires in order for *AEMO* to assess the capability of a *system restart service* to meet the *system restart standard*."

8. **Network business engagement with SRAS providers:** The existing rules require network businesses to engage with SRAS providers to resolve any issues related to delivery of restart services and to participate in testing of prospective restart services.

9. **AEMO procures SRAS**: Following the requirements established in the SRS **(4)** and the AEMO procurement objective **(5)**, having consulted with network businesses **(6)** and sourced all necessary information to inform its assessment of restart services **(7)**, AEMO will undertake a procurement process, to acquire sufficient SRAS to meet the SRS.

AEMO guideline and reporting requirements

10. **AEMO is required to develop an SRAS Guideline**: The Commission's draft more preferable rule clarifies AEMO's processes for developing the SRAS Guideline. The SRAS guideline must be designed to meet the SRS. Specifically, the Guideline must include:

> "1. a description of the technical and availability requirements of *system restart ancillary services;*

2. a process for meeting the aggregate required reliability of *system restart ancillary services* for each *electrical sub-network* under clause 8.8.3(aa)(3);

3. a process for the modelling, assessment and physical testing of *system restart ancillary services* proposed to be provided by an *SRAS Provider*; and

4. a process for determining the number, type and location of *system restart ancillary services* required to be procured for each *electrical sub-network* consistent with the *system restart standard*."

As under the current arrangements, AEMO may amend the SRAS Guideline in accordance with the rules consultation procedures.

11. **AEMO required to report annually on SRAS**: The Commission's draft more preferable rule requires AEMO to report annually on a number of matters including:

    1. the total estimated annual cost for the provision of *system restart ancillary services*, broken down to charges for availability and use, for each *electrical sub-network* and for each *region*;

    2. any *electrical sub-network* where *system restart ancillary services* were not acquired by *AEMO* to a level satisfactory to meet the *system restart standard*, and the reasons why the *system restart standard* was not met;

    3. the processes followed by *AEMO* for testing and assessing the ability of any *system restart ancillary services* acquired by *AEMO* under clause 3.11.9 to meet the *system restart standard*, including any assumptions made by *AEMO* in its testing and assessment processes regarding the state of the transmission network during a *major supply disruption*; and

    4. the process followed by *AEMO* to acquire *system restart ancillary services* for each *electrical sub-network*."

Development of subnetwork boundaries

12. **AEMO required to establish subnetwork boundaries:** The NER requires AEMO to determine the boundaries of electrical subnetworks, in accordance with the SRS.

SRAS cost recovery

13. **Regional benefit ancillary services procedures:** The Commission's draft more preferable rule requires AEMO to develop Regional benefit ancillary services procedures in accordance with the rules consultation procedures. Specifically:

    "*AEMO* must develop and *publish* the regional benefit ancillary services procedures in accordance with the *Rules consultation procedures*. Without limiting the matters to be included in the regional benefit ancillary services procedures, they must require *AEMO* to take into account:...

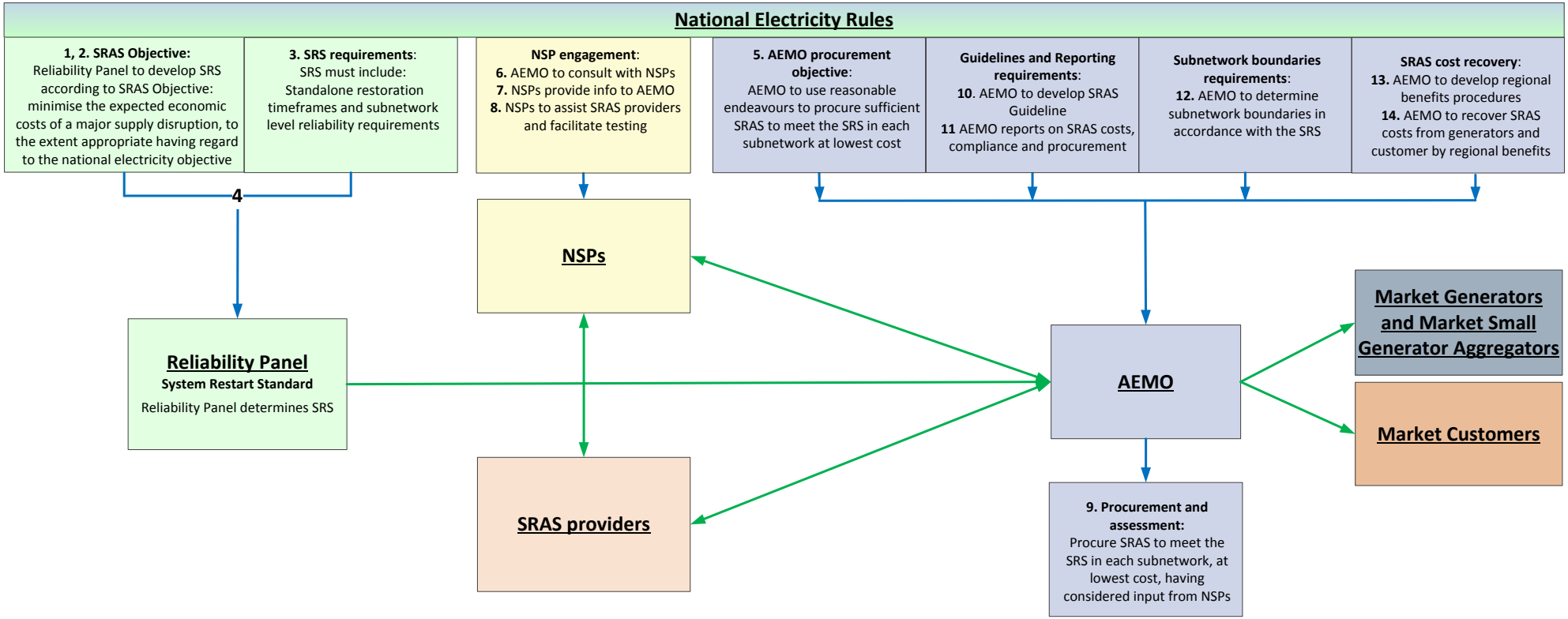
2. for a *system restart ancillary service*, that can be used to restart *generating units* in two or more *regions*, the relative benefit provided by that service to each *region*."

AEMO will develop regional benefit factors for each restart service in accordance with these procedures.

14. **Cost recovery:** The existing rules require AEMO to recover half the costs of SRAS from market customers and the other half from market generators and market small generation aggregators, on the basis of the energy generation and consumption of each.

The operation of the SRAS frameworks is set out in Figure 2.1. Rules requirements are shown as blue arrows, while interactions between different market bodies and organisations are shown as green arrows.

Figure 2.1 New SRAS frameworks



2.5 Transitional arrangements

If this draft more preferable rule is confirmed in the final rule determination, both the Reliability Panel and AEMO may undertake a number of consultations to incorporate the changes made in the final rule determination.

- The Reliability Panel will be issued a terms of reference from the AEMC to review the SRS, to reflect the changes made to the SRAS frameworks.
- AEMO may undertake a rules consultation process to amend:
  - the Regional benefits ancillary services procedures, to reflect the changes made to the SRAS cost recovery processes; and
  - the SRAS Guideline, to reflect the changes made to AEMO's Guideline processes.

The Commission has included draft transitional rules that will enable AEMO and the Reliability Panel to commence these consultations, prior to the date of commencement of the final rule, if either body chooses to do so.

The Commission will also consider whether other transitional arrangements are required to delay commencement of the final rule, or parts of the final rule, to account for completion of the consultations described above. Any such transitional rules will be included in the final determination.

3 Commission's assessment of AEMO's proposed rule change

The Commission has decided to make a draft more preferable rule that incorporates some of AEMO's proposed rule. This section sets out the Commission's assessment of AEMO's proposed rule. The Commission's draft more preferable rule is discussed in Chapter 5.

AEMO's rule change proposal included the following key proposals.

SRAS procurement and competition in SRAS markets: AEMO argued that SRAS markets are currently non-competitive and that this lack of competition has resulted in substantial increases in the price of SRAS in recent years. To address this perceived lack of competition, AEMO proposed the introduction of a price arbitration option in the SRAS procurement process.

The Commission does not consider that the introduction of price arbitration as part of the SRAS procurement process is appropriate. There would be significant costs and risks associated with introducing price arbitration in SRAS markets. Any weakness of competition in SRAS markets is better addressed through improving outcomes in the competitive SRAS procurement process. The Commission's draft more preferable rule, which includes proposed changes to improve outcomes in SRAS markets, is discussed in more detail in Chapter 5.

SRAS cost recovery processes: AEMO argued that the current approach to SRAS cost recovery results in non-cost reflective SRAS charges and transfers between regions. To address this situation, AEMO proposed the introduction of a process to recover SRAS costs on the basis of the regional benefit they provide.

The Commission has decided to incorporate AEMO's proposal for regional SRAS cost recovery in its draft more preferable rule. Recovering the cost of SRAS on the basis of the regional benefits it provides is likely to result in more cost reflective SRAS charges, which may result in more efficient operational and investment decisions by generators.

Remove definition of primary and secondary SRAS: AEMO argued that the current definitions of primary and secondary SRAS provide no benefit to the market and should be removed from the NER. The Group of Generators supported this proposed change to the NER.

The Commission's draft more preferable rule removes the definitions of primary and secondary SRAS from the NER. Removing these definitions may expand the range of potential restart services while maintaining an adequate standard of reliability.

Minor amendments: AEMO proposed a number of minor amendments to the NER, including:

- clarifying the definition of non-market ancillary services (NMAS);
- amending some apparent cross referencing errors in clause 3.11.4A(b) that requires AEMO to use reasonable endeavours to acquire SRAS; and
- removing "catch all" provisions that allow AEMO to consider "any other relevant matters".

The Commission's draft more preferable rule incorporates some of AEMO's proposed minor amendments.

This section sets out the Commission's assessment of AEMO's proposed rule changes.

3.1 SRAS procurement and competition in SRAS markets

This section addresses AEMO's proposal to introduce a price arbitration option into the SRAS procurement process. The Commission considers that it would not be appropriate to introduce any form of regulation, including price arbitration, into the SRAS procurement process, as there are likely to be a number of substantial costs and risks associated with introduction of a regulatory approach.

3.1.1 Current arrangements and AEMO's proposed rule

AEMO argued that a lack of competition in SRAS markets resulted in large increases in SRAS costs between the 2008 and 2012 SRAS tenders. It suggested this outcome was due to the following factors:

- the relatively small size of the SRAS market;
- a lack of alternative SRAS providers; and
- information asymmetries between SRAS providers and AEMO.

AEMO argued that these factors have allowed SRAS providers to tender at prices well above long run marginal cost, with little risk of losing market share.

Currently, SRAS is procured via an open tender process. This process explicitly precludes the price of SRAS from arbitration under the NER clause 8.2 Dispute Resolution provisions.[17] AEMO argued that these arrangements prevent it from "negotiat[ing] the price of services where they are deemed to not be providing cost/service balance and value". It therefore proposed the extension to SRAS of the procurement and arbitration processes that currently apply to network support control and ancillary services (NSCAS).

Under this proposed approach, AEMO would undertake an assessment of the competitiveness of each SRAS tender process. If it deemed a tender process to be non-competitive, the NER would require AEMO and the SRAS provider to negotiate in good faith, taking into account the need to meet the SRAS Objective.

If no agreement could be reached during this negotiation, either AEMO or the SRAS provider would then have the option to refer the tender to the Dispute Resolution Adviser for arbitration, as per NER clause 8.2.

Further detail of AEMO's proposed price arbitration option is included in Appendix C.

17 NER clause 8.2 requires the AER to appoint a person, or persons, to perform the functions of a Dispute Resolution Advisor. It also sets out the matters that may be considered in a dispute resolution and the process for resolution

3.1.2 Stakeholder views

A number of generator stakeholders, as well as AEMO, commented on the degree of competition in SRAS markets, and the effect of this on the price of SRAS.

Competition in SRAS markets

The NGF and Origin questioned whether an increase in the price of SRAS necessarily indicated a failure of competition.[18] Various other factors, such as the abolition of the Snowy region and the end of a long period of low SRAS prices, were highlighted as possible causes of an increase.[19]

The NGF, GDF Suez and Macquarie Generation argued that the threat of new entry in SRAS markets acts as a significant constraint on the pricing strategies of SRAS providers.[20] The NGF suggested that low levels of new entry indicated SRAS prices were still below the cost of a new entrant.[21] However, AEMO suggested that there is insufficient experience in the NEM to draw any conclusions about whether the price of SRAS has driven new investment, or failed to do so. AEMO argued that the few new SRAS facilities installed since NEM start may also have been installed in the absence of an SRAS market.[22]

Macquarie Generation and Alinta suggested that a perception of regulatory uncertainty, principally in the form of AEMO making changes to its SRAS guidelines, was a key factor limiting new entry in SRAS markets.[23] More flexible contract terms and longer lead times were supported, as was extending the lead time between contract execution and the commencement of service.[24]

Introduction of price arbitration

Several stakeholders were opposed to AEMO's proposal to introduce a negotiation / arbitration framework.

Origin, GDF Suez, Alinta and the NGF all argued that the introduction of an arbitration option would act as a deterrent to SRAS providers. They argued this may cause existing SRAS providers to fail to maintain relevant facilities or to not offer in future tenders, while potential new providers may be deterred from entering the market.[25]

AGL argued that there was a risk that, under an arbitration model, SRAS prices could be determined incorrectly.[26] Macquarie Generation argued that it would be difficult to

18 NGF, 1st round submission, p.10.; Origin, 1st round submission, p.2.

19 Ibid.

20 NGF, 1st round submission, p.10.; GDF Suez, 1st round submission, p.4.; Macquarie generation, 1st round submission, p.4.

21 NGF, ibid.

22 AEMO, 1st round submission, p.6.

23 Macquarie generation, 1st round submission, p.5.; Alinta, 1st round submission, p.4.

24 Alinta, ibid.

25 NGF, 1st round submission, p.12.; GDF Suez, 1st round submission, p.5.; Alinta, 1st round submission, p.5.; origin, 1st round submission, p.6.

26 AGL, 1st round submission, p.2.

identify what parts of a facility were actually used to provide SRAS, adding complexity to the process of estimating costs of SRAS under price arbitration.[27]

The NGF argued that the differences between NSCAS and SRAS mean that arbitration was only warranted in the procurement process for the former service, as NSCAS is typically highly localised while SRAS is a generally competitive service with multiple potential providers.[28]

3.1.3 Commission's assessment

The Commission does not consider that it is appropriate to introduce a price arbitration option into the SRAS procurement process. While SRAS markets may not be strongly competitive at present, this does not warrant the introduction of price regulation, including AEMO's proposed price arbitration option. The Commission's decision is based around the significant costs and risks associated with the introduction of regulation.

A key risk of regulation is the potential for the dampening of efficient investment signals. The presence of a price arbitration option may increase perceived downside risk for SRAS providers, potentially dissuading new entrants and encouraging the retirement of older SRAS units. The risk of regulatory error when determining costs could also dampen price signals, further weakening incentives for efficient levels of new investment.

The implementation of a price arbitration option will also create a number of costs. The actual determination of an arbitrated tender price would be a complex and challenging process, particularly the calculation of capital costs. It would most likely require the establishment of a suitably experienced expert panel, at significant cost. Undertaking multiple arbitrations for different tenders would further increase these costs.

The Commission also considers that to make a price arbitration option workable, it would be necessary to introduce a mechanism to prevent an SRAS provider from simply withdrawing a tender that was referred to the Dispute Resolution Adviser for arbitration.[29] The existence of such a provision would likely act as a strong disincentive to potential SRAS providers from tendering. The Commission notes AEMO's comment that the price arbitration provisions have never been exercised in the NSCAS procurement processes.[30]

Given the extent of these costs and risks, the Commission considers that a regulatory approach to SRAS procurement is not warranted at this time.

However, the Commission also considers that there is some evidence of limited competition in SRAS markets. The Commission considers that this is best addressed by introducing several new arrangements designed to improve the SRAS procurement

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27 Macquarie generation, 1st round submission, p.5.

28 NGF, 1st round submission, p.12.

29 This was the general approach proposed by the National Energy Market Management Company (NEMMCO) in the 2006 SRAS rule change, where SRAS tenderers were prevented from withdrawing once AEMO had issued a particular notice.

30 AEMO, 1st round submission, p.8.

process and to encourage competition in SRAS markets more generally. These arrangements include:

- allowing AEMO to procure SRAS on the basis of meeting an aggregate reliability requirement for each subnetwork, potentially increasing the range of restart services that AEMO may engage to meet the SRS;
- removing the requirement for AEMO to procure SRAS through a tender process, allowing AEMO to adopt alternative procurement arrangements and potentially expanding the range of potential SRAS providers;
- amending AEMO's reporting obligations to increase competitive pressure in SRAS markets; and
- changing cost recovery processes, to encourage new entry in SRAS markets and more competitive outcomes generally.

These Commissions draft more preferable rule is described in more detail in Chapter 5. Further detail regarding the Commission's considerations of competition in SRAS markets and potential approaches to SRAS procurement is provided in Appendix C.

3.2 SRAS cost recovery processes

This section addresses AEMO's proposal to recover SRAS costs on the basis of the regional benefit they provide.

The Commission's draft more preferable rule incorporates AEMO's proposed rule to move to regional cost recovery. The Commission considers that AEMO's proposed rule is likely to promote the NEO by increasing the cost reflectivity of SRAS charges and enhancing competitive outcomes in SRAS markets.

3.2.1 Current arrangements

Currently, the total cost of SRAS is recovered equally from all regions of the NEM, on a 50/50 basis from generators and customers.[31] These charges reflect the respective energy generation or consumption of each participant.

The current arrangements can result in differences between the cost of SRAS and SRAS charges levied on participants in a region. In some cases, the cost of sourcing sufficient SRAS to meet the SRS in a region may be markedly higher than the actual SRAS charges levied on participants in that region. As demonstrated in Figure 3.1, this situation occurred in 2012/13, where the cost of sourcing SRAS in Tasmania was markedly higher than the SRAS charges levied on Tasmanian participants. The inverse occurred in Queensland, where SRAS charges were substantially higher than costs.

The current arrangements for SRAS cost recovery are explained in more detail in Appendix D.

31 In full, the NER requires half of all SRAS costs to be recovered from market generators and small generation aggregators, and the other half from market customers.

Figure 3.1 SRAS charges recovered and payments made 2012/13

REGION	SRAS RECOVERED ($M, NOMINAL)	SRAS PAYMENT ($M, NOMINAL)	DIFFERENCE ($M, NOMINAL)
NSW	17.6	18.2	(0.6)
QLD	13.8	5.9	7.9
SA	3.5	3.1	0.4
TAS	3.2	10.2	(6.9)
VIC	13.1	13.8	(0.7)
Total	51.2	51.2	-

Source: AEMO, Rule change proposal: System Restart Ancillary Services, December 2013, p.11.

3.2.2 AEMO's proposed rule

AEMO argued that the current SRAS cost recovery arrangements may result in inefficient outcomes, as participants in some regions pay SRAS charges that do not reflect the cost of providing SRAS in that region. AEMO considered that this situation results in inefficient cross subsidisation between regions.

AEMO therefore proposed that the cost of SRAS should be recovered on a regional basis. AEMO proposed that this regional cost recovery would better reflect the relative benefit that specific restart services provide to different regions.

AEMO's proposed rule requires AEMO to develop a regional benefit factor (RBF) to be applied to SRAS. This RBF would allocate the cost of each restart service to a region, according to the benefit that it provides to that region.[32] AEMO advised that the cost of updating its internal systems to introduce an RBF for SRAS would amount to around $70,000.[33]

Under the proposed rule, AEMO would be required to develop RBFs for SRAS cost recovery in accordance with a new NER clause 3.15.6A(c4)(2).[34] This new clause would require AEMO to develop and publish Regional benefit ancillary services procedures for SRAS that will determine the relative benefit provided by each restart service that can be used to restart generating units in two adjoining regions. This procedure would be developed by AEMO according to the rules consultation procedures and interested participants would have the opportunity to comment on their development.

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32 AEMO has also advised that it intends to develop separate RBFs to apply to SRAS availability and usage charges for each restart service. The intention of developing separate RBFs is to allocate costs accurately in case a restart service is called upon to provide services to a subnetwork other than the subnetwork to which it was originally contracted.

33 AEMO, Rule change proposal, December 2013, p.15.

34 NER clause 3.15.6A(c4) currently requires AEMO to develop and publish Regional Benefit ancillary services procedures for NSCAS. This document establishes how AEMO will determine how different regions benefit from provision of NSCAS. AEMO proposed that the same procedural approach to the development of NSCAS RBF procedures be applied to SRAS.

3.2.3 Stakeholders' views

Macquarie Generation, the NGF and GDF Suez were opposed to the introduction of regional cost recovery. Macquarie Generation suggested that the costs of calculating a regional benefit factor and implementation would likely outweigh any benefits of regional cost recovery.[35] Similarly, GDF Suez argued that if inter-regional power supplies were going to be used to restore power systems, then SRAS costs should be spread across multiple regions.[36]

The NGF argued that SRAS provides system benefits and should be recovered accordingly.[37] The NGF also suggested that as market customers are the primary beneficiaries of SRAS, all of the costs of SRAS should be recovered from market customers, rather than the current 50/50 split between customers and generators.[38]

Alinta suggested that the issue of cost recovery should be considered in the context of whether SRAS is considered a localised or a NEM-wide service. If it is considered a NEM-wide service then benefits accrue to all customers regardless of location. In this case, Alinta suggested that any differences in SRAS charges and costs between regions is not a distortion but a representation of where services are located and the value of those services against the standard.[39]

AEMO and Origin supported the proposed recovery of SRAS on a regional basis. AEMO suggested that the existing process for the recovery of NSCAS costs that benefit more than one region could be applied to SRAS without causing any material complexity.[40] Origin stated that it supported regional cost recovery on the basis of addressing potential cross subsidisation between regions.[41]

3.2.4 Commission's assessment

The Commission's draft more preferable rule incorporates AEMO's proposal for the recovery of SRAS costs according to regional benefits. The Commission considers that the draft more preferable rule will result in more cost reflective SRAS charges and promote more efficient operational and investment decisions.

The Commission has considered the following issues in assessing AEMO's proposed rule:

- whether the 50/50 recovery of SRAS costs from market customers and generators remains appropriate;
- the potential benefits associated with introducing a regional benefits approach to SRAS cost recovery, including improved cost reflectivity of SRAS charges and incentives for generators; and

35 Macquarie Generation, 1st round submission, p.6.

36 GDF Suez, 1st round submission, p.5.

37 NGF, 1st round submission, p.13.

38 Ibid.

39 Alinta, 1st round submission, p.5.

40 AEMO, 1st round submission, p.8.

41 Origin, 1st round submission, p.6.

- the potential costs and complexities of implementing regional recovery of SRAS costs.

Equal recovery of costs from market generators and customers

Under current arrangements, the cost of SRAS is recovered equally from market generators and market customers. The NGF proposed that this arrangement be changed to recover the costs of SRAS solely from market customers. The NGF argued that customers place a higher value on SRAS and therefore should bear the costs of providing this service.[42]

The Commission considers that both market customers and market generators benefit from the provision of SRAS. While market customers benefit from the restoration of energy, generators benefit through being able to meet contracted positions and avoiding other operational costs associated with a prolonged outage.

It is difficult to accurately quantify the relative benefits that flow to different classes of participant from the provision of SRAS. The Commission considers that the current 50/50 split between market customers and generators remains a reasonable approach to the allocation of costs and has decided not to accept the NGFs suggested approach.

Benefits of introducing regional cost recovery

The Commission considers that there are two main benefits associated with the introduction of regional cost recovery:

- improved cost reflectivity of SRAS charges; and
- improved competitive outcomes in SRAS markets.

SRAS provides the capability to independently restore supply in each subnetwork. This principle has informed the Commission's draft more preferable rule regarding the function of the SRS, as discussed in section 5.2.1. The Commission considers that the benefit of a restart service primarily flows to participants in the subnetwork to which that service is contracted.

The Commission considers that the approach to SRAS cost recovery should reflect this general principle. This is especially the case given that SRAS costs in each region may differ substantially, depending on factors such as technology and fuel type. The cost of providing sufficient SRAS to meet the SRS may also be higher in specific regions, if the Reliability Panel has varied the SRS to apply in subnetworks within that region.[43] Regional cost recovery should enhance the cost reflectivity of SRAS charges, by ensuring that the cost of meeting the SRAS in each subnetwork is borne by participants in that region.

Given that the cost to provide SRAS may differ between regions, a regionalised approach may change the SRAS charges faced by participants. This reflects the increased cost reflectivity of SRAS charges under a regionalised approach. Such

42 NGF, 1st round submission, p.13.

43 Under current arrangements, the Reliability Panel has the ability to vary the SRS between subnetworks to reflect technological system limitations and economic factors. This issue is discussed in further detail in section 5.2.3.

changes in SRAS charges are likely to be particularly relevant in terms of the incentives they create for generators.

Generators typically face two sets of incentives in SRAS markets. Firstly, the prospect of earning revenues may encourage them to offer SRAS and to invest in SRAS facilities. This incentive is signalled by the potential prices that SRAS providers can charge for their services in different subnetworks.

Secondly, generators also bear half of the total cost of SRAS through the SRAS charges they face as participants. This means that a portion of the total cost of providing SRAS is recovered from the same parties that created that cost in the first place.

As discussed above, introducing regional cost recovery will increase the cost reflectivity of SRAS charges in a region. This may create a number of specific incentives for generators in areas with high SRAS costs and charges. It will promote competitive outcomes in SRAS markets, as existing SRAS providers in these regions face the prospect of making large payments to their direct competitors if they lose a tender process. This could create stronger incentives for these SRAS providers to price their own offers competitively, in order to win the tender process. It will also help drive more efficient investment decisions, as other generators may face stronger incentives to enter SRAS markets by investing in SRAS facilities. More detail regarding this process, and the Commission's reasoning, is included in Appendix D.

While the Commission considers that there are clear benefits associated with regional cost recovery, there are also a number of complexities and potential costs associated with the introduction of this approach. These are discussed in further detail below. On balance, however, the Commission considers that these costs are outweighed by the benefits of regional cost recovery.

Costs and complexities of regional cost recovery

Moving to regional cost recovery may result in some changes to the total ancillary services charges faced by both market generators and market customers. The current magnitude of SRAS costs suggests that the impact of these changes should be relatively minor.[44] The Commission considers any changes should be manageable for both market customers and market generators.

There are also likely to be costs associated with changing AEMO's IT and settlement processes to allow for regional recovery. AEMO has suggested that the costs of making these changes will be around $70,000. The Commission considers that this cost is acceptable, given the likely benefits that will flow from regional cost recovery. The Commission also notes AEMO's comment that the existing procedure applicable to cost allocation for NSCAS that benefits more than one region could be applied to SRAS without adding any material complexity.[45]

The Commission also considered the possibility of subnetwork level cost recovery. Although this approach would more closely reflect the general principle that SRAS

44 In 2012/13, total SRAS charges levied in each region ranged from $3 million to $8 million. While future SRAS charges will depend on future SRAS costs, the Commission expects that any changes in SRAS charges that flow from this rule change would likely sit somewhere within this range.

45 AEMO, 1st round submission, p.8.

provides benefits at the subnetwork level, it is likely to be complex to implement. The Commission is satisfied that regional cost recovery represents a reasonable compromise between increasing the accuracy of SRAS cost allocation and associated implementation costs.

The Commission notes comments made by stakeholders regarding other potential complexities of implementing regional SRAS cost recovery. Several stakeholders suggested that regional cost recovery may be difficult where a subnetwork spans a region boundary. The Commission notes that AEMO has advised that regional benefit factors will be capable of dealing with this outcome. These RBFs will allow for the allocation of the costs of individual restart services to the specific regions that benefit, regardless of the location of subnetwork boundaries. In any case, participants will be able to provide input into the development of these RBFs when AEMO begins development of the Regional benefit ancillary services procedures in accordance with the rules consultation procedures.

The Commission's draft more preferable rule includes changes to NER clause 3.15.6A that differs from those originally proposed by AEMO. Specifically, the Commission has proposed different formulae to be used in the settlement of SRAS costs. These new formulae better reflect the principle of allocating the costs of specific restart services to the regions that benefit most from the provision of those services. These new clauses have been developed in consultation with AEMO.

Implementation of regional cost recovery and the 2015 SRAS tender process

The Commission notes that its draft more preferable rule may be relevant to the tender process currently underway for SRAS contracts to begin in July 2015. Given that SRAS contracts for this period are not expected to be executed until late May or early June 2015,[46] the Commission considers that SRAS providers will have adequate time to factor in changed cost recovery processes into their tenders, if this is relevant.

The Commission notes that if this draft more preferable rule is confirmed in the final rule determination, AEMO will need to consult under the rules consultation procedures on the new Regional benefit ancillary services procedures. Draft transitional rules have therefore been included in the draft more preferable rule that will allow AEMO to commence these consultations, prior to the date of commencement of the final rule.

The Commission will also consider whether other transitional arrangements are required to delay commencement of the final rule, or parts of the final rule, to account for completion of this consultation. Any such transitional rules will be included in the final determination.

3.3 Definition of SRAS

This section addresses AEMO's proposal to remove the current definitions of primary and secondary SRAS from the NER.

46 As per www.aemo.com.au, Procurement of System Restart Ancillary Services (SRAS) from 1 July 2015, viewed on 04/12/14.

The Commission's draft more preferable rule incorporates AEMO's proposal to remove these definitions from the NER. The Commission considers that this may expand the range of potential restart services while maintaining satisfactory levels of reliability.

3.3.1 Current arrangements

Currently, the NER defines two types of SRAS: primary and secondary restart services. The NER requires the SRS to include guidelines on the required reliability of these primary and secondary restart services. AEMO is then required to establish the technical and availability requirements of each service in its SRAS description.

The SRS defines primary restart services as having a reliability of 90 per cent, and secondary services as having a reliability of 60 per cent. The current SRAS description provides further detail regarding the nature of what each service must be capable of doing, as well as timeframes, technical requirements and guidance on how reliability of services will be assessed.[47]

3.3.2 AEMO and the Group of Generators' proposed rule

AEMO argued that the separate definitions of primary and secondary services in the NER serve no particular benefit. AEMO considered that their removal would provide greater clarity for potential SRAS providers regarding what services are required. More generally, AEMO argued that application of a single set of reliability, availability and technical requirements should apply to all SRAS, with a focus on the outcomes required to achieve the SRS.

To achieve this, AEMO proposed the following amendments to the NER:

1. **Clause 3.11.4A:** remove reference to primary and secondary services from the SRAS procurement objectives and the SRAS description;
2. **Clause 8.8.3(aa):** remove references to primary and secondary services from the description of the SRS; and
3. **Chapter 10 definitions:** remove definition of primary and secondary SRAS.

Under AEMO's proposed rule, there would be no formal differentiation in terms of the reliability characteristics of SRAS.

The Group of Generators supported AEMO's proposal to remove the definitions of primary and secondary SRAS. They considered that AEMO should be free "to select any combination and form of services on offer to meet the Standard at an efficient cost while allowing for adequate consideration of economic, commercial and technical considerations, consistent with the NEO."[48]

The Group of Generators proposed similar amendments to AEMO, to excise the definitions of primary and secondary SRAS from the NER. However, the Group of

47 For SRAS, AEMO measures compliance with the reliability requirements of the SRS as the ratio of total number of trading intervals each restart service is available, to the total number of trading intervals in the same period. For more information see: AEMO, *SRAS Guidelines*, September 2014, p.8.

48 Group of Generators' rule change proposal, p.7.

Generators also proposed amendments to the SRS,[49] to replace the current description of the reliability of primary and secondary services with a new clause: "Each type of system restart ancillary services shall have a reliability range referenced in the SRAS description unless AEMO, as procurer, determines that a lower reliability range provides an appropriate trade-off, consistent with the SRAS Objective, or a greater standard of reliability is required given the characteristics of the specified electrical subnetwork."[50]

The Group of Generators' proposed approach to the definition of services relates to the consideration of the function of the SRS and AEMO's role within the SRAS frameworks. This is addressed in Chapter 5.

3.3.3 Stakeholder views

Stakeholders generally supported AEMO's proposal to remove the definitions of primary and secondary SRAS from the NER.

The NGF considered that the current definitions of SRAS may be redundant, on the proviso that a single definition of reliability standard can be used to procure sufficient SRAS in each electrical subnetwork to meet the SRAS Objective. The NGF argued that documentation should be developed by AEMO to prove this will be the case.[51]

Macquarie Generation cautioned against any changes to the SRAS frameworks that would reduce the field of potential tenderers in SRAS rounds. It argued that AEMO "should give itself the scope to make decisions where it can award one or more contracts based on a trade-off between cost and the level of restart service offered."[52]

3.3.4 Commission's assessment

The Commission's draft more preferable rule incorporates AEMO's proposal to remove the definitions of primary and secondary restart services.

The Commission considers that removal of these definitions from the NER will:

- lower potential barriers to entry for new SRAS providers; and
- expand the range of potential restart services while maintaining adequate levels of reliability.

Lowering potential barriers to new entry

The Commission considers that the existence of different classes of restart service could have two effects on potential SRAS providers.

Qualifying as a primary restart service may serve as a way of differentiating a restart service from its competitors. As discussed in the AEMC's 2006 *System Restart Ancillary Services and pricing under market suspension* rule change (the 2006 SRAS rule change), this

49 The Commission notes that the SRS is determined by the Reliability Panel and cannot be changed by the AEMC directly.

50 Ibid., p.17.

51 NGF, 1st round submission, p.9.

52 Macquarie Generation, 1st round submission, p.3.

could provide an economic incentive to participants,[53] by bestowing preferential treatment on those restart services that qualify as a primary service.[54]

The existence of such qualifying standards could also dissuade new entrants from offering services that may be close to, but do not necessarily meet, the requirements of a primary service. Potential providers may consider that the additional costs of increasing the reliability of a service to meet these requirements outweigh the potential benefits associated with winning a tender or SRAS contract.

On balance, the Commission considers that any potential benefit of service differentiation provided by these definitions is minimal. Their removal may encourage a wider range of potential SRAS providers to offer restart services. In conjunction with measures that will allow AEMO to procure a wider range of services (described in sections 5.2.2 and 5.3.1), the Commission considers that removal of these definitions may encourage new entrants and expand the range of potential restart services. This also addresses the concerns raised by Macquarie Generation that removing the SRAS definitions would reduce the field of potential SRAS tenderers.

Maintaining reliability levels while expanding the range of potential restart services

Generally, the Commission considers that AEMO should have the capability to procure a range of restart services to meet the requirements of the SRS.

As discussed in section 5.2.2, the Commission's draft more preferable rule will allow AEMO to procure SRAS on the basis of meeting a subnetwork level aggregate reliability requirement. Under this approach, AEMO may choose to procure a mix of lower reliability restart services to provide the same aggregate level of reliability as would be achieved by procuring one higher reliability restart service.

The Commission considers that removal of the definitions of primary and secondary restart services is necessary to enable AEMO to effectively procure SRAS in this manner. Removing the definitions of primary and secondary services will allow AEMO adequate flexibility to determine the optimal mix of restart facilities that will allow it to meet the requirements of the SRS at lowest possible cost.

The SRAS frameworks require procured SRAS to be capable of reliably restoring each subnetwork within the timeframes of the SRS. The Commission has considered whether removing these definitions of primary or secondary SRAS will have any impact on the reliability of system restoration. Given that under the Commission's draft more preferable rule AEMO will be required to meet a subnetwork level aggregate reliability requirement defined in the SRS, removing these terms should not have any negative consequences on the reliability of system restoration.

Implementation of removal of the definitions of primary and secondary SRAS and its effect on the 2015 SRAS tender process

The Commission notes that the draft more preferable rule to remove the definition of primary and secondary restart services will require amendment of the SRS and

53 AEMC, *System Restart Ancillary Services and pricing under market suspension - Final Determination*, 20 April 2006, p.17.

54 Under NER clause 3.11.4A(c)(3), AEMO is currently required to focus its procurement on the acquisition of primary services.

potentially to AEMO's SRAS Guideline document. Transitional rules have been included to reflect this.

Given that the current 2015 SRAS tender is already underway, with tender offers based around the existing SRS and SRAS guidelines, the Commission does not consider that the draft more preferable rule will affect the 2015 tender process.

3.4 Minor amendments

This section addresses AEMO's proposal to make a number of minor amendments to the NER. These amendments are designed to clarify some apparent cross referencing errors and to remove ambiguities.

The Commission's draft more preferable rule incorporates AEMO's proposed changes to clarify the definition of NMAS and to remove various "catch all" provisions. These changes are likely to improve the function of the SRAS frameworks.

The Commission has decided to make a draft more preferable rule regarding AEMO's procurement of SRAS under NER clause 3.11.4A(b), to introduce a specific SRAS procurement objective. This is discussed in more detail in Chapter 5.

3.4.1 AEMO's proposed rule

AEMO identified three minor changes.

NMAS definition

The current Chapter 10 definition of NMAS incorrectly suggests that SRAS is acquired by Transmission Network Service Providers (TNSPs) under connection agreements or network support agreements. The Commission considers that this is incorrect, as SRAS is procured solely by AEMO. The current description also suggests that there are services other than NSCAS procured by TNSPs. The Commission also considers that this is incorrect, as TNSPs are only responsible for procuring NSCAS.

To address this, AEMO proposed amendments to the Chapter 10 definition of NMAS to clarify that NMAS includes:

- NSCAS and other services acquired by TNSPs under connection agreements or network support agreements to meet the service standards linked to the technical requirements of schedule 5.1 or in applicable regulatory instruments; and
- SRAS and NSCAS acquired by AEMO under ancillary service agreements.

Reference to tender guidelines

AEMO stated that NER clause 3.11.4A(b) currently contains an incorrect reference that requires AEMO to use reasonable endeavours to procure SRAS in accordance with the relevant provisions of clause 3.11.4A. AEMO stated that this is incorrect, as AEMO's processes for procuring SRAS are established in NER clause 3.11.5.

AEMO proposed to amend clause 3.11.4A(b) to refer to clause 3.11.5.

Catchall provisions

AEMO also proposed the removal of provisions in NER clauses 3.11.4A(d)(3) and 3.15.6A(c4) that allow it to consider "any other matters considered relevant by AEMO".

AEMO argued that these provisions are not needed as the relevant rules do not preclude the inclusion of other matters.

AEMO proposed to amend clauses 3.11.4A(d)(3) and 3.15.6A(c4) to remove these "catch all" provisions.

3.4.2 Stakeholder views

Grid Australia supported AEMO's proposed amendment to the Chapter 10 definition of NMAS as this would remove any ambiguity regarding TNSPs' ability to procure NSCAS.

There were no other stakeholder comments on this proposal.

3.4.3 Commission's considerations

The Commission's draft more preferable rule incorporates AEMO's proposal to change the definition of NMAS, as the current definitions are incorrect.

The Commission's draft more preferable rule also reflects AEMO's proposal to remove "catch all" provisions. The draft more preferable rule includes an amendment to clause 3.15.6A(c4) to remove reference to remove the terms "any other relevant factors.

The amendment to clause 3.11.4A(b) has not been made because the draft more preferable rule removes the obligation for AEMO to procure SRAS through a tender process, and therefore AEMO's proposed change is unnecessary. Furthermore, as discussed in section 5.1.3, the Commission's draft more preferable rule provides AEMO with a new SRAS procurement objective.

4 Commission's assessment of the Group of Generators' proposed rule change

This Chapter sets out the Commission's assessment of the Group of Generators' proposed rule changes. In several cases, the Commission has agreed with the underlying issues raised by the Group of Generators, but considers that the NEO can be better met through a draft more preferable rule. This draft more preferable rule is discussed in more detail in Chapter 5.

The Group of Generators' rule change proposal includes the following proposals.

Redefine major supply disruption, economic costs and SRAS costs in the NER: The Group of Generators argued that the current SRAS frameworks provide insufficient guidance regarding the nature of the event that SRAS is procured to mitigate, the economic costs of that event and the costs of procuring SRAS.

To address this, the Group of Generators proposed to redefine a major supply disruption event as a multi-region or NEM-wide event.[55] Other changes were proposed to the definition of economic costs and cost of supply, to guide how these terms should be interpreted by the Reliability Panel when developing the SRS.

Define the SRS as an operational standard and increase AEMO's reporting / consultation requirements: The Group of Generators argued that there is a lack of certainty in the market regarding the ability of procured SRAS to meet the restoration timeframes of the SRS.

To address this, the Group of Generators proposed that the SRS should be changed from a target that guides AEMO's procurement of SRAS, to an operational standard that AEMO would be required to meet in the event of a major supply disruption. The Group of Generators also proposed increased reporting and consultation requirements for AEMO to provide evidence to the market as to the ability of procured SRAS to restore the system within the timeframes of the SRS.

Define the role of the Reliability Panel: The Group of Generators argued that AEMO should be subject to an approval process when it seeks to make changes to its SRAS guideline documents. The Group of Generators therefore proposed that the Panel be required to approve any changes made by AEMO to several of the SRAS guideline documents.

The Group of Generators also argued that the Panel could benefit from increased guidance in the NER regarding its functions and consultative processes. The Group of Generators therefore proposed that the Panel be required to consult with multiple stakeholders in addition to AEMO when developing the SRS. The Group of Generators also proposed that the SRS explicitly state that it remains current until amended by the Panel.[56]

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55 The Commission notes that the Group of Generators have actually proposed to "redefine" the term major supply disruption through proposed amendments to the SRAS Objective and SRS, rather than to the Chapter 10 definition.

56 The Commission notes that the SRS is reviewed and determined by the Reliability Panel, separately to the rule change process. The Commission cannot make changes directly to the SRS.

4.1 Redefine major supply disruption, economic costs and SRAS costs in the NER

The Group of Generators proposed several amendments to the SRAS Objective and the SRS. These changes were intended to provide increased guidance regarding the nature of a major supply disruption event and the costs associated with that event.

The Commission considers that these issues are best addressed by providing the Reliability Panel with improved guidance regarding the function of the SRS. Clause 8.8.3(aa) of the NER sets out the matters that must be included in the SRS. As the SRS is developed by the Reliability Panel, the Commission cannot change it directly, however changes to clause 8.8.3(aa) will clarify what must be considered by the Panel when developing the SRS.

The Commission's draft more preferable rule will provide additional guidance to the Reliability Panel regarding the development of the SRS, through a number of changes to clause 8.8.3(aa). These changes are in keeping with the Commission's general assessment framework set out in Chapter 2, which considers that different market bodies within the SRAS frameworks should be provided with clear guidance regarding their roles and responsibilities, and allowed adequate scope to fulfil their functions effectively and efficiently.

This section sets out the analysis of the Group of Generators' proposed rule. The Commission's draft more preferable rule is discussed in Chapter 5.

4.1.1 Current arrangements

Current NER and SRS definitions

The current SRAS Objective states that:

> "The objective for *system restart ancillary services* 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*"

The term major supply disruption is in turn defined in Chapter 10 of the NER as:

> "The unplanned absence of *voltage* on a part of the *transmission system* affecting one or more *power stations*."

There is no further information provided in the NER regarding the size of an event that would qualify as a major supply disruption. In particular, the NER does not indicate whether this event should be defined as an unplanned loss of voltage affecting a single subnetwork, a single region, multiple subnetworks/regions or the entire NEM. The NER also provides no further explanation regarding the definition of the economic costs of a major supply disruption, or of the costs of supplying SRAS.

AEMO's 2013/14 review of SRAS arrangements

During 2013/14, AEMO undertook a review of SRAS arrangements in the NEM (the 2013/14 SRAS review). One of the key issues addressed in that review was how AEMO should interpret the term major supply disruption. In particular, AEMO questioned

whether it should assume that this event refers to a NEM-wide black system, or a more limited, region-wide black system.[57]

This interpretation is highly relevant to the operation of SRAS, as in the past it has shaped AEMO's decisions regarding the minimum quantity of SRAS it considered it must procure in each subnetwork. This relationship between the assumed size of a major supply disruption and SRAS quantity procured is discussed in Box 4.1.

Box 4.1: Nature of the major supply disruption assumed and number of SRAS procured by AEMO

The size of a major supply disruption event may affect the number of restart services that are needed to restore power in that subnetwork within the timeframes of the SRS:

- Under the conditions of a regional black system event, supply may be available from neighbouring energised subnetworks to assist in restoration. This may mean that a smaller number of restart services are needed to restore that subnetwork within a given restoration timeframe.
- Under the conditions of a NEM wide black system event, no supply would initially be available from neighbouring subnetworks. This may mean that a larger number of restart services are needed to restore that subnetwork within a given restoration timeframe.

Prior to its 2013/14 SRAS review, AEMO had assumed that the major supply disruption it was procuring SRAS to mitigate was a NEM wide black system event. To address this event, it procured a minimum of two SRAS per subnetwork.

As part of its 2013/14 SRAS review, AEMO argued that this assumption was no longer valid and proposed that a region-level black system event formed a more appropriate basis for procurement.[58] Accordingly, AEMO proposed reducing its minimum procurement to one SRAS per subnetwork, arguing that supply from neighbouring subnetworks could be used to help in a region-wide system restoration.

AEMO has since moved away from this approach of interpreting the nature of a major supply disruption, and now procures SRAS according to meeting the SRS independently in each subnetwork.[59]

More detail of AEMO's reviews of SRAS arrangements and the SRAS guidelines is provided in Appendices G and H.

57 AEMO, *System Restart Ancillary Services - Draft report*, May 2013, p.25. The term "black system" is defined in Chapter 10 as "The absence of *voltage* on all or a significant part of the *transmission system* or within a *region* during a *major supply disruption* affecting a significant number of *customers*." A major supply disruption may therefore consist of different kinds of black system events, such as a region wide black system event, or a NEM-wide black system event.

58 AEMO's recommendation was informed by analysis provided by DNV KEMA, as discussed in Box 4.3.

59 AEMO, *SRAS Documents consultation*, September 2014, p.2.

AEMO's initial proposal to move away from a procurement assumption of a NEM-wide black system was opposed by a number of generator stakeholders.[60] A number of these stakeholders stated that AEMO's interpretation was incorrect, suggesting that the probability of a NEM-wide black system was non-negligible. It was also suggested that by changing its interpretation of this NER term and potentially reducing the quantity of SRAS it procured, AEMO would:

- fail to procure sufficient SRAS to meet its obligations under the SRS; and
- be amending aspects of the SRAS frameworks that were more appropriately dealt with by the Reliability Panel.

These issues were a key input into the Group of Generators' rule change proposal.

4.1.2 The Group of Generators' proposed rule

The Group of Generators argued that the NER provides insufficient guidance regarding the nature of the event that SRAS is procured to mitigate, as well as the costs associated with that event. They argued that this lack of guidance has resulted in AEMO making an inappropriate interpretation of major supply disruption, potentially resulting in AEMO procuring too few restart services to effectively meet the requirements of the SRS.

To address this uncertainty, the Group of Generators proposed that the SRAS Objective, currently set out in NER clause 3.11.4A(a), be redefined to specify that the term major supply disruption "include[s] but is not limited to a NEM-wide or multiple region event".[61]

In support of this rule change proposal, the Group of Generators provided a report from ROAM Consulting that examined the probability of multi region or NEM-wide black system events in the NEM, and associated costs. The ROAM report found that the statistical probability of a multi-region black system event in the NEM was not negligible, and argued that AEMO should therefore procure more SRAS than it had proposed in its 2013/14 SRAS review. A summary of the ROAM report is included in Box 4.2.

The Group of Generators also proposed amendments to NER clause 8.8.3(aa), which sets out the matters that must be included in the SRS. The Group of Generators proposed that this clause be amended to require the SRS to include specific definitions of key terms from the SRAS Objective. Specifically, it was proposed that the terms economic cost, major supply disruption and cost of supply from the SRAS Objective be defined in the SRS as follows:

- economic cost requires consideration of the total opportunity costs, financial, social and non-financial, to energy users and the market, generally and to specific sensitive loads;

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60 More information on AEMO's 2013/14 SRAS review is available at: http://www.aemo.com.au/Consultations/National-Electricity-Market/Open/System-Restart-Ancillary-Services-2013-Consultation

61 The Commission notes that the term major supply disruption is already defined in Chapter 10 of the NER as "the unplanned absence of *voltage* on a part of the *transmission system* affecting one or more *power stations*". The Group of Generators did not propose any changes to this Chapter 10 definition.

- major supply disruption refers to the unplanned absence of voltage on a part of the transmission system affecting one or more power stations, including a NEM-wide or multiple region event; and
- cost of supply refers to the offer price of competing options to meet the SRAS Objective.

The Group of Generators argued that these amendments were necessary as the current lack of guidance in the NER has created uncertainty in the market. They considered that the nature of major supply disruption "goes to the intent of the Standard and even the SRAS Objective itself". The Group of Generators therefore argued that this term should not be defined by AEMO, but should instead be clarified as part of the framework under which AEMO makes its operational decisions.

The Group of Generators also proposed that the SRS should be amended to provide a "clarification of the form of assessment of economic costs ... to ensure a simple assessment based on offer prices by SRAS providers or potential SRAS providers is not used as the sole determinant of a successful bidder". The intention of the Group of Generators' proposed change to the definition of costs in the SRS is "to require AEMO to consider all of the economic costs and benefits, as well as the prices offered by competing bids, as part of the competitive tender process."[62]

Box 4.2: ROAM Consulting: Review of SRAS requirements

ROAM Consulting was engaged by the Group of Generators to:

- examine the probability of different kinds of black system events in the NEM, and;
- evaluate the economic value of procuring SRAS, comparing the existing procurement processes with AEMO's proposal to reduce the minimum number of SRAS procured in each subnetwork from two to one.

ROAM reviewed various studies that examined historical data regarding blackouts in a number of power systems around the world. ROAM advised that "there is consensus across the literature that the distribution of large blackouts follows a "power-law distribution", where there is a clear relationship between the size of a blackout and the probability of that sized blackout occurring."[63] ROAM applied this analysis to the NEM, to estimate the probability of different sized black system events.

ROAM's analysis found that there was a non-negligible probability associated with several multi-region black system events in the NEM.

4.1.3 Stakeholder views

A number of stakeholders commented on the Group of Generators' proposal to specify the nature of the major supply disruption.

62 Group of Generators, rule change proposal, p.8.

63 ROAM Consulting, *Review of SRAS in the NEM*, May 2014, p. 12.

The NGF disagreed with AEMO's assessment regarding the probability of a NEM-wide black system event, as part of its 2013/14 SRAS review. The NGF stated that the prospect of a multi-region or NEM-wide black system event was not negligible.[65] The NGF also suggested that if a region wide black system event formed the basis for SRAS procurement, there was an increased risk that the SRAS Objective would not be met.[66]

AGL supported the proposed clarification of the terms major supply disruption and economic costs. AGL also argued against the use of any assumptions regarding inter-regional supply to inform the quantity of SRAS that should be procured.[67]

Alinta suggested that SRAS should be procured to mitigate the worst case scenario of a NEM wide black system event.[68]

Tomago Aluminium stated that it was opposed to any changes that would dilute the robustness of SRAS, and urged caution before moving to any arrangements that could result in insufficient SRAS providers being available to restart the network in the event that a NEM-wide or multi-region event did occur.[69]

In its submission, AEMO agreed that there was a need for more clarity in the SRAS frameworks, both in terms of the SRAS Objective and the principles for procuring SRAS. As such, AEMO supported a review of the SRS to clarify the nature of the event that SRAS is procured to mitigate.[70] AEMO also stated that when determining how much SRAS should be procured, a probabilistic analysis is necessary to reflect the remoteness of the relevant risk and the cost of SRAS to address that risk.[71]

4.1.4 Commission's assessment

The Commission considers that defining the nature of a major supply disruption is important, as the scale of this event informs how the Reliability Panel determines the SRS and is ultimately relevant to the quantity of restart services that AEMO must procure.

The Commission considers that SRAS should be capable of restoring each subnetwork following various major supply disruption events, including a multi-region or NEM-wide event.

The Commission has therefore made a draft more preferable rule that will require the SRS to include restoration timeframes for the standalone restoration of each subnetwork. This will provide better guidance for the Reliability Panel by clearly specifying the matters the SRS must include. It will also provide better guidance to AEMO regarding how it should procure SRAS to meet the SRS.

65 NGF, 1st round submission, p.2.

66 Ibid. p.4.

67 AGL, 1st round submission, pp.1-2.

68 Alinta, 1st round submission, p.2.

69 Tomago Aluminium, 1st round submission, p.2.

70 AEMO, 1st round submission, p.1.

71 Ibid.

This section sets out the analysis of the Group of Generators' proposal. The draft more preferable rule is discussed in Chapter 5.

Major supply disruption definition

The NER does not explicitly specify the scale of the major supply disruption event that is referred to in the SRAS Objective.[72] As discussed above, the Group of Generators argue this has resulted in AEMO having to make its own interpretation of the size of a major supply disruption, in order to determine:

(a) whether supply would be available from a neighbouring subnetwork; and

(b) how many restart services it must therefore procure in each subnetwork to meet the restoration timeframes.

As discussed in section 4.1.2, the Group of Generators argued that AEMO's proposal to interpret major supply disruption as a regional black system event could result in an under-procurement of SRAS. They considered that the definition of major supply disruption should be explicitly defined in the NER as a NEM-wide or a multiple region event. The Group of Generators suggested that while the probability of such an event may be low, AEMO should still procure on the basis of meeting the worst case scenario.

The Commission agrees that restart services should be procured on the basis of restoring supply following all kinds of major supply disruptions, including a multi-region or NEM-wide black system event. This is because, given the difficulty of determining the probability of such an event and the extent of associated costs for consumers, it would not be appropriate to procure SRAS on the basis of a regional black system event only. This could lead to an inadequate level of SRAS being procured.

The Commission acknowledges that the likelihood of a NEM-wide black system event is probably very low. This was examined in detail by DNV KEMA, as part of the analysis provided to AEMO to inform its 2013/14 SRAS review. This report is summarised in Box 4.3.

The Commission considers that DNV KEMA's work provides a useful qualitative review of the possible triggers and spread of a NEM wide black system event. However, it provides no power system modelling to determine the way in which a cascading power failure might actually propagate in the NEM. It also does not consider other, less severe but more probable events, such as a two region or multi region black system.[73]

The Commission also notes ROAM Consulting's statistical analysis, which suggested that the probability of a multi-region event in the NEM was non-negligible. Given the relative shortness of the NEM's history, ROAM's work was based on historic information from international power systems. As with DNV KEMA's work, ROAM's analysis did not involve any detailed power system analysis.[74]

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72 While major supply disruption event is defined in Chapter 10 of the NER, this definition does not indicate whether the event is at the level of an individual subnetwork, region, multiple regions or NEM-wide.

73 DNV KEMA, *AEMO responsibilities to procure SRAS*, 30 December 2013.

74 ROAM Consulting, *Review of SRAS in the NEM*, May 2014.

Box 4.3: DNV KEMA assessment of likelihood of a NEM-wide black system event

DNV KEMA was asked by AEMO to comment on the relative likelihood of a NEM-wide versus a region-wide black system event, and the appropriateness of the proposal to procure SRAS on this basis.[75]

DNV KEMA considered a number of issues in its assessment. Firstly, it undertook a qualitative review of possible events that could trigger a cascading power failure, concluding that there was no such event that could cause a NEM wide failure.[76] DNV KEMA also reviewed the NEM transmission network topology and concluded that there was a high probability that a cascading power failure would be contained by transmission network break points at region boundaries. This would reduce the probability of a cascading power failure spreading beyond a single NEM region.

Given these factors, DNV KEMA found that there was no credible event that could cause a NEM-wide black system event and that AEMO's proposal to use region-wide black system events as the basis for future SRAS requirements was appropriate.[77]

Despite the analysis included in these two reports, the Commission considers the probability of a NEM-wide black system event cannot be determined with any certainty. Similarly, it is not possible to determine the probability of other kinds of major supply disruptions, such as a two region or a multi-region black system event. However, it is clear that each of these kinds of events would cause severe economic disruption and would have major consequences for consumers generally.

Given the uncertainty surrounding the probability of these events and the scale of their potential impacts, the Commission considers that it is prudent and necessary that sufficient restart services are procured to meet any kind of major supply disruption, including a NEM-wide black system event. SRAS should therefore be procured on the basis of restarting the system from the "worst case" condition of a NEM-wide black system event.[78]

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75 DNV KEMA, *AEMO responsibilities to procure SRAS*, 30 December 2013.

76 A cascading power failure occurs when an unexpected event, such as a generator tripping or the failure of a major transmission network element, triggers an abrupt excursion in frequency and/or voltage. Normally such events will be contained because the components of the power system are designed to withstand these abrupt excursions of frequency and/or voltage. However, if a subsequent generating unit trips, or a protection system does not operate correctly during the excursion, this can make the excursion worse. This may result in further generating units tripping, which may in turn worsen the excursion, causing still further units to trip. This cascading effect will propagate until it reaches points in the power system where the transmission network is naturally weaker. In the case of the NEM, these points typically occur at the borders of electrical sub-networks.

77 Ibid. pp.73-75.

78 The Commission notes that this "worst case" black system event reflects a scenario where the transmission network is fully de-energised but remains intact, with all lines available for service.

Although the Commission considers that restart services should be procured to address the potential for a NEM-wide black system event, the Group of Generators' proposed changes to the SRAS Objective are not considered to be the optimal approach to reflecting this in the NER. The Group of Generators' proposed rule change provides insufficient guidance regarding how the definition of major supply disruption event should drive actual decisions by the Reliability Panel and AEMO. In particular, it is not clear how the Reliability Panel would interpret this definition when it develops the SRS restoration timeframes, which is one of the key factors that drives AEMO's procurement processes.

Instead, the Commission's draft more preferable rule amends NER clause 8.8.3, which defines the matters that must be included in the SRS, to reflect the worst case scenario of a NEM-wide black system event, or multiple region events. The draft more preferable rule described in Chapter 5 will require the Reliability Panel to include restoration timeframes in the SRS based on the independent restoration of each subnetwork, under the assumption that energy supply from neighbouring subnetworks (other than energy provided under a contracted restart service) cannot be used to assist in the restoration of that subnetwork. These are the conditions that would be expected under a NEM-wide or potentially a multi-region black system event.

Economic cost and SRAS cost definition

The Group of Generators proposed that specific definitions of economic costs and costs of procuring SRAS should be included in the SRS, via amendments to NER clause 8.8.3(aa).

Inclusion of these terms in the SRS is intended to guide AEMO's interpretation of the SRAS Objective, by specifying the kinds of costs that AEMO must consider when developing its SRAS guidelines and when procuring SRAS. As discussed in Chapter 5, the Commission considers that the SRAS Objective should no longer apply directly to AEMO when developing its SRAS guidelines and when procuring SRAS. Instead, AEMO will have its own SRAS procurement objective. As such, the Group of Generators' proposed inclusion of these cost definitions would not provide AEMO with any increased guidance regarding its procurement of SRAS.

The Reliability Panel should also have an appropriate degree of flexibility when determining the SRS, subject to meeting the SRAS Objective. The Commission considers that placing overly detailed requirements in the NER would reduce this flexibility and could impede the Panel's ability to consider or exclude whatever issues it considers relevant.

For these reasons, the Commission's draft more preferable rule does not require specific definitions of economic costs and costs of supplying SRAS to be included in the SRS.

This is the assumption that AEMO currently uses when assessing the ability of procured SRAS to restore supply within the restoration timeframes.

4.2 Define the SRS as an operational standard and increase AEMO's reporting obligations

The Group of Generators proposed that the SRS should be redefined as an operational standard. Defining the SRS as an operational standard would create an obligation for AEMO to be able to meet the requirements of the SRS in the event of a major supply disruption. AEMO would be required to provide proof that it has met or was capable of meeting the SRS following a major supply disruption.

The Commission considers that defining the SRS as an operational standard could result in AEMO procuring more restart services, resulting in increased costs for consumers. However, given the number of factors external to SRAS and that cannot be controlled by AEMO that will affect actual system restoration times, procuring more restart services may not actually increase the likelihood of restoring the system within specific timeframes.

4.2.1 Current arrangements

Currently, the NER does not indicate whether the SRS represents an operational standard or whether it is a procurement target to inform AEMO's procurement of SRAS.

The SRS itself currently defines the restoration timeframes as a procurement target, rather than an operational standard:

> "The restoration timeframe represents the 'target timeframe' to be used by AEMO in the procurement process. It is not a specification of any operational requirement that should be achieved in the event of a black system condition."

In its 2012 determination of the SRS, the Reliability Panel clarified that it considered the SRS to be a procurement target and not an operational standard, noting that:[79]

> "as with other criteria set out in the standard, this restoration timeframe benchmark is to assist AEMO with the procurement process. It does not directly determine the actual time that would be required to restart the system following a black system event. This approach is consistent with the provision in other markets where generally there are no specific time limits set for the restoration of the system following a black system event."

In its final report, the Panel acknowledged that actual system restoration would be affected by many factors:[80]

> "the Panel considers that given the number of factors that could affect the time to restore the system if a black system event did occur, it would not be practical to specify a definite time in which the system should be restored. In addition, the purpose of the standard is to set a standard to guide the procurement of SRAS and not to set any specific operational requirements."

79 Reliability Panel, *Draft Determination - System Restart Standard*, February 2012, p.13.

80 Reliability Panel, *Final Determination - System Restart Standard*, April 2012, p.13.

4.2.2 The Group of Generators' proposed rule

The Group of Generators argued that the restoration timeframes within the SRS should form an operational standard that AEMO must meet, rather than providing a target to guide AEMO's procurement of SRAS.

There are two key components to the Group of Generators' proposed rule change:

- redefining the SRS as an operational standard; and
- increasing AEMO's reporting requirements.

The Commission has considered each of these components separately. While the Commission considers that redefining the SRS as an operational standard is not practically achievable in application, there is merit in clarifying AEMO's reporting obligations.

Redefining the SRS as an operational standard

The Group of Generators have proposed that the SRS should be explicitly defined as an operational standard. The intention of this change is that AEMO would be required to meet the requirements of the SRS, particularly the restoration timeframes, during an actual system restoration following a major supply disruption.

To define the SRS as an operational standard, the Group of Generators propose that the SRS be amended to clarify that the restoration timeframes of the SRS should be able to be met where procured SRAS meet the requirements of the SRAS description and the SRAS quantity guidelines.[81]

Increasing AEMO's reporting requirements.

The Group of Generators also propose a number of new reporting obligations on AEMO. The intention of these changes is to require AEMO to demonstrate how procured SRAS will actually be capable of meeting an operational SRS.

These proposed new reporting requirements include:

- Expanding the range of matters that AEMO must identify in the SRAS description[82] to include:
  - the maximum amount of time within which each type of system restart ancillary service will restore power in accordance with its specified service; and
  - the manner in which each type of system restart ancillary service will be relied upon to energise neighbouring electrical sub-networks.

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81 The Group of Generators have proposed some changes to the SRS through NER clause 8.8.3(aa), which sets out the matters that must be included in the SRS and which can be amended by the Commission via the rule change process. However, for this particular change, the Group of Generators have proposed that the SRS itself be changed directly. Given that the SRS is determined by the Reliability Panel through its own processes, the Commission is not able to make changes directly to the SRS.

82 AEMO is required to develop the SRAS description under NER clause 3.11.4A(d). The current version is included in AEMO's SRAS Guidelines. See: AEMO, *SRAS Guidelines*, September 2014.

- Expand the range of matters that AEMO must identify in the SRAS quantity guidelines[83] to include:
  - the maximum amount of time within which power is expected to be restored within each electrical sub-network; and
  - with a reasonable degree of certainty demonstrate the extent to which each electrical sub-network can be energised from an adjacent or other electrical sub-network.
- A requirement on AEMO to report to jurisdictions when it has been unable to meet the SRS.
- A requirement on AEMO, prior to conducting a procurement process, to publish a methodology for assessing restoration under NEM-wide system black conditions, and multiple region outages, under a number of scenarios.
- Additional consultation with network businesses and the Reliability Panel, including requiring AEMO to:
  - consult with network businesses regarding the assumptions used in any relevant analysis and any modelling for the purpose of determining technical arrangements across the network; and
  - advise the Reliability Panel of any technical issues identified by a relevant network business that may reduce the likelihood that at the time of an event the restoration timeframe will not be met.
- A requirement on AEMO, prior to the release of the Reliability Panel's Annual Market Performance Review (AMPR), to:
  - provide the Reliability Panel with an overview and relevant analysis for any and all system restart tests conducted since the last AMPR;
  - advise the Reliability Panel whether AEMO is of the view that an alternative combination of restart services could meet the SRAS objective at lower costs; and
  - identify issues or concerns that may reduce the ability of procured restart services to meet the SRS.

4.2.3 Stakeholder views

Stakeholders commented on both the proposal for the SRAS to become an operational standard, as well as increased reporting and consultation obligations for AEMO. Stakeholder comments are summarised below according to these two topics.

SRS as an operational standard

A number of generators and other stakeholders argued that the SRS should be redefined as an operational standard.

83 AEMO is required to develop the SRAS quantity guidelines under NER clause 3.11.4A(f). The current version is included in AEMO's SRAS Guidelines. See: AEMO, *SRAS Guidelines*, September 2014.

The NGF and Alinta considered that while actual restoration of the system is dependent on a number of factors, there should be a reasonable expectation that the restoration timeframes could be met.[84] Alinta suggested that an operational SRS would act as a benchmark against which AEMO must justify its procurement of restart services as well as any proposed changes to the SRAS frameworks.

Tomago Aluminium stated that as a business that would be severely impacted by a prolonged black out, it favoured any change that made restoration timeframes firmer.[85]

AEMO suggested that if the SRS were defined as an operational standard, it would face an incentive to over-acquire services to reduce the risk of not meeting the SRS. AEMO argued that it would have no option but to require SRAS providers to guarantee their capability to meet their specified energising timeframes. AEMO suggested that this would increase the cost of providing SRAS.[86]

Grid Australia considered that turning the SRS into an operational standard could create new testing and modelling requirements for TNSPs. This would create additional costs for network service providers for which they may not be currently funded or sufficiently resourced.[87]

AEMO argued that under black system conditions, it must restore the system in an orderly manner to meet system security requirements. AEMO also argued that it must have flexibility to restore the system under changing conditions and should not be required to meet any specific standard or set of requirements that might inhibit its operational abilities.[88]

Reporting and consultation requirements

GDF Suez supported a requirement on AEMO to report on whether it had been unsuccessful in meeting the SRS in each subnetwork, suggesting that this may encourage new entrants. GDF Suez also suggested that AEMO could be required to treat the SRS as a planning standard, and to provide planning studies and probabilistic analysis to demonstrate how procured SRAS could meet the SRS under a number of black system scenarios.[89]

Origin agreed with the proposal that AEMO should be required to consult with TNSPs when assessing procured SRAS.[90]

AEMO advised that it supports transparency in relation to the procurement of SRAS, subject to considerations of commercial confidentiality and the costs and benefits of making information available.[91]

84 NGF, 1st round submission, p.8.; Alinta, 1st round submission, p.4.

85 Tomago Aluminium, 1st round submission, p.1.

86 AEMO, 1st round submission, p.2.

87 Grid Australia, 1st round submission, p.2.

88 AEMO, 1st round submission, p.2.

89 GDF Suez, 1st round submission, p.5.

90 Origin, 1st round submission, p.2.

91 AEMO, 1st round submission, p.2.

4.2.4 Commission's assessment

The Commission has decided not to define the SRS as an operational standard. Converting the SRS to an operational standard is unlikely to be practically achievable in application, given the many variables outside of AEMO's control that will affect the actual restoration of the power system following a major supply disruption. The Commission also considers that requiring AEMO to meet an operational standard may result in increased costs that provide no real benefit to consumers.

The Commission considers that there is benefit in requiring AEMO to provide additional reporting. The Commission's draft more preferable rule requires AEMO to publish additional information on its procurement and assessment processes, as well as reporting on whether it has met the SRS in each subnetwork and, if not, why this occurred.

The Commission's draft more preferable rule will require AEMO to engage with network businesses when assessing potential restart services, while requiring network businesses to provide all information necessary to inform AEMO's assessment of potential restart services. These new reporting and consultation requirements are discussed in further detail in Chapter 5.

Given issues of commercial sensitivity and system security, the Commission considers that it would not be appropriate to publish detailed information on system restoration capability. Requiring AEMO to report to the Reliability Panel is also unlikely to improve current arrangements.

In assessing the Group of Generators' proposed rule for an operational SRS, two key issues were considered:

- the effects of converting the SRS into an operational standard; and
- the potential value of increasing AEMO's reporting and consultation obligations.

Further discussion of these two issues is provided below.

Converting the SRS into an operational standard

The restoration of the power system after a major supply disruption involves many processes. Typically, these processes will follow a sequence that broadly resembles the following:

- restart services are activated and begin the re-energisation of the auxillaries of larger generating units;
- larger generating units are gradually brought online and connection infrastructure / transmission bus-bars are re-energised;
- major transmission pathways are re-energised, with tranches of load gradually reconnected;
- separate parts of the power system are re-synchronised and rejoined; and
- finally, distribution level networks are gradually brought online to restore supply to major load centres.

Each of these stages requires careful management and specific actions to be executed by a number of different participants. Those generators who have system restart capability

will bring generating units online and reconnect to the power system gradually, a process that must be carefully controlled to avoid generator units tripping and having to be restarted. TNSPs will re-energise load blocks to stabilise generators and maintain voltage and frequency stability on major transmission pathways. Different network businesses will follow directives from AEMO to manage the re-synchronisation of separated parts of the power system when required. Distribution network service providers (DNSPs) will reconnect low voltage load blocks to restore supply to residential and commercial customers. Throughout this process, AEMO manages and co-ordinates the actions of the different participants, according to the regional system restart plan and local black start plans.

SRAS itself plays an important but limited role in this process. While reliable and sufficient restart services are necessary to begin a system restoration, the actual process of restoring supply to end use consumers within a given timeframe will require the cooperation and effective management of many different participants. The speed of restoration will also be affected by any damage to the power system, including damage to transmission and distribution network infrastructure.

Given the number of factors other than SRAS that will affect the time to restore the power system, the Commission considers it is not practically achievable in application to consider the SRS to be an operational standard. Actually meeting the restoration timeframes in the SRS will be dependent on many factors that AEMO cannot control, nor reasonably account for in its assessment and modelling of procured SRAS. Requiring AEMO to provide evidence that procured SRAS will restore the system within a given timeframe is therefore not practically achievable.

The Commission also considers that requiring AEMO to meet an operational standard could result in a substantial increase in SRAS costs, without a commensurate improvement in certainty of meeting the restoration timeframes. AEMO has suggested that if it were required to meet an operational standard, it may procure more restart services and require increased levels of reliability/speed from those services, to try and provide some increased certainty that it could meet its requirements. However, given the number of factors outside of AEMO's control described above, this would likely increase SRAS costs while providing little increased certainty regarding the speed of system restoration.

The Commission considers that the current arrangements, where the SRS acts as a target that guides AEMO in its procurement of SRAS, remains appropriate. All of AEMO's SRAS functions, including procurement, guideline development and establishing subnetwork boundaries, are guided by the SRS. The Commission considers that this arrangement will continue to deliver adequate and efficient restart capability in the NEM.

Increasing AEMO's reporting and consultation obligations

The Group of Generators proposed that AEMO should be required to undertake additional analysis, reporting and consultation to provide evidence that procured SRAS is capable of meeting the SRS.

This section sets out the assessment of each of the Group of Generators' proposed reporting requirements.

AEMO reporting on restart service capability: The Group of Generators proposed that AEMO should provide detailed reporting of how restart services would restore each subnetwork, and how fast each subnetwork could be restored, in its SRAS guidelines.

The Commission considers that this information is likely to be highly sensitive, both in terms of its commercial value to SRAS providers, as well as in regards to the security and safety of the system restoration process itself.[92] The level of detail in this information, such as how individual units will contribute to the process of system restoration, is more appropriately contained in AEMO's system restart plan.[93] The system restart plan is defined in the NER as confidential and it is not published by AEMO.

Given the sensitivity of this information, the Commission has decided not to incorporate the Group of Generators' proposed changes to the SRAS description and quantity guidelines in its draft more preferable rule.

AEMO power system modelling methodology: The Commission notes the Group of Generators' proposal that AEMO should be required to develop and publish a methodology and modelling approach to assess the ability of procured SRAS to meet the SRS.

The Commission understands that AEMO has already developed static and transient power system modelling approaches to assess the ability of procured restart services to meet the SRS. This approach is established in AEMO's current SRAS assessment guidelines.[94]

The draft more preferable rule will continue to require AEMO to develop a process for the assessment and physical testing of restart services, as part of its SRAS Guideline. This is discussed in section 5.3.

AEMO annual reporting to the Reliability Panel: The Commission considers that the Group of Generators' proposal for AEMO to report annually to the Reliability Panel is largely unnecessary and could lead to duplication. Under NER clause 8.8.3(b), the Panel is required to report on market performance generally, including SRAS, on an annual basis. The Panel also has the ability to seek information and advice from AEMO as it sees fit under NER clause 8.8.3(h) to inform this reporting. These requirements are sufficient so that AEMO provides the Panel with all the information it requires to review the performance of SRAS.

AEMO and network business engagement: The Commission considers that there is merit in requiring AEMO and network businesses to actively consult and engage as part of the assessment of potential restart services. AEMO has advised the Commission that

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92 Note that in this context, security refers to the physical safety and security of the facilities that provide restart services, and, more generally, the physical safety and security of the capability to restart the power system. See section 5.3.1 for more detail.

93 The system restart plan, which sets out how AEMO and market participants will restore the power system during a major supply disruption, is described in NER clause 4.8.12.

94 For more information, see: http://www.aemo.com.au/Consultations/National-Electricity-Market/Open/2014-System-Restart-Ancillary-Services-Consultations.

it already actively seeks engagement and input from TNSPs, but has received mixed responses from different businesses.

The Commission considers that the expertise and experience of network businesses is central to an effective assessment of potential restart services. The draft more preferable rule therefore:

- requires AEMO to establish a process for engaging with network businesses; and
- requires network businesses to provide AEMO with all necessary information to inform its assessment of potential restart services.

The draft more preferable rule is discussed in more detail in Chapter 5.

AEMO annual reporting: The Commission considers that the Group of Generators' proposal for AEMO to report wherever it has been unable to meet the SRS in any subnetwork is likely to benefit the market. AEMO should also be required to provide general advice to the market explaining why it has been unable to meet the SRS in any subnetwork, as well as more general information related to its procurement processes.

The Commission's draft more preferable rule requires AEMO to publish an annual report that:

- identifies any subnetworks where AEMO has failed to meet the SRS and provides a general explanation of why this has occurred;
- describes the procurement processes followed by AEMO to attempt to source sufficient SRAS to meet the SRS in each subnetwork;
- describes the processes followed by AEMO for assessing and testing the capability of SRAS to meet the SRS in each subnetwork, including any assumptions made by AEMO regarding the condition of the transmission system during a major supply disruption; and
- identifies the total cost of meeting the SRS in each subnetwork and region, broken down into availability and usage charges.

These new reporting requirements will increase AEMO's accountability regarding how it has met its responsibilities within the SRAS frameworks. This is consistent with the NEO as it will increase transparency, providing more information to participants and facilitating more efficient decision making. These new reporting arrangements are described in further detail in Chapter 5.

4.3 Define the role of the Reliability Panel

The Group of Generators have proposed several changes to the Reliability Panel's processes.

The Commission considers that the Group of Generators proposed changes to the Reliability Panel's functions are not likely to meet the NEO, as they may reduce the flexibility of the Reliability Panel and AEMO to carry out their respective responsibilities within the SRAS frameworks.

4.3.1 The Group of Generators' proposed rule

The Group of Generators proposed a number of changes related to AEMO's development of its SRAS guideline documents, as well as the Reliability Panel's consultation process.

Under current arrangements, AEMO may amend the SRAS guidelines under the rules consultation procedures. The Group of Generators considered that in its recent 2013/14 SRAS review and in its changes to the SRAS guidelines, AEMO has operated outside of its organisational remit and has made inappropriate interpretations of the SRAS Objective and the SRS. The Group of Generators therefore proposed that the Reliability Panel should have responsibility for reviewing and approving any changes proposed by AEMO to its SRAS guidelines, including the SRAS quantity guidelines, SRAS description, SRAS assessment guidelines and the Boundaries of electrical subnetworks document.

The Group of Generators also considered that there has been some confusion in the market regarding who has responsibility for amending the SRS. The Group of Generators therefore proposed that the SRS should explicitly state that the Reliability Panel alone has responsibility for administering and amending the SRS.

The Group of Generators also considered that the Reliability Panel should be required to consult with a range of stakeholders specified in the NER when developing the SRS. The Group of Generators therefore proposed that the NER be amended to specify that the Reliability Panel must consult with a defined range of market participants and other key stakeholders when developing the SRS.

4.3.2 Stakeholder views

A number of generators argued that there was insufficient oversight of AEMO in the current SRAS frameworks and that the Reliability Panel should be the primary custodian of the SRS, rather than AEMO.

The NGF suggested that the SRS is currently worded in a "general" way, so that the SRAS guidelines, administered by AEMO, become the main domain whereby key market parameters are defined. To address this outcome, the NGF considered that clearer oversight of the development of these guidelines by the Reliability Panel was necessary.[95] This proposal was supported by Grid Australia, Alinta, Origin and AGL.

GDF Suez stated that AEMO should be able to procure SRAS to meet the SRS in the most cost effective manner, and should be free to perform this function with little or no direct oversight from other bodies. However, GDF Suez also considered that AEMO should not have the authority to unilaterally amend the level of service or make any other interpretation of the SRS. GDF also stated that it did not support a periodic review of the SRS by the Reliability Panel.[96]

AEMO stated that the current arrangements include an adequate separation of responsibilities. AEMO argued that its own governance structure, not-for-profit status and statutory responsibilities mean that it has no obligation or incentive to act other

95 NGF, 1st round submission, p.4.

96 GDF Suez, 1st round submission, p.2.

than independently in accordance with the NEO, SRS and SRAS objective. AEMO suggested that a periodic review of the SRS was warranted, given the extent of changes in generating technologies, increasing distributed generation and demand side participation.[97]

4.3.3 Commission's assessment

In its assessment of the Group of Generators' proposed rule, the Commission has considered the following two key areas:

- Reliability Panel approval of changes by AEMO to the SRAS guidelines; and
- Reliability Panel's processes in determining the SRS.

The Commission has considered the potential for a periodic review of the SRS by the Reliability Panel in section 5.1.5.

Reliability Panel approval of changes by AEMO to the SRAS guidelines

As discussed in Chapter 2, the Commission considers that effective SRAS governance arrangements establish clear roles and responsibilities within the SRAS frameworks, allowing each body adequate scope and flexibility to fulfil these responsibilities effectively. Each body is then held accountable for how it has met its responsibilities, through transparent reporting processes.

The Commission considers that the Group of Generators' proposal for the Reliability Panel to approve any changes made by AEMO to its SRAS guidelines is unlikely to be effective. Firstly, the Commission considers that such an arrangement could reduce AEMO's flexibility in making necessary adjustments to the SRAS Guideline. Secondly, it is not clear how this process would work and what would happen if the Panel did not approve a proposed change by AEMO. Finally, this additional regulatory oversight could increase costs for both the Reliability Panel and AEMO.

The Commission's draft more preferable rule clarifies AEMO's role within the SRAS frameworks. It requires AEMO to report annually on how it has met its responsibilities, as well as requiring AEMO to develop effective operational documents in a transparent and consultative manner. The Commission therefore considers that oversight by the Reliability Panel is not necessary.

Reliability Panel's processes

The Group of Generators proposed that the Reliability Panel should be required to consult with a specific range of stakeholders when developing the SRS.

As discussed above, the Commission considers that each body must have adequate scope and flexibility to fulfil its responsibilities within the SRAS frameworks. It is not the function of the NER to determine how the Reliability Panel consults with stakeholders when developing the SRS.

The Commission acknowledges that there is a wide range of stakeholders that may provide valuable input into the SRS. The Reliability Panel amends the SRS under an open and transparent process that allows all interested parties to provide comment. The

97 AEMO, 1st round submission, p.2.

Reliability Panel will also draw upon all necessary expertise and seek comment from relevant stakeholders as it considers necessary.

The Group of Generators have also proposed that the SRS should be amended to specifically state that it remains current until such time as amended by the Panel.

Given that NER clause 8.8.1 clearly states that the Panel is responsible for determining the SRS, the Commission sees no benefit in requiring the SRS to include the Group of Generators' proposed drafting.[98]

98 The Commission also notes that the SRS itself is determined by the Reliability Panel. The Commission therefore has no power to include or exclude any terms directly in the SRS.

5 The Commission's draft more preferable rule

The Commission's draft more preferable rule incorporates AEMO's proposed approach to SRAS cost recovery and the definition of restart services, as discussed in Chapter 3. The draft more preferable rule also addresses many of the key issues raised by AEMO and the Group of Generators.

This Chapter sets out the key issues considered by the Commission in developing the draft more preferable rule.

The Commission considers that the NER need to provide further guidance regarding the governance of the SRAS frameworks. In particular, additional guidance is needed regarding the distribution of roles and responsibilities of both the Reliability Panel and AEMO.

As discussed in Chapter 2, the Commission has considered three key principles when assessing the appropriate distribution of roles and responsibilities of different market bodies within the SRAS frameworks:

- Firstly, clear functional separation is central to the effectiveness of the SRAS frameworks. Each body should have a clearly defined role and function.
- Secondly, within its clearly defined role and function, each body should have adequate scope and operational flexibility to fulfil its objective.
- Finally, each body should be clearly accountable for the decisions it makes. This accountability is best provided through transparent reporting processes.

These principles have been designed in accordance with the NEO. Clear functional separation helps to avoid overlap or duplication of roles and responsibilities. Flexibility to operate within defined objectives allows each body the ability to fulfil these objectives as efficiently as possible. Clear reporting requirements maintains transparency and creates incentives on each body to fulfil its role efficiently and effectively. These arrangements will provide the market with more certainty and better information regarding the function of the SRAS frameworks, allowing participants to make more efficient operational and investment decisions.

The Commission's draft more preferable rule will improve the SRAS frameworks to reflect these principles. It defines the roles of the Panel and AEMO, improves operational flexibility and increases reporting obligations for AEMO.

The draft more preferable rule also changes the NER to enhance the competitiveness of SRAS markets, including changes to AEMO's processes for SRAS procurement and reporting on the costs of SRAS. The Commission considers that these changes will contribute to the achievement of the NEO as they will help maintain competitive pressure within SRAS markets. This is in the long term interests of consumers, as it will support more efficient operational and investment decisions.

For this draft determination each of the draft more preferable rules is set out below, grouped according to the key benefits that the Commission expects they will provide to the market, including:

- better guidance regarding roles and responsibilities;

- better guidance regarding the function of the SRS; and
- more efficient consultation, reporting and procurement processes.

5.1 Better guidance regarding roles and responsibilities

In line with the principles identified above, the Commission's draft more preferable rule provides better guidance regarding the distribution of the roles and responsibilities of the Reliability Panel and AEMO.

The Commission considers that the key function of the Reliability Panel is to develop the SRS, taking into account the SRAS Objective and any other matters it considers relevant, while AEMO's key function is predominantly operational, with a focus on procuring sufficient SRAS to meet the SRS. This distribution of responsibilities is in line with the intention of the current rules.

The Commission's draft more preferable rule introduces four key changes to the NER to clarify this division of responsibilities:

- clarifying the SRAS Objective, to provide the Panel with improved guidance regarding the development of the SRS;
- removing the obligation for AEMO to consider the SRAS Objective;
- introducing a new SRAS procurement objective, requiring AEMO to use reasonable endeavours to acquire SRAS to meet the SRS at lowest cost; and
- clarifying that a major supply disruption applies to loss of supply to one or more connection points.

In its Consultation Paper, the Commission also raised the concept of requiring the Reliability Panel to undertake a periodic review of the SRS. The Commission has decided that the current arrangements, where the Reliability Panel reviews the SRS at the direction of the Commission, remain broadly appropriate.

5.1.1 Clarifying the SRAS Objective

The current SRAS Objective is included in clause 3.11.4A(a) of the NER:

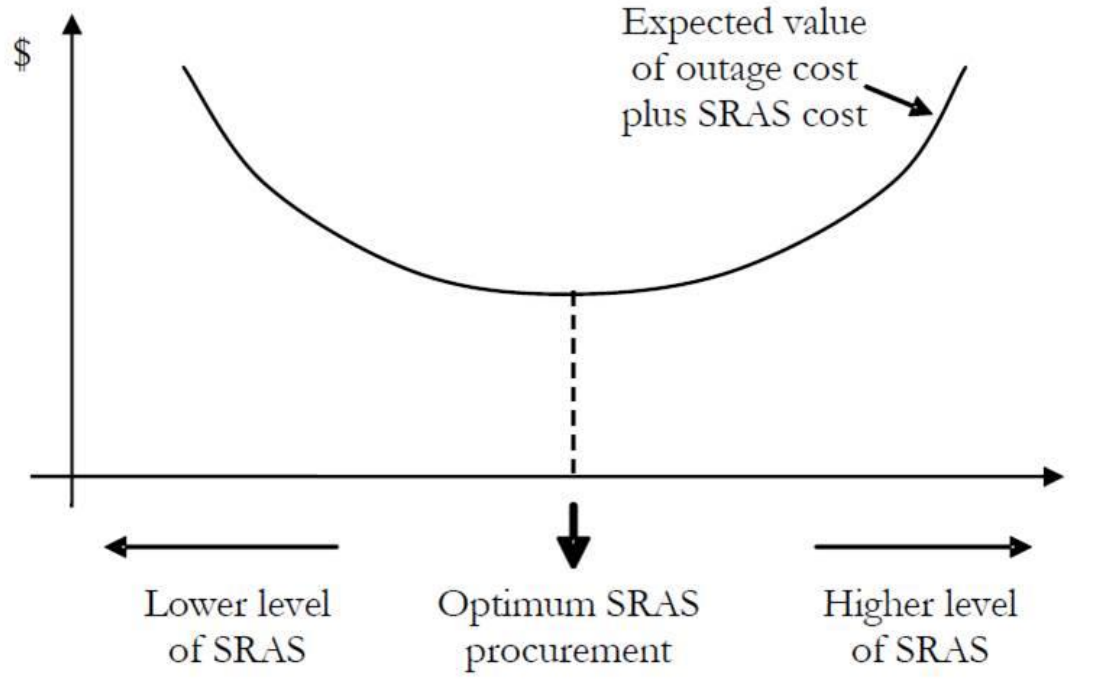
> "The objective for *system restart ancillary services* is to minimise the expected economic costs to the *market* in the long term and in the short term, of a *major supply disruption*, taking into account the cost of supplying *system restart ancillary services*, consistent with the *national electricity objective* (**the *SRAS* Objective**)."

The SRAS Objective forms the basis of the Reliability Panel's development of the SRS. As it is currently defined, the SRAS Objective implies a trade-off between the cost of a major supply disruption event against the costs of procuring additional SRAS to mitigate that event. In theory, such an approach would involve minimising the sum of:

- the total cost of procured restart services; and
- the cost of the major supply disruption that those restart services were procured to mitigate.

This concept is illustrated in Figure 5.1.

Figure 5.1 Optimal SRAS procurement



Source: Firecone, *Review for AEMC of the Proposed NEMMCO Rule for System Restart Ancillary Services*, Dec. 2005, p.6.

The possibility of determining the restoration timeframes according to such an approach has been considered a number of times over the last decade. In each case, no workable approach was identified that could be used to determine the optimal quantity of SRAS to procure. These previous considerations are summarised in Box 5.1.

Box 5.1: Previous assessments of the practical application of a cost benefit analysis

A number of parties have considered the practicability of undertaking a cost / benefit type assessment to determine the appropriate restoration timeframes of the SRS:

- In 2004, NEMMCO identified a number of difficulties with adopting such an approach, including the complexities of identifying the probability of different kinds of black system events, the volume of load that would be lost and the actual cost of lost load to different parties. NEMMCO concluded that "it is impossible to arrive at an absolutely correct assessment of 'best value' ... Sensible guidelines and principles should nevertheless yield an answer that is 'approximately right'. The alternative approach of attempting to 'accurately' determine the appropriate value for every measurable parameter seems most likely to yield an answer that is 'precisely wrong'."[99]
- In 2005, Firecone discussed the concept of identifying the correct balance between the costs of a major supply disruption and the cost of SRAS. Firecone suggested that the optimal situation would be where "the marginal

99 NEMMCO, *Review of system restart ancillary service arrangements – Final report*, July 2004, p.12.

cost of a change in the level of SRAS ... bought is equal to the change in the expected value of outage costs resulting from that change in SRAS procurement."[100] However, Firecone provided no practical approach as to how this marginal benefit / cost trade-off could be calculated.

- Finally, in 2012, the Reliability Panel considered how it could develop the SRS to be consistent with the SRAS Objective. The Panel considered that the "economic cost of a black start event could be difficult to estimate, although it could potentially be very significant".[101]

  Given this difficulty, the Panel decided not to adopt a cost/benefit approach in developing the SRS. Instead, it considered whether the existing SRS was likely to inhibit the standard economic criteria of static, allocative and dynamic efficiency.

The Commission considers that the current SRAS Objective does not provide the Reliability Panel with effective guidance regarding how it should go about determining the SRS. In particular, it is not appropriate to require the Reliability Panel to undertake a full cost benefit type assessment when developing the SRS.

Undertaking a full cost benefit analysis requires the quantification of key variables, including the probability of certain events occurring, and the costs associated with those events. However, the Commission considers that it is not possible to estimate accurate values for these variables with regard to a potential major supply disruption.

The probability of a major supply disruption occurring is inherently uncertain. There is a very large number of unpredictable variables involved in the triggering and propagation of a cascading failure. The extent of these unpredictable variables makes any kind of meaningful risk assessment impossible, given the number of simplifying assumptions that would be needed. This means that it is very difficult, and possibly misleading, to assign a probability to a region wide, multi-region or a NEM-wide black system event, for the purposes of undertaking a cost benefit analysis.[102]

Furthermore, the costs associated with a large scale major supply disruption are also extremely difficult to quantify. These costs are not likely to be limited to the immediate interruption of economic capacity, but are likely to have prolonged consequential effects.[103] These costs will also vary substantially between different users, as well as across time.

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100 Firecone, *Review for AEMC of the Proposed NEMMCO Rule for System Restart Ancillary Services*, December 2005, p.6.

101 Reliability Panel, *System Restart Standard - Final Determination*, April 2012, p.8.

102 The Commission notes the varying comments received from stakeholders on the merits, or otherwise, of undertaking some form of probabilistic analysis. For example, while GDF Suez suggested there was merit in "carrying out some analysis, to at least establish whether the probability and/or impact is so small that it can be ignored, or whether there is a level of likelihood that warrants mitigation measures", Alinta suggested that there was no need for "detailed economic and technical analysis ... to develop the rules in this area". See: Alinta, 1st round submission, p.1.; GDF Suez, 1st round submission, p.2.

103 Subsequent effects of a prolonged loss of power may include repair costs for damage to equipment, or the permanent loss of industrial units caused by the prolonged failure. Static, $/MWh type

Given the difficulty of quantifying the probability of occurrence of a major supply disruption event and associated economic costs, the Commission considers that a degree of judgement is implicit in developing an effective SRS. The experience and expertise of the Reliability Panel makes it the appropriate body to undertake the necessary analysis to make this judgement. The Panel will be guided by the proposed revised SRAS Objective, which involves a consideration of the NEO. The Panel will therefore be required to base its judgement on a consideration of whether the parameters it includes in the SRS will be in the long term interests of consumers.

To better guide the Reliability Panel when exercising its judgement, the Commission considers that the SRAS Objective should be clarified. These changes would remove the current requirement for the Panel to undertake a cost benefit analysis of economic costs against the costs of procuring SRAS. The revised SRAS Objective will meet the NEO by allowing the Reliability Panel to make more effective judgements, which will enhance certainty and confidence in the market, facilitating more efficient participant decision making.

The Commission's draft more preferable rule sets out a new, revised SRAS Objective:

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

The draft more preferable rule then requires the Reliability Panel to develop the SRS to be consistent with SRAS Objective. Specifically, the SRS must:

> "be reviewed and determined by the *Reliability Panel* in accordance with the *SRAS Objective*."

The revised SRAS Objective includes two key changes from the current arrangements.

Firstly, the revised SRAS Objective is now defined as a term in Chapter 10 of the NER. This Chapter 10 definition firstly states that the SRAS Objective is to "minimise the costs of a major supply disruption". The Commission considers that this change will help guide the Panel by defining that the Panel's key focus in setting the parameters of the SRS is to manage the consequences of a major supply disruption for consumers. As discussed below, the term "economic" costs has also been removed from the SRAS Objective, as having regard to the NEO already requires consideration of economic efficiencies.

By explicitly requiring the Panel to minimise this impact "to the extent appropriate having regard to the NEO", the Panel will also be guided by considerations of overall efficiency. The Commission considers that this will guide the Panel's interpretation of the requirement to minimise costs. For example, while the Reliability Panel could set the parameters of the SRS in order to completely minimise or remove all of the potential costs of a major supply disruption, this is unlikely to be in keeping with the efficiency requirements of the NEO.[104] Instead, the Commission considers that in meeting this

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measurements, such as value of customer reliability or gross state product, may not be an appropriate measure of the true dynamic costs of a major supply disruption.

104 Under the hypothetical situation where the Panel's sole objective was to completely minimise the costs of a major supply disruption, the Panel could set the parameters of the SRS such that AEMO would be required to procure sufficient SRAS to facilitate the fastest physically possible recovery of

SRAS Objective, the Panel would consider how it could most efficiently manage and minimise the extent of these costs, in order to meet the long term interests of consumers.

Secondly, the Commission's draft more preferable rule removes the costs of supplying SRAS from the SRAS Objective. As discussed above, the Commission considers that it is not appropriate for the Panel to be required to undertake a full cost benefit analysis when determining the SRS. Removing references to SRAS costs is in keeping with removing the obligation on the Panel to undertake this full cost benefit analysis.

The Commission considers that by redefining the SRAS Objective to focus on the NEO, the Panel will be required to consider all matters relevant to meeting the long term interests of consumers. This is likely to include consideration of the costs of procuring SRAS, as well as any other matters the Panel considers relevant.

The revised SRAS Objective would apply only to the Reliability Panel.

In conjunction with the changes discussed in the next section, the Commission considers that these changes will provide the Reliability Panel with improved guidance regarding how to develop the SRS.

5.1.2 Removing the obligation for AEMO to consider the SRAS Objective

Under current arrangements, both the Reliability Panel and AEMO are required to consider the SRAS Objective when undertaking their respective roles in the SRAS frameworks:

- NER clause 8.8.3(aa)(1) requires the Reliability Panel to develop the SRS to be consistent with SRAS Objective.
- NER clause 3.11.4A(c)(1) requires AEMO to develop each of its SRAS guidelines, and any other related SRAS documents, to be consistent with the SRAS Objective.

The Commission considers that a single body should be responsible for interpreting the SRAS Objective and developing the SRS. The Commission's draft more preferable rule therefore provides that the revised SRAS Objective will apply only to the Reliability Panel.

The Commission considers that AEMO should not be required to meet the revised SRAS Objective. In developing the draft more preferable rule, the Commission has applied a set of principles it considers will guide the allocation of governance roles and responsibilities that will contribute to the NEO. These principles are set out below.

Organisational fit

Requiring AEMO to consider wider questions of economic cost and making trade-offs between those different costs does not sit well with AEMO's primary function of procuring, assessing and testing SRAS.

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the power system. Taken to extremes, this could necessitate the building of SRAS capability for every generation unit. While this would potentially minimise the costs of a major supply disruption, it would also be a highly inefficient outcome that would not be in keeping with the NEO.

Definition of responsibilities

Currently, AEMO is required to meet both the SRAS Objective and the SRS. The Commission considers that the current arrangements provide inadequate guidance to AEMO regarding its actual role and responsibilities within the SRAS frameworks.

For example, under the current arrangements, it is not clear whether AEMO should simply procure sufficient SRAS and develop its guidelines to meet the SRS, or whether it should be undertaking more wide ranging reviews and assessments of the SRAS frameworks in order to meet the SRAS Objective. Requiring AEMO to meet both the SRS and the SRAS Objective makes it unclear as to what approach AEMO should adopt and its proper function within the SRAS frameworks.

This was identified as an issue by the Group of Generators and a number of stakeholders, who considered that current arrangements require AEMO to hold a degree of risk and responsibility that is beyond its appropriate remit.

Avoiding duplication and promoting accountability

Under current arrangements, there may be a risk of duplication in terms of the decision making of AEMO and the Reliability Panel. In particular, the Commission considers that there is a risk that both bodies may seek to undertake an assessment of economic costs and benefits, as implied by of the SRAS Objective. The Commission considers that such duplication would be inefficient and creates a risk that the relative accountabilities of the Reliability Panel and AEMO are not clear.

Given these factors, the Commission's draft more preferable rule removes the current requirement for AEMO to consider the SRAS Objective when developing its guidelines and when procuring SRAS. This will address any confusion regarding the division of responsibility between AEMO and the Reliability Panel in the SRAS frameworks.

5.1.3 New AEMO procurement objective

In line with the other changes discussed above, the Commission considers that AEMO's primary function within the SRAS frameworks needs to be clarified.

Therefore the draft more preferable rule introduces a separate SRAS procurement objective into the NER:

> "AEMO must use reasonable endeavours to acquire *system restart ancillary services* to meet the *system restart standard* at the lowest cost."

In developing this SRAS procurement objective, the Commission has considered the following issues.

Clarification of purpose

The new SRAS procurement objective is based on the existing rules, which require AEMO to use reasonable endeavours to acquire SRAS. The Commission considers that a general obligation should remain on AEMO to use reasonable endeavours to procure SRAS.

AEMO will be required to demonstrate what reasonable steps it has taken to meeting this requirement as part of its annual reporting obligations, discussed in section 5.3.

Focus on price

The new SRAS procurement objective contains a clear focus on sourcing SRAS at the lowest price. The Commission notes that the Group of Generators and a number of other stakeholders suggested that AEMO should not focus only on the price of SRAS when procuring, but rather should also consider a range of costs.[105]

The Commission considers that the broader assessment of economic costs is better undertaken by the Reliability Panel when it develops the SRS. Given that these issues will be adequately considered by the Panel, AEMO's focus should be solely on procuring SRAS that matches the requirements of the SRS, at the lowest cost possible. This distribution of responsibilities between the Panel and AEMO is designed to deliver an efficient quantity of SRAS, at an efficient price.

Organisational fit

Given its operational knowledge and previous experience in procuring SRAS, AEMO is best equipped to source sufficient SRAS to meet the SRS. As discussed in section 5.3.1, the Commission's draft more preferable rule removes the requirement for AEMO to procure SRAS only through a prescribed tender process. This will further enhance AEMO's opportunities to procure SRAS at lowest cost.

AEMO is also responsible for the physical testing of procured services, as well as the development of the boundaries of electrical subnetworks, in accordance with the requirements of the SRS. The new SRAS procurement objective would not apply to AEMO's fulfilment of these roles, where it will continue to be required to meet the SRS.

5.1.4 Clarification of the definition of major supply disruption

Currently, the term major supply disruption is defined in Chapter 10 of the NER as:

> "The unplanned absence of *voltage* on a part of the *transmission system* affecting one or more *power stations*."

The Commission considers that ultimately, the purpose of procuring restart services is to maintain the reliable supply of electricity services to consumers. This is in accordance with the NEO, which requires the Commission to consider the long term interests of consumers, with respect to the reliability of supply of electricity services.

Under current arrangements, both generators and customers pay an equal share of the costs of SRAS.[106] As discussed in section 3.2, the Commission considers that this is appropriate, as both generators and customers derive benefit from the provision of SRAS.

Given these factors, the Commission's draft more preferable rule amends the Chapter 10 definition of major supply disruption to reflect that SRAS is ultimately procured to minimise the economic costs of a major supply disruption for the benefit of both

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105 The Group of Generators suggested that these costs should include the total opportunity costs, financial, social and non-financial, to energy users and the market, generally and to specific sensitive loads. See: Group of Generators rule change proposal, p.15.

106 As discussed in Chapter 3, half of the total cost of SRAS is recovered from Market Generators and Market Small Generation Aggregators, while the other half is recovered from Market Customers.

customers and generators. The words "supply to connection points" have been introduced into the definition, as this refers to supply to all registered participants.[107]

The new definition of major supply disruption is as follows:

> "The unplanned absence of *voltage* on a part of the *transmission system* affecting one or more *power stations* and which leads to a loss of *supply* to one or more *connection points*."

5.1.5 Periodic review of the SRS by the Reliability Panel

Under current arrangements, there is no standing requirement for the Reliability Panel to review the SRS on a regular basis. The Reliability Panel may review and amend the SRS following receipt of terms of reference from the Commission.

In its 2012 determination of the SRS, the Reliability Panel raised the prospect of it undertaking a periodic review of that document. The Panel suggested that a periodic review may be necessary to reflect changing market conditions, including changes in generation technology, or the distribution of generation and load centres.[108] In their first round submissions to this rule change, AEMO and Macquarie Generation supported a periodic review of the SRS by the Reliability Panel, while GDF Suez and Alinta did not.[109] The National Generators Forum considered that the SRS should only be reviewed by the Reliability Panel where there was a clear failure in current arrangements.[110]

The Commission considers that existing arrangements remain broadly appropriate. Should significant changes in the market necessitate a review of the SRS, the Panel may advise the Commission when and if such a review is necessary. The Commission may then issue a terms of reference as needed. The Commission considers that these arrangements will help to reduce the extent of any regulatory costs associated with reviewing the SRS, and will also reduce the risk of any regulatory uncertainty amongst participants that might arise due to the prospect of periodic changes to the SRS.

5.2 Increased guidance regarding the function of the System Restart Standard

The matters that the Reliability Panel must include in the SRS are established in NER clause 8.8.3(aa). Amongst other matters, this clause requires the Reliability Panel to develop the SRS to:[111]

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107 The NER Chapter 10 definition of connection point is "The agreed point of *supply* established between *Network Service Provider*(s) and another *Registered Participant*, *Non-Registered Customer* or *franchise customer.*

108 Reliability Panel, *System Restart Standard - Final Report*, April 2012, p.23.

109 AEMO, 1st round submission, p.2.; Macquarie generation, 1st round submission, p.4.; GDF Suez, 1st round submission, p.3.; Alinta, 1st round submission, p.3.

110 NGF, 1st round submission, p.8.

111 These other matters include the development of subnetwork boundaries and diversity requirements of SRAS. The SRS requires AEMO to develop subnetwork boundaries based on consideration of the structure of power system, including the location of generation and load, as well as network

- identify the maximum amount of time within which system restart ancillary services are required to restore supply to a specified level;
- include guidelines on the required reliability of primary restart services and secondary restart services; and
- apply equally across all regions, unless the Reliability Panel varies the SRS between electrical sub-networks to the extent necessary:
  - to reflect any technical system limitations or requirements; or
  - if the benefits of adopting the SRS would be outweighed by the costs of implementing such a standard.

Based on these requirements in the NER, the Reliability Panel currently determines the restoration timeframes and reliability requirements, which themselves contain three key variables that guide AEMO's procurement of SRAS. These three variables are set out below.

Type	Variables
Restoration timeframes	**Timeframe.** Maximum time in which restoration must occur: currently expressed by the Reliability Panel as time to restore plant auxiliaries, and time to restore a fraction of peak load in each subnetwork.
	Volume. The specified level to which the subnetwork must be restored within the above timeframe: currently expressed by the Reliability Panel as a fraction of peak load within each subnetwork.
Reliability requirements	**Reliability.** Level of reliability of the restart services that enable the restoration.

The Commission considers that additional guidance in the NER will help the Reliability Panel in its determination of these variables.

To provide this guidance, the Commission's draft more preferable rule requires the Reliability Panel to determine a standalone restoration timeframe for each subnetwork, which will include the maximum time in which restoration must occur and the volume of load to be restored, under the assumption that supply is unavailable from any neighbouring subnetwork.

The draft more preferable rule also requires the Reliability Panel to establish an "aggregate" reliability requirement for each subnetwork. As discussed in section 3.3, the draft more preferable rule also removes the definitions of primary and secondary restart services from the NER.

The Commission considers that these changes will promote the NEO by providing improved clarity and certainty regarding the proper function of the SRS. This will allow for better decision making by both the Reliability Panel and AEMO, supporting more efficient operational and investment decisions by market participants.

topology. The SRS also requires AEMO to procure SRAS on the basis of electrical, geographic, technological and fuel diversity.

The draft more preferable rule introduces four key changes to NER clause 8.8.3, which defines the matters that must be included in the SRS:

- **Standalone restoration timeframes:** Requiring the SRS to specify the maximum amount of time in which each subnetwork should be restored to a specified level, under the assumptions that each subnetwork must be restored on an independent basis.
- **Subnetwork level reliability requirements:** Requiring the SRS to contain an aggregate reliability requirement for each subnetwork that AEMO must meet when procuring SRAS.
- **Ability of the Panel to vary the SRS between subnetworks:** Clarifying that the Panel may vary the SRS between subnetworks, to reflect technical or economic specifics of that subnetwork.
- Removing references to primary and secondary restart services (addressed in section 3.3).

5.2.1 Standalone restoration timeframes

As discussed in section 4.1, the Commission considers it is prudent and necessary to procure SRAS on the basis of meeting a range of possible major supply disruption events, including a NEM-wide or multi region black system event. This reflects the fact that it is not possible to determine with any degree of accuracy the probability that a major supply disruption will involve a NEM-wide, multi-region or single region black system event. Given the significant costs to consumers associated with such events, the Commission considers it necessary that a minimum level of SRAS is procured to insure against even the worst case scenario of a NEM-wide black system event.

The key consequence of a NEM-wide black system event is that each subnetwork within the NEM would be in a black system condition. This means that each subnetwork would be unable to rely on a neighbouring energised subnetwork to supply energy that could provide assistance in system restoration.[112]

As all kinds of major supply disruption scenarios must be covered by SRAS, including the worst case of a NEM-wide black system, the Commission considers that SRAS procurement should therefore occur on the basis of enabling the independent restoration of each subnetwork.

The SRS is the key document that guides AEMO in its procurement of SRAS. The Commission therefore considers that the SRS should include a set of "standalone restoration timeframes", being the timeframes for the independent restoration of each subnetwork to a specified level. The Reliability Panel will also determine a reliability requirement for each subnetwork, as described in further detail in section 5.2.2.

112 The Commission acknowledges that, in practice, the most probable kind of black system event is likely to be at the level of the subnetwork or region. In this case, AEMO would make use of any and all resources at its disposal to restore the system to a secure and safe operating state, including using energy supplied from neighbouring subnetworks/regions. However, this operational reality is separate to the contingency planning that should inform the process of SRAS procurement.

The Commission also considers that the SRS should specify that each restart service can only be contracted by AEMO to provide restart services to a single subnetwork at any one time. This is to further clarify that restart services must be procured by AEMO on the basis of restoring each subnetwork on a standalone basis. As explained below, this does not preclude AEMO from procuring SRAS located in one subnetwork to provide restart services in another. However, AEMO may only contract that SRAS to provide restart services to the one subnetwork at any given time.

Under the Commission's draft more preferable rule, AEMO would be required to base its procurement around meeting these target standalone restoration timeframes for each subnetwork, under the pre-defined assumption that each subnetwork must be restored on an independent basis. This means that when procuring SRAS to enable the restoration of a given subnetwork, AEMO could not assume that energy supply was available from a neighbouring energised subnetwork to assist in restoration.[113] AEMO would also be required to enter into contracts with each restart service to provide restart services to only one subnetwork at any given time. Finally, AEMO would also be required to procure SRAS in accordance with meeting the subnetwork level reliability requirements defined by the Reliability Panel.

Under the Commission's draft more preferable rule, AEMO could procure SRAS located in one subnetwork for the purposes of providing restart services to a different subnetwork, provided that the restart service is contracted to that subnetwork. This is not the same as relying on energy supply from a neighbouring subnetwork to assist in a restoration. This distinction is explained in Box 5.2.

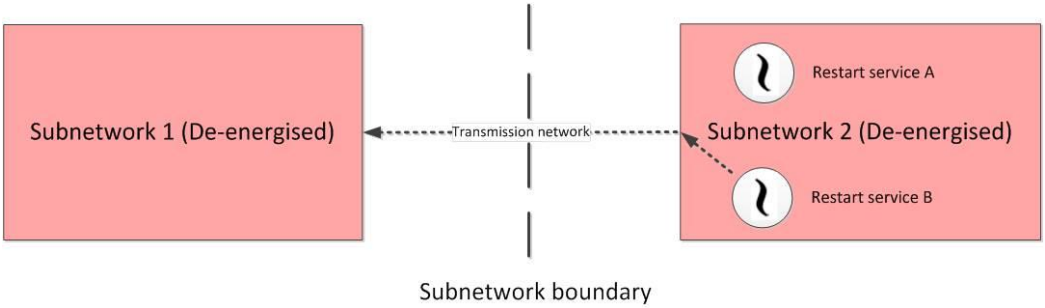
113 In this context, an energised subnetwork refers to a subnetwork that has not collapsed to a black system condition.

Box 5.2: Use of SRAS in neighbouring subnetworks

Given the restoration timeframe requirements of the SRS, SRAS facilities are likely to be located in the same subnetwork, or at least the same region, as the subnetwork to which they are contracted to provide restart services. Exceptions to this may exist, typically where an SRAS facility is located close to a subnetwork border and can easily provide restart services to a neighbouring subnetwork.[114]

Under the assumption that the transmission power system is intact,[115] the transmission lines that connect the two subnetworks could be used to provide a restart service across the subnetwork boundary. Such an arrangement is illustrated in Figure 5.2.

Figure 5.2 SRAS used to restore a neighbouring subnetwork



In this scenario, both subnetwork 1 and 2 are in a black system condition, and both restart services A and B are located in subnetwork 2. Restart service A has been contracted to provide restart services to subnetwork 2. Restart service B has been contracted to provide restart services to subnetwork 1.

Energy from restart service B is transported across the transmission lines that connect the two subnetworks to assist in the restoration of subnetwork 1. In this example, both subnetworks are restored independently.

Given the points discussed above, the Commission's draft more preferable rule requires the SRS to include a standalone restoration timeframe for each subnetwork. The draft more preferable rule also clarifies that SRAS may be sourced in one subnetwork to supply restart services to another subnetwork, provided it has been contracted to provide restart services to that subnetwork. The Commission's draft more preferable rule amends NER clause 8.8.3(aa) as follows to state that the SRS must:

> "identify the maximum amount of time within which *system restart ancillary services* are required to restore *supply* in an *electrical sub-network* to a specified level, under the assumption that *supply* (other than that provided under a

114 Note that these services would still need to meet the restoration timeframe requirements of the SRS in the given subnetwork, which currently refer to the restoration of station auxillaries within 90 minutes, and restoration of a volume of peak load within 4 hours. AEMO would also be guided by the strategic diversity requirements of the SRS when procuring SRAS, which require it to consider electrical, fuel, technological and geographical diversity.

115 Being the assumption that is currently applied by AEMO when assessing the capacity of procured SRAS to restore each subnetwork

system restart ancillary services agreement acquired by *AEMO* for that *electrical sub-network*) is not available from any neighbouring *electrical sub-network*."

The draft more preferable rule also amends NER clause 8.8.3(aa) to state that the SRS must:

> "specify that a *system restart ancillary service* can only be acquired by AEMO under a *system restart ancillary services* agreement for one *electrical sub-network* at any one time."

These amended clauses, and the requirement that they place on the Reliability Panel, are in keeping with the assessment framework set out in Chapter 2. The NER establishes the basic requirements of what SRAS must be capable of doing - in this case, restoring each subnetwork on a standalone basis. The Reliability Panel then has the ability to meet this requirement by considering whatever matters it sees fit in developing the SRS. The Panel will be accountable for how it has met this requirement though its determinations on the SRS.

In developing this approach, the Commission has considered two key issues:

- different standalone restoration timeframes for each subnetwork; and
- interactions with AEMO's development of subnetwork boundaries.

Different standalone restoration timeframes for each subnetwork

The Commission considers that the draft more preferable rule will help to clarify the Panel's ability to vary the SRS to reflect the specific conditions of each subnetwork.

Under existing arrangements, the Reliability Panel is able to vary the SRS across different subnetworks.[116] The Panel may therefore choose to establish different standalone restoration timeframes for each subnetwork. It may also establish different reliability requirements for each subnetwork.

When deciding whether to vary the SRS between subnetworks, the Panel is able to consider the different economic and technical aspects of each subnetwork. This may involve consideration of whether there are specific sensitive loads within each subnetwork, and whether this may warrant the establishment of different standalone restoration timeframes.

As discussed in section 3.2, the Commission considers that the proposal to recover SRAS costs on the basis of regional benefits will mean that any differences in SRAS costs caused by varying the SRS to include a different standalone restoration timeframe will be borne by participants in the region that receives a portion of the subsequent benefit of the different standalone restoration timeframe.[117]

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116 The Panel's ability to amend the SRS in this way is clarified in section 5.2.3 below.

117 As the SRS will require SRAS to be procured on the basis of restoring each subnetwork independently, regional benefit cost recovery would imply that the cost of an individual restart service must always be recovered from the same region in which that subnetwork is located. However, as discussed in section 3.2.4, AEMO's regional benefit factors allow for the allocation of the cost of an individual service across two or more regions, which may appear to conflict with this principle. The Commission understands that, in practice, the cost of a restart service is only likely to be allocated across multiple regions where a restart service has been procured in a subnetwork that crosses a region boundary, or where a restart service is actually used to assist in the restoration of a

Interactions with AEMO's development of subnetwork boundaries

The Commission considers there is a possibility of an interaction between the establishment of standalone restoration timeframes by the Panel, and changes made by AEMO to the boundaries of electrical subnetworks.

Under the draft more preferable rule, the Reliability Panel may choose to vary the SRS between subnetworks, potentially developing different standalone restoration timeframes for each subnetwork. If the Panel were to take such an approach, it may determine these standalone restoration timeframes based on the characteristics of each subnetwork, including the existing subnetwork boundaries.

AEMO has the ability to amend the boundaries of these electrical subnetworks. Such changes to subnetwork boundaries are necessary from time to time in order to reflect changes in the location of load and generation centres, or changes in transmission network topography.

There is a possibility that if AEMO were to amend a subnetwork boundary, this may affect its ability to continue to meet the standalone restoration timeframes established for that subnetwork. Equally, the standalone restoration timeframes the Panel had established for that subnetwork may no longer be valid, if the boundaries of that subnetwork have been changed markedly.

The Commission acknowledges the possibility of such an interaction and notes that it is already possible under existing arrangements. In any case, any such interactions are manageable through existing processes. When AEMO amends the boundaries of electrical subnetworks, it must do so under the rules consultation procedures. This will provide adequate opportunity to explore any interactions with established restoration timeframes.

5.2.2 Subnetwork level reliability requirement

Under current arrangements, NER clause 8.8.3(aa) requires the SRS to include:

> "guidelines on the required reliability of primary restart services and secondary restart services"

The SRS currently defines the reliability of primary and secondary restart services as:[118]

> "Primary restart services shall have a reliability of 90 per cent.
>
> Secondary restart services shall have a reliability of 60 per cent.
>
> Services may be considered in combination to meet a higher level of reliability than the individual service.
>
> AEMO will determine the manner in which reliability will be assessed, and clarify the provisions for combining services, in accordance with the requirements under the Rules."

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region other than the region which it was originally procured to service (in this case regional benefit factors for usage charges will apply, other than regional benefit factors for availability charges).

118 As discussed in section 3.3 above, the Commission has proposed the removal of the definitions of primary and secondary restart services. The Reliability Panel will be required to amend the SRS accordingly.

Under existing arrangements, AEMO complies with the requirements of the SRS by measuring the reliability of each restart service, according to its SRAS assessment guidelines. AEMO is required under the NER to focus on the procurement of primary services, which have a reliability level of 90%.[119]

The draft more preferable rule amends the reliability requirements to allow AEMO to procure SRAS on the basis of meeting an aggregate, subnetwork level reliability requirement. This would align the approach to developing reliability requirements with that taken to restoration timeframes, and may also expand the range of restart services that AEMO could utilise to meet the SRS.

Under the Commission's draft more preferable rule, the Panel will be required to establish an aggregate reliability requirement for each subnetwork in the SRS. AEMO will then describe how it will meet these requirements in the new SRAS Guideline document (see section 5.3.1 below).

While the detailed operational approach taken by AEMO to meeting this new subnetwork level reliability requirement will be developed at its discretion, Box 5.3 provides a simplified example of how this new requirement might be satisfied.

119 For more information see: AEMO, *SRAS Guidelines*, September 2014, p.8.

Box 5.3: Example: meeting a subnetwork level reliability requirement

In this example, AEMO is required to meet a given restoration timeframe, with a subnetwork reliability requirement of 90%

AEMO has four potential restart services from which to choose. AEMO has determined that each of these services is capable of meeting the given restoration timeframe for the subnetwork on its own. However, each service has a different level of reliability.

Service	Reliability Level
A	90%
B	70%
C	60%
D	50%

The reliability of these services may be measured in terms of how often they would be expected *not* to start. For example, if the 90% reliability service was started 10 times, it would be expected not to start once.

Using this approach, AEMO can meet its subnetwork level reliability requirement of 90% in two ways:

- Procure service A: Probability of no start of service A = 10%.

  Reliability = 90%

- Procure service B, C and D: Probability of no start of service B, C ***or*** D = 30% * 40% * 50% = 6%.

  Reliability = 94%.

AEMO will also consider factors including cost, temporal availability, geographical location and diversity requirements.

5.2.3 Ability of the Panel to vary the SRS between subnetworks

Under NER clause 8.8.3(aa)(2), the Reliability Panel is able to vary the SRS between different subnetworks. This allows the Reliability Panel to vary the SRS where it considers there is a strong technical or economic reason for it to do so.

This clause has been amended to clarify its purpose, particularly as this relates to allowing the Panel to vary the SRS on the basis of economic conditions in a given subnetwork. The Commission considers that this may occur where a subnetwork contains specific sensitive loads, or consumers with usage profiles that would

substantially increase the economic cost of a black system event occurring in that subnetwork.[120]

As discussed in section 3.2, regional SRAS cost recovery will mean that increases in SRAS costs to meet a higher level of service would be recovered from the participants in the region that receives a portion of the benefits from that higher level of service.

Accordingly, the draft more preferable rule amends NER clause 8.8.3 to specify that the SRS must:

> "apply equally across all *regions*, unless the *Reliability Panel* varies the *system restart standard* between *electrical sub-networks* to the extent necessary:
>
> - to reflect any technical system limitations or requirements; or
> - to reflect any specific economic circumstances in an *electrical sub-network*, including but not limited to the existence of one or more *sensitive loads*."

5.3 More efficient consultation, reporting and procurement processes

As discussed in Chapter 2, the Commission considers that the Reliability Panel and AEMO should have sufficient scope to meet their defined responsibilities within the SRAS frameworks. It is better for these bodies to be held accountable for how they fulfil their obligations through transparent reporting processes, instead of adding further prescription in the NER to determine how each body is to meet its responsibilities.

The Commission considers that the Reliability Panel's existing reporting obligations provide sufficient accountability.

The Commission's draft more preferable rule changes AEMO's reporting requirements to enhance accountability in the SRAS frameworks. These changes contribute to the achievement of the NEO by increasing the transparency of AEMO's processes and will provide participants with better information to inform efficient decision making.

The draft more preferable rule contains a number of changes related to AEMO's procurement, reporting and consultation processes. These include.

- **Improved procurement and guideline processes:**
  - removing the current requirement for AEMO to procure SRAS through a tender process as prescribed in the NER; and
  - simplifying the requirements for AEMO to develop the SRAS Guideline.
- **Improved AEMO reporting.** Requiring AEMO to report annually on:
  - the total cost of procuring SRAS in each subnetwork and region, broken down into availability and usage charges;
  - whether AEMO has been unable to procure sufficient SRAS to meet the SRS in any subnetwork, including the reasons why the SRS was not met;

120 Sensitive loads is a term defined in Chapter 10 of the NER as "*Loads* defined as sensitive for each *participating jurisdiction* by the *Jurisdictional System Security Coordinator* for that *participating jurisdiction*.

- the processes followed by AEMO for testing and assessing the ability of any SRAS to meet the SRS; and
- the processes followed by AEMO to acquire SRAS for each electrical sub-network.

- **Improved network business consultation and information provision.** Recognising the important role of network businesses in the SRAS procurement and assessment process, the draft more preferable rules requires:
  - AEMO to consult with relevant network businesses to identify and resolve any issues relating to the capability of any proposed restart service to meet the SRS; and
  - network businesses to provide information requested by AEMO to assess the capability of a restart service to meet the SRS.

5.3.1 Improved procurement and guideline processes

This section sets out the Commission's reasoning for a number of changes to AEMO's procurement and guideline processes.

Removing the current requirements for AEMO to only procure SRAS through a tender process

Under current arrangements, AEMO is required to procure SRAS solely through a tender process in NER clause 3.11.5. AEMO is required to set out this tender process in published tender guidelines.

This tender process requires AEMO to:

- call for expressions of interest before issuing invitations to tender for SRAS;
- define the timeframes over which AEMO will assess these expressions of interest;
- provide the terms and conditions of the ancillary services agreement that a successful tenderer would be expected to enter into with AEMO; and
- set out the principles AEMO will apply in assessing expressions of interest and tenders.

The Commission considers that these requirements are overly restrictive. By requiring AEMO to only procure SRAS through a highly prescriptive tender process, there is a risk of excluding more efficient means of sourcing SRAS. This would have negative impacts for consumers, particularly if it impedes competition in SRAS markets.

AEMO should have adequate flexibility and scope to fulfil its defined responsibilities within the SRAS frameworks. The draft more preferable rule therefore removes the current NER clauses that restricts AEMO to procuring SRAS through a defined tender process. Removal of these clauses will allow AEMO to procure SRAS through whichever process it considers most appropriate, as long as it continues to meet the requirements of the SRS.

Under this arrangement, AEMO may choose to continue procuring SRAS through an open tender process. In doing so, it may choose to alter the form of that tender process.[121]

Alternatively, AEMO may choose to procure SRAS through other processes. The Commission notes that in several other jurisdictions, including the United Kingdom, restart services are primarily procured on the basis of directly negotiated contracts. This process is described in Box 5.4:

Box 5.4: Directly negotiated contracts for SRAS

Directly negotiated contracting is the principal procurement method used by National Grid in the United Kingdom for the procurement of restart services. Typically, National Grid will enter into direct negotiations of long term (10 years or more) contracts for the establishment of new SRAS facilities. These longer contracts terms are designed to allow sufficient time for the full recovery of capital costs associated with the construction of the new facility.

Directly negotiated contracts could be used by AEMO to expand the range of potential SRAS sources. For example, longer term bilateral contracts could be entered into with individual counter-parties. This may reduce the risk associated with making investment in SRAS facilities, supporting either the construction of new SRAS facilities or the expansion of existing SRAS facilities. This may also help to manage SRAS costs for participants, if a reduction in investment risk translates into lower SRAS charges.

The Commission considers that AEMO should be free to select from these procurement methods, or any other procurement method, that it considers will allow it to better meet the SRS. In doing so, AEMO will determine what information it will need to provide to prospective SRAS providers to inform the SRAS procurement process. As discussed in section 5.3.2, AEMO will also be required to publish an annual report that describes the process it used to procure SRAS in each subnetwork.

Further to this requirement for annual reporting on its processes, the Commission has also considered whether AEMO should be required to publish a high level summary of any directly negotiated contracts it enters into for the provision of SRAS. To be useful, such reporting could potentially include information regarding the location or type of restart services engaged through direct negotiation, or information related to the contract itself such as the names of counterparties, or the cost and terms of the contract.

The Commission considers that it is not appropriate to require AEMO to publish any contract summary reporting. This is because while this reporting would increase the degree of transparency regarding AEMO's procurement of SRAS, it is also likely to have

121 The Commission considers that if it chooses to procure SRAS through a tender process, AEMO need not follow the current tender requirements included in the NER. For example, AEMO need not follow the two step process of calling for expressions of interest before issuing invitations to tender.

implications for the maintenance of the safety and physical security of the power system.[122]

This is primarily due to the sensitive nature of the information that might be included in any such contract summaries. The Commission notes that much of this information, such as the location of specific restart services, is already included in the system restart plans developed by AEMO.[123] Due to the sensitivity of the information included in these documents, they are listed as confidential information in the NER and are not published.

The Commission also considers that maintaining the confidentiality of this information is in keeping with the Critical Infrastructure and Resilience strategy established under the Trusted Information Sharing Network (TISN).[124] In particular, the Commission notes guidance from TISN regarding the need to protect sensitive information related to the power system, in order to prevent this information being used by terrorists or criminals to damage critical infrastructure. The Commission considers that such sensitive information would include descriptions of the location, position, or dimensions of physical SRAS facilities, or any other specific information related to those facilities.[125] The Commission considers that as this information is not readily available through other channels, it is important that it is not released through placing new reporting requirements on AEMO.

Simplifying the NER requirements for AEMO to develop the SRAS guidelines

Currently, the NER requires AEMO to develop a number of guidelines that set out various operational aspects of SRAS in the NEM, including:

- **the SRAS description:** which establishes the technical and availability requirements of each type of system restart ancillary service;
- **the SRAS assessment guidelines:** which establish AEMO's approach to modelling and assessment of proposed restart services, as well as the processes for physical testing of restart services; and
- **the SRAS quantity guidelines:** which establish the procedure for determining the number, type and location of system restart ancillary services required to be procured for each electrical sub-network.

122 In this instance, "security" refers to the physical protection of the facilities that provide restart services and the capability to restart the system itself, rather than the more specialised use of the term power system security, which refers to the maintenance of voltage and frequency.

123 The system restart plan and local black system procedures are described in NER clause 4.8.12. The system restart plan establishes the processes for the management and coordination of system restoration activities during any major supply disruption. NER clause 4.8.12(b) lists the system restart plan as confidential information.

124 The Trusted Information Sharing Network (TISN) is established and managed by the Australian Government Attorney General's Department. TISN establishes a framework for businesses and government to share information on security issues relevant to the protection of critical infrastructure and the continuity of essential services in the face of all hazards. More information is available here: http://www.tisn.gov.au/Pages/default.aspx

125 Trusted Information Sharing Network, *Infrastructure Information in the public domain*, 2006, p.4.

The Commission considers that AEMO should continue to publish these guidelines, as they provide the market with necessary information. The draft more preferable rule contains three minor changes to the relevant rules.

1. A general simplification of the wording of the relevant NER clauses.
2. Clarifying that AEMO may prepare these guidelines as a single document, the SRAS Guideline.
3. Including in the SRAS Guideline a new requirement for AEMO to explain how it will meet the new aggregate subnetwork level reliability requirement, as discussed in section 5.2.2.

5.3.2 Improved AEMO reporting

The Commission considers that AEMO should be required to report annually on how it has discharged its obligations within the SRAS frameworks.

Transparent reporting maintains the accountability of bodies within the SRAS frameworks. It provides the market with confidence that each body has satisfactorily fulfilled its obligations and helps to highlight any areas of the current frameworks that may not be functioning optimally. The draft more preferable rule is therefore consistent with the NEO as it will increase transparency regarding AEMO's processes, providing the market with better information to allow participants to make more efficient decisions.

In determining what information should be included by AEMO in this annual reporting, the Commission has considered the following factors:

- **Usefulness of the information:** There are administrative costs associated with undertaking annual reporting. Information should only be published where it is likely to provide a clear net benefit to the market generally.
- **Sensitivity of the information:** As discussed in section 4.2, much of the information relating to the type, location and specific capabilities of procured restart services is highly sensitive, both in terms of commercial and system security.
- **Effect of the information on competitiveness of SRAS markets:** Information is used by market participants to inform investment and operational decisions. It is necessary to consider how this information may affect the level of competition in current SRAS markets.

Given these considerations, the draft more preferable rule requires AEMO's annual reporting to include the following:

- **Cost information reporting:** the total cost of procuring SRAS in each subnetwork and region, broken down into availability and usage charges.
- **SRS compliance reporting:** whether AEMO has been unable to procure sufficient SRAS to meet the SRS in any subnetwork, including the reasons why the SRS was not met.
- **Process reporting:** information on the processes followed by AEMO for:

- modelling, assessing and testing the ability of SRAS to meet the SRS; and
- procuring SRAS for each electrical sub-network.

Cost information reporting

The draft more preferable rule lessens the current requirement on AEMO to publish information on the cost and quantities of SRAS procured in each subnetwork. While AEMO will report annually on the cost of procured SRAS in each subnetwork, this reporting will not include the quantity of SRAS procured in each subnetwork. The Commission considers that this will increase the degree of competitive pressure in SRAS markets.

At the conclusion of each SRAS tender, AEMO is currently required to publish information on the cost and quantities of SRAS procured in each subnetwork area. This information includes:

- the total estimated annual SRAS costs, broken down into availability and usage charges, for each subnetwork; and
- the number of SRAS acquired for each subnetwork.

Information on the prices and quantities of SRAS can be used by SRAS providers to inform investment decisions. Higher prices in a subnetwork provide a signal that new SRAS investment may be needed in that subnetwork. New SRAS providers may also make use of this information when determining the "price to beat" to win market share.

Pricing and quantity information can also be used by SRAS providers when developing tendering strategies. In particular, this information may be used by SRAS providers to develop a better estimate of their competitors' offers. This may encourage an SRAS provider to "price up" toward its estimate of its next competitor's price. Such an outcome is more likely to occur where competition in SRAS markets is limited; as discussed in Appendix C, the Commission considers there is some evidence that this is currently the case in SRAS markets.

The Commission therefore considers that a trade-off must be made between these two potential uses of information. This trade-off is influenced by the degree of competition in a given market. As discussed in Appendix C, current SRAS markets do not appear to be strongly competitive. The Commission therefore considers that the amount of information published regarding SRAS prices and quantities should be reduced.

The draft more preferable rule requires AEMO to report only the total cost of SRAS in each subnetwork and region. This will continue to provide sufficient information to inform efficient investment decisions, while reducing the potential for non-competitive outcomes in SRAS markets. AEMO will no longer be required to report on the total quantity of SRAS procured in each subnetwork.

As AEMO will now have the ability to procure SRAS outside of a defined tender timeframe, it will be required to report annually on the total cost of SRAS in each subnetwork.

SRS compliance reporting

The Commission considers that AEMO should be required to report annually on whether it has met the SRS in each subnetwork. This reporting will provide the market

with information regarding AEMO's ability to discharge its key requirement within the SRAS frameworks.

The draft more preferable rule requires AEMO to report on:

- any electrical sub-network where system restart ancillary services were not acquired by AEMO to a level satisfactory to meet the SRS, and
- the reasons why the SRS was not met.

The Commission considers that this reporting will help provide the market with confidence that AEMO has used reasonable endeavours to procure sufficient SRAS to meet the requirements of the SRS. It will also help to clearly identify any areas of the NEM where the SRS has not been met, and the key reasons for this. This information is likely to be of particular interest to stakeholders in relevant jurisdictions. It may also inform the Reliability Panel's annual reporting on SRAS, which forms part of its existing annual market performance review.

In publishing this report, AEMO will need to consider the sensitivity of the relevant information that it publishes. For any subnetworks where AEMO has been unable to procure sufficient SRAS to meet the SRS, AEMO will consider matters of commercial and security sensitivity when reporting on the reasons why this has occurred.

Process reporting

As discussed above, AEMO is required to develop guidelines that establish how it will model, assess and test restart services.

The draft more preferable rule requires AEMO to report annually on what processes it has followed in meeting these requirements, including any power system studies undertaken to assess the ability of procured SRAS to meet the SRS.

In reporting on its testing and assessment processes, the draft more preferable rule requires AEMO to specify any assumptions it has made regarding the state of the transmission network during a major supply disruption. The Commission considers that this requirement will provide the market with improved certainty regarding the circumstances in which AEMO considers procured restart services would actually be capable of restoring the system within the restoration timeframes.

The key obligation on AEMO in its testing and assessment process reporting is to provide an overview of the general methodological approach it has taken. If it so chooses, AEMO may also report on the results of these assessments and tests, having regard to matters of commercial confidentiality and system security.

Under the new SRAS frameworks, AEMO will be able to choose what process to follow in order to procure SRAS. AEMO will be required to publish a report on the processes it has used to procure SRAS in each subnetwork. As with its reporting on assessment and testing, the Commission considers that this reporting will focus on the processes followed by AEMO, rather than reporting on which SRAS providers have been engaged to provide restart services.

5.3.3 Improved network business consultation and information gathering processes

In their rule change proposal, the Group of Generators highlighted the key role that network businesses play in the assessment of individual SRAS facilities and in AEMO's general assessment of the ability of procured services to meet the SRS.

The Commission agrees that network businesses play a central role in the procurement and the assessment of SRAS. The current rules already require network businesses to engage with SRAS providers to facilitate testing and resolve any issues related to the delivery of restart services. However, the existing rules provide no guidance regarding how AEMO and network businesses should engage during the SRAS procurement and assessment process, nor what information should be provided by network businesses to AEMO.

The draft more preferable rule therefore imposes two new requirements for AEMO and network businesses:

- AEMO must consult with relevant network businesses to identify and resolve issues in relation to the capability of any proposed restart service.
- Network businesses must provide any information reasonably required by AEMO to assess the capability of a restart service to meet the SRS.

AEMO to consult with network businesses

Under the existing NER, there is no explicit requirement for AEMO to consult with network businesses during the SRAS procurement process.

The Commission considers that AEMO should actively consult with any relevant TNSPs and DNSPs when procuring and assessing the ability of any particular SRAS to meet the SRS. Both TNSPs and DNSPs have detailed operational knowledge of their own networks, practical information that should be considered by AEMO when undertaking the power system studies that will help it determine the ability of each service to meet the requirements of the SRS.

The Commission understands that AEMO already actively engages with several network businesses when procuring and assessing SRAS. Formalising this process in the NER will provide the market with better guidance regarding the central role of network businesses in the development of restart capability.

Network businesses to provide AEMO with requested information

Under the existing NER, there is no requirement for network businesses to provide information to AEMO for the purposes of procuring and assessing restart services. The Commission understands that AEMO has requested information from various network businesses to inform its power system studies, and has met with mixed responses from different businesses.

The Commission considers that network businesses should provide AEMO with all information reasonably required by AEMO for the purposes of assessing whether procured SRAS is capable of meeting the SRS. This is necessary so that AEMO's assessment of restart services is as accurate and effective as possible.

The draft more preferable rule therefore requires network businesses to provide any information that AEMO reasonably requires in order to assess the capability of a system restart service to meet the SRS. While there may be some costs for network businesses associated with meeting this requirement, these are unlikely to be substantial. In any case, the Commission considers that developing and providing this information to AEMO falls within the general responsibilities of network businesses as network operators.

Abbreviations

AEMC or Commission	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AMPR	Annual Market Performance Review
DNSP	Distribution network service providers
NEL	National Electricity Law
NEM	National Electricity Market
NEMMCO	National Energy Market Management Company
NEO	national electricity objective
NGF	National Generators Forum
NMAS	non-market ancillary services
NSCAS	network support control and ancillary services
RBF	regional benefit factor
SRAS, or restart services	system restart ancillary services
SRS	system restart standard
TNSP	Transmission Network Service Providers
TTHL	trip to house load

A Summary of issues raised in submissions

The Commission has addressed most of the issues raised in stakeholder submissions in the draft determination. This section addresses some of the issues raised in submissions that were not directly addressed in the determination.

Stakeholder	Topic	Issue	AEMC Response
GDF Suez	Role of the Reliability Panel	The Reliability Panel should be required to consult on development of the SRS in accordance with the standard rules consultation procedures.	The Commission considers that the Reliability Panel's existing processes provide adequate transparency and accountability in the development of the SRS.
GDF Suez	SRAS definition	GDFSAE supports the removal of primary and secondary restart definitions, although it might lead to some existing (cheaper) SRAS sources no longer qualifying. This could potentially result in higher SRAS costs...Clear guidelines are necessary to provide potential SRAS providers with guidance regarding what factors will be taken into account when assessing potential SRAS sources.	The Commission considers that the removal of the definitions of primary and secondary services should not reduce the likelihood of lower reliability or cheaper sources of SRAS qualifying to provide restart services. If anything, the Commission considers that relaxation of the current definitions should expand the potential range of restart services.
Grid Australia	Modelling	AEMO's proposed use of dynamic system modelling would provide some additional certainty regarding the ability of procured SRAS to restore the system. However, AEMO's proposal may be limited to specific SRAS and may not extend to modelling the system and assessment of critical loads and other circumstances.	The Commission considers that the form of AEMO's power system modelling can be addressed as part of the development of the SRAS Guideline. Under the Commission's draft more preferable rule, the SRAS Guideline will be developed by AEMO in accordance with the rules consultation procedures and stakeholders will be able to provide commentary on the appropriate form of power system modelling of SRAS through that process.
Macquarie Generation	Competition in SRAS	SRAS competition could be facilitated by publication of tender results at the sub-region level. This would provide more effective price signals.	The Commission considers that publication of cost and quantity data at this level of detail may further reduce the effectiveness of competition in those

Stakeholder	Topic	Issue	AEMC Response
			subnetworks where competition is already relatively weak. This is discussed in more detail in Appendix C. The Commission also considers that the publication of tender results at the subnetwork level could result in the release of confidential and sensitive information.
Macquarie Generation	Directions powers	Reliance on directions power would be a mistake - in the absence of SRAS tenders, SRAS providers may decommission or mothball SRAS units.	The Commission considers that while AEMO has access to the use of directions powers in regards to SRAS, it is not likely that AEMO would rely on this power to meet its obligations under the SRS.
Macquarie Generation	Spot market suspension	There is currently some uncertainty regarding when AEMO would restore spot market function. Macquarie Generation argue that there is some risk that AEMO would prematurely restore the spot market to send price signals to encourage restoration of generators, rather than utilising SRAS. Macquarie Generation therefore calls for the introduction of a specific trigger in the NER which would define exactly when AEMO may resume spot market operations after a market suspension.	The Commission considers that issues relating to the suspension of the spot market are out of scope of this rule change.

B Legal requirements under the NER

This appendix sets out the relevant legal requirements under the National Electricity Law (NEL) for the AEMC in making this draft determination.

B.1 Draft determination

In accordance with section 99 of the NEL, the Commission has made this draft more preferable rule determination in relation to the rules proposed by:

- AEMO; and
- The National Generators Forum, AGL, Alinta Energy, Energy Brix, GDF Suez, Intergen and Origin Energy.

B.2 Consolidation of the rule change proposals

Under section 93 of the NEL, the Commission may treat two or more rule change proposals as one proposal, if it considers that it is necessary or desirable to do so.

The Commission decided to consolidate these two rule changes proposals as both relate to the same subject matter and deal with related aspects of the SRAS frameworks. There is also some overlap in terms of the issues considered.

B.3 Power to make the rule

The Commission is satisfied that the draft more preferable rule falls within the subject matter about which the Commission may make rules.

The draft more preferable rule falls within section 34 of the NEL because it relates to:

- the operation of the NEM (section 34(1)(a)(i));
- the operation of the national electricity system for the purposes of the safety, security and reliability of that system (section 34(1)(a)(ii)); and
- the activities of persons (including Registered participants) participating in the NEM or involved in the operation of the national electricity system (section 34(1)(a)(iii)).

B.4 Commission's considerations

In assessing the rule change proposals, the Commission considered:

- the Commission's powers under the NEL to make the rule;
- the rule change proposals;
- the fact that there is no relevant Ministerial Council on Energy (MCE) Statement of Policy Principles;[127]

127 Under section 99(2)(a)(iv) of the NEL, the AEMC must have regard to any relevant MCE statement of policy principles in making a rule. The MCE is referenced in the AEMC's governing legislation and is a legally enduring body comprising the Federal, State and Territory Ministers responsible for

- submissions received during first round consultation; and
- the Commission's analysis as to the ways in which the draft more preferable rule will or is likely to, contribute to the NEO.

B.5 Power to make a more preferable rule

Under section 91A of the NEL the Commission may make a rule that is different (including materially different) from a market initiated proposed rule, if the Commission is satisfied that, having regard to the issues or issues that were raised by the market initiated proposed rule, the more preferable rule will or is likely to better contribute to the achievement of the NEO.

As discussed in Chapters 3, 4 and 5, the Commission has determined to make a draft more preferable rule. The reasons for the Commission's decision are set out in Chapter 5.

B.6 Civil penalty provision

The Commission's draft more preferable rule amends the current clauses 3.11.5(o) and 3.11.7(a) of the NER, now numbered as clauses 3.11.2(f) and 3.11.5(l). These NER clauses are currently classified as civil penalty provisions under clause b(1) and Schedule 1 of the National Electricity (South Australia) Regulations (Regulations). The Commission's draft more preferable rule also introduces new clause 3.11.9(d).

If the Commission makes a final rule in the form of the draft more preferable rule, it will be recommending to the COAG Energy Council that clauses 3.11.2(f) and 3.11.5(l) of the NER be retained as civil penalty provisions, and that clause 3.11.9(d) of the NER be classified as a civil penalty provision under the Regulations.

When recommending that clauses be retained or classified as civil penalty provisions, the Commission must notify the COAG Energy Council of the policy rationale for taking this course of action. The Commission considers that clause 3.11.9(d) ought to be classified as a civil penalty provision because this clause is equivalent to the obligation currently imposed on NMAS Providers, and classification of this provision as a civil penalty provision would encourage compliance by relevant parties.

The Commission notes that until any amendments to the Regulations are made and come into effect, the above provisions will have no civil penalty consequences.

B.7 Others

Under section 91(8) of the NEL, the Commission may only make a rule that has effect with respect to an adoptive jurisdiction if satisfied that the proposed rule is compatible with the proper performance of AEMO's declared network functions. The Commission considers that the draft more preferable rule is compatible with AEMO's declared network functions because it does not affect AEMO's performance of those functions.

Energy. On 1 July 2011 the MCE was amalgamated with the Ministerial Council on Mineral and Petroleum Resources. The amalgamated Council is now called the COAG Energy Council.

C SRAS procurement: Commission's considerations

This appendix sets out the detail of the Commission's analysis of current arrangements and key issues in SRAS procurement.

C.1 Current arrangements for SRAS procurement

Non market ancillary services (NMAS) are procured by AEMO. NMAS includes SRAS as well as network support control ancillary services (NSCAS).[128]

The process for procurement of NSCAS and SRAS is set out in clause 3.11.5 of the NER. AEMO is required to procure both services via an open tender process. AEMO must develop tender guidelines that set out how it will call for expressions of interest for potential NSCAS and SRAS providers and issue invitations to tender. AEMO is also required to publish information on the annual cost of NSCAS and SRAS.

The NSCAS procurement process includes an option for arbitration. This includes an assessment by AEMO of the competitiveness of NSCAS tenders. If this tender process is deemed to be non-competitive, the NER requires AEMO and NSCAS suppliers to negotiate tenders in good faith, according to set principles. If agreement cannot be reached, AEMO or the NSCAS provider may refer the tender to the Dispute Resolution Adviser for arbitration, under NER clause 8.2.[129]

For the procurement of SRAS, NER clause 3.11.5(p) states that disputes regarding SRAS are to be dealt with under the clause 8.2 provisions. However, this clause explicitly excludes consideration of the price of SRAS from arbitration.

C.2 Increases in SRAS costs

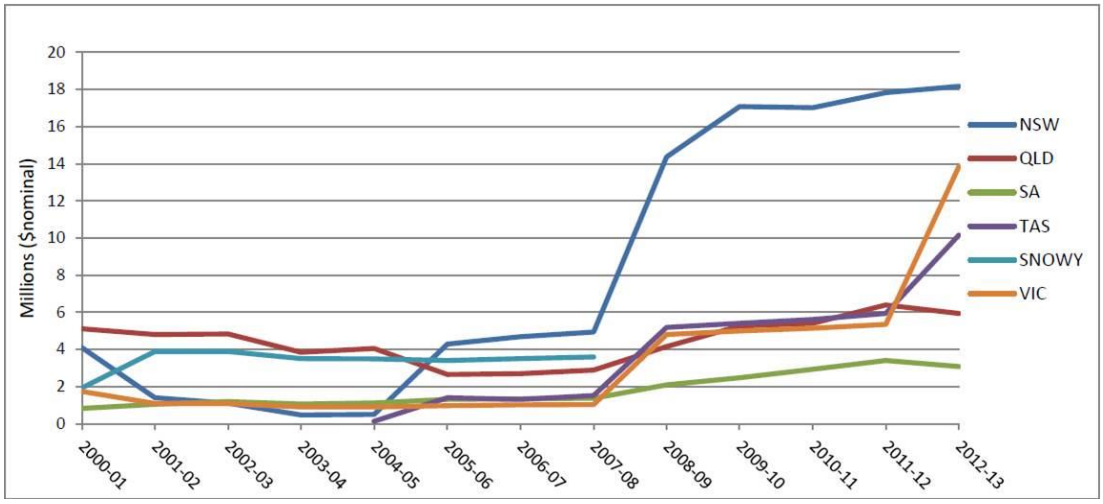
In its rule change proposal, AEMO highlighted that the total cost of procuring SRAS has increased in recent years.[130] Over the last two SRAS tenders, total SRAS costs have increased from approximately $30.6 million in 2008/09 to $51.2 million in 2012/13 (nominal), with the largest increases occurring in New South Wales, Tasmania and Victoria.

128 NSCAS are procured to maintain or increase power flows on networks. They are normally procured by TNSPs, with AEMO only procuring NSCAS when it has identified a "NSCAS gap" in the volumes of NSCAS procured by TNSPs. See box C.3 below and NER clause 3.11.3 for more information.

129 NER clause 8.2 requires the AER to appoint a person, or persons, to perform the functions of a Dispute Resolution Advisor. It also sets out the matters that may be considered in a dispute resolution and the process for resolution.

130 In this instance, the "cost" of SRAS refers to the aggregate cost of all of the services procured by AEMO to meet the SRS. These costs are the sum of the availability, testing and usage charges paid by AEMO to SRAS providers.

Figure C.1 Regional SRAS costs



Between the 2008 and 2012 tenders, the total quantity of SRAS procured in the NEM increased by one. These changes are highlighted in figure C.2, reproduced from AEMO's 2012 report on the cost and quantities of SRAS procured in the 2012 tender.[131]

Figure C.2 Changes in regional SRAS costs and quantities

Electrical Sub Network	No. of services (2008-2012)	No. of services (2012-2014)	Change in no. of services	2011-2012 ($M)	2012-2013 ($M)	% Change in cost
Queensland - North	2	1	⇩ -1	2.1	1.3	⇩ -36.3%
Queensland - Central	2	3	⇧ 1	3.0	3.4	⇧ 14.2%
Queensland - South	2	2	⇨ 0	1.4	2.3	⇧ 66.6%
New South Wales - North	3	3	⇨ 0	10.2	11.5	⇧ 12.2%
New South Wales - South	3	2	⇩ -1	11.5	10.7	⇩ -7.3%
Victoria - Latrobe Valley	1	2	⇧ 1	1.8	6.1	⇧ 245.8%
Victoria - North and West	0	1	⇧ 1	0.0	3.9	⇧
South Australia	3	3	⇨ 0	3.4	3.6	⇧ 5.7%
Tasmania - North	2	2	⇨ 0	4.1	6.3	⇧ 55.1%
Tasmania - South	1	1	⇨ 0	1.9	3.1	⇧ 57.1%
National Electricity Market	19	20	⇧ 1	39.4	52.2	⇧ 32.4%

Note:

1. The availability cost for 2012-2013 is estimated on the basis of the contracted level of performance for *SRAS* availability.
2. The testing cost for 2012-2013 assumes one successful test per annum.
3. The costs for 2013-2014 would approximate the 2012-2013 costs adjusted for consumer price index.

Taking into account the changes in total quantities and costs between the two tender rounds, the NEM-wide average unit cost of SRAS increased from around $1.61 million

131 Note that the table includes only availability and testing charges. For more information, see: AEMO, *System Restart Ancillary Service tender process 2012: Report and notice in accordance with NER 3.11.5(l) and 3.13.5*, July 2012.

in 2008/09 to $2.56 million in 2012/13. This represents an almost 60% increase in average unit cost between the two periods.

It should be noted that factors other than increases in SRAS quantities may have influenced price changes. For example, as suggested by the NGF, the abolition of the Snowy region in July 2008 and the end of a long period of lower SRAS prices may have contributed to the increase in SRAS prices. Other factors, such as the introduction of the carbon pricing mechanism in 2012 and the effects of the global financial crisis, may also have placed upward pressure on underlying SRAS costs.

C.3 Assessment of competition in SRAS markets

In assessing AEMO's proposal for the introduction of an arbitration option in SRAS procurement, the Commission has considered the degree of competition in SRAS markets and whether this was likely to result in any marked inefficiencies for consumers.

While significant, an increase in the cost of SRAS is not itself an automatic indication that SRAS markets are non-competitive. Given particular market conditions, SRAS providers may be able to earn temporary profits by winning tenders at prices that are above costs.[132] These profits create incentives for new SRAS providers to enter the market, increasing competition. Over time, an effectively competitive SRAS market will include trade-offs between higher prices and new investment, with prices over time tending to converge toward the long run marginal cost of providing SRAS.

Various market characteristics may influence the function and effectiveness of this process:

- **Market concentration and rivalry:** Competitive pressure can exist between existing SRAS providers, or may come from the threat of entry from potential competitors. This effect may be weakened if there is only a small number of existing providers in the first place. It may also be weakened if new competitors are either prevented from entering or are clearly unlikely to enter the market.
- **Choice**: AEMO, as the sole buyer of SRAS, should be able to exercise choice between different SRAS providers, or have the freedom to choose not to buy.
- **Information**: AEMO should have access and be able to use information to inform its choices when procuring SRAS.

There is evidence that current SRAS markets may not strongly display all of these characteristics.

C.3.1 Market concentration

The effectiveness of competition will be influenced by the number of competitors that are active in a market. While concentrated markets may display some competitive characteristics, an increase in the number of active competitors will generally increase the degree of competitive pressure faced by each SRAS provider.

132 In this context "cost" refers to the fixed and variable costs of individual SRAS providers. This should not be confused with the definition of the total SRAS costs faced by AEMO, being the aggregate cost of all of the services procured by AEMO to meet the SRS.

AEMO have suggested that there are a limited number of providers in current SRAS markets. To assess the degree of concentration in SRAS markets, AEMO considered whether it would have been able to meet its SRAS obligations in each subnetwork, with any one tender discarded. Where this was not possible, AEMO considered the tender process for the subnetwork to be non-competitive. Using this assessment framework, AEMO found that no subnetworks were competitive in the 2008 tender, while only the Latrobe Valley subnetwork was found to be competitive in 2012.[133]

AEMO also indicated that due to a shortage of acceptable offers received in the 2012 SRAS tender, it was unable to meet all of its SRAS obligations in seven of the ten subnetworks.[134] In each case, this was due to the fact that AEMO did not receive enough tenders to successfully meet all of the requirements set out in the SRS and its own SRAS guidelines.

The Commission considered whether other measures might give an indication of the concentration of SRAS markets. One such approach is the Herfindahl-Hirschman Index (HHI), which measures the number and size of firms relative to a market.

Box C.1: Herfindahl-Hirschman Index

The HHI is calculated as the sum of the squares of each SRAS provider's market share (expressed as a percentage). It returns values ranging from zero to 10,000, which reflect market types that range from a large number of unique providers to a single dominant provider.

The HHI is generally used as a high level indicator of the likely degree of competition between the firms in a market. As a guide, the Australian Competition and Consumer Commission uses HHI values above 2000 as an indicator of potential impacts on competition when assessing mergers.[135]

To develop an HHI for SRAS markets, the AEMC identified all the unique providers who tendered for SRAS in each region in 2012, including both successful and unsuccessful tenderers. Market share was determined as the number of unique SRAS facilities owned by each firm in each region, expressed as a percentage of the total number of SRAS facilities in the region.[136] As shown in Table C.1 below, in all cases the HHI is above 2000, and is markedly higher in Queensland and Tasmania.

133 This assessment approach is also used by AEMO in assessing whether NSCAS tenders are competitive. See: AEMO, SRAS Rule change proposal, p.8; and AEMO, System Restart Ancillary Services - Draft Report, May 2013, p.17.

134 AEMO, *System Restart Ancillary Service tender process 2012: Report and notice in accordance with NER 3.11.5(l) and 3.13.5*, July 2012. Note that AEMO has since revised the total number of subnetworks down to six.

135 ACCC, *Merger guidelines,* November 2008, p. 37.

136 A regional approach, rather than subnetwork, was taken in order to simplify analysis. A subnetwork approach would return higher HHI values.

Table C.1 HHI values for each region

Region	HHI
New South Wales	2,777
Queensland	5,000
South Australia	3,750
Victoria	2,222
Tasmania	10,000

The Commission considers that AEMO's evidence and these HHI results indicate that current SRAS markets may be relatively concentrated, although the degree of this concentration varies between regions. This may not be conducive to strong rivalry between firms currently active in SRAS markets.

C.3.2 Threat of new entry

The threat of new entry will also affect the degree of competitive pressure in a market.

Several stakeholders suggested that this threat is a significant constraint on existing SRAS providers' pricing strategies, as the relatively low price of investing in new SRAS facilities means that new entry remains a credible threat. Stakeholders advised the Commission that the total cost associated with investing in a new fast start diesel generator (a typical facility capable of providing SRAS) is around $1 million per MW of capacity provided. Given that the capacity of such SRAS units may be as small as 10MW - 15MW, this is a relatively small cost outlay when compared to the typical cost of investment in generation units.

AEMO has also identified a number of publicly announced new gas turbine generation projects, several of which have progressed to the stage where a development site has been acquired.[137] All of these facilities could potentially be adapted to provide SRAS in the future. In addition, a review of the list of the existing generation fleet shows that there are many existing units that may fit the general requirements of potential SRAS facilities, following relatively low cost adaptations.

A review of the two most recent SRAS tender processes indicates that two new restart services were provided between 2008 and 2012. This is discussed in Box C.2.

137 More information can be found at: http://www.aemo.com.au/Electricity/Planning/Related-Information/Generation-Information

Box C.2: New entry in SRAS markets: 2008-2012

The SRAS tender process is confidential and detailed information on the results of each tender are not published. This includes the individual units contracted and the price of individual services. However, stakeholders have advised the Commission and provided confidential information regarding levels of new entry in SRAS markets between the 2008 and 2012 tenders.

Two new unique SRAS facilities were offered in 2012. The services provided by these facilities were not accepted by AEMO, on the basis that they were not required to meet the SRS in that particular subnetwork.

There were several other "new" services offered between the two tender periods. These new services were in fact changes to the definition of existing services, such as changing from a secondary to a primary service, changing the number of larger units to be restored, or changes to ownership of existing facilities.

The Commission acknowledges that there appears to have been some limited new entry in SRAS markets and that the threat of further new entry remains theoretically possible.

Despite this, current market conditions may reduce the extent and probability of this threat. This may have the effect of reducing the competitive constraints faced by current SRAS providers, at least in the short to medium term.

Outcomes in energy markets are particularly likely to influence the probability of new entry in SRAS markets. Factors such as low demand, a relative surplus of generation capacity and uncertainty over future environmental policies have all reduced the need for new investment in energy markets. This in turn reduces the likelihood of new entry in SRAS markets, as SRAS facilities are typically built as an add-on to much larger units designed to supply the energy market.

The likelihood of new entry may also be reduced by the presence of regulatory requirements. Current arrangements in the NER, the SRS and AEMO's SRAS guidelines place a number of specific regulatory requirements on AEMO and on SRAS providers.[138] For example, the SRS currently includes specific facility level reliability requirements that SRAS providers must meet, while the NER explicitly requires AEMO to focus on the procurement of primary services. Meeting these requirements may add to the costs of entering SRAS markets.

The Commission has made a draft more preferable rule to reduce the specificity of what facilities may provide SRAS. This may expand the range of potential services that can be used by AEMO to provide SRAS. Further detail of these recommendations is provided in Chapter 5.

Various stakeholders have also suggested that AEMO's current approach to SRAS contracting may deter new entry in SRAS markets. Stakeholders suggested that in previous SRAS tenders, AEMO has finalised and executed SRAS contracts only a short time before service is due to commence. Relatively short contract periods may also

138 The Commission notes that AEMO has now completed a review of its guidelines which resulted in a number of simplifications and improvements to these documents.

provide insufficient certainty regarding the ability to recover costs, potentially increasing prices.

The Commission has made a draft more preferable rule that will expand the range of options available to AEMO to procure SRAS. The Commission considers that AEMO could make use of this capability to enter into contracts with longer lead times or longer terms. Further detail of these recommendations is provided in Chapter 5

Given these factors, the Commission considers there is some evidence that current SRAS markets may be reasonably concentrated and that the threat of new entry may be subdued, at least in the short term. However, the Commission also considers that there is no evidence to suggest that these barriers to entry are likely to be permanent. As such, new entry in SRAS markets remains a viable threat, in the medium to longer term.

C.3.3 Choice

In effectively competitive markets, buyers are able to exercise choice and select from a range of products offered by different firms. Buyers are also free to choose not to buy, if their estimation of the value of the products on offer is less than the price. The ability for buyers to exercise choice is therefore a central driver of effective competition.

AEMO is the sole buyer of SRAS. AEMO's capability to exercise choice in its role is constrained by a number of regulatory obligations established in the NER, the SRS and in its own SRAS guidelines.

Under current NER arrangements, AEMO is required to use "reasonable endeavours" to source SRAS, to meet both the SRAS Objective and the SRS and to focus its procurement on sourcing primary SRAS. The SRS then requires AEMO to procure SRAS that meets specific restoration timeframes, reliability levels and particular strategic and geographic diversity requirements.

Historically, AEMO's own guidelines also established a number of specific requirements that constrained its choice when procuring SRAS. Most notably, the SRAS description has historically included a detailed set of functional criteria for primary and secondary SRAS, while the SRAS quantity guidelines required AEMO to procure a minimum of two SRAS in each subnetwork.[139]

These requirements may constrain AEMO's capability to exercise choice when procuring SRAS. This reduces the extent of AEMO's countervailing power, which may further weaken the competitive pressures faced by SRAS providers.

The Commission's draft more preferable rule allows AEMO to procure SRAS on the basis of meeting a subnetwork level reliability requirement. The draft more preferable rule also removes the definitions of primary and secondary restart services. This may help to expand the range of potential services available to AEMO. Further detail of these recommendations is provided in Chapter 5.

139 The Commission notes that AEMO's recent changes to its SRAS guidelines have simplified these documents, focussing AEMO's procurement on meeting the SRS and removing a number of the more detailed requirements.

C.3.4 Information

Information is used by both buyers and sellers in a transaction. Information asymmetries, where one party has access to more or better quality information, may provide that party with an advantage in the transaction. Systemic information asymmetries between different market participants may reduce the general effectiveness of competition in a market.

As discussed above, AEMO faces a number of regulatory obligations in terms of its procurement of SRAS. These obligations are included in public documents such as the NER, SRS and the SRAS guidelines.

AEMO is required to publish the total estimated cost of SRAS for each subnetwork, as well as the number of SRAS procured for each subnetwork.[140] SRAS providers may make use of this information when structuring their tenders and pricing strategies.

In contrast, the only information available to AEMO is that provided by SRAS tenderers in their tender documents. AEMO has access to very little other definitive information that it might use to inform its negotiations with SRAS providers, such as information regarding the costs to provide each service.

These information asymmetries may weaken AEMO's negotiating position and countervailing power in SRAS markets, reducing the extent of competitive pressure faced by SRAS providers.

The Commission's more preferable draft rule reduces the granularity of the information on SRAS costs and quantities that AEMO is required to publish. Further detail of these recommendations is provided in Chapter 5.

C.3.5 Summary of assessment of competition in SRAS markets

There is some evidence that SRAS markets may not be strongly competitive at present.

SRAS markets appear to be reasonably concentrated, with a small number of providers in each subnetwork. The threat of new entry also appears to be subdued at present, primarily reflecting conditions in energy markets. However, there is no evidence to suggest that these barriers to new entry are permanent. The Commission's draft more preferable rule also makes a number of changes that may expand the scope of potential sources of SRAS.

Limited choice and information asymmetries may reduce AEMO's countervailing power in SRAS markets, reducing the degree of competitive pressure faced by SRAS providers. The Commission's more preferable draft rule increases the options available to AEMO when procuring SRAS and increases the degree of competitive pressure by reducing the probability of non-competitive bidding in SRAS markets.

140 NER cl. 3.11.5(n).

C.4 Assessment of AEMO's proposed arbitration model for SRAS procurement

In assessing AEMO's proposed rule, the Commission has weighed the costs and inefficiencies associated with any SRAS market competition issues against the costs and risks of introducing a price arbitration option into SRAS procurement.

C.4.1 Magnitude of impact of any weakness in the competitiveness of SRAS markets

In its rule change proposal, AEMO identified a lack of competition in SRAS markets as being a key driver of increases in SRAS costs. While it is true that SRAS costs increased sharply between the 2008 and 2012 tenders, they continue to make up a very small portion of the end use charges faced by consumers.

In 2012/13, total SRAS costs were $51.2 million. Given the total volume of energy traded in the NEM in that year, this amounted to an average charge of $0.28/MWh.

Expressed another way, while the total value of NEM wholesale energy traded in 2012/13 was $11.4 billion, the total cost of SRAS in 2012/13 represented around 0.45% of this value.

Given the small scale of SRAS costs, any potential dis-benefit to consumers is likely to be outweighed by the costs related to the introduction of AEMO's price arbitration option. These costs and risks are discussed below.

C.4.2 AEMO's proposed price arbitration model

AEMO's proposed SRAS arbitration option would involve extending the current NSCAS procurement processes to SRAS. The current NSCAS procurement processes allow for arbitration by the Dispute Resolution Adviser on all aspects of an NSCAS tender, including price. The current arrangements for NSCAS are discussed summarised in Box C.3 below.

Under AEMO's proposed arbitration model, AEMO would determine whether SRAS tenders received in a subnetwork were competitive. AEMO and tenderers would then be required to negotiate in good faith, taking into account the SRAS Objective. If AEMO and tenderers could not reach agreement on terms and conditions, AEMO or the tenderer could then refer the tender to the Dispute Resolution Adviser for arbitration.

This model reflects the arbitration option that exists in the NSCAS procurement process. The Commission understands that, to date, this arbitration option has not been applied. It is therefore unclear as to how an SRAS arbitration would actually operate. The Commission understands that under this model, the Dispute Resolution Adviser would appoint an expert panel to assess the tender, in a similar vein to the assessment of claims for compensation under NER clause 3.14.6.[141] This expert panel would then

141 These provisions allow parties affected by the application of the administered price cap to claim for compensation for foregone operating costs. They have been used once in the history of the NEM, where the Dispute Resolution Adviser appointed a three member expert panel to assess a claim for compensation from Synergen Power. The costs of appointing the expert panel involved were a substantial portion of the total compensation finally awarded to Synergen Power. More information

determine whether the price of SRAS in a given tender was "reasonable", potentially setting an alternative tender price.

Box C.3: Network Support and Control Ancillary Services

Network Support and Control Ancillary Services (NSCAS) are procured by TNSPs or AEMO to maintain power system security, reliability and the power transfer capability of the transmission network.

NSCAS consists of three main services: voltage control, network loading and stability control.

Various pieces of equipment can be installed, or equipment operating regimes implemented, to provide these services. This can be done by a range of participants, including NSPs, generators or market customers.

Typically, TNSPs will install equipment or procure services to deliver necessary levels of NSCAS. As part of its National Transmission Network Development Plan, AEMO is also required to consider whether there any "gaps" in the volume of NSCAS procured by TNSPs. Where such a gap has been identified and TNSPs have failed to procure sufficient NSCAS, AEMO may act as NSCAS procurer.

To date, AEMO has acted as NSCAS procurer on one occasion, procuring NSCAS from Snowy Hydro and Transgrid to provide voltage control services.[142] The NSCAS procurement arbitration option was not exercised in the procurement of these services.

The Commission considers that there are several risks associated with this model. It is also likely to be difficult and costly to implement.

The very presence of an arbitration option in SRAS procurement may create substantial downside risk for SRAS providers. This may discourage new providers from entering, or existing suppliers from re-offering. Furthermore, the arbitration process itself would likely require the assessment of detailed and complex cost information. There is a real probability of errors being made during the assessment of such claims, potentially resulting in the determination of lower than efficient prices. This may further discourage efficient levels of new entry, or encourage existing SRAS providers to exit the market.

The Commission also considers that to make a price arbitration option workable, it would be necessary to introduce a mechanism to prevent an SRAS provider from simply withdrawing a tender that was referred to the Dispute Resolution Adviser for arbitration.[144] Such a provision could be included as part of the tender process itself and could require the tenderer to keep their offer available for a defined time. The

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can be found here: http://www.aemc.gov.au/Markets-Reviews-Advice/Compensation-claim-from-Synergen-Power

142 Australian Energy Market Operator, *2013 National Transmission Network Development Plan*, AEMO, 2013, Appendix B.4.

144 This was the general approach proposed by NEMMCO in the 2006 SRAS rule change, where SRAS tenderers were prevented from withdrawing once AEMO had issued a particular notice.

Commission considers that the existence of a provision of this type would likely act as a further disincentive to potential SRAS providers from tendering.

The actual process of arbitrating a price is also likely to be costly. The Commission considers that there are likely to be substantial costs associated with convening a suitably experienced expert panel to advise each arbitration. AEMO and tenderers are also likely to face substantial legal costs due to participating in the arbitration. These costs would then be multiplied by the number of SRAS tenders referred to arbitration. In aggregate, these costs could substantially erode any savings benefits otherwise achieved through an arbitration process.

Given these factors, the Commission has decided not to include a price arbitration option in the draft more preferable rule. As discussed above, the costs and risks of introducing this option outweigh any potential consequences of the problem they are intended to address.

D SRAS cost recovery: Commission's considerations

D.1 Current arrangements

In the NEM, SRAS cost recovery occurs on a smeared, NEM wide basis. This means that the total, NEM-wide costs of SRAS are recovered equally from all regions.

These costs are also recovered on a 50/50 basis from market generators (including market small generation aggregators) and market customers. This recovery is conducted on a pro-rated basis according to respective energy generation or consumption.

This approach to cost recovery may result in differences between the cost of procuring SRAS, and the SRAS charges recovered from participants in that region.

Figure D.1 shows how volumes of generation and consumption can determine the SRAS charges recovered from participants in a region, and how this may differ from the cost of actually sourcing SRAS to meet the SRS in that region.

In this example, the total cost of procuring SRAS is $10 million, with $3M, $5M and $2M of that total attributable to providing restart services for regions A, B and C respectively. Total energy generation and consumption is 1000MWh across all three regions, with 150MWh, 650MWh and 200 MWh generated and consumed in each region respectively.

While the cost of providing SRAS to meet the SRS in region A is $3 million, generators and consumers in that region generate and consume only 15% of the total energy. Accordingly, the SRAS charges recovered from participants in that region are only $1.5 million. In contrast, while the cost of providing SRAS in region B is $5 million, the SRAS charges recovered from participants in that region total $6.5 million.

Figure D.1 SRAS cost recovery

D.2 Regional benefits recovery and generator incentives

Moving from the current, smeared approach to a regional benefits cost recovery may either increase or decrease the SRAS charges faced by participants in a region. This largely depends on the current degree of divergence between regional SRAS charges and the cost of procuring SRAS to meet the SRS in that region.

In those regions where SRAS charges are currently *higher* than the cost of SRAS, moving to regional benefits approach to cost recovery may lower SRAS charges.

Although participants in these regions will benefit from lower SRAS production costs, this is unlikely to markedly change incentives. As the quantity of SRAS demanded is determined by the SRS, any change in the price of SRAS is unlikely to have a significant effect on the quantity demanded. A change in price is therefore unlikely to drive any particular allocative efficiency gains.[145] Similarly, a reduction in the price of SRAS is unlikely to have any substantial impact on generator operational or investment decisions.

In those regions where SRAS charges are currently *lower* than the cost of procuring SRAS, moving to a regional benefits cost recovery approach may increase SRAS charges. This may change the incentives faced by generators.

Generators typically face two sets of related incentives in SRAS markets. Firstly, the prospect of earning revenues may encourage generators to offer SRAS and to invest in SRAS facilities. Secondly, as generators also bear half of the total cost of SRAS through the SRAS charges they pay, increases in these charges may encourage generators to offer and invest in SRAS, in order to manage their exposure to SRAS charges.

This second incentive operates by recovering a portion of the total cost of SRAS from the same parties that created that cost in the first place. This effect, and its consequences for generator incentives, is described in Box D.1 below.

Under the current, NEM-wide approach to cost recovery, the effect described in box D.1 may be weakened. Smearing the costs of SRAS across the NEM may mean that generators in a region do not necessarily face the cost consequences of their own bidding strategies.

In contrast, moving to a regional benefits cost recovery approach will sharpen this effect, at least in those regions where SRAS charges do not currently reflect costs. This may drive a number of beneficial outcomes for consumers. Firstly, competition in SRAS markets may be enhanced, with SRAS providers facing stronger incentives to price competitively in order to win the tender process. Secondly, potential SRAS providers may face stronger incentives to enter the market, driving efficient levels of investment in SRAS over the long term.

145 Allocative efficiency is more likely to be achieved where the price of a good or service is equal to the marginal cost of producing another unit of that good or service. Aligning the price of a good with the marginal cost of production will result in an optimal quantity of the good or service demanded/consumed.

Box D.1: SRAS cost recovery - a three generator example

Consider a region in which there are three potential SRAS providers: generators A, B and C.

Two system restart services are required in the region, and all of the three generators are tendering for the service.

Generators A and B may profit if they are able to win the tender process and charge a high price. Given that both market customers and generators face SRAS charges, these profits will translate into payments from market customers to generators A and B, as well as from generator C to generators A and B.

Generator C may therefore face incentives to win the tender, in order to avoid making payments to its direct competitors. To do so, it offers SRAS at a more competitive price, in order to win the tender and to reduce the potential for its competitors to earn significant profits if it loses. As competitors to generator C, generators A and B will face similar incentives that will influence their tendering strategies.

Other generators who are not currently SRAS providers may also face incentives to avoid making payments to their competitors. To do so, these generators may choose to enter the market by investing in SRAS facilities.

The key consequence of this effect is that SRAS providers are exposed to the consequences of their own tendering strategies. While winning higher prices in an SRAS tender may result in increased revenue for an SRAS provider, those revenues will also be eroded through the subsequent increase in SRAS charges faced by that generator.

D.3 Previous consultations

In April 2006 the Commission published the final determination of the *System restart ancillary service arrangements and pricing under market suspension* rule change. In that determination, the Commission decided that a NEM-wide approach to regional cost recovery was appropriate.

This section provides an overview of the issues considered in the 2006 determination and an explanation of why the Commission has decided to introduce a different approach to cost recovery in this draft determination.

In its rule change proposal, the National Energy Market Management Company (NEMMCO, now AEMO) had proposed a regional approach to SRAS cost recovery. NEMMCO argued that a regional approach to cost recovery was justified because:

- the rules allow for the variation of the SRS between regions, with the possibility of a more onerous standard being applied in some regions. Any subsequent increase in the cost of SRAS in a region should then be recovered from participants in that region;
- limited prospects that SRAS in one region would be used to provide restart services in another region; and

- regional characteristics may result in material differences in SRAS costs.

In the final determination of the 2006 SRAS rule change, the AEMC decided to reject NEMMCO's proposal for regional cost recovery.

In that final determination, the AEMC considered that the simplicity of a smeared approach would reduce regulatory costs for AEMO and therefore the market as a whole. AEMO have now advised that the total costs of implementing regional cost recovery will amount to around $70,000. The Commission considers that this cost is likely to be outweighed by the benefits of regional cost recovery, such as increasing the degree of competition in SRAS markets and driving efficient investment in SRAS provision.

In 2006, the AEMC also considered that the potential for subnetwork boundaries to cross regional boundaries could create problems for regional recovery. The Commission understands that AEMO's proposed regional benefit factors will now allow for SRAS costs to be allocated to regions by determining the extent to which each individual restart facility has actually benefited a region. This should mean that total SRAS costs can be allocated to different regions, regardless of the location of subnetwork boundaries.

Finally, in 2006 the AEMC considered that an SRAS located in one subnetwork could be used to restore a neighbouring subnetwork. The AEMC therefore considered that the shared benefit provided by such an SRAS facility would be better reflected through a smeared cost recovery approach. The Commission considers that the development of RBFs by AEMO is intended to accurately allocate the costs of an SRAS to the region that it benefits. In particular, AEMO have advised that separate RBFs will be calculated for the allocation of the availability and usage charges of specific restart services. This means that if an SRAS located in one region is actually called upon to provide a restart service that benefits another region, the usage charges of that service will be allocated to the benefiting region.

E Current arrangements: System Restart Ancillary Services

E.1 System Restart Ancillary Services

System restart ancillary services (SRAS) are procured by AEMO in order to mitigate the impact of a major supply disruption. SRAS provides the capability to restart the power system if there has been major loss of power in the system, or if the system has collapsed to a "black system" condition.[146]

Box E.1: Black system events in Australia

Events where there is a major loss of power in the system, or where the system has collapsed to a black state, are relatively rare.

Since the commencement of the NEM, there has only been one black system event. This event occurred in the North Queensland subnetwork on 22 January 2009 and was the result of a non-credible contingency event on the 275kV transmission network. This event resulted in loss of more than 60% of North Queensland demand, and lasted for approximately 2 hours and 20 minutes.[147] Restart services were not utilised to restore the power system in this event.

Outside of the NEM, a black system event resulted in a major interruption of supply to the Darwin-Katherine area in the Northern Territory, on 12 March 2014. This event was caused by a number of switching errors and equipment malfunctions and was followed by the failure of several restart services. The resulting black system event affected 65,000 customers, lasting for approximately 1 hour and 20 minutes in Katherine, and around 14 hours in Darwin.[148]

SRAS is important as there are significant economic and social costs associated with the total loss of power supply, although the magnitude of these costs may vary between users. SRAS is effectively an insurance product that is procured to minimise these potential costs. The consequences of a loss of power supply are described in Box E.2.

146 A black system is defined in Chapter 10 as "the absence of *voltage* on all or a significant part of the *transmission system* or within a *region* during a *major supply disruption* affecting a significant number of customers".

147 NEMMCO, *Power System Incident Report - Black System Condition in North Queensland on 22 January 2009*, 2009.

148 Northern Territory Utilities Commission, *Independent Investigation into Darwin-Katherine System Black 12 March 2014*, 2 April 2014; Evans and Peck, *Utilities Commission of the Northern Territory - Independent Investigation into Darwin-Katherine System Black 12 March 2014*, April 2014.

Box E.2: The consequences of a loss of power supply

Major losses of power supply cause direct economic costs in terms of lost output, and there can be significant additional costs such as those resulting from disruption caused to transportation and communication networks. Public health risks can result, and these are exacerbated by the difficulties faced by emergency services in responding to events. There can also be severe social costs, potentially including a breakdown in law and order.

One of the most prominent major power outages in recent years occurred in North America in 2003, where 50 million people lost power for up to two days. This was estimated to have cost around $6 billion at that time and contributed to 11 deaths.[149]

SRAS is provided by generators which have the capability to start, or remain in service, without electricity being provided from the grid. They must be capable of delivering electricity to a connection point within timeframes derived to meet the SRAS Objective and be able to control frequency and voltage. SRAS is commonly provided by a number of different technologies, including:[150]

- generating units that can restart without being connected to the grid, such as hydro or various gas turbine generating units;
- trip to house load (TTHL) schemes, which include large generating units that can disconnect from the grid and continue to supply their own auxiliaries;[151] and
- 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.

SRAS is one method that may be used to restore the power grid following a major supply disruption. Electricity from a restart service is primarily used to restart other generating units, in order to restore a defined load within given voltage and frequency parameters.

SRAS is procured on the basis of the restoration of power in a specific electrical sub-network. An electrical sub-network is a part of the network defined by AEMO in accordance with the System Restart Standard (SRS), that reflects factors including the concentration of load and generation as well as the structure of the network.

The current SRAS frameworks are established through a number of NER clauses. These clauses set out the SRAS Objective, and require the Reliability Panel to develop the SRS. The NER also require AEMO to develop various SRAS guidelines. These are discussed in further detail below.

149 Productivity Commission 2013, *Electricity Network Regulatory Frameworks*, Report No. 62, Canberra, p.13.

150 This information reproduced from: Australian Energy Market Operator, *System Restart Ancillary Services - Final Report*, AEMO, 12 February 2014, pp. 6-7.

151 Auxiliaries refer to machinery that initiates and supports the function of large generating units, such as conveyer belts and coal pulverisers.

E.2 NER requirements relating to SRAS

NER clause 3.11.4A(a) contains the current SRAS Objective, which sets out the high level purpose of SRAS as follows:[152]

> ""The objective for *system restart ancillary services* 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* (**the *SRAS* objective**).""

The term major supply disruption is currently defined in Chapter 10 of the NER as:

> "the unplanned absence of *voltage* on a part of the *transmission system* affecting one or more *power stations*."

The SRAS Objective informs all other aspects of the SRAS frameworks. Under current arrangements, it must be considered by both AEMO and the Reliability Panel when carrying out their respective roles.

Under current arrangements, the NER establishes the definition of primary and secondary SRAS. AEMO is then required to provide a further description of these services, including the technical and availability requirements for each, in its SRAS guidelines.

The NER sets out a high level description of the various SRAS guidelines to be developed by AEMO.[153] The NER also describes the processes to be followed by AEMO when procuring SRAS, including the tendering process it must use.[154]

E.3 Reliability Panel: System Restart Standard

Clause 8.8.3(a) of the NER requires the Reliability Panel to determine the SRS.[155] The SRS provides AEMO with guidance regarding the procurement of restart services. Key aspects of the SRS include:

- **Restoration timeframes:** The SRS requires AEMO to procure SRAS sufficient to:
  - re-supply and energise the auxiliaries of power stations within 1.5 hours of a major supply disruption occurring to provide sufficient capacity to meet 40 per cent of peak demand in that sub-network; and
  - restore generation and transmission such that 40 per cent of peak demand in that sub-network could be supplied within four hours of a major supply disruption occurring.

152 Note that some of the NER clauses discussed in this appendix have been amended or deleted as part of the draft more preferable rule.

153 NER clause 3.11.4A.

154 NER clause 3.11.5(b)

155 The current SRS is reproduced as Appendix F of this document. Note that following completion of this rule change, the Reliability Panel will be directed by the Commission to undertake a review of the SRS, to reflect the new draft more preferable rule.

- **Reliability of services:** The SRS provides detail regarding the reliability standards that must be met by primary and secondary SRAS. Specifically, primary SRAS are defined as those services with a reliability of 90%, while secondary services are defined as those services with a reliability of 60%. Services may be considered in combination to deliver higher levels of reliability. AEMO is responsible for defining the manner in which reliability will be assessed and how services may be combined.
- **Guidelines for the determination of electrical sub-networks:** The SRS defines the matters that AEMO must consider when establishing electrical sub-networks, including the length and strength of transmission corridors between areas and generation centres as well as quantities of generation and load within an area.
- **Guidelines for specifying diversity and strategic location of services:** The SRS defines the matters that AEMO must consider in order to maintain a degree of independence between the various restart services that it procures, including electrical, technological, geographical and fuel diversity in procured SRAS.

The Reliability Panel develops the SRS through a public consultation process. The last such consultation process was completed in 2012.

E.4 AEMO: SRAS guidelines and procurement

Subject to the NER and the SRS, AEMO is responsible for developing the SRAS guidelines.[156] The guidelines establish the operational detail of SRAS, including the technical descriptions of SRAS, testing and assessment requirements and how AEMO procures SRAS.

AEMO is required to develop the following guidelines:

- **SRAS description:** The SRAS description establishes the technical parameters and characteristics of primary and secondary restart services.
- **SRAS assessment guidelines:** The SRAS assessment guidelines establish the framework followed by AEMO for the testing of SRAS.
- **SRAS quantity guidelines:** The SRAS quantity guidelines establish the quantity of SRAS that AEMO will procure in each sub-network area and the procedures followed to maintain the strategic diversity of SRAS.
- **SRAS tender guidelines:** The SRAS tender guidelines set out the processes that will be followed by AEMO when procuring SRAS.
- **Boundaries of Electrical Sub-Networks:** This document sets out the principles and specific factors considered by AEMO in determining each sub-network area as well as setting out the specifics of each sub-network boundary.

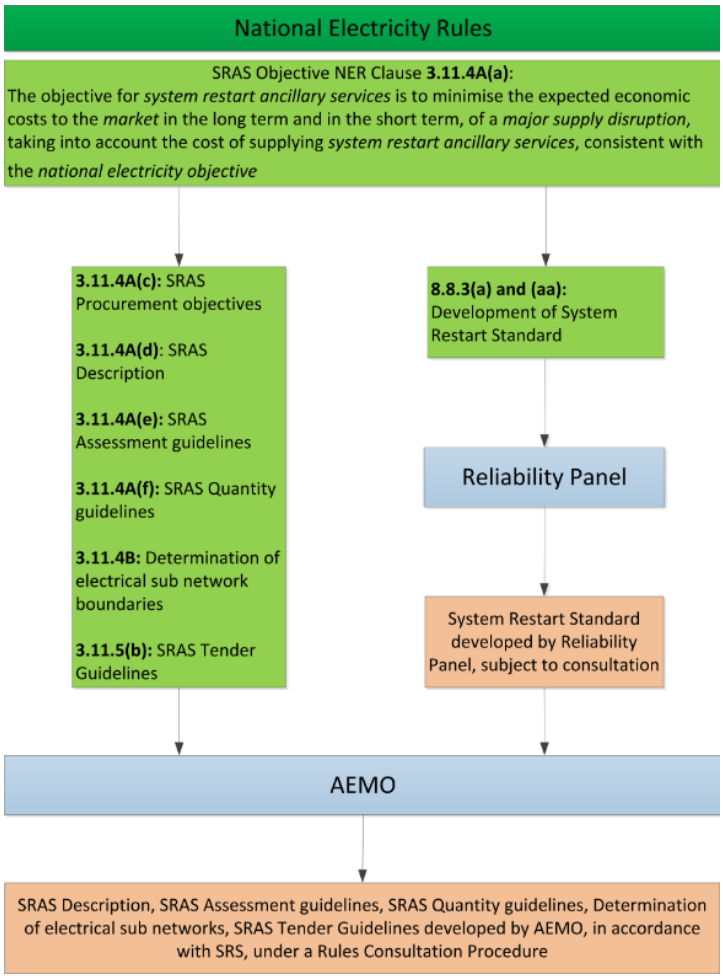
The NER require AEMO to procure SRAS through a prescribed tender process. The most recent tender processes took place in 2008 and 2012, with the tender process for SRAS contracts to begin in July 2015 currently underway.

156 Note that the Commission's draft more preferable rule proposes a number of changes to these arrangements, including amendments to come clauses and abolition of others.

The NER explicitly excludes matters related to the price of SRAS from being referred to the Dispute Resolution Adviser, under chapter 8 of the NEL.

A summary of the current SRAS regulatory arrangements is provided in Figure E.1.

Figure E.1 Current regulatory arrangements



F System Restart Standard

System Restart Standard

1. Introduction

This System Restart Standard (standard) was determined by the Reliability Panel (Panel) in accordance with clauses 8.8.1(a)(1a) and 8.8.3 of the National Electricity Rules (Rules). The purpose of this standard is to provide guidance and set a benchmark to assist the Australian Energy Market Operator (AEMO) in procuring sufficient system restart ancillary services (SRAS) to meet the requirements of the National Electricity Market (NEM). This standard is effective from 1 August 2013.

2. Requirements of the standard

The requirements of the standard are specified under clause 8.8.3(aa) of the Rules, which states that (italicised terms are defined under the Rules):

"The *system restart standard* must:

1. be consistent with the *SRAS* objective referred to in clause 3.11.4A(a);
2. apply equally across all *regions*, unless the *Reliability Panel* varies the *system restart standard* between *electrical sub-networks* to the extent necessary:

(a) to reflect any technical system limitations or requirements; or

(b) if the benefits of adopting the *system restart standard* would be outweighed by the costs of implementing such a standard;

3. identify the maximum amount of time within which *system restart ancillary services* are required to restore *supply* to a specified level;
4. include guidelines on the required reliability of *primary restart services* and *secondary restart services*;
5. include guidelines to be followed by AEMO in determining *electrical sub-networks*, including the determination of the appropriate number of *electrical sub-networks* and the characteristics required within an *electrical sub-network* (such as the amount of generation or *load*, or electrical distance between *generation centres*, within an *electrical sub-network*);
6. include guidelines specifying the diversity and strategic locations required of *primary restart services* and *secondary restart services*."

In making its determination of the standard, the Panel detailed the factors considered in its decision in AEMC Reliability Panel 2012, System Restart Standard, Final Determination, 12 April 2012. Consistency of the standard with the SRAS objective is explained in this report and the final decision with respect to the other requirements under clause 8.8.3(aa) are outlined below.

3. Applicability of the standard in electrical sub-networks

This standard shall apply equally across all regions and electrical sub-networks.

4. Restoration timeframe

For each electrical sub-network, AEMO shall procure SRAS sufficient to:

- re-supply and energise the auxiliaries of power stations within 1.5 hours of a major supply disruption occurring to provide sufficient capacity to meet 40 per cent of peak demand in that sub-network; and
- restore generation and transmission such that 40 per cent of peak demand in that sub-network could be supplied within four hours of a major supply disruption occurring.

The restoration timeframe represents the 'target timeframe' to be used by AEMO in the procurement process. It is not a specification of any operational requirement that should be achieved in the event of a black system condition.

5. Reliability of services

Primary restart services shall have a reliability of 90 per cent.

Secondary restart services shall have a reliability of 60 per cent.

Services may be considered in combination to meet a higher level of reliability than the individual service.

AEMO will determine the manner in which reliability will be assessed, and clarify the provisions for combining services, in accordance with the requirements under the Rules.

6. Guidelines for the determination of electrical sub-networks

AEMO shall determine the boundaries for electrical sub-networks without limitation by taking into account the following factors:

- the number and strength of transmission corridors connecting an area to the remainder of the power system;
- the electrical distance (length of transmission lines) between generation centres;
- the quantity of generation in an area, which should be in the order of 1000MW or more; and
- the quantity of load in an area, which should be in the order of 1000MW or more.

7. Guidelines for specifying the diversity and strategic location of services

There shall be diversity in the SRAS procured by AEMO to provide an appropriate level of independence between the services procured. AEMO shall consider diversity of the services by taking into account the following guidelines:

- Electrical - diversity in the electrical characteristics shall be considered particularly with respect to whether there would be a single point of electrical or physical failure;
- Technological - diversity in technologies shall be considered to minimise the reliance of services on a common technological attribute;
- Geographical - diversity in geography shall be considered to minimise the potential impact of geographical events such as natural disasters; and
- Fuel - diversity in the type of fuel utilised by services shall be considered to minimise the reliance on one particular fuel source.

G AEMO's 2013/14 review of SRAS arrangements

AEMO's 2013/14 review of SRAS arrangements was a key input into the Group of Generators' and AEMO's rule change proposals.

Issues and Options Paper

In its Issues and Options Paper, published February 2013, AEMO argued that current SRAS arrangements did not meet the SRAS Objective. AEMO suggested that the current cost of procuring SRAS outweighed the likely economic benefit associated with minimising the impact of a black system condition.

Generally, AEMO stated that it intended to take an "economic" approach to identifying the quantity of SRAS that it would procure. This would involve measuring the probability of different events occurring in a region or electrical subnetwork, against the consequence of such an event, using an economic measure of unserved energy. AEMO would then procure SRAS if this analysis identified that the economic benefits outweighed the cost.[157]

In order to better meet the SRAS Objective, AEMO also stated that it would reassess some of its key assumptions that underpinned its SRAS procurement and operational processes.

These key assumptions related to the nature of the major supply disruption event that SRAS is procured to mitigate and included:[158]

- that the major supply disruption event was a NEM-wide system shutdown;
- that there was no infrastructure damage to the transmission network following a major supply disruption event;
- that no generation was available from a neighbouring subnetwork and that each islanded subnetwork must be restored from within that subnetwork; and
- one SRAS is unavailable in each electrical subnetwork, requiring the procurement of an additional SRAS in each subnetwork.

AEMO argued that many of these assumptions were in fact incorrect and should be changed. AEMO argued that it was highly unlikely that the entire NEM would enter a black system condition, as these conditions were unlikely to propagate across regional boundaries. Given this, AEMO argued that energised subnetworks would be available to supply restart capability to a blacked out subnetwork. Finally, given that supply was available from neighbouring subnetworks, it was no longer necessary to procure a minimum of two SRAS in any given subnetwork.

157 AEMO, *System Restart Ancillary Services - Issues and Options Paper*, January 2013, p.4.

158 Ibid., pp.18-19.

Box G.1: DNV KEMA assessment of likelihood of a NEM-wide black system event

DNV KEMA was asked to comment on the relative likelihood of a NEM-wide versus a region-wide black system event, and the appropriateness of the proposal to procure SRAS on this basis.[159]

DNV KEMA considered a number of issues in its assessment. Firstly, it undertook a qualitative review of possible events that could trigger a cascading power failure, concluding that there was no such event that could cause a NEM wide failure.[160] DNV KEMA also reviewed the NEM transmission network topology and concluded that there was a high probability that a cascading power failure would be contained by transmission network break points at region boundaries. This would reduce the probability of a cascading power failure spreading beyond a single NEM region.

Given these factors, DNV KEMA found that there was no credible event that could cause a NEM-wide black system event and that AEMO's proposal to use region-wide black system events as the basis for future SRAS requirements was appropriate.[161]

Draft report

In its Draft Report, published May 2013, AEMO expanded on these initial recommendations.

In response to the Issues and Options paper, several stakeholders had queried whether it was within AEMO's appropriate remit to be considering the nature of the event that SRAS is procured to mitigate, and whether AEMO should be amending SRAS quantities and subnetwork boundaries on this basis.

In response to these queries, AEMO stated that the NER requires AEMO to consider both the SRS and the SRAS Objective when procuring SRAS. AEMO argued it was therefore appropriate for AEMO to reconsider the quantities of SRAS procured in light of rising SRAS costs, in order to meet the overarching requirements of the SRAS Objective, so that procured SRAS was delivering value for customers.[162]

159 DNV KEMA, *AEMO responsibilities to procure SRAS*, 30 December 2013.

160 A cascading power failure occurs when an unexpected event, such as a generator tripping or the failure of a major transmission network element, triggers an abrupt excursion in frequency and/or voltage. Normally such events will be contained because the components of the power system are designed to withstand these abrupt excursions of frequency and/or voltage. However, if a subsequent generating unit trips, or a protection system does not operate correctly during the voltage and/or frequency excursion, this can make the excursion worse. This may result in further generating units tripping, which may in turn worsen the excursion, causing still further units to trip. This cascading effect will propagate until it reaches points in the power system where the transmission network is naturally weaker. In the case of the NEM, these points typically occur at the borders of electrical sub-network.

161 Ibid. pp.73-75.

162 AEMO, *System Restart Ancillary Services - Draft Report*, May 2013, p.19.

AEMO also recommended that SRAS should be procured on the basis of meeting a regional, rather than a NEM wide, black system condition. AEMO considered that the assumption of a NEM wide black system was overly conservative, arguing that the grid was likely to separate at regional boundaries. AEMO then stated that it was reasonable to assume that a blacked out subnetwork could be re-energised through a combination of domestically located SRAS and supply from neighbouring subnetworks.[163]

AEMO also proposed reducing the number of electrical subnetworks from ten to seven and procuring only one SRAS per subnetwork (other than in Tasmania where two would be procured). This was recommended on the assumption that on the mainland, supply would be available from energised neighbouring subnetworks to restore a blacked out subnetwork.

Final Report

In its final report, published February 2014, AEMO moved away from its original position regarding the nature of the major supply disruption event that SRAS is procured to mitigate. AEMO acknowledged that there was significant disagreement among industry and AEMO regarding the nature of this event.[164]

To address this uncertainty, AEMO proposed that the Reliability Panel should undertake a review of the SRS. This review would consider the probability of occurrence of different kinds of supply disruption events, ranging from subnetwork level event to a NEM-wide event.

However, AEMO also reiterated that it considered a NEM wide supply disruption to be a very low probability event and the existing assumption of a NEM-wide event had resulted in an over procurement of SRAS. AEMO also stated that it considered it was appropriate to assume that supply was available from a neighbouring region to restart a blacked out region. Accordingly, AEMO reiterated its draft report recommendation that one SRAS be procured in each subnetwork.[165]

AEMO also made a number of other recommendations, including:

- Amending the NER to introduce a price arbitration option for SRAS procurement, similar to that currently in place for Network Support Control Ancillary Services.
- Recovering SRAS costs on a regional basis, due to the current NEM-wide smeared recovery resulting in differences in SRAS payments made and costs recovered in some NEM regions.
- Replacing the definitions of primary and secondary restart services in the NER with a single definition of system restart ancillary services, as these definitions are ineffective and are resulting in some inefficient outcomes.
- Seeking dynamic data from generators and Transmission Network Service Providers (TNSPs) sufficient to allow AEMO to perform dynamic / transient modelling to assess SRAS proposals.

163 Ibid., p.26.

164 AEMO, *System Restart Ancillary Services - Final Report*, February 2014, p.4.

165 Ibid.p.24.

AEMO also noted that it would undertake a consultation to amend the SRAS guidelines and related documents.

H AEMO's 2014 SRAS guideline consultation

In March 2014, AEMO commenced a consultation process for proposed changes to the various SRAS guidelines, including the SRAS description, SRAS quantity guidelines, SRAS assessment guidelines, SRAS tender guidelines and Boundaries of electrical subnetworks.

Issues Paper

In the issues paper of its consultation process, published March 2014, AEMO made a number of initial recommendations, including:

- A single description for both primary and secondary SRAS, which differs only in terms of the reliability of those services.
- Changes to the number of electrical subnetworks, consolidating several subnetworks and reducing the overall number of subnetworks from 10 to six.
- Regarding the SRAS quantity guidelines, AEMO proposed:
  - the removal of the current "floor" of two SRAS to be procured for each subnetwork area; and
  - instead, where technically feasible, AEMO would assume that an electrical sub-network can be restarted using an adjoining sub-network. In those cases, AEMO would procure sufficient SRAS to meet the SRS if interconnecting transmission lines were unable to provide restart capability. Where transfer capability did not exist (Tasmania), AEMO proposed to procure sufficient SRAS to meet the SRS with any one SRAS out of service.

Draft Report

The draft report of AEMO's consultation process was published in June 2014. The key recommendations made included:

- Changes to the SRAS description to specify how SRAS will be described, assessed and tested, with a focus on procuring SRAS primarily on the basis of meeting the requirements of the SRS.
- Recognition that individual, lower reliability SRAS may be combined to meet the reliability standard.
- Developing on the recommendations made in the Issues paper, AEMO proposed several further changes and clarifications to the SRAS quantity guidelines:
  - removal of the "floor" of two SRAS per subnetwork area;
  - removal of any reference to assumptions regarding supply from adjoining subnetworks; and
  - restating the assumption that the transmission network would be fully available, subject to their standard technical limitations, in the event of a black system condition.
- Clarification that the boundary between the QLD South subnetwork and the NSW subnetwork would fall across the existing Queensland / NSW regional border at the QLD / NSW Interconnector.

- For the next round of SRAS tenders to begin in July 2015, AEMO proposed a contract term of three years, with options for extension beyond this period.
- Consolidation of the current SRAS guidelines into a single document.

Final Report

The final report of AEMO's consultation process was published on September 2014. The key recommendations made were broadly similar to those made in the draft, with the following clarifications:

- The SRAS quantity guidelines would not specify a maximum or minimum number of SRAS to be procured. Instead, that number would be determined according to AEMO's evaluation of the number and combination of SRAS that will most efficiently meet the SRS for that sub-network.
- Any assumptions relating to availability of supply from adjoining sub-networks, availability of other SRAS sources and interconnectors, were deleted. AEMO specified that "the extent of a shutdown (whether NEM-wide or electrical sub-network-wide) is not relevant to achieving the SRS, as sufficient SRAS must be procured to meet the SRS for each electrical sub-network."[166]

166 AEMO, *SRAS Documents consultation - Final Report and Determination*, September 2014, p.17.