CONSULTATION ON SRAS GUIDELINE ELECTRICAL SUB-NETWORK BOUNDARIES NSCAS TENDER GUIDELINES

ISSUES PAPER

Published: **June 2017**

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

EXECUTIVE SUMMARY

System restart ancillary services (SRAS) can be used to re-energise a part of the National Electricity Market (NEM) power system following a black system or other major supply disruption. AEMO procures SRAS from generating units capable of starting and re-energising parts of the power system without taking supply from the power system.

The publication of this Issues Paper commences the first stage of the Rules consultation process conducted by AEMO to make the 'SRAS Guideline' under clause 3.11.7 of the National Electricity Rules (NER). AEMO proposes that the SRAS Guideline will also incorporate AEMO's determination of electrical sub-network boundaries under clause 3.11.8 of the NER.

The new SRAS Guideline will replace the set of SRAS guidelines published in September 2014, for SRAS procured with a contract start date on or after 1 July 2018. The SRAS Guideline will reflect the revised NER requirements introduced on 1 July 2015, and the AEMC Reliability Panel's final determination of the system restart standard (SRS) to apply from 1 July 2018.[1] In particular, the SRAS Guideline must be designed to meet the SRS at the lowest cost. This is the 'SRAS Procurement Objective'.

AEMO also intends to incorporate relevant learnings and recommendations resulting from the black system event in South Australia on 28 September 2016.

The most significant changes that the revised NER and SRS now require the SRAS Guideline to address include:

1. The individual reliability of each SRAS is to be assessed considering three mandatory elements: availability, start-up performance and reliability of any transmission components between the restart source and the delivery point (essentially the first transmission substation). AEMO also proposes to incorporate a redundancy factor (point of failure within the SRAS equipment) and an additional reliability factor to cover relevant plant attributes that are not otherwise accounted for.
2. In addition to the reliability requirements for individual SRAS, the SRAS Guideline must describe how AEMO assesses whether the SRAS procured (or to be procured) can be expected to meet the aggregate reliability requirement now specified in the SRS for each electrical sub-network. Essentially this assessment combines the expected individual service reliability with the diversity factors specified in the SRS. The aggregate reliability requirement will be a key determinant of the number and location of SRAS to be procured to meet the target supply restoration quantity and timeframes for each sub-network.
3. The SRS confirms that AEMO is to determine the boundaries of electrical sub-networks after assessing the technical characteristics that enable AEMO to procure adequate SRAS to coordinate a response to a major supply disruption. As far as practicable, a sub-network should be capable of remaining in at least a satisfactory operating state during the supply restoration process. AEMO is analysing whether the existing sub-networks meet the SRS requirements.
4. The revised SRS sets out the target restoration levels and timeframes that AEMO's procurement of SRAS should be designed to achieve for the existing electrical sub-networks. While these differ from the current standard, AEMO does not anticipate that AEMO's assessment and testing process or power system studies need to be materially different in nature from those in the current SRAS assessment guidelines. However, AEMO proposes to undertake more robust verification of test procedures and an additional ad-hoc test.
5. The NER now allows for significantly greater flexibility in the procurement of SRAS. AEMO proposes to allow for both competitive tenders and direct contract negotiations, depending on the

[1] Published 15 December 2016. Available: http://www.aemc.gov.au/Markets-Reviews-Advice/Review-of-the-System-Restart-Standard/Final/AEMC-Documents/Final-System-Restart-Standard.aspx

circumstances (to be specified in the SRAS Guideline). This flexibility will allow AEMO to move more quickly to procure any additional or replacement SRAS at any time, should it be necessary to meet an identified shortfall in meeting the SRS for a sub-network. Prospective SRAS providers will also be able to register their interest in providing SRAS with AEMO at any time.

For completeness, this consultation also addresses the requirement for AEMO to make new tender guidelines for Network Support and Control Ancillary Services (NSCAS), under clause 11.81.3 of the NER. Other than minor drafting and format amendments, AEMO proposes that the existing NSCAS Tender Guidelines will remain unchanged.

AEMO invites stakeholders to provide feedback on the Guideline as stated in the Notice of First Stage of Consultation published with this document.

CONTENTS

1. STAKEHOLDER CONSULTATION PROCESS

As required by the National Electricity Rules (NER), AEMO is consulting on the SRAS Guideline, boundaries of electrical sub-networks and NSCAS Tender Guidelines in accordance with rule 8.9 of the NER.

A glossary of terms used in this Issues Paper is at Appendix A.

AEMO has published an initial draft of the proposed SRAS Guideline (incorporating the boundaries of electrical sub-networks) with this Issues Paper to assist stakeholders in making submissions.

AEMO's indicative timeline for this consultation is detailed in the Notice of First Stage of Consultation published with this Issues Paper.

Submissions on the matters raised in this Issues Paper and any other matter relating to the proposed SRAS Guideline, boundaries of electrical sub-networks or NSCAS Tender Guidelines must be made in accordance with deadline stated in the Notice of First Stage of Consultation.

Either in submissions or prior to the submissions due date, stakeholders can request a meeting with AEMO to discuss the issues and proposed changes raised in this Issues Paper.

AEMO also intends to work with transmission network service providers (TNSPs) and generators on the provision of system design, settings, and other modelling information for plants and systems used in SRAS delivery. This data will allow AEMO to perform any additional dynamic or transient modelling required to assess any proposed SRAS to assist in future procurement processes. AEMO will also work with TNSPs regarding any defined technical issues relating related to proposed or contracted services.

2. BACKGROUND

2.1 System restart ancillary services

System restart ancillary services (SRAS) can be used to restore the power system following a major supply disruption, such as a black system event. As part of AEMO's power system security responsibilities, AEMO must procure adequate SRAS to enable it to coordinate a response to a major supply disruption.

Under the NER, SRAS can only be provided by facilities with 'black start capability'. That is defined as the capability to restart a disconnected generating unit and enable it deliver power to the network using an energy source independent of the power system. This is the initial step in energising other generators and restoring the transmission system to a point where it is capable of supplying load to customers.

The system restart standard (SRS) is determined by the Reliability Panel convened by the Australian Energy Market Commission (AEMC), and sets the key targets and guidelines for AEMO's procurement of SRAS. The SRS includes the levels of supply (generation and transmission) that the procured SRAS should be capable of restoring within specified target timeframes after a major supply disruption affecting an electrical sub-network in the National Electricity Market (NEM) power system.

2.2 Requirement for this consultation

With effect from 1 July 2015, the AEMC amended the NER to provide for a revised regime for the acquisition of SRAS.[2] The transitional rule made at that time (rule 11.81) required:

- The Reliability Panel to revise the SRS as soon as practicable after 1 July 2015, to take into account the NER amendments.
- AEMO to develop and publish the first SRAS Guideline and the network support and control ancillary services (NSCAS) tender guidelines, as soon as practicable after the AEMC publishes the SRS as revised by the Reliability Panel.

The AEMC published the Reliability Panel's determination of the revised SRS on 15 December 2016. The revised SRS will apply from 1 July 2018.

AEMO is now required to develop the SRAS Guideline and the NSCAS Tender Guidelines. At the same time, AEMO also needs to review the current electrical sub-network boundaries to determine whether they remain consistent with the revised guidelines in the SRS.

AEMO is consulting on all these matters in accordance with the Rules consultation procedures in rule 8.9 of the NER.

2.3 Amended regulatory requirements

2.3.1 SRAS Guideline

The NER

Clause 3.11.7(a1) of the NER requires AEMO to use reasonable endeavours to acquire SRAS to meet the SRS at the lowest cost. This is the SRAS Procurement Objective.

For this purpose, AEMO must develop and publish an SRAS Guideline under clause 3.11.7(c). The SRAS Guideline is to be designed to achieve the SRAS Procurement Objective and must include, in accordance with clause 3.11.7(d):

[2] *National Electricity Amendment (System Restart Ancillary Services) Rule 2015 No. 5*, Available at: http://aemc.gov.au/Rule-Changes/System-Restart-Ancillary-Services

(1) a description of the technical and availability requirements of SRAS;

(2) a process for meeting the aggregate required reliability of SRAS for each electrical sub-network (as set out in the SRS);

(3) a process for the modelling, assessment and physical testing of proposed SRAS, including any assumptions regarding the state of transmission elements during a major supply disruption;

(4) a process for determining the number and location of SRAS required for each electrical sub-network, consistent with the SRS;

(5) guidance on the factors AEMO takes into account when making a decision to follow a particular type of procurement process to acquire SRAS;

(6) a process for AEMO to follow for contacting a potential SRAS Provider to negotiate the provision of SRAS without a competitive tender process; and

(7) a process for a potential SRAS provider to contact AEMO to offer the provision of system restart ancillary services without a competitive tender process.

The SRS

The SRS specifies the target megawatt (MW) supply restoration capability, timeframes and aggregate SRAS reliability requirements for each of the current electrical sub-networks, as follows:

Table 1 – SRS restoration requirements

Electrical Sub-Network	Supply to be restored (MW)	Restoration Timeframe (hours)	Required Aggregate Reliability
Queensland North	825	3.5	90%
Queensland South	825	3.0	90%
New South Wales*	1,500	2.0	90%
Victoria	1,100	3.0	90%
South Australia	330	2.5	90%
Tasmania	300	2.5	95%

* In addition, SRAS procured in NSW should include sufficient SRAS to independently restart, without drawing power from the power system, at least 500 MW of generation capacity north of Sydney within four hours of a major supply disruption with an aggregate reliability of at least 75%.

In addition, the SRS includes guidelines for AEMO to follow in:

- Determining the aggregate reliability of SRAS. Aggregate reliability is the probability that generation and transmission in an electrical sub-network is expected to be restored to the specified level within the specified time. The SRS guidelines require AEMO to consider the expected reliability of individual SRAS (incorporating availability, start-up performance and reliability of transmission components within the service), in combination with an assessment of the electrical, geographical and energy source diversity of services procured.
- Determining the boundaries of electrical sub-networks (see section 2.3.2 below for further detail).
- Assessing the diversity of services. For the purposes of its aggregate reliability assessment, AEMO is to assess the impact of diversity of services, incorporating electrical, geographical and energy source diversity, in particular to account for any single points of failure.
- Determining the strategic location of SRAS for an electrical sub-network. The locational value of an SRAS is a measure of how its geographical and electrical location affects its ability to energise the transmission network and other generating units. A strategic location for an SRAS may be outside the electrical sub-network for which it is to be used.

2.3.2 Electrical sub-networks

Under clause 3.11.8 of the NER, AEMO must determine the boundaries of electrical sub-networks within the NEM for the purposes of acquiring SRAS and determining the system restart plan under clause 4.8.12 of the NER.

The SRS restoration targets (from 1 July 2018) have been set for the existing electrical sub-networks, as determined in September 2014, with an additional requirement for the restoration of a specified level of generation north of Sydney.

However, as the SRS also contains revised guidance for determining sub-network boundaries, AEMO must review the existing boundaries to confirm whether they will remain consistent with the SRS from 1 July 2018.

In determining these boundaries, the SRS requires AEMO to consider the technical characteristics that would facilitate the procurement of adequate SRAS to coordinate a response to a major supply disruption. These characteristics include:

- The number and strength of connecting transmission corridors connecting an area to the remainder of the power system.
- The electrical distance between generation centres.
- Whether a proposed electrical sub-network is capable of being maintained in a satisfactory state to the extent practicable during restoration, and in a secure operating state from a stage when AEMO determines it is practicable.

2.3.3 NSCAS Tender Guidelines

The 2015 NER amendments changed the previous requirements applicable to the procurement of SRAS, but the corresponding requirements for NSCAS remained unchanged. Prior to 1 July 2015, the NER addressed the tender guidelines for procuring both types of non-market ancillary services in a single rule (clause 3.11.5, NER version 71).

As a result, clause 11.81.3 of the NER requires AEMO to develop a new set of NSCAS Tender Guidelines.

3. SRAS GUIDELINE

An initial draft SRAS Guideline has been published with this Issues Paper. Stakeholders should note that the draft does not yet address all of the requirements of the NER and the SRS in detail. This section of the Issues Paper indicates how AEMO proposes to address each of the NER requirements to be included in the SRAS Guideline.

3.1 SRAS Description

3.1.1 Requirements

An SRAS can only be provided by generating units that can, following disconnection and without taking power from the grid, energise a point on the transmission network to facilitate the delivery of electricity to other generation units.[3]

The SRS provides that the reliability of any individual SRAS will incorporate the availability of that service, the expected start-up performance and the reliability of the transmission components between the SRAS source and the first transmission substation to which it is connected.

3.1.2 Proposed guideline

Capability and technical requirements

Consistent with the revised NER, SRAS are no longer categorised as primary or secondary restart services. Otherwise, however, AEMO proposes that the capability and technical requirements specified in the existing SRAS description will be largely unchanged.

SRAS individual reliability

Individual reliability is a measure of the ability of an SRAS source to contribute to meeting the aggregate reliability requirements for an electrical sub-network (aggregate reliability is further discussed in section 3.2 of this Issues Paper).

Consistent with the SRS, the reliability of an individual SRAS incorporates the following mandatory assessment parameters:

- The percentage availability of the SRAS source (proportion of trading intervals it is in service and capable of delivering the specified level of service).
- The start-up performance of the SRAS source (based on historical statistics).
- Reliability of the transmission components between the SRAS source and the delivery point (based on historical statistics).

AEMO also proposes to include two other factors in this assessment:

- A redundancy factor that represents the electrical diversity, or points of failure, within an SRAS source. For example, a service that could be initiated independently by any one of four units would have greater redundancy than one that relies on a single unit.
- An additional operational reliability factor that would take into account any attributes of the plant that are relevant to reliability but not captured by the other parameters. This might include availability of back-up fuel supplies, history of tripping in operation, or the ability to perform sequential starts.

Individual reliability of an SRAS can be determined in a number of different ways. AEMO is considering options for assessing and combining (or weighting) the above assessment parameters to determine

[3] See the definitions of 'system restart ancillary service' and 'black start capability' in Chapter 10 of the NER

individual reliability, and welcomes suggestions on these matters. AEMO will specifically seek to engage with SRAS providers and TNSPs on matters relating to transmission component reliability between SRAS components and up to the first terminal or substation on the transmission network

As the SRS provides for an aggregate reliability level for each sub-network, AEMO does not propose to set a minimum availability or reliability threshold for an SRAS source that can be offered to AEMO. AEMO will consider the individual reliability of SRAS when determining the combination of SRAS sources that meets the aggregate reliability requirement at the lowest cost. On that basis, an SRAS source with relatively low availability (compared with previous levels of 90% or more) could be part of the optimal mix.

3.2 Aggregate requirements for an electrical sub-networks

3.2.1 Requirements

The SRS requires AEMO to procure sufficient SRAS sources for each electrical sub-network to meet the supply restoration levels and target timeframes (detailed in section 2.3.1 of this Issues Paper), with a specified probability (aggregate reliability).

In determining the aggregate reliability of SRAS for an electrical sub-network, AEMO must incorporate an assessment of the impact of electrical, geographical and energy source diversity in the services, as described in clause 8 of the SRS.

3.2.2 Proposed guideline

Supply restoration requirements

AEMO has proposed a process for modelling and assessment of power system restoration in the SRAS Guideline that is substantially similar to the current process. The results obtained from the modelling and assessment of the restoration performance of each proposed SRAS will be used to assess its ability, individually and in combination with other proposed SRAS, to meet the restoration level and target timeframes for an electrical sub-network.

Aggregate Reliability

AEMO will consider the following factors in determining the aggregate reliability for each electrical sub-network (consistent with clauses 4 and 8 of the SRS):

- Individual SRAS reliability (see section 3.1.2 of this Issues Paper).
- Electrical diversity (single points of electrical or physical failure between services).
- Geographical diversity (single points of failure relating to the potential impact of localised events on multiple services).
- Energy source diversity (single points of failure of fuel supply between services).

AEMO intends to work with each transmission network service provider (TNSP) to identify any issues likely to impact the reliability of the transmission corridors associated with the SRAS sources within each electrical sub-network.

AEMO is considering options for the combination of these factors in a calculation to determine aggregate reliability, and welcomes suggestions on these matters.

AEMO notes the possibility that the identification of a specific formula in the SRAS Guideline may enable prospective SRAS providers to identify how their plant would rate against their competitors in the aggregate reliability determination. Accordingly there may be a need to balance an appropriate level of certainty for prospective providers against the potential for pricing outcomes that frustrate the achievement of the SRAS Procurement Objective.

3.3 Modelling, assessment and physical testing

3.3.1 Requirements

The SRAS Guideline must include AEMO's process for modelling, assessment and testing of the technical capability of each SRAS, and how AEMO will model the expected contribution of a proposed SRAS to the restoration of generation and transmission in an electrical sub-network. The Guideline must include AEMO's modelling assumptions about the state of transmission elements during a major supply disruption.

3.3.2 Proposed Guideline

General assessment requirements

As already noted, AEMO proposes that the general modelling, and assessment requirements will be similar to those in the existing SRAS assessment guidelines. AEMO welcomes any new generation technologies that have black start capability and can contribute to meeting the SRS requirements at the lowest cost.

Power system studies

AEMO proposes to conduct power system studies to assess proposed SRAS, similar to those in the existing SRAS assessment guidelines, with the additional objective now included in SRS - that each electrical sub-network must be maintained in:

- A satisfactory operating state to the extent practicable during the restoration process.
- A secure operating state from a stage in the restoration when it is practicable to do so.

In conducting power system studies for modelling purposes, AEMO proposes to assume that all transmission elements will be generally capable of operating within their technical limits. However, AEMO will take into account inoperability and other operating restrictions that AEMO identifies would result from black system conditions.

There are many disparate potential causes of a black system or other major supply disruption. While some of these could involve physical damage to network elements, AEMO considers that no meaningful probability of occurrence can be determined for any given part of the transmission network. It is also important to note that AEMO takes into account the possibility of failure of a relevant major transmission element when assessing the individual and aggregate reliability of SRAS procured for an electrical sub-network.

SRAS tests

The testing of SRAS capability is central to effective planning for the restoration process. To be effective, testing should simulate real event conditions as far as practicable. This objective will be reflected in the SRAS Guideline, SRAS agreements, and in the oversight of the testing process.

AEMO proposes that the SRAS test requirements will be similar to those in the existing SRAS assessment guidelines, but with an additional requirement for contracted SRAS providers to conduct at least two SRAS tests in any financial year. This will include:

- One test conducted at a date and time nominated by the SRAS provider, and agreed by AEMO.
- One test conducted when advised by AEMO on not less than 24 hours' notice, at a reasonable time having regard to market and system conditions.

These proposals are intended to respond to learnings from the black system event in South Australia on 28 September 2016. The additional test with 24 hours' notice is intended to provide greater assurance

that the contracted SRAS is ready to respond to a disruption event that could occur at any point in time, and an opportunity to identify any latent issues that could arise between annual tests.

3.4 Number and location of SRAS

3.4.1 Requirements

The SRAS Guideline must include a process for determining the number and location of SRAS to be procured for an electrical sub-network to meet the SRS. That process must also consider the strategic location (or locational value) of an SRAS, i.e. how its geographical and electrical location (whether inside or outside the relevant sub-network) best facilitates power system restoration.

3.4.2 Proposed guideline

The number and location of SRAS that AEMO procures for each electrical sub-network results from AEMO's determination of the combination of SRAS (where available from the offers made to AEMO) that will best meet the SRAS Procurement Objective. In making this determination, AEMO proposes to consider:

- Each aspect of the SRS to be met for that sub-network (quantity of supply to be restored, timeframe and aggregate reliability requirement).
- The amount of generation and transmission that can be restored by each SRAS and the time in which that can be achieved, based on AEMO's modelling and taking into account the location of the SRAS.
- The cost of SRAS offered.

In terms of number of services, for example, a combination of four services that can meet the SRS will be preferred over a combination of two services that is equally effective but has a higher cost.

In terms of location, the most strategically located SRAS source with the capability to restart several other large generating units using strong connections relatively close to large load centres will be valued above a service with a lower capability, but if a combination of two or more services in other locations can meet the SRAS at a lower cost, that combination will rank above the single most strategically located source.

The draft SRAS Guideline published with this Issues Paper indicates that the optimal combination of SRAS will be determined following the modelling and assessment process.

3.5 Procurement processes

3.5.1 Requirements

The SRAS Guideline must include guidance on the factors AEMO takes into account when making a decision to follow a particular type of procurement process to acquire SRAS, and a process for AEMO to follow for contacting a potential SRAS Provider to negotiate the provision of SRAS without a competitive tender process.

3.5.2 Proposed guideline

In developing proposed guidance on SRAS procurement processes, AEMO has had regard to the AEMC's considerations in the SRAS Rule determination, in particular the UK National Grid's procurement guidelines[4], and AEMO's own recent experience in procuring SRAS for the NEM.

[4] National Grid Electricity Transmission plc Procurement Guidelines version 14.0, effective 1 April 2016, available at: http://www2.nationalgrid.com/WorkArea/DownloadAsset.aspx?id=8589935070

During the 2015 SRAS procurement process, AEMO undertook extensive technical power system studies to model the restart capability of all SRAS sources for which expressions of interest were submitted. AEMO now has a reasonably comprehensive understanding of the current SRAS capability in the NEM. The SRAS Guideline will also provide a mechanism by which new potential sources of SRAS can offer capability to AEMO (see section 3.6).

On that basis, AEMO is able to assess the likelihood that competition will exist between Generators to provide SRAS for a particular sub-network and, therefore, whether a competitive tender process is likely to result in cost-effective outcomes. Where this is not the case, SRAS can be procured more efficiently through a targeted approach to the Generator or combination of Generators with the capability to provide the service(s) required to meet the SRS for a sub-network.

Circumstances may arise where an SRAS needs to be replaced before the end of its contract term in order to continue to meet the SRS – for example, because of permanent withdrawal of a generator, or long-term availability or reliability issues. Depending on the location and the combination of SRAS already procured, there may be only one feasible solution to fill the gap. Alternatively there may be limited competitive options but a direct approach to the potential providers will be justified because of timing imperatives to fill the gap, or because a replacement is required for a relatively short term.

In all cases where AEMO seeks to procure SRAS by direct negotiation, AEMO will be required to consider and approach all known SRAS Providers capable of contributing to meeting the SRS in the relevant electrical sub-network.

AEMO's proposed procurement processes and relevant considerations are included in the draft SRAS Guideline published with this Issues Paper. AEMO is currently reviewing the terms and conditions on which it will acquire SRAS, and will make the standard form of SRAS Agreement available for comment with the draft report on the proposed SRAS Guideline. The terms are expected to be similar to the current published form of SRAS Agreement, updated to reflect the revised SRS and SRAS Guideline and applicable recommendations and learnings from the 28 September 2016 black system event.

3.6 Unsolicited offers

3.6.1 Requirements

The SRAS Guideline must include a process for a potential SRAS provider to contact AEMO to offer the provision of system restart ancillary services without a competitive tender process. AEMO is not required to accept any such offer.

3.6.2 Proposed guidelines

The draft SRAS Guideline includes an ability for Generators to submit expressions of interest or offers to provide SRAS for one or more electrical sub-networks. AEMO considers that information should be kept confidential, subject to the National Electricity Law and NER.

AEMO would evaluate that information and any additional information necessary to establish the technical capability and performance of the proposed SRAS. If there is no immediate procurement need, AEMO would retain the information for a specified validity period and consider it in any procurement process undertaken at that time.

4. ELECTRICAL SUB-NETWORK BOUNDARIES

4.1 Requirements

Clause 3.11.8 of the NER provides that the power system is to be divided into electrical sub-networks for the purpose of acquiring SRAS and determining and implementing the system restart plan. AEMO must determine the boundaries of electrical sub-networks in accordance with the guidelines determined by the Reliability Panel under clause 8.8.3(aa)(5) of the NER.

Those guidelines are included in the SRS, which require AEMO to consider the technical characteristics that would facilitate the procurement of adequate SRAS to enable AEMO to coordinate a response to a major supply disruption. These technical characteristics would include, without limitation:

- 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.
- An electrical sub-network should be capable of being maintained in a satisfactory operating state to the extent practicable during the restoration process, and in a secure operating state from a stage in the restoration when it is practicable to do so, as determined by AEMO.

The target restoration quantities and timeframes have been specified in the SRS for the existing electrical sub-networks: Queensland North, Queensland South, New South Wales, South Australia, Victoria and Tasmania. For New South Wales there is an additional requirement for SRAS to be capable of restoring 500 MW of generation capacity (north of Sydney) within four hours of a major supply disruption with 75% reliability.

4.2 Proposed changes

The current boundaries for electrical sub-networks are defined in the existing SRAS Guidelines. AEMO is considering whether those boundaries continue to meet the revised requirements, noting that any boundary changes will require the Reliability Panel to review its determination of the supply restoration levels, timeframes and aggregate reliability of SRAS in each sub-network.

To inform this analysis, AEMO seeks feedback from all relevant TNSPs on any matters related to the technical characteristics identified in the SRS that AEMO should consider in its determination of electrical sub-network boundaries.

5. NSCAS TENDER GUIDELINES

The NER requirements for the procurement of SRAS were changed in July 2015 and moved to a different clause of the NER. They were previously expressed as requirements for tender guidelines for non-market ancillary services (both SRAS and NSCAS) in clause 3.11.5 of the NER.

The requirements for the NSCAS Tender Guidelines remain in clause 3.11.5 and are substantially unchanged from the previous combined requirements.

In fact AEMO's practice for some years has been to publish its Tender Guidelines for SRAS and NSCAS in separate documents. AEMO therefore proposes to re-issue the NSCAS Tender Guidelines with substantially the same content, updated as necessary to reflect the current NER.

Any changes to the NSCAS Tender Guidelines (last determined in December 2011) are expected to be minimal, therefore a draft has not been provided with this Issues Paper.

Stakeholders are invited to comment on whether they consider that substantive changes to the NSCAS Tender Guidelines are necessary.

6. SUMMARY OF MATTERS FOR CONSULTATION

AEMO invites submissions on any aspect of the proposed SRAS Guideline, electrical sub-network boundaries or NSCAS Tender Guidelines.

In particular, AEMO seeks stakeholder views on whether its proposed approach to the matters listed below is consistent with the SRS and the SRAS Procurement Objective.

- Technical and reliability requirements for individual SRAS.
- The proposed process for modelling, assessment and testing of the capability of individual proposed SRAS, including proposed assumptions about the state of the transmission network.
- The proposed process for meeting the aggregate required reliability of SRAS for each electrical sub-network.
- How AEMO proposes to determine the number and location of services with the capability to meet the SRS for each electrical sub-network.
- How AEMO proposes to determine an appropriate procurement option (competitive tender or selective negotiation), and the description of each process.
- The proposed process for generators to register their interest in providing new SRAS capability.
- Relevant technical information for AEMO's determination of electrical sub-network boundaries.

Stakeholders are also invited to and identify any areas where more information may be required, or propose feasible additional or alternative options that they consider might better meet the SRAS Procurement Objective from 1 July 2018, and are consistent with the national electricity objective in section 7 of the National Electricity Law.

APPENDIX A - GLOSSARY

This Issues Paper uses many terms that are defined in the NER. They have the same meanings here. In addition, the following terms have the meanings set out in the table.

Term or acronym	Meaning
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator Limited
MW	Megawatts
NEM	National Electricity Market
NER	National Electricity Rules
NSCAS	Network support and control ancillary service
NSCAS Tender Guidelines	The guidelines to be developed and published by AEMO under clause 3.11.5(b) of the NER.
SRAS	System restart ancillary service
SRAS Guideline	The guideline to be developed and published by AEMO under clause 3.11.7(c) of the NER.
SRAS Procurement Objective	The objective AEMO is to achieve by procuring SRAS, as set out in clause 3.11.7(a1) of the NER.
SRAS Provider	A Registered Participant who provides SRAS, or has offered to provide SRAS, to AEMO.
SRS	System restart standard (unless otherwise specified this refers to the version determined by the Reliability Panel and published by the AEMC on 15 December 2016, effective from 1 July 2018).
TNSP	Transmission Network Service Provider