

Notice that NSCAS gap remains in South Australia

July 2024

Notice under NER 3.11.3(c)





Important notice

Purpose

The purpose of this publication is to provide details of why AEMO considers that the Network Services and Control Ancillary Services gap identified in South Australian in the 2023 Network Support and Control Ancillary Services (NSCAS) Report will remain, after considering responses from the relevant TNSP under clause 3.11.3(b) of the National Electricity Rules (NER).

AEMO publishes these details in accordance with clause 3.11.3(c)(1) of the National Electricity Rules (NER). This publication is generally based on information available to AEMO as at 28 June 2024 unless otherwise stated.

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1 Summary

In December 2023, AEMO declared a Network Support and Control Ancillary Service (NSCAS) gap for Voltage Control in the South Australian region (relevant NSCAS Gap). This gap was documented in the *2023 NSCAS Report*¹ and represented an immediate need for up to 200 MVar² of voltage control in the Adelaide metropolitan area.

Following this declaration, AEMO sought advice from ElectraNet under clause 3.11.3(a) of the National Electricity Rules (NER) regarding the timing by which arrangements would be in place to meet the relevant NSCAS gap. ElectraNet subsequently responded under NER 3.11.3(b) and advised of their active work to address this gap via a Regulatory Investment Test for Transmission (RIT-T) – with a solution expected to be in place progressively across 2025-26.

After considering responses made under NER 3.11.3(b), AEMO considers that the relevant NSCAS gap will remain until a permanent solution is delivered by ElectraNet in mid-2026. As such, AEMO considers that it is necessary to acquire NSCAS to meet the relevant NSCAS gap to prevent an adverse impact on power system security in accordance with the power system security standards and must use reasonable endeavours to acquire NSCAS to meet the relevant NSCAS gap (NER 3.11.3(c)(2) and (4)).

This notice is being published to provide details of why AEMO considers that the declared NSCAS gap will remain, as required under NER 3.11.3(c)(3).

2 Background

NSCAS are defined in the NER as services with the capability to control the active or reactive power flow into or out of a transmission network. NER 3.11.6(a) describes the purposes for which these services can be used which include maintaining power system security in accordance with the power system security standards.

In preparing its annual NSCAS report under NER 5.20.3, AEMO must assess the need for these NSCAS and identify any NSCAS gaps³.

The NER gives Transmission Network Service Providers (TNSPs) primary responsibility for acquiring NSCAS (with or without a declared gap). However, AEMO is required to use reasonable endeavours to procure NSCAS under NER 3.11.3(c)(4), where it considers that:

- an NSCAS gap will remain after considering any response from the relevant TNSP under NER 3.11.3(b), and
- acquiring NSCAS to meet the relevant NSCAS gap is necessary to prevent an adverse impact on power system security and reliability of supply of the transmission network in accordance with the power system security standards and the reliability standard.

¹ AEMO. 2023 Network Support and Control Ancillary Services (NSCAS) Report. December 2023. Available via https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/system-strength-requirements/2023-nscas-report.pdf?la=en.

² The reactive power required from a solution that addresses this gap will depend on the network locations it is provided from.

³ NSCAS gap is defined in the NER as “Any NSCAS need that AEMO forecasts will arise at any time within a planning horizon of at least 5 years from the beginning of the year in which the most recent NSCAS Report applies.”

3 Discussion

3.1 An NSCAS Gap was declared for South Australia in December 2023

Since November 2021, South Australia has been operated with a minimum requirement of two large synchronous generators online. This represented a reduction from previous levels, following commissioning of four new synchronous condensers in the region to address a more onerous system strength requirement.

In June 2023, ElectraNet provided a revised set of limits advice that considered system operation with fewer synchronous generators online. As part of this advice, ElectraNet stipulated that operation with a single synchronous generating unit is only possible when a specific set of voltage controls conditions are met – including that demand is above 600 MW, a set of specific reactive power control devices is available, at least one 275 kV-connected synchronous generator is online, and there is no credible risk of South Australia separating from the NEM.

The revised limits advice confirmed that voltage control is one factor driving the current two generating unit requirement in South Australia; and that this requirement may be relaxed to a one-unit requirement under certain conditions where additional voltage control measures are met and fast-start resecure options are available in the region. Addressing this need in isolation is unlikely to result in a zero-unit requirement until PEC Stage 2 has been commissioned, and adequate grid reference testing has been conducted.

AEMO's 2023 NSCAS Report, published on 1 December 2023, modelled the latest limits advice and confirmed that a voltage control need did exist in South Australia when operating with fewer than two synchronous generating units online.

As this NSCAS need was unmet, and existed within the five-year planning horizon, AEMO declared an immediate NSCAS gap for up to 200 MVar⁴ of voltage control in the Adelaide metropolitan area during periods when South Australian demand is below 600 MW, and South Australia is not islanded or at credible risk of islanding⁵.

3.2 AEMO engaged with ElectraNet on mitigation arrangements

Prior to publishing the 2023 NSCAS Report, AEMO engaged with ElectraNet to understand the timing and actions being taken to address the identified NSCAS need. AEMO noted in this report that ElectraNet was progressing a voltage control RIT-T which was expected to close the declared NSCAS gap, and that this process included an invitation to non-network service providers.

Following declaration of the NSCAS gap in the 2023 NSCAS Report, AEMO sought formal advice from ElectraNet under NER 3.11.3(a) as to when arrangements would be in place to meet the declared NSCAS gap.

⁴ The reactive power required from a solution that addresses this gap will depend on the network locations it is provided from.

⁵ Two synchronous generating units are separately recommended for management of ramping events when South Australia is islanded or at credible risk of islanding.

During this engagement process, ElectraNet concluded their voltage control RIT-T⁶, and identified a preferred option to install six switchable 275 kV reactors in the Adelaide and South East regions, comprising of:

- five switched 275 kV reactors connected in the Adelaide metropolitan region. Three 60 MVar, at Parafield Gardens West, Torrens Island and Magill and two 50 MVar at Para and Cherry Gardens; and
- one 50 MVar switched 275 kV reactor at South East substation.

This preferred option also included implementing automatic control schemes for transmission-connected reactive plant and automation of on-load tap changers at 32 connection points. ElectraNet have taken early action by installing a system spare reactor at Cherry Gardens, which was commissioned in September 2023.

The preferred option is expected to take one-to-two years to design and construct, with commissioning taking place progressively and concluding in financial year 2026. The RIT-T did not identify a means of providing the necessary voltage control services any faster.

Based on ElectraNet's responses under NER 3.11.3(b), AEMO considers that the relevant NSCAS Gap will not be met until mid-2026.

3.3 AEMO considers that an NSCAS gap will remain

After considering ElectraNet's responses under NER 3.11.3(b), AEMO considers that the declared NSCAS gap will remain until a permanent solution is delivered by ElectraNet through delivery of their RIT-T outcomes in mid-2026.

Until then, the lack of sufficient voltage control services is likely to have an adverse impact on power system security in accordance with the power system security standards. As such, AEMO considers that it is necessary to progress procurement of NSCAS under NER 3.11.5 to prevent these adverse impacts.

4 Next steps

This notice is being published under NER 3.11.3(c)(3) to provide details of why, after considering ElectraNet's responses under NER 3.11.3(b), AEMO considers that the declared voltage control NSCAS gap in South Australia will remain.

Under NER 3.11.3(c)(4), AEMO will therefore use reasonable endeavours to acquire NSCAS to meet the relevant NSCAS gap in accordance with NER 3.11.5.

⁶ At https://www.electranet.com.au/wp-content/uploads/ritt/SA_Transmission_Network_Voltage_Control_PACR.pdf.