



Statement of Need under 3.11.12(a) of the National Electricity Rules – MSL Transitional Services

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Version: 1

Effective date: 23 December 2024

Status: FINAL

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Current version release details

Version	Effective date	Summary of changes
1	23 December 2024	First version

Executive Summary

Australians continue to invest in distributed photovoltaics (DPV) at world-leading levels. More than one-third of homes across the country now host rooftop solar systems, helping households and business reduce their energy bills and directly contributing to the decarbonisation of the energy system.

Given the growing aggregate contribution of DPV generation, there are increasing periods where DPV generation is very high relative to underlying demand, resulting in low demand from the grid. Minimum Operational Demand has been declining in all NEM *regions* in recent years and is forecast to continue this trajectory¹. In Victoria and South Australia, this decline has been particularly sharp².

Other types of consumer energy resources and behind-the-meter flexibility (including electric vehicles (EVs), storage and demand response) can be harnessed to 'soak up' excess DPV generation. However these capabilities are operationally limited at present, and will take time to develop and scale.

AEMO has identified the potential for scenarios to occur where the demand for grid-connected generation is so low that *power system security* violations would emerge, requiring new pre-emptive management actions.

The current approach to manage MSL conditions in Victoria is to *direct* battery energy storage systems (BESS) in South Australia and Victoria to assist with maintaining *power system security* during MSL2 or MSL3 events. The use of the *direction* powers in the NER are considered as a last resort.

As a result of a recent rule change, AEMO is now able to procure *transitional services* to address this emerging *power system security* issue. AEMO is seeking to meet the objectives of the 'Improving security frameworks for the energy transition' rule change³ by procuring *transitional services* to reduce or replace the need for *directions* to address emerging MSL conditions.

This Statement of Need describes in more detail the *power system security* need and the intended approach for addressing it under the new *transitional services* framework.

1. Introduction

1.1. Purpose and scope

This statement has been prepared in accordance with clause 3.11.12(a) of the National Electricity Rules (**NER**) in relation to the procurement of *transitional services* by AEMO to address *power system security* issues arising during minimum system load (**MSL**) conditions in Victoria and South Australia (**MSL Transitional Services**). This statement describes:

¹ See chapter 2.4 of 2024 ESOO https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2024/2024-electricity-statement-of-opportunities.pdf?la=en&hash=2B6B6AB803D0C5F626A90CF0D60F6374

² <https://aemo.com.au/-/media/files/initiatives/der/managing-minimum-system-load/2024-minimum-demand-and-emergency-backstop.pdf?la=en>

³ <https://www.aemc.gov.au/rule-changes/improving-security-frameworks-energy-transition>

- How MSL Transitional Services satisfy the *Transitional Services Objective*, that is how they will contribute to maintaining a secure power system in the transition to a low- or zero- emission power system.
- The *power system security* need necessitating the procurement of MSL Transitional Services, including:
 - The expected duration of the need; and
 - Why this *power system security* need cannot be met by an *inertia network service*, a *system strength service*, a *market ancillary service*, or a *NMAS*.
- AEMO’s intended process to procure MSL Transitional Services and its reasons for choosing that process.

This statement is focused on the need for *transitional services* in Victoria and South Australia. Refer to the Transition Plan for System Security⁴ for the work underway in other *regions*.

1.2. Definitions and interpretation

1.2.1. Glossary

Terms defined in the National Electricity Law and the NER have the same meanings in this Statement of Need unless otherwise specified in this clause.

Terms defined in the NER are identified in this Statement of Need by italicising them, but failure to italicise a defined term does not affect its meaning.

The words, phrases and abbreviations in the table below have the meanings set out opposite them when used in this Statement of Need.

Table 1: Terms or acronyms

Term or acronym	Meaning
BESS	Battery Energy Storage Systems
CER	Consumer Energy Resources
DNSP	Distribution Network Service Provider
DPV	Distributed photovoltaic is a type of CER that is a small-scale source of local solar generation that connects to the grid at the distribution level
FCAS	Frequency Control Ancillary Services
IBR	Inverter-based resources
ISF Rule	<i>National Electricity Amendment (Improving security frameworks for the energy transition) Rule 2024</i>
LOR	Lack of Reserve
Minimum Operational Demand	As defined in https://aemo.com.au/newsroom/media-release/minimum-operational-demand
MSOL	Minimum Safe Operating Level
MSL	Minimum System Load

⁴ https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/transition-planning/aemo-2024-transition-plan-for-system-security.pdf?la=en

Term or acronym	Meaning
MSL Framework	The framework developed by AEMO to maintain <i>power system security</i> during periods of low demand as summarised in Table 2
MSL Transitional Services	The <i>transitional services</i> the subject of this Statement of Need
NEM	National Electricity Market
NER	National Electricity Rules
NMAS	Non-Market Ancillary Services
NSCAS	Network Support and Control Ancillary Services
Operational Demand	As defined in AEMO Demand Terms in EMMS Data Model ⁵
Other NMAS	Any of an <i>inertia network service</i> , a <i>system strength service</i> , a <i>market ancillary service</i> or an <i>NMAS</i> which is not a <i>transitional service</i>
Regional Demand	Is the Operational Demand for a particular <i>region</i> ,
Statement of Need	This statement published under NER 3.11.12(a)
TNSP	Transmission Network Service Provider
VNI	Victoria to New South Wales Interconnector

1.2.2. Interpretation

The principles of interpretation set out in Schedule 2 of the National Electricity Law apply to this Statement of Need.

1.3. Related documents

Title	Location
Demand Terms in EMMS Data Model	demand-terms-in-emms-data-model.pdf
Transition Plan for System Security	https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/transition-planning/aemo-2024-transition-plan-for-system-security.pdf?la=en
2024 Electricity Statement of Opportunities	https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2024/2024-electricity-statement-of-opportunities.pdf?la=en&hash=2B6B6AB803D0C5F626A90CF0D60F6374
Victorian Minimum System Load Procedure Overview	Victorian Minimum System Load Procedure Overview
Engineering Roadmap FY2025 Priority Actions Report	https://aemo.com.au/-/media/files/initiatives/engineering-framework/2024/nem-engineering-roadmap-fy2025-priority-actions.pdf?la=en&hash=E934DFFF6D4544B9F117BAF6A6E4088D
Supporting secure operation with high levels of distributed resources	https://aemo.com.au/-/media/files/initiatives/der/managing-minimum-system-load/2024-minimum-demand-and-emergency-backstop.pdf?la=en
Transfer Limit Advice – System Strength in SA and Victoria April 2024	https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/congestion-information/transfer-limit-advice-system-strength.pdf

⁵ https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/dispatch/policy_and_process/demand-terms-in-emms-data-model.pdf https://aemo.com.au/-/media/files/electricityregion/nem/security_and_reliability/dispatch/policy_and_process/demand-terms-in-emms-data-model.pdf

Title	Location
Transitional Services Guideline	https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2024/transitional-services-guideline-consultation/transitional-services-guideline.pdf?la=en

2. Background

2.1. MSL conditions and current approach

Driven by constantly increasing levels of DPV, Minimum Operational Demand has been declining in all NEM regions in recent years and is forecast to continue this trajectory⁶. In Victoria and South Australia, this decline has been particularly sharp⁷.

The Victorian and South Australian power systems are now operating at times with very high levels of DPV and low load, such that power system security issues can arise. MSL conditions may arise on rare occasions, for example AEMO has identified possible scenarios where VNI export limit violates when there is very low demand in Victoria and South Australia.

The current approach to manage MSL conditions in Victoria is to direct battery energy storage systems (BESS) in South Australia and Victoria to assist with maintaining power system security during MSL2 or MSL3 events.

To support this approach, AEMO introduced the Minimum System Load framework (**MSL Framework**), summarised in Table 2. It aims to mirror the existing LOR framework used for low supply reserve conditions. The operational procedure currently used by AEMO is described in the “Victorian Minimum System Load Procedure Overview”⁸. This procedure is temporary and intended to apply for the spring and summer 2024-25 period only.

Table 2: MSL Framework

	Definitions	AEMO Actions
MSL1	Demand is two credible load contingencies away from MSL3	Monitor the situation. Publish MSL notice with MSL thresholds when forecast, which can be up to a week ahead.
MSL2	Demand is one credible contingency away from MSL3	Take actions required to land satisfactory and return to and remain secure within 30 minutes following a credible contingency.
MSL3	Forecast demand is insufficient to maintain a secure operating state	Additionally, instruct network service providers (NSPs) to maintain regional demand ⁹ above the MSL3 threshold.

⁸ https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/2024-11-01-vic-msl-procedure-factsheet_final.pdf?la=en

⁹ See <https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/data-nem/operational-demand-data> for details on electricity demand.

2.2. Transitional services NMAS framework

The objective of the new *transitional services* NMAS framework¹⁰ is to allow AEMO to procure *transitional services* with the aim to transition to a low- or zero-emissions power system where AEMO can maintain *power system security*. Procurement of Type 1 *transitional services* to address MSL conditions may enable increased DPV penetration whilst still maintaining *power system security*.

The AEMC also made it clear that the *transitional services* NMAS framework was also intended to help reduce the number of security directions that need to be issued by AEMO and that directions should not need to be relied on as a primary mechanism to procure services or system needs.

AEMO is hereby proposing to procure MSL Transitional Services, as Type 1 Services, from BESS service providers to reduce or replace the need for *directions* to address MSL conditions.

3. Statement of Need

3.1. Description of power system security need

As mentioned in the section above, the Victorian and South Australian *power systems* are now operating at times with very high levels of DPV and low *load*, such that *power system security* issues can arise. These issues can arise in rare operational conditions, particularly when operational demand is low, and there are network outages that reduce the export capability from Victoria to other *regions*.

AEMO must, wherever possible, adjust operating conditions so that the *power system*, following a *credible contingency event*, lands in a *satisfactory operating state* and can then be returned to a *secure operating state* (refer to NER clause 4.2.4) within 30 minutes.

If there is a *load* contingency or other unexpected event while operating below the MSL2 threshold, the power system may suddenly fall below the MSL3 threshold, where action is required to increase operational demand to return the *power system* to a *secure operating state*. It can take up to 90 minutes for DNSPs to activate their DPV backstop mechanisms to increase Operational Demand, creating situations in which AEMO would not be able to return the *power system* to a *secure operating state* in the time required. There is significant uncertainty on the extent and timeliness of the DPV backstop mechanism available to respond to such events.

For example, if the Victorian Operational Demand is less than the MSL2 threshold, a large *credible contingency event* (either a trip of the Alcoa Portland Smelter, or a trip of the Basslink interconnector), will result in the VNI exceeding the secure limits. AEMO has two options to restore and then maintain flow on VNI within secure limits:

1. Action by the DNSPs to increase Operational Demand (by operation of controlled loads, or limiting generation from DPV), of which the magnitude and timeliness of the response is not certain; and
2. Charging of the Victorian and South Australian scheduled BESS (as *loads*), which are an energy limited resource. Storage headroom needs to be reserved ahead of time to ensure this response is available.

¹⁰ <https://www.aemc.gov.au/rule-changes/improving-security-frameworks-energy-transition>

Since the magnitude and timeliness of the response from DNSP actions to increase Operational Demand in distribution networks are uncertain, AEMO seeks to acquire MSL Transitional Services in South Australia and Victoria to enable the second option to be available without the use of *directions*.

The need to manage these MSL conditions has already arisen and AEMO needs to procure MSL Transitional Services as soon as possible. Other processes and *NMAS* will not deliver the required near-term solutions, so AEMO seeks to contract with BESS service providers for the provision of MSL Transitional Services. These agreements would require BESS service providers to:

1. Provide a specific level of storage headroom at the start of an MSL period, which can be activated for MSL purposes.
2. Operate as required by AEMO when the service is activated during the MSL period to manage *power system security*.

3.2. Description of MSL Transitional Services

It is proposed that AEMO will use the MSL Transitional Services to contract BESS service providers in South Australia and Victoria to:

- Agree an appropriate time and methodology to discharge batteries to prepare for a given MSL event.
- Agree a guaranteed amount of power charging capacity for a given MSL event.
- Dispatch the charging capacity (batteries acting as a *load*), if needed to restore the power system to a *secure operating state* within 30 minutes (likely requiring response from BESS providers within 5-10 minutes), and maintain that *secure operating state* until other actions can be taken (such as activation of backstop mechanisms or restoration of *load*).

3.3. Duration of the need

In parallel with the procurement of MSL Transitional Services, AEMO is developing a range of tools and solutions to manage *power system* challenges during MSL conditions. These tools and solutions are being actively considered and developed over time, noting that their implementation through regulatory mechanisms will take time while the need for action is already present, especially in Victoria and South Australia¹¹. These include:

- Reducing the amount of generation that needs to remain online to provide essential services – this can be done by reducing the Minimum Safe Operating Levels (MSOLs) of essential units, or investment in new assets that can provide system services in other ways (such as synchronous condensers, batteries, and/or reactors).
- Increasing demand – practical options to increase responsive demand may evolve over time but are very limited at present. This may include new industries which increase flexible levels of demand, and may also include electrification of appliances and transport, and increased demand response and coordination of CER.

¹¹ See <https://aemo.com.au/-/media/files/initiatives/der/managing-minimum-system-load/2024-minimum-demand-and-emergency-backstop.pdf?la=en>

- Storing energy – storage can help move energy from daytime periods to other periods, particularly during emergency conditions. This capability will likely increase due to increased investment in storage technologies, and through the coordination of CER storages.
- Decreasing DPV generation – along with reducing generation from non-scheduled generating units (including embedded and exempt generation), it is crucial that adequate operational controls are available to actively manage DPV.

It is expected that the above solutions will take some time to implement and updates will be included in the 2025 Transition Plan for System Security. MSL Transitional Services have been designed as a transitional tool to meet the need for an MSL management solution, while other enduring solutions are being put in place. The expected duration of the *power system security* need for MSL Transitional Services is up to three years, noting that Type 1 contracts have a maximum duration of three years. However, specific *ancillary services agreements* for MSL Transitional Services are likely to have a shorter duration.

3.4. Meeting the Transitional Services Objective

The Transitional Services Objective is set out in NER 3.11.11(a) in these terms: “*The objective of transitional services is to acquire services that enable AEMO to maintain power system security in the transition to a low- or zero-emissions power system*”.

As discussed above, MSL issues are being caused by increasing levels of DPV in the NEM, during shoulder seasons (spring and autumn in southern NEM), specifically on sunny days with mild temperatures and already low Operational Demand (weekends or public holidays). MSL conditions occur during periods of high renewable penetration (DPV working at the peak capacity) and low levels of synchronous generation (decreased to its minimum if it is not required for system strength, FCAS, voltage control or reserve adequacy).

MSL Transitional Services will be used to maintain *load* reserves such that the *power system* can be returned to a *secure operating state* within 30 minutes following a credible *load* contingency, or other unexpected event which results in the *power system* suddenly becoming insecure (eg demand has fallen below the MSL3 threshold, or a security violation is arising).

BESS service providers have raised concerns with AEMO about the impacts the issue of *directions* are having on their projects’ ongoing economic viability, and the effect *directions* are having on new investment in BESS. AEMO considers that the use of MSL Transitional Services will provide greater certainty to BESS service providers than the continued sole use of *directions* to manage *power system security* during MSL conditions. The provision of MSL Transitional Services will enable AEMO to plan for provision of additional *load* during MSL events.

Having BESS contracted to be available during MSL events will reduce the need for market intervention by providing AEMO with an alternative mechanism to manage MSL conditions.

Effective use of Type 1 MSL Transitional Services contracts in place of *directions*, providing participants with more certainty on cost recovery, will help decrease the risk of declining investment in BESS in the NEM.

3.5. Why the service cannot be met by another NMAS

AEMO has determined that MSL Transitional Services are required for *power system security* but cannot otherwise be provided by an *inertia network service*, a *system strength service*, a *market ancillary service* or a *NMAS* (each an **Other NMAS**).

This is due to the urgency and real time operational nature of the identified need, the applicable time frames and requirements applicable to those services in the NER, the generation profile required in the lead up to and following an MSL period, as well as limitations on the planning assumptions and methodology.

The maintenance of *power system security* during MSL conditions currently requires a number of large synchronous units to remain online to deliver essential *power system security* services. Sufficient essential services can be provided within the present operational toolkit, however to ensure sufficient provision of these essential services, a minimum number of large synchronous units need to be in operation.

Essential services include system strength, *voltage* control, reactive power management, *inertia*, *frequency* control, and ramping management, which must be delivered at all times. Some technologies (such as synchronous condensers and batteries) can deliver many of these services with low or zero MSOLs, but these are only available to a limited degree at present.

Over time, other frameworks may deliver alternative methods of delivering these essential services such that the minimum number of large synchronous units required reduces. This will reduce the MSL thresholds, which could reduce the incidence of the potential BESS MSL Transitional Services being called upon.

The situations under which MSL Transitional Services are expected to be necessary in Victoria are currently outside the scope of the system-normal, committed project, and credible contingency scenario assumptions allowed under the NSCAS framework.

In particular, *transitional services* to manage MSL are likely to initially be required to maintain *power system security* during prior or multiple outage conditions, beyond the single *credible contingency events* covered under the NSCAS framework.

In December 2024 AEMO assessed the need for NSCAS within the NEM. The result of the assessment, based on the latest NSCAS Description and Quantity Procedure, was that there was no NSCAS *gap* in Victoria relating to MSL periods.

See April 2024 Transfer Limits Advice publication¹² for more information system strength unit combinations, and for more information on *power system security* risks see the 2024 NSCAS report¹³.

¹² https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/congestion-information/transfer-limit-advice-system-strength.pdf

¹³ See the 2024 NSCAS report section 2.5.1 subheading Low Demand Conditions https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/system_security_planning/2024-nscas-report.pdf?la=en.

3.6. Procurement process

In selecting a suitable procurement process for MSL Transitional Services, AEMO must follow the guidance in Chapter 2.3 of the Transitional Services Guidelines. AEMO has determined to follow the direct request for offer process for this procurement.

AEMO has determined that it is not practicable to run a competitive tender process for the acquisition of MSL Transitional Services because:

- The urgency of the identified need means that there is insufficient time to run such a process. It is AEMO’s intention to contract MSL Transitional Services as soon as possible. AEMO is expecting that MSL conditions are particularly likely to occur around Easter 2025.
- AEMO has determined that the MSL Transitional Services available from all potential providers is unlikely to exceed the level required to meet the identified need. Subject to market engagement, AEMO considers that all Victorian and South Australian BESS service providers could be potential service providers of MSL Transitional Services.

It is for these reasons that a direct procurement process is considered by AEMO the most effective and timely means to achieve the required outcomes.

After undertaking market engagement following the publication of this Statement of Need, AEMO will issue a request to all potential service providers that:

- to the best of AEMO’s knowledge, will be capable of providing MSL Transitional Services; and
- would assist in meeting the security requirement as set out in this Statement of Need.

4. Next Steps

AEMO’s proposed timing and next steps for procuring MSL Transitional Services are set out in Table 3.

Table 3: Tentative procurement timelines

Activity	Timeline
Market engagement	December 2024 and January 2025
Direct Requests for Offer submitted to potential service providers	January 2025
Offers received from potential service providers	February 2025
AEMO assessment of offers and contract negotiations	March 2025
MSL Transitional Services contracts in place	April 2025