

Minimum System Load (MSL) Procedure overview

Effective September 2026

This document is provided for explanatory purposes only and may be updated or amended. It does not constitute legal, business, engineering or technical advice and should not be relied on as a substitute for obtaining detailed advice about the NEL, the NER, or any other applicable laws, procedures or policies. AEMO has made reasonable efforts to ensure the quality of the information in this document but does not guarantee its accuracy or completeness.

Purpose

At times of very low electricity demand¹, the power system may have more generation operating than it can securely accommodate. AEMO uses the Minimum System Load (MSL) framework to identify these conditions early and coordinate appropriate actions with industry to maintain power system security.

This overview explains the System Normal MSL procedure² for the mainland National Electricity Market, including how MSL thresholds³ are determined, how AEMO communicates forecast conditions, and the actions AEMO and participants may take. It also explains the circumstances in which AEMO may issue a direction.

This overview covers system normal conditions only. Different arrangements may apply when South Australia or Queensland is operating as an island or at risk of islanding. Tasmania is outside the scope of this procedure.

AEMO will monitor and update its approach to management of MSL conditions as necessary as further information becomes available over time. The National Electricity Law (NEL) and the National Electricity Rules (NER) take precedence over the MSL procedure, and AEMO may also act inconsistent with the procedure outlined in this overview at any time if needed to deliver on its responsibilities under the NEL or NER.

MSL framework

The MSL framework is intended for managing low demand conditions to maintain system security. It is based on system security principles defined in the NER, with a notification framework developed based on the Lack of Reserve (LOR) notification framework, as summarised in Table 1.

Table 1 – MSL Framework

	Definition	AEMO actions
MSL1	Demand is two credible contingencies ⁴ away from MSL3	Monitor the situation. Publish MSL market notice with MSL thresholds when forecast (up to a week ahead).

¹ Where the MSL procedure refers to demand, it refers to operational demand less significant non-scheduled generation. This demand term is also used in Projected Assessment of System Adequacy (PASA). See definitions at <https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/data-nem/operational-demand-data> and the Demand Terms in EMMS Data Model document, available here: <https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/market-operations/policy-and-process-documentation>.

² As AEMO's MSL procedure is an internal-only document, this overview is intended as a reference for industry on the MSL procedure.

³ The MSL thresholds specify levels of low demand at which system security risks may arise in a region, and are dynamic based on system conditions. When actual or forecast demand falls below the MSL1, MSL2 or MSL3 threshold, the corresponding MSL condition exists or is forecast to exist.

⁴ This includes network and load contingencies.



	Definition	AEMO actions
MSL2	Demand is one credible contingency away from MSL3	Take available actions to clear the MSL2 condition if possible. Take actions required to land satisfactory and return to and remain secure within 30 minutes following a credible load contingency.
MSL3	Demand is insufficient to maintain a secure operating state.	Take any residual MSL2 management actions available. Additionally, instruct network service providers (NSPs) to maintain demand above the secure threshold.

MSL thresholds

As noted in Table 1, the MSL3 threshold is defined by the level of demand at which security violations are likely to occur. This will manifest in the NEM's dispatch engine (NEMDE) as a violation of an interconnector limit, FCAS requirement, or a regional supply-demand balance constraint. The demand level at which this may occur depends on a range of system conditions, including:

1. **Interconnector power transfer capability out of a region**, including any network outages⁵ that reduce this capability.
2. **Any network or unit outages that affect voltage management capability in the region**. This may require additional or different units to remain operating to manage transmission voltages.
3. **Demand in neighbouring regions**. If demand is simultaneously low in a neighbouring region, this can limit the potential to export.
4. **The combination of units operating in MSL conditions**. This may include more than the minimum number of units required to deliver essential system services (such as system strength, inertia, frequency control and voltage control) and resource adequacy (including consideration of impacts on the evening peak or subsequent days).⁶
5. **The minimum safe operating level (MSOL) of units operating in MSL conditions**.
6. **Charging behaviour of bidirectional units (BDUs)**: The charging behaviour of these units during the daytime demand "trough" period (where high distributed energy resource generation can result in low demands) can improve MSL conditions.

These interdependent factors mean that MSL thresholds change continuously as power system conditions change. AEMO tracks the relevant factors and releases market notices when MSL conditions are forecast, so that management actions can be coordinated efficiently with sufficient lead time.

Market information on MSL thresholds

AEMO releases market notices of MSL1, 2 and 3 conditions up to 7 days ahead. The market notices include details about:

- The MSL condition (e.g. forecast or actual MSL1, 2 or 3), and
- The region the MSL condition applies to, and

⁵ To manage high voltage conditions during low demand periods, AEMO may intentionally instruct the TNSP to de-energise lines. This could also reduce interconnector power transfer capability out of a region.

⁶ If there are outages of units with smaller Minimum Safe Operating Levels (MSOLs), then it may be necessary to operate a unit combination with a higher loading requirement to deliver essential services. This will increase the level of the MSL thresholds.



- The MSL1, 2 and 3 thresholds, based on system conditions at the time and the latest information available to AEMO.

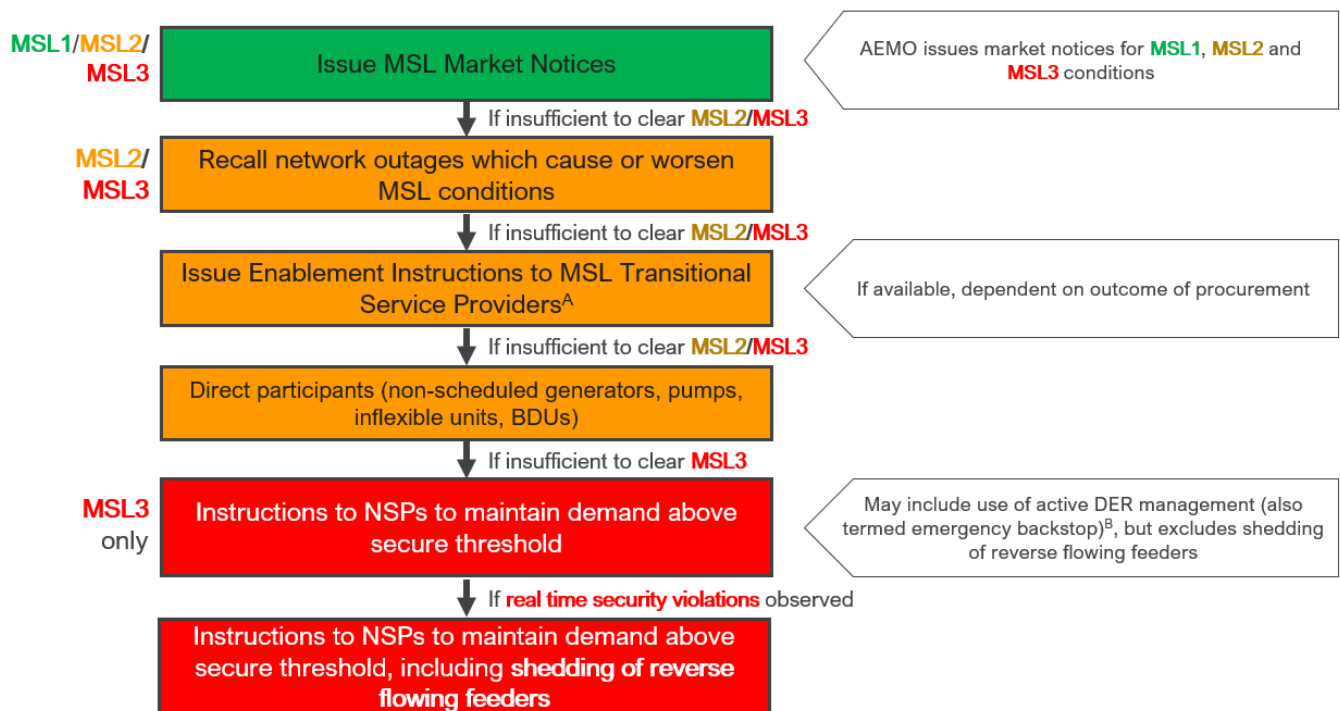
An updated market notice will be released if MSL conditions change substantially, including information on the updated MSL thresholds. This might occur in response to actions taken to clear a MSL2/MSL3 condition.

A market notice will also be issued if directions and instructions are given to manage power system security related to MSL.

AEMO's approach to manage MSL conditions

AEMO's approach to managing power system security during MSL conditions is summarised in Figure 1. This approach is based on the Power System Security Guidelines⁷, and illustrates the order of actions AEMO is likely to consider when managing MSL conditions. The figure is a suggested priority order of actions only and AEMO will determine the appropriate action, or combination of actions at the time, based on power system conditions, the effectiveness and availability of each option, and its obligations under the NER.

Figure 1 – MSL management suggested priority order (as of September 2026)



^A Further information on the MSL Transitional Services procurement can be found at: <https://www.aemo.com.au/consultations/tenders/provision-of-minimum-system-load-transitional-services-nem-wide>.

^B These measures are safeguards of last resort and are only considered where necessary to maintain or restore power system security. The specific actions available will depend on each jurisdiction's arrangements and the conditions at the time.

⁷ AEMO (20 July 2026) Power System Security Guidelines, https://www.aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_3715-power-system-security-guidelines.pdf



MSL directions to participants and expected actions

Charging by BDUs can help absorb energy during periods of low operational demand. The updated MSL procedure takes expected BDU charging behaviour into account when calculating MSL thresholds, which is expected to reduce the need for directions.

If MSL directions become necessary, decisions are driven by power system security and reliability requirements, with reasonable endeavours taken to minimise costs related to a direction. The options described in Table 2 are in a suggested priority order, but the circumstances at the time will dictate which particular options will be utilised in managing an MSL condition. All actions are taken at the latest time, with reference to the action lead time⁸.

Table 2 – Expected MSL directions to participants to manage system security

Type of unit	MSL direction	Description
Flexible units (semi-scheduled units, fast start units)	No direction expected under system normal conditions	Flexible units are expected to respond to price signals and NEMDE dispatch, including reducing generation as MSL conditions arise without need for direction.
Non-scheduled generators (NSG)	Direction to 0 MW	Applicable to NSG in a region. In most cases, this is enacted via network service providers (NSPs) and applies to large or significant NSG.
Pumps	Synchronise or remain synchronised and follow dispatch targets	Applicable to all pumps in a region, if commercially unavailable ⁹ . In MSL2, if a pump selected for direction can respond in less than 30 mins, the direction is given post-contingent ¹⁰ .
Inflexible units ¹¹	Maintain 0 MW output at [HRS] on [DATE]	AEMO will not direct units to 0MW if they are required for system security, reliability, or other essential services including reserve adequacy. If AEMO needs to direct an inflexible unit to 0 MW, the decision will be based primarily on the requirements of power system security and reliability. Relevant considerations may include the unit's minimum safe operating level, reactive power capability, expected return-to-service time and the prevailing operational conditions. In MSL2, if a unit selected for direction can reduce generation to 0 MW in less than 30 mins, the direction is given post-contingent¹⁰. Where technically suitable alternatives are available, AEMO may also consider whether units have recently been subject to an MSL direction. The relative importance of these factors will depend on conditions at the time. If a unit is selected for direction, AEMO issues direction and places a direction constraint on the unit, considering the time required to safely reduce generation to 0 MW.
BDUs	Synchronise or remain synchronised and follow dispatch targets.	AEMO may direct eligible BDUs where: - an MSL2 or MSL3 condition is forecast or in dispatch and the available charging headroom of the regional BDU fleet¹² is insufficient to support management of the condition, or - an MSL3 condition is forecast within 90 minutes. Where a direction is required, it may apply to available BDUs in the affected region with a nameplate energy capacity greater than 50 MWh. A direction may require a BDU to synchronise or remain synchronised and follow dispatch targets. Associated constraints may be used to preserve charging capability and prevent discharge and lower regulation participation during the relevant MSL condition.

The timeline of expected actions to manage MSL conditions is summarised in Table 3.

⁸ This is the latest possible time at which the action would be effective to manage the MSL condition, accounting for technical requirements.

⁹ Commercially available pumping load is accounted for automatically in the MSL threshold, so no direction is required for commercially available pumps.

¹⁰ This means that the direction would be given following a contingency event (or any unexpected deterioration in conditions) that results in a forecast or actual MSL3.

¹¹ This refers to units which have MSOL for technical and plant safety reasons and are hence inflexible at their MSOL, as noted in AEMO's Dispatch Procedure SO_OP_3705, section 9.4: https://www.aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_3705-dispatch.pdf?rev=730b1e5b46c24eaaab40e28d67f49a5f&sc_lang=en.

¹² This is calculated based on SCADA data on current state of charge (SOC), and registration data of the installed MWh capacity of the BDU.



Table 3 – Expected actions during MSL conditions

AEMO actions	Participant actions
Up to 7 days ahead: - Publish MSL1/MSL2/MSL3 market notices (MNs) - Contact inflexible unit participant trading desks to confirm key unit parameters	- No immediate action is required. Participants should continue to submit bids and rebids in accordance with the NER and applicable AER guidance, accurately reflecting their current operational capability. Early and accurate information assists AEMO to assess and manage forecast MSL conditions¹³. - Inflexible units: When contacted by AEMO, confirm current operating parameters and ensure that information provided to AEMO accurately reflects the unit's operational capability, and update bids if necessary¹³. It is requested that participants keep AEMO informed of changes to MSOL (e.g. if the unit is operating in an unusual condition that might increase MSOL).
In the hours prior to a forecast MSL2/MSL3: - Contact inflexible unit participant trading desks to confirm key unit parameters. - Take actions as necessary to clear MSL2 & MSL3 (e.g. recall network outages, enable MSL Transitional Services), accounting for anticipated participant behaviour. Each action taken at the latest time to act.	- Inflexible units: When contacted by AEMO, confirm current operating parameters and ensure that information provided to AEMO accurately reflects the unit's operational capability, and update bids if necessary¹³. - All participants: be ready for direction if given
If MSL2/MSL3 condition persists, issue directions to participants, as per Table 2. MSL directions do not include the time at which they will be cancelled, as MSL conditions are dynamic.	- All technologies: respond to direction if given. It will assist the MSL condition to make market-based decisions early and reflect in bids, as outlined in the 'desired responses during MSL conditions' factsheet¹³ - Inflexible units: respond to direction if given and update bids if necessary and in accordance with the NER¹⁴. - BDUs: respond to direction if given. If the BDU reaches any technical limit, consider updating bids if necessary and in accordance with the NER¹⁴.
Direction cancellation: - For BDUs: at the earlier of end of the MSL2 and MSL3 condition, or 1600h unless in MSL3 - For all other participants: at the earlier of end of all MSL conditions, or 1600h unless in MSL3	Participants resume market behaviour

Further details on technology-specific approaches taken in the MSL procedure are outlined on AEMO's website¹⁵.

Keeping stakeholders informed

The Quarterly NEM LOR Framework Report includes analysis of MSL conditions¹⁶. AEMO will also provide further information and analysis in market event reports¹⁷ if AEMO directions were given, and in incident reports for reviewable operating incidents¹⁸.

¹³ Desired responses during MSL condition are outlined here: https://www.aemo.com.au/-/media/files/learn/fact-sheets/2025/effective-market-responses-to-msl-and-dpvc-market-notice.pdf?rev=3980fb2649ce4ffd95e0b174593230dc&sc_lang=en.

¹⁴ Refer to NER 4.8.9 for obligations regarding compliance with directions, as well as AEMO's *Procedures for issue of directions and clause 4.8.9 instructions* (4 July 2024), available: https://www.aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_3707-procedures-for-issue-of-directions-and-clause-4-8-9-instructions.pdf?rev=46e86b5772534af7aea52619c8ab4a3b&sc_lang=en.

¹⁵ AEMO, *Managing Minimum System Load (MSL)*, 'The MSL framework', available: <https://www.aemo.com.au/initiatives/major-programs/nem-distributed-energy-resources-der-program/managing-distributed-energy-resources-in-operations/managing-minimum-system-load>.

¹⁶ AEMO, *NEM Lack of Reserve Framework Quarterly Reports*, available: <https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/system-operations/power-system-operation/nem-lack-of-reserve-framework-quarterly-reports>

¹⁷ AEMO, *Market event reports*, available: <https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-events-and-reports/market-event-reports>

¹⁸ AEMO, *Power system operating incident reports*, available: <https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-events-and-reports/power-system-operating-incident-reports>. An example incident report which contains references to capabilities to increase demand can be found here: AEMO (May 2023) Trip of South East Tailem Bend 275kV lines on 12 November 2022, Section 4, https://aemo.com.au/-/media/files/electricity/nem/market_notices_and_events/power_system_incident_reports/2022/trip-of-south-east-tailem-bend-275-kv-lines-november-2022.pdf?la=en&hash=A89F330CF6C979E52EF15EB86E5CF058



For further information, refer to:

- AEMO's [MSL webpage](#) for more information, including MSL briefing slides for industry and measures to increase demand (e.g. active DER management, also termed emergency backstop).
- Power System Security Guidelines¹⁹
- AEMO's Dispatch Procedure²⁰
- The Australian Energy Regulator (AER) Rebidding guidelines²¹
- AEMO's Procedures for issue of directions and clause 4.8.9 instructions²².

Contact

For additional information please contact: OperationsStakeholders@aemo.com.au.

¹⁹ AEMO (20 July 2026) Power System Security Guidelines, https://www.aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_3715-power-system-security-guidelines.pdf

²⁰ AEMO (1 April 2026) Dispatch Procedure SO_OP_3705, https://www.aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_3705-dispatch.pdf?rev=730b1e5b46c24eaaab40e28d67f49a5f&sc_lang=en.

²¹ AER, Rebidding and technical parameters guidelines, <https://www.aer.gov.au/industry/registers/resources/guidelines/rebidding-and-technical-parameters-guidelines>.

²² AEMO, *Procedures for issue of directions and clause 4.8.9 instructions*, available: https://www.aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_3707-procedures-for-issue-of-directions-and-clause-4-8-9-instructions.pdf?rev=46e86b5772534af7aea52619c8ab4a3b&sc_lang=en.