Victorian Minimum System Load Procedure Overview

November 2024

Purpose

This overview is intended to assist industry in understanding the application of the Minimum System Load (MSL) procedure for Victoria. It provides a brief description of the MSL framework, how MSL procedures will be applied to Victoria during a MSL event and threshold definitions.

Framework

The MSL framework is summarised in Table 1. It aims to replicate the existing Lack of Reserve (LOR) framework and is intended for managing low demand conditions to maintain system security.

Table 1 - MSL framework

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

The operational procedure used by AEMO for managing MSL periods in Victoria in Spring 2024 and Summer 2024/25 is summarised in Table 2. This procedure will be updated iteratively, to continue delivery of AEMO's responsibilities as further information becomes available over time. AEMO may also act outside of this procedure at any time if needed to deliver on its responsibilities under the National Electricity Rules (NER).

Where this procedure refers to demand, the value used is the demand used in Projected Assessment of System Adequacy (PASA), which refers to operational demand[1] but excludes the contribution from non-scheduled intermittent generation ≥ 30 MW[2].

Table 2 – AEMO MSL procedure in Victoria (as at 1 November 2024)

Notice Level	Actions
Forecast or actual demand < **MSL1** threshold	• Publish MSL1 market notice (includes MSL1, 2, 3 thresholds)

[1] Operational Demand in a region is demand that is met by local scheduled generating units, semi-scheduled generating units, and non-scheduled intermittent generating units of aggregate capacity ≥ 30 MW, and by generation imports to the region and by Wholesale Demand Response. It excludes the demand met by non-scheduled non-intermittent generating units, non-scheduled intermittent generating units of aggregate capacity < 30 MW, exempt generation (e.g. rooftop solar, gas tri-generation, very small wind farms, etc), and demand of local scheduled loads.

[2] This also includes the exceptions noted in Section 1.2 of Demand Terms in EMMS Data Model

Notice Level	Actions

Forecast or actual demand < **MSL2** threshold	• Publish MSL2 market notice.
	• Notify AusNet and ElectraNet.
	• Contact scheduled unit traders for information on technical limitations.
	• Take all available actions necessary to clear the MSL2 condition. Each action is taken at the relevant Latest Time to Intervene, so that actions are informed by latest possible forecasts. Actions to be taken if feasible include:
	  ○ Recall any planned network outages that reduce VIC->NSW or VIC->TAS export capability.
	  ○ Constrain any significant non-scheduled generation to 0 MW (if they are still operating).
	  ○ Decommit scheduled units in Victoria if not required for essential system services and their bids indicate they intend to continue operating during the MSL2 period.
	  ○ Move to a smaller minimum unit combination in South Australia for delivery of essential system services (if available).
	• Notify AusNet and ElectraNet and re-release Market Notice if MSL1, 2, and 3 thresholds have changed >125 MW following actions taken.
	If these actions are not sufficient to clear the MSL2 condition, then:
	• 0700-0900hrs: Direct Battery Energy Storage Systems (BESS) in VIC and SA to remain available and follow dispatch targets#. Apply constraints to BESS in VIC and SA to progressively discharge to reach pre-agreed minimum state of charge levels.
	• 0900-1300hrs: Direction remains in place until 1300 or MSL2/3 condition is no longer forecast. Apply constraints to BESS to hold them in reserve dispatched at 0 MW. BESS will automatically receive targets to start to charge if necessary to avoid a security violation.

Forecast or actual demand < **MSL3** threshold
 	
OR
 	
Security violations in forecast or dispatch
	• Publish MSL3 market notice.
	• At the Latest Time to Intervene^ (so actions are based on the latest possible forecast), instruct:
	  ○ AusNet to maintain VIC demand above the VIC threshold*
	  ○ ElectraNet to maintain SA demand above the SA threshold*
	• Apply a bias to the demand forecast to represent actions taken.

1300hrs or MSL2/3 condition no longer forecast	• Cancel directions and remove constraints on BESS.
Demand > MSL1, or 1800hrs	• Cancel instructions, directions and market notices.

This direction is applied to all fully commissioned BESS in VIC and SA with storage capacity > 15 MWh and that are registered as bidirectional units (BDUs).

^ Based on DNSP advice, the Latest Time to Intervene for emergency backstop activation is 90 minutes. This may be revised as DNSPs implement improved systems to activate mechanisms more rapidly.

* The individual demand thresholds for VIC and SA are calculated based on the total amount of demand increase required in Victoria to clear the security violation. The split of this amount is then determined based on the relative contribution of each region to that security violation. Based on historical periods, this amount is typically 10% contribution from SA (or less if SA has minimal exports to VIC), and the remainder of the contribution in Victoria.

Threshold definitions

The VIC MSL3 threshold is defined by the level of Victorian demand at which security violations are likely to occur. This will manifest as a violation of the Victoria to New South Wales Interconnector (VNI) export limit. The demand level where this occurs changes depending on a range of system conditions, including:

- The availability of the Basslink interconnector (if Basslink is unavailable, VIC MSL issues will arise at higher VIC demand levels since it is not possible to export to Tasmania).
- Any outages of transmission network equipment that affect the VNI export limits.
- Any network or unit outages that affect voltage management capability in VIC and SA. This may require additional or different units remain operating to support transmission voltages.
- The possible need to intentionally de-energise 500kV lines in Victoria to manage high voltage conditions within acceptable ranges (which reduces VNI export limits).
- The demand levels in SA (if demand is simultaneously low in SA, this can lead to "forced" flows on the Heywood Interconnector into Victoria). This can be affected by outages of major loads in SA.
- The combination of minimum units that need to operate in SA and VIC to deliver essential system services (such as system strength, inertia and voltage control). 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.
- The MSOLs of these essential units. These may change, for example if market participants implement new measures to operate at lower MSOL levels, or if the unit is operating in an unusual condition.

These interdependent factors mean that MSL levels change continuously as the power system status changes. Based on present studies, the VIC MSL3 threshold can be as low as ~640 MW under some conditions, and as high as ~1,610 MW under conditions with multiple outages. These values are subject to change.

Keeping stakeholders informed

AEMO uses the following operational mechanisms to keep stakeholders informed on MSL:

- In week-ahead and real-time operations, AEMO releases market notices if there are forecast or actual MSL issues. MSL1 notices include the MSL1, 2 and 3 levels.
- From 31 October 2024, the quarterly NEM LOR Framework Report will include analysis of MSL conditions[3].
- If backstop mechanisms are activated and the event is considered significant, AEMO will also provide further information and analysis in an incident report[4].

Contact

If you have any further questions, or need additional information please contact us at OperationsStakeholders@aemo.com.au.

[3] https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/system-operations/power-system-operation/nem-lack-of-reserve-framework-quarterly-reports

[4] For example: 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