Minimum Demand Threshold Management

Including Emergency Solar Management (ESM)

Presented to WA Electricity Consultative Forum
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Agenda

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Context

- One of the priority recommendations of AEMO's 2021 Renewable Energy Integration - SWIS Update report, was the introduction of capability to allow curtailment of rooftop PV to ensure power system security.
- This became a requirement for all new or upgraded PV grid connection applications (less than 5 kVA) after the 14th February 2022.
- The instruction of Emergency Solar Management (ESM) is a last resort action that AEMO will take to ensure power system security.
- Commissioning of grid scale storage will allow us to push the limits of system operation further, and the longer term intent is for this capability to be used to support the integration of DER into the relevant markets.
- This presentation describes AEMO's process for activating this protocol and the relevant market notifications.

New Concepts

Minimum Demand Threshold (MDT)

- Maintain sufficient levels of Ancillary Services in the system;
- Maintain a secure operating state;
- Withstand a credible contingency;
- Ensure effective operation of system protection schemes to avoid a system black event.

MDT Notice

- New market notification to express when an MDT event is likely to occur, when market interventions are used and when curtailment of DPV is occurring.
- This will be done as a Dispatch Advisory.
- This notification provides improved visibility of the increased likelihood and occurrence when ESM is implemented.
- A similar approach is being used in the NEM (South Australia).

MDT Event

- An MDT Event is defined at any point the system demand would surpass the threshold without intervention.
- The event also considers the duration in which the forecast predicts the system demand would surpass the threshold.

Summary of MDT Operations Protocol

When the demand forecast indicates the demand is expected below the MDT:

T-3 Days

- Notification is sent to Western Power indicating likelihood of an MDT Event Day.

T-1 Day

- New notification sent to Western Power based on more accurate forecast, confirming likely MDT Event Day;
- Western Power provides available MDT Management (MDTM) capacity amounts;
- **MDT 1 Notice** issued (Dispatch Advisory) for information to market.

On the Day

- AEMO Control room confirms details with Western Power Control room;
- **MDT 2 Notice** issued when additional actions are being taken.

2 Hours before (MDT + 50MW)

- AEMO declares Emergency Operating State;
- Instruct Western Power to maintain system load above MDT;
- **MDT 3 Notice** is issued and MDTM occurs (inclusive of ESM).

Close Out

- Restoration of any actions taken under MDTM;
- All 3 MDT Notice Dispatch Advisories are withdrawn;
- System returns to Normal Operating state.

MDT Notice

Dispatch advisories with the relevant notifications will be issued to the market:

MDT Notice 1

This will be expected to occur one day prior to the MDT event and will line up with the latest forecast to Western Power.

This notice shares that challenging operating conditions are forecast.

MDT Notice 2

This will occur after the MDT Notice 1 is in place and on the morning of, just prior to system interventions being applied.

This notice shares that AEMO is taking available steps to maintain system security, such as recalling planned outages or constraining larger generators.

MDT Notice 3

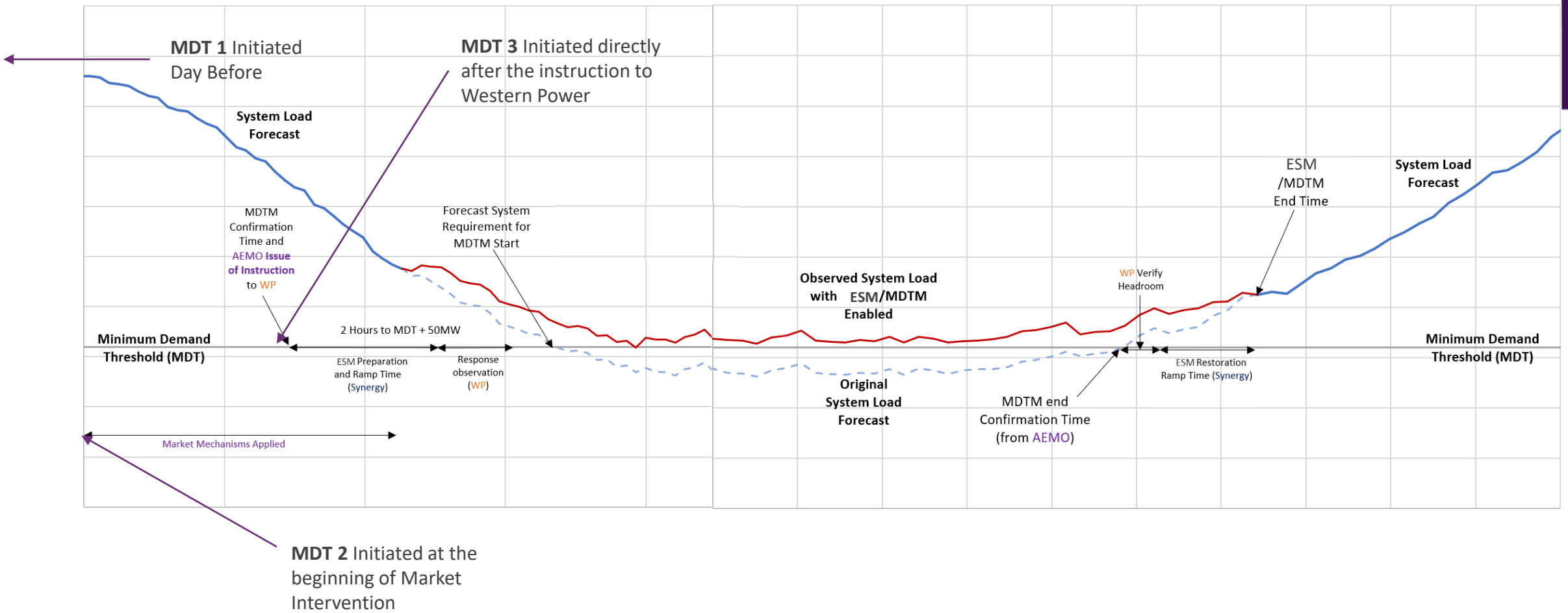
This will occur after a MDT Notice 2 is in place and AEMO have given the instruction to maintain system load above MDT.

This notice shares that an Emergency State has been declared. It is likely that some rooftop PV will be constrained to protect system security and reduce risks.

AEMO Actions on the Day

1. Ensure all relevant outages that can be restored, have been.
2. Issues Dispatch Advisories for each MDT notice level, including an Emergency Operating State when instructing Western Power to maintain demand above an MDT.
3. Dispatch appropriately to manage the reduction to minimum load and then increase when the event is complete.
4. When load starts increasing and there is adequate capacity to restore the curtailed PV, AEMO will give an instruction to Western Power to restore.

Example of an MDT event



Conclusions

- Existing process between AEMO and Western Power will continue to prepare for and manage low demand days.
- This particular process will be followed if load is expected to fall below the MDT.
- If there is a short term change in forecast, the process will be followed with shorter time frames and responses as soon as practicable.
- This process will be refined over time as experience is gained in various aspects and further understanding of system limits is developed.

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