# MTEP Extreme Events Process Overview

Planning Subcommittee

January 28, 2026

Post Only

# Purpose & Key Takeaway

## Purpose

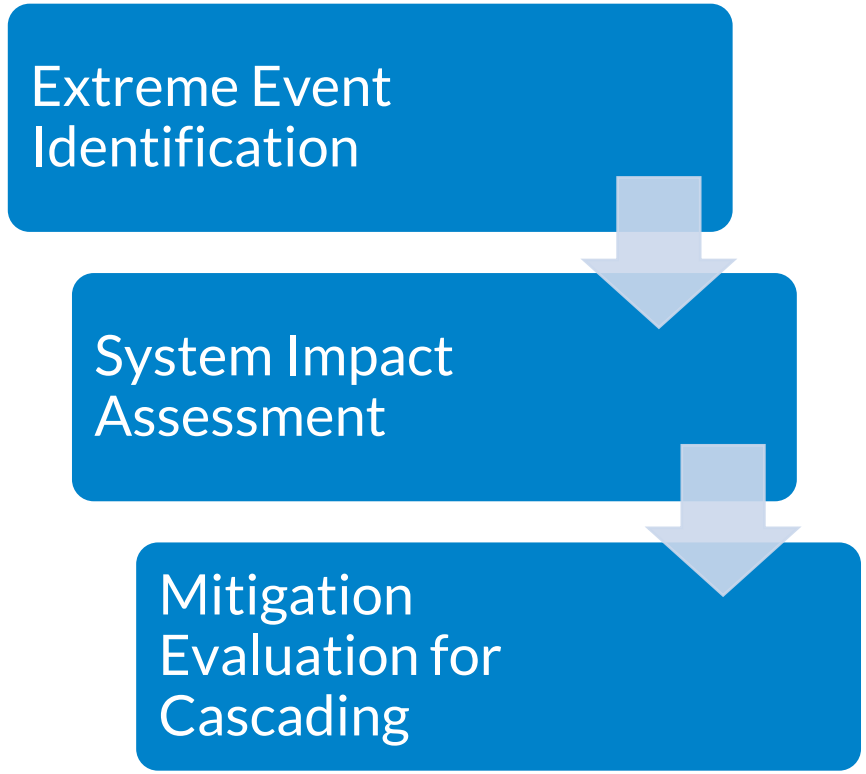
Present MISO MTEP25 Extreme Events (EE) study results

## Key Takeaways

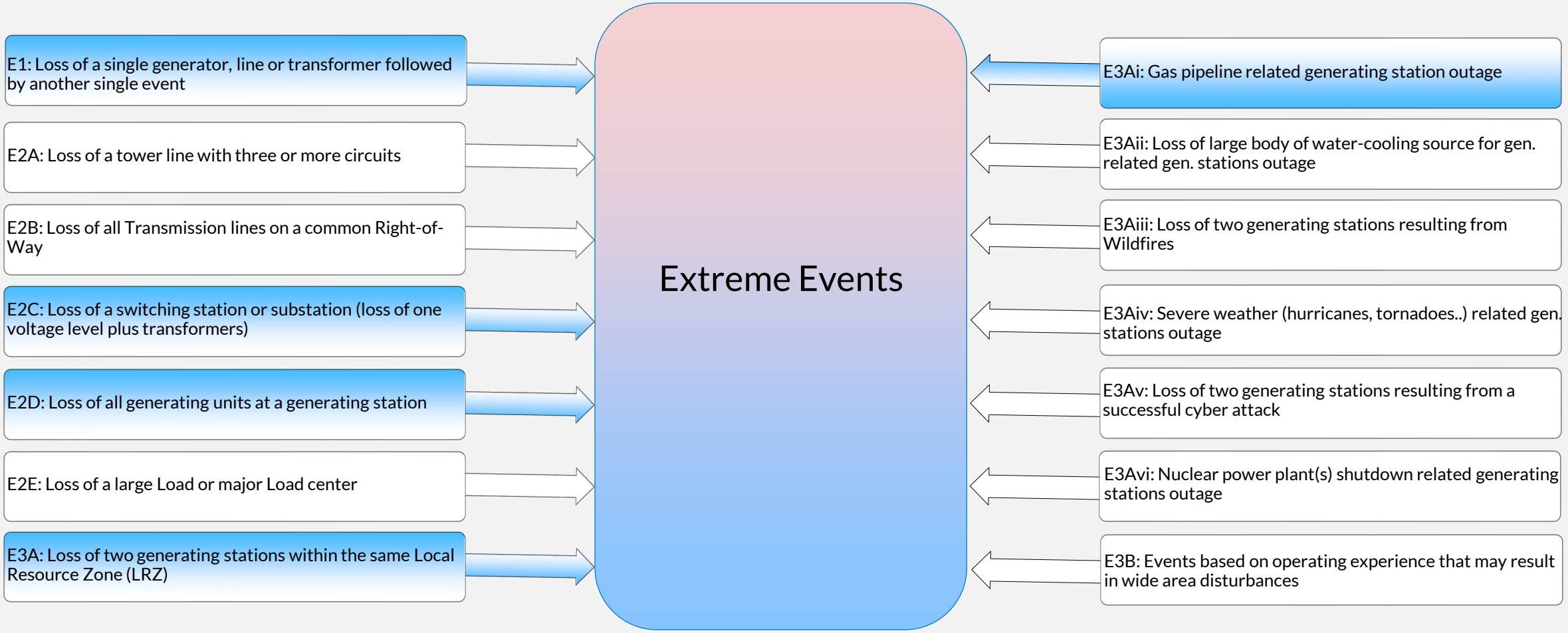
- MISO works with TOs to develop a list of Extreme Events as defined in TPL-001 standard
- MISO simulates events, tests for Cascading, and works with TOs to identify actions which could reduce the likelihood or severity of Cascading events
- For the MTEP25 Extreme Events study, some cascading events are identified in all four (4) MISO planning regions

# MISO performs annual Extreme Event assessment as required by NERC TPL-001-5.1 standard

- Goal is to provide a broad view of potential system impacts of a wide range of low frequency high impact events
- MISO utilizes scripting within existing commercial software TARA to perform contingency analysis to identify potential cascading failures, with some events requiring more hands-on solution techniques
- MISO and Transmission Planners evaluate possible mitigation actions if cascading is caused by extreme events

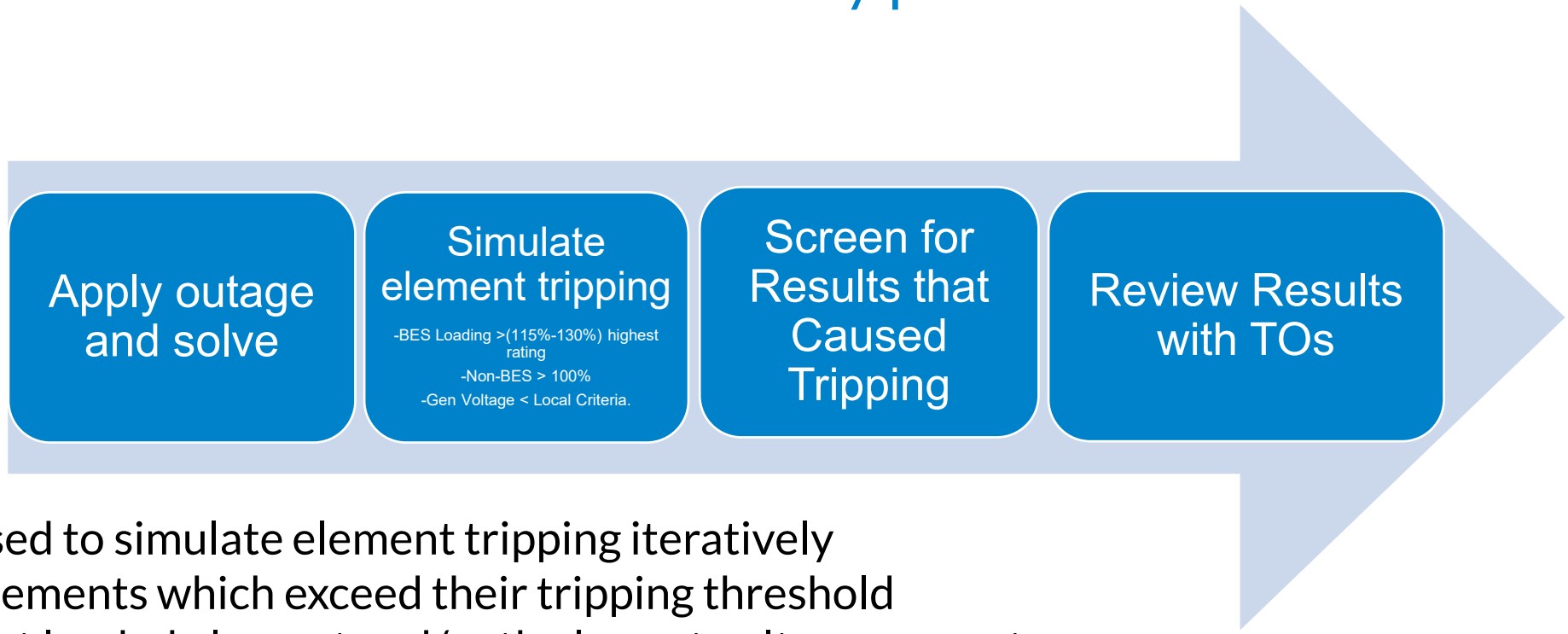


# MISO and Transmission Planners collaboratively develop extreme events contingencies from fourteen Extreme Events categories required by the NERC TPL-001-5.1 Standard




Shaded items indicate MISO supplements the contingencies in this category.

# Extreme Events are simulated to identify possible modes of cascading failure




TARA was used to simulate element tripping iteratively

- Identify elements which exceed their tripping threshold
- Trip highest loaded element and/or the lowest voltage generator
- Count the number of BES elements tripped and amount of load disconnected

Review Screened Results for Cascading, based on MISO's criteria:

- Three (3) or more BES elements tripped following event
- One (1) or more BES element tripped and >1000 MW nonconsequential load loss

# MISO and Transmission Planners evaluate possible mitigation actions if cascading is caused

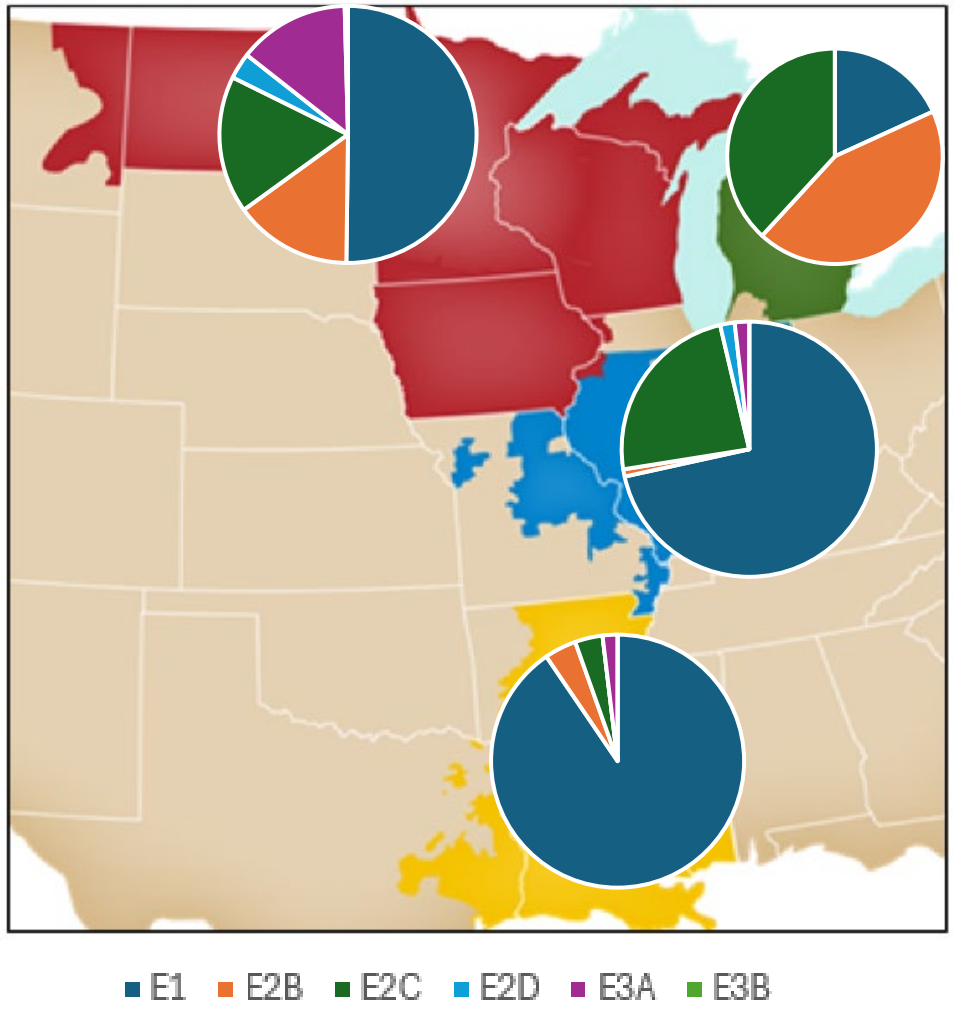
NERC TPL-001_R3.5: "…an evaluation of possible actions designed to reduce the likelihood or mitigate the consequences and adverse impacts of the event(s) shall be conducted."

For results which cause Cascading, one or more possible actions are identified

Common acceptable mitigations identified as a part of MTEP25 analysis include:

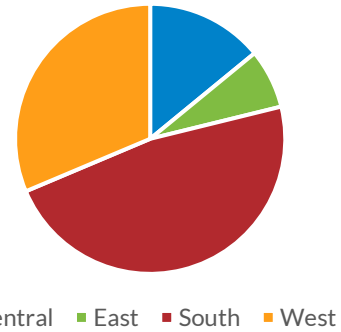
- Planned or conceptual projects (Corrective Action Plan)
- Upgrading physical plant security
- New or existing Operating Guides or protective schemes (RAS)
- Load Shed and Market Redispatch

# MTEP25 extreme event results which cause Cascading by MISO Planning Region. MISO South has the largest percentage of Extreme Contingencies which meet the criteria




- E1 events: *Loss of two BES elements*
- E2B events: *Loss of all transmission on a common right of way*
- E2C events: *Loss of one voltage level at a switching station or substation*
- E2D events: *Loss of all generating units at one station*
- E3A events: *Loss of all generating units at two stations*
- E3B events: *Other events based on operating experience*

By Region




The largest share of the results are in the south.

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