



MISO Market Capacity Emergency

SO-P-EOP-11-002 Rev: 23

ROLE			ROLE	
BAO	☒		SM	☒
IRAC	☒		RC	☒
UDS	☒		G&I	☒
SOE	☒		LBA	☒
TOP	☒		MP	☒
GOP	☒		ORM	☒

Rev History	Reason for Issue	Revised By	Issue Date	Effective Date
23	Out-of-Cycle Review. Step 4.3.3. update. Compliance Review completed. Operating procedure owner approval on file.	Don Hunter/ Alessandro Stammes/ Austin Francis	10/15/2025	10/15/2025
22	Out-of-Cycle Review. Clarified SM and ORM responsibilities. Updated Capacity Advisory entry conditions. Removed Module E-related steps in Alert/Warning. Added request waiver steps in Warning. Removed Priority 6-NN tags in Step 3b. Added notes for maintaining regulating reserves, firm load shed. Added actions to terminate Emergency Energy purchases and reload Export curtailments in Downgrade/Termination. Removed MBAA Sub-Region definitions. Updated Attachment 6/Table 4: Max Gen Emergency Overview. Compliance Review completed. Operating procedure owner approval on file.	Don Hunter/ Alessandro Stammes/ Austin Francis	09/30/2025	09/30/2025

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1.0 Purpose	1
2.0 Precautions and Limitations	1
2.1 Roles and Responsibilities.....	3
3.0 Entry Conditions.....	4
3.1 Capacity Advisory	4
3.2 Max Gen Alert.....	5
3.3 Max Gen Warning.....	5
3.4 Max Gen Event	5
4.0 Instructions.....	5
4.1 Capacity Advisory	5
4.1.1 Capacity Advisory - MISO Actions	5
4.1.2 Capacity Advisory - MISO Stakeholder Actions.....	7
4.2 MISO Actions during a Max Gen Emergency.....	9
4.2.1 Max Gen Declaration - MISO Actions.....	9
4.2.2 Max Gen Alert - MISO Actions	9
4.2.3 Max Gen Warning - MISO Actions.....	10
4.2.4 Max Gen Event Step 1a - MISO Actions.....	13
4.2.5 Max Gen Event Step 1b - MISO Actions.....	13
4.2.6 Max Gen Event Step 2a - MISO Actions.....	14
4.2.7 Max Gen Event Step 2b - MISO Actions.....	15
4.2.8 Max Gen Event Step 2c - MISO Actions.....	16
4.2.9 Max Gen Event Step 3a - MISO Actions.....	17
4.2.10 Max Gen Event Step 3b - MISO Actions	17
4.2.11 Max Gen Event Step 4a - MISO Actions	18
4.2.12 Max Gen Event Step 4b - MISO Actions	18
4.2.13 Max Gen Event Step 5 - MISO Actions.....	19
4.2.14 Max Gen Event Downgrade/Termination - MISO Actions.....	20
4.3 MISO Stakeholder Actions during a Max Gen Emergency	21
4.3.1 Max Gen Alert Level Actions - MISO Stakeholder Actions	21
4.3.2 Max Gen Warning - MISO Stakeholder Actions	22
4.3.3 Max Gen Event Step 1a - MISO Stakeholder Actions	22
4.3.4 Max Gen Event Step 1b - MISO Stakeholder Actions	22
4.3.5 Max Gen Event Step 2a - MISO Stakeholder Actions	23
4.3.6 Max Gen Event Step 2b - MISO Stakeholder Actions	24
4.3.7 Max Gen Event Step 2c - MISO Stakeholder Actions	24



4.3.8 Max Gen Event Step 3a - MISO Stakeholder Actions	24
4.3.9 Max Gen Event Step 3b - MISO Stakeholder Actions	24
4.3.10 Max Gen Event Step 4a/b - MISO Stakeholder Actions	24
4.3.11 Max Gen Event Step 5 - MISO Stakeholder Actions	25
4.3.12 Max Gen Event Downgrade/Termination - MISO Stakeholder Actions	26
5.0 Definitions	26
6.0 References	27
6.1 NERC References	27
6.2 FERC References	27
6.3 MISO References	28
Attachment 1 — Reserve Margin Example Calculations	29
Attachment 2 — Maximum Generation Declaration Template	31
Attachment 3 — Load Management Update Form Example	33
Attachment 4 — Slice-of-System PPAs Load/Schedule Curtailment	34
Attachment 5 — Additional Information	36
Attachment 6 — Maximum Generation Emergency Overview	37
Attachment 7 — UDS Operator Actions During a MISO Market Capacity Emergency ..	40
Attachment 8 — Summary of Market Capacity Emergency Procedure Steps	41



1.0 Purpose

Provide a set of Emergency operating instructions to address Capacity Emergencies and Energy Emergencies within the MISO Balancing Authority Area (MBAA), including preparation, management, and recovery from an Emergency.

2.0 Precautions and Limitations

1. As conditions require, MISO may provide instructions to move directly to any section or step within this procedure. Actions described in earlier levels or steps should still be completed as time permits.
2. If sufficient relief is obtained during the implementation of an action during a declaration step, subsequent actions within that declaration step do NOT need to be taken.
3. The Operating Reserve Requirement for the MBAA consists of Regulation and Contingency Reserve Requirements.
4. The Operating Reserve Requirement for a Region or Sub-Area consists of a Contingency Reserve Requirement based on the Most Severe Single Contingency (MSSC) within its boundaries.
5. Available economic Resources are calculated from the Available Economic Maximum Limits, including Behind the Meter Generation (BTMG), minus capacity that cannot be committed due to congestion or excessive Time-to-Start, and adjusted for Constraint Stranded MW and Net Scheduled Interchange (NSI) obligations.
6. South Region available economic Resources are the South Available Economic Maximum Limits (including BTMG, but reduced by Resources that cannot be committed due to congestion or excessive Time-to-Start), adjusted for South Constraint Stranded MW, Regional Dispatch Transfer (RDT) NSI, and Resources from the North/Central Region that are deliverable to the South via the RDT up to the Regional Dispatch Transfer Limit (RDTL) — typically 3,000 MW.
7. The Reserve Margin Entry Condition for an MBAA Capacity Advisory includes allowance for loss of the MSSC and subsequent recovery within 90 minutes for the second MSSC (if applicable), plus uncertainties.



8. Reserve Margin Entry Conditions will be based on the forecasted uncertainty level for the given operating day(s).
9. MISO will use the Mid-Term Load Forecast (MTLF) or Short-Term Load Forecast (STLF), as applicable, to determine available Operating Reserves. MISO may adjust Load Forecast values based on sustained error over time and will document the reasons for any adjustment.
10. Transmission System Emergencies requiring immediate action will be declared and resolved per SO-P-EOP-00-004 Transmission System Emergency. Transmission constraints that limit energy transfers to the MBAA or a sizable Sub-Area of the MBAA and result in a Capacity or Energy Emergency for such area will be managed through this procedure.
11. Energy deficient BA obligations include taking immediate actions to mitigate any undue risk to the Interconnection, including Load shedding, if required.
12. MISO posts the Max Gen Declaration notification to the MISO Market and Operations — Real-Time Operations Website.
13. Depending on the urgency of the Max Gen Emergency, manual Load Shedding may be used to control the Emergency at any time. This includes the immediate shedding of Load to return the Area Control Error (ACE) to zero.
14. MISO's posting of the Max Gen Declaration notification to the RT Ops Website via Operator Interface (OI) serves as notice of the existence and duration of the conditions requiring the implementation of the procedures set forth in Section 40.2.20 of the Tariff. Historical Max Gen Declarations can be found on MISO's Open Access Same Time Information System (OASIS) page.
15. MISO will render all available Emergency assistance to others, as requested, in accordance with SO-I-NOP-00-479 Purchasing and Selling Emergency Energy, provided that the requesting entity has implemented their comparable Emergency procedures, unless such actions violate safety, equipment, regulatory, or statutory requirements.
16. If MISO is NOT able to send Load Modifying Resource (LMR) availability reminders to Market Participants (MPs), MISO will communicate implementation instructions via the Demand Side Resource Interface (DSRI) Tool using up-to-date availability information in the tool, assuming it is correct.
17. MISO Shift Manager (SM) should evaluate additional staffing requirements per SO-I-NOP-00-441 Real-Time Event Resolution.



18. The Reserve Procurement Enhancement (RPE) objective for the RDT North-to-South is to elevate Market Clearing Prices (MCP) and energy prices in the South Region to clear additional Contingency Reserves, allowing recovery of the RDT Flow to 116% post-contingent of the South MSSC. Operators must then determine how to further reduce the RDT Flow to 100%. When RPE on RDT is violated, additional generation should be started.
19. An infographic of MISO's Market Capacity Emergency Procedure steps is included in Attachment 8 — Summary of Market Capacity Emergency Procedure Steps.

2.1 Roles and Responsibilities

1. In addition to the roles and responsibilities in SO-P-EOP-11 MISO Emergency Operation Plan, the following also apply:
 - MISO Operations Risk Management (ORM) Team
 - Issues forward-looking Market Capacity Declarations up to and including the FRAC Next Day (ND) Case.
 - Coordinates with the Shift Manager (SM) prior to issuance.
 - Capacity Advisories may be issued up to 5 days in advance but must be declared no later than 23:59 EPT the day prior to the operating day.
 - Capacity Advisories are not issued on a same-day basis, as the real-time process begins after the FRAC Handoff.
 - MISO Shift Manager (SM)
 - Issues real-time Market Capacity Declarations, including Max Gen Alerts and higher, after the FRAC ND Handoff per SO-I-NOP-00-491 FRAC Handoff procedure, based on current system conditions.
 - Coordinates with the ORM Team prior to issuance.



3.0. Entry Conditions

3.1. Capacity Advisory

1. Entry conditions are based on the Reserve Margin, which is the Total Operating Reserves compared to the Operating Reserve Requirement, either in MW or as a % of the Load, plus Operating Reserve Requirements. See Attachment 1 — Reserve Margin Example Calculations for examples.
 - Reserve Margin:
$$\text{Total Operating Reserves} - \text{Operating Reserve Requirement}$$
 - Reserve Margin (%):
$$100 * (\text{Total Operating Reserves} - \text{Operating Reserve Requirement}) / (\text{Load} + \text{Operating Reserve Requirement})$$
 - Total Operating Reserves MBAA:
$$(\text{Avail Eco Max} - \text{Constraint Stranded MW} - \text{NSI}) - \text{Load}$$
 - Total Operating Reserves South Region:
$$(\text{Avail Eco Max} - \text{Constraint Stranded MW} - \text{RDT NSI} + \text{RDTL}) - \text{Load}$$

ORM/
SM

Note

[□]

- **IF Reserve Margin thresholds are forecasted below the associated uncertainty level, THEN:**
 - A Capacity Advisory may be declared up to 5 days in advance but must be declared no later than 23:59 EPT the day prior to the operating day.
 - Capacity Advisories are not issued on a same-day basis.
 - The decision to declare a Capacity Advisory may also consider other information such as time frame, weather, and other uncertainty factors.
 - Increasing the Reserve Margin Entry Conditions may be required.

2. IF the following conditions are identified, THEN **PERFORM** Section 4.1 Capacity Advisory: [□]
3. MBAA, Region, or Sub-Area forecasted Reserve Margin is less than the Reserve Margin threshold based upon the associated forecasted uncertainty level.



3.2. Max Gen Alert

SM

Note

[□]

- For a negative Reserve Margin, a Warning or Event should be declared.
- Increasing the Reserve Margin Entry Conditions may be required.

1. IF any of the following conditions are identified, THEN **PERFORM**
Section 4.2.2 Max Gen Alert - MISO Actions:

[□]

- MBAA, Region, or Sub-Area forecasted Reserve Margin is less than 1,500 MW, or less than the largest single contingency for that Sub-Area.
- South Region forecasted Reserve Margin is less than 500 MW.

3.3 Max Gen Warning

SM

Note

[□]

A negative Reserve Margin means that Load and Operating Reserve Requirements cannot be met with normal economic Resources. In this scenario, a Max Gen Warning or Event should be declared.

1. IF the following condition is identified, THEN **PERFORM**
Section 4.2.3 Max Gen Warning - MISO Actions:

[□]

- MBAA, Region, or Sub-Area actual or forecasted Reserve Margin is less than zero.

3.4 Max Gen Event

SM

1. IF the following condition is identified, THEN **PERFORM**
Section 4.2.4 Max Gen Event Step 1a - MISO Actions:

[□]

- MBAA, Region, or Sub-Area actual or forecasted Reserve Margin is less than zero, **and**
- Warning level actions are NOT sufficient.

4.0 Instructions

4.1 Capacity Advisory

ORM/
SM

4.1.1 Capacity Advisory - MISO Actions

1. **COMMUNICATE** Capacity Advisory as follows:

[□]

A. DEFINE the boundaries of the Capacity Advisory area.

[□]

B. DEFINE the start and end time of the Capacity Advisory **and** **COMMUNICATE** those times to the UDS Operator to allow STR Default and RPE MSSC Overrides to be entered.

[□]



- C. **SEND** the Capacity Advisory declaration to affected members via OI per SO-I-NOP-00-448 Event Communications Matrix. ☐
- D. **SEND** the Capacity Advisory declaration via Reliability Coordinator Information System (RCIS). ☐
- E. **DECLARE** Conservative System Operations per SO-P-NOP-00-449 Conservative System Operations, if conditions warrant and not already declared. ☐
- SM 2. IF OI is unavailable, or the SM determines a conference call is necessary, THEN **PERFORM** a conference call with affected reliability entities per SO-P-NOP-00-483 Reliability Coordination Conference Call. ☐
- SM 3. IF a significant shortage of Operating Reserves is anticipated in any Reliability Assessment Commitment (RAC) process, THEN **DETERMINE** whether to issue LMR Scheduling Instructions in anticipation of a Max Gen Emergency Event Step 2a or higher. ☐
- A. **SEND** an informational message via OI to the impacted area(s) indicating that LMRs have been called in anticipation of a Max Gen Emergency. ☐
- B. **SEND** LMR Scheduling Instructions (from longest to shortest lead time) via MISO Communication System (MCS) for the forecasted Max Gen Emergency. ☐
- UDS **Note** ☐
- For Steps 4 to 8, **REFER** to Attachment 7 — UDS Operator Actions During a MISO Market Capacity Emergency.
4. IF a Capacity Advisory or higher is declared for the North/Central Region only, THEN **OVERRIDE** the STR RPE MSSC Default value(s) for non-Zone only in the Energy Market Displays (EMD) Global Reserve Requirements menu, as specified in SO-I-EOP-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing, for the duration of the Capacity Advisory or higher declaration. ☐
- UDS 5. IF a Capacity Advisory or higher declaration is made for the North/Central Region and a Capacity Advisory or higher declaration is added for the South Region, THEN **OVERRIDE** the System-Wide STR Default value(s) and **OVERRIDE** the South Region STR RPE MSSC in Zone 8 in the EMD Global Reserve Requirements menu for the duration of the Capacity Advisory or higher declaration, as specified in SO-I-EOP-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing. ☐



- UDS 6. IF a Capacity Advisory is declared for the South Region only, THEN **OVERRIDE** the STR RPE MSSC Default value(s) for Zone 8 only in the EMD Global Reserve Requirements menu for the duration of the Capacity Advisory or higher declaration, as specified in SO-I-EOP-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing. [□]
- UDS 7. IF a Capacity Advisory or higher declaration is made for the South Region and a Capacity Advisory or higher declaration is added for the North/Central Region, THEN **OVERRIDE** the System-Wide STR Default value(s) and **OVERRIDE** the North/Central STR RPE MSSC for Non-Zone in the EMD Global Reserve Requirements menu for the duration of Capacity Advisory or higher declaration, as specified in SO-I-EOP-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing. [□]
- UDS 8. IF a System-Wide Capacity Advisory is declared, THEN **OVERRIDE** the STR Default value(s), the North/Central STR RPE MSSC for Non-Zone, and the South Region STR RPE MSSC for Zone 8 in the EMD Global Reserve Requirements menu, for the duration of the Capacity Advisory or higher declaration, as specified in SO-I-EOP-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing. [□]
- ORM/
UDS/
SM 9. **NOTIFY** Day Ahead (DA) and Forward Reliability Assessment and Commitment (FRAC) Operators when STR updates are complete. [□]

4.1.2 Capacity Advisory - MISO Stakeholder Actions

- MP 1. WHEN notified by MISO, THEN **ENSURE** all market data is updated with the best available information for the operating day(s), including the following: [□]
- Facility and generation availability, outages, and de-rates
 - Generation Offers, including any changes to reflect fuel availability
 - Fuel supply and inventory concerns
 - Fuel switching capabilities
 - Environmental constraints
 - Load forecast Values
 - LMR Availability in the DSRI Tool
 - Voluntary Load Management information



- Load Management Measures (LMM) and any Voluntary Load Management in the MCS
- Emergency Demand Response (EDR) offers

MP

Note

[□]

LMRs should be implemented at NO less than the MW amount scheduled and following the guidelines provided by MISO.

MP

2. IF notified by MISO, THEN **IMPLEMENT** LMRs. [□]
3. **UPDATE** the DSRI Tool as follows: [□]
 - A. **NAVIGATE** to the Active Event by selecting one of the following: [□]
 - The Scheduling Instruction event banner
 - The Active Event from the dashboard
 - The Events tab
 - B. **REVIEW** the Event Timeline and LMR Instructions broken down by each LBA. [□]
 - C. **ACKNOWLEDGE** the LMR Scheduling Instructions. [□]
 - D. **NAVIGATE** to the Resource Deployment tab of the Active Event. [□]
 - E. **ENTER** and **SUBMIT** the MW Amounts of Resources that will be deployed to meet the LMR Scheduling Instruction obligation per LBA. [□]
 - F. Upon receiving the LMR Scheduling Instruction, **UPDATE** the LMR Availability for all Resources designated to respond, ensuring their availability accurately reflects what is now accessible to MISO. [□]



4.2 MISO Actions during a Max Gen Emergency

4.2.1 Max Gen Declaration - MISO Actions

- SM 1. **DECLARE** applicable Max Gen Alert/Warning/Event as follows: ☐
- A. **DEFINE** the boundaries of the declaration area. ☐
- B. **DEFINE** the start and end time of the declaration. ☐
- C. **SEND** the Max Gen Declaration via OI per SO-I-NOP-00-448 Event Communications Matrix. ☐
- D. **SEND** the Max Gen declaration summary information via RCIS within 30 minutes. ☐
- SM 2. **ENSURE** Conservative System Operations has been declared per SO-P-NOP-00-449 Conservative System Operations. ☐
- SM 3. IF OI is unavailable or the SM determines a conference call is necessary, THEN **PERFORM** a conference call with affected reliability entities per SO-P-NOP-00-483 Reliability Coordination Conference Call. ☐

4.2.2 Max Gen Alert - MISO Actions

- SM 1. IF starting the declaration at a Max Gen Alert, THEN **DECLARE** Max Gen Alert per Section 4.2.1 Max Gen Declaration - MISO Actions. ☐
- UDS 2. **IMPLEMENT** Emergency Pricing - Tier 0 per SO-I-EOP-00-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing. ☐

SM **Note** ☐

This survey is to gain an idea of the amount of LMM Load reduction expected to be available, if needed.

3. **SEND** a survey via the MCS LMM Tool in the Load Management Tab to LBAs to ensure LMM information is updated. ☐
- A. IF the Drill Mode is currently on, THEN **ENSURE** to “Switch to Live Mode”. ☐
- BAO 4. IF changes in Operating Reserve availability are identified, THEN **NOTIFY** the SM. ☐
- IRAC 5. **ENSURE** available economic Resources are committed to meet Load, firm transactions, and reserve requirements. ☐



G&I

6. **COORDINATE** with MPs to schedule any non-scheduled MWs from external Resources, up to their cleared Module E Capacity obligation. [□]

RC

Note [□]

The following analysis should be completed in time for implementation during the potential Warning declaration.

7. **COORDINATE** with neighboring Reliability Coordinators (RCs) and MISO TOPs to raise transfer capability into the declaration area or make available Constraint Stranded MW from generation (on- or off-line) in the declaration area, including review of Transmission Loading Relief (TLR) activity, binding constraints, available reconfiguration options, and use of short-term Emergency ratings. [□]

ALL

8. LOG actions taken and relevant information in response to the declaration. [□]

Note [□]

- Actions are taken to preserve Resources dedicated to firm Load and to maintain Operating Reserves.
- Actions available at this level should be fully utilized, time permitting, by all entities within the defined declaration area prior to declaring an Emergency.

4.2.3 Max Gen Warning - MISO Actions

SM

1. IF starting the declaration at a Max Gen Warning or escalating from a Max Gen Alert, THEN **DECLARE** Max Gen Warning per Section 4.2.1 Max Gen Declaration - MISO Actions. [□]



- | | | |
|-----|---|-----|
| UDS | 2. IMPLEMENT Emergency Pricing - Tier I per SO-I-EOP-00-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing. | [] |
| G&I | 3. SUSPEND Coordinated Transaction Scheduling (CTS) for the duration of the Capacity Emergency per SO-I-AOP-00-224 CTS Failure Modes. | [] |
| G&I | 4. COMMUNICATE CTS suspension to PJM. | [] |
| SM | 5. REVIEW EDR offers to determine EDR availability and MW amounts for the Warning period. | [] |
| SM | 6. OBTAIN updated MW relief amount available during the effective Warning period by LBA from MCS. <ul style="list-style-type: none">• LMMs – Stage 1• LMMs – Stage 2 | [] |
| SM | 7. REVIEW LMR availability in the MCS-LMR Tool for the declaration period. | [] |
| SM | 8. DIRECT the following actions to raise forecasted capacity: | [] |
| BAO | A. TERMINATE Inadvertent Payback process per SO-I-NOP-00-462 Inadvertent Interchange Management, if required to assist system conditions. | [] |
| BAO | B. DETERMINE if a request for Time Error Correction termination should be made per SO-P-NOP-00-455 Balancing Authority Operations. | [] |
| SM | 9. SEND OI message to MPs to schedule remaining available External and Internal Resources (Module E Registered Capacity Resources) that are deliverable to the Warning area, considering transmission constraints. | [] |
| G&I | 10. NOTIFY the SM of forecasted changes in MBAA NSI due to loss of imports. | [] |
| G&I | 11. MODIFY webTrans E-tag validation mode to reflect Max Gen in affected areas (North, South, or All) per SO-I-EOP-00-006 Interchange Scheduling Operations during Emergency Conditions. | [] |
| G&I | 12. COORDINATE to determine amount of non-firm and firm Export Schedules to curtail, as identified below. | [] |



- G&I
13. IF Export Schedule Limits are exceeded, THEN **CURTAIL** Export Schedules from the declaration area in amounts required to relieve shortage conditions in the following order per SO-I-EOP-00-006 Interchange Scheduling Operations during Emergency Conditions:
- [□]
- A. Non-Firm Transmission Schedules.
 - B. Firm Schedules from Capacity (Module E) Resources that are NOT meeting their Schedule and Capacity requirements.
 - C. Firm Schedules from non-Capacity (Module E) Resources that are NOT meeting their Schedule requirements.
 - D. Firm Transmission schedules from Power Purchase Agreements (PPAs) that represent a Fleet of Resources, when those Resources are NOT meeting their collective Resource obligation.
- SM
14. IF forecasting an escalation to Max Gen Event Step 2.a or higher, THEN **NOTIFY** GOPs via OI in the declaration area with Generators de-rated due to environmental restrictions, and request that they obtain waivers from the appropriate government agencies. [□]
- RC
15. **NOTIFY** TOPs to implement reconfiguration options agreed upon to raise transfer capability into the declaration area or to make available Constraint Stranded MW from generation in the declaration area. [□]
- ALL
16. **LOG** actions taken and relevant information in response to the declaration. [□]

**4.2.4 Max Gen Event Step 1a - MISO Actions**

SM	<u>Note</u> [□] Actions in this section are taken to attempt to preserve Resources dedicated to firm Load and maintaining Regulating Reserves. 1. IF starting the declaration at a Max Gen Event Step 1a or escalating from a lower Max Gen level, THEN DECLARE Max Gen Event 1a per Section 4.2.1 Max Gen Declaration - MISO Actions. [□]
SM	2. NOTIFY On-Call Director to implement SO-P-AOP-00-217 MISO and State Officials 24X7 Communication Protocols During Emergencies. [□]
IRAC	<u>Note</u> [□] AME are Resources with a commit status of Emergency. 3. COMMIT the following Available Max Emergency (AME) designated Resources: [□] • Generation Resources • Demand Response Resources – Type 1 • Demand Response Resources – Type 2

4.2.5 Max Gen Event Step 1b - MISO Actions

SM	1. IF starting the declaration at a Max Gen Event Step 1b or escalating from a lower Max Gen level, THEN DECLARE Max Gen Event Step 1b and EEA1 per Section 4.2.1 Max Gen Declaration - MISO Actions. [□]
IRAC/ UDS	<u>Note</u> [□] The IRAC Operator ensures Emergency Ranges are available for use by UDS, and the UDS Operator verifies these ranges as preliminary actions to implementing them in Event Step 1b. 2. ENSURE unit Emergency Ranges are pushed per SO-I-EOP-00-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing. [□]

IRAC/
UDS**Note**

[□]

Resources selected to provide Regulating Reserve for each Generation Resource, Demand Response Resource – Type II, and External Asynchronous Resource for use in MISO's RAC, Automatic Generation Control (AGC), and UDS for the MBAA (or Sub-Area due to a transmission constraint) are to be excluded when implementing Emergency Maximum Limits.

ALL

3. **ACTIVATE** Emergency Maximum Limits per SO-I-EOP-00-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing. [□]

4. **LOG** actions taken and relevant information in response to the declaration. [□]

4.2.6 Max Gen Event Step 2a - MISO Actions

SM

Note

[□]

- LMM – Stage 1 and LMRs are utilized on a pro-rata basis within the declaration area based on availability of those actions, except for EDRs, which are committed in merit order.
- LMRs can be called in anticipation up to one hour prior to their required notification time. If MISO does NOT declare a Max Gen Emergency Event Step 2a or higher at least two hours prior to the start of the Scheduling Instructions issued in anticipation, then, the LMRs are NOT obligated to perform.

UDS

1. IF starting the declaration at a Max Gen Event Step 2a or escalating from a lower Max Gen level, THEN **DECLARE** Event Step 2a and EEA2 per Section 4.2.1 Max Gen Declaration - MISO Actions. [□]

2. **ENSURE** Emergency Pricing has been implemented as follows:

- If previously implemented, THEN **CHANGE** to Tier II. [□]
- If NOT previously implemented, THEN **IMPLEMENT** Emergency Pricing - Tier II per SO-I-EOP-00-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing. [□]

SM

3. **DETERMINE** Manitoba Hydro's EEA status. [□]

SM

4. IF Manitoba Hydro is in an EEA concurrently with MISO's EEA2 or higher, THEN **PERFORM** SO-I-NOP-00-481 MISO-Manitoba Hydro Concurrent EEA. [□]



SM

Note

[□]

- One MW value will be provided per LBA for Load reduction.
- Determination of individual LMMs to be utilized will be managed at the LBA level.
- Reduction MW amounts for each LBA will be determined by proration of the total amount available in the declaration area.
- If OI is unavailable, notifications will be made via phone.
- LMR Load reduction amounts communicated to LBAs are for information only; LBAs do not implement LMRs

5. **NOTIFY** LBAs of required Load reduction via LMM – Stage 1 and LMRs in MW amounts via MCS. [□]

SM

6. **COORDINATE** with MPs on implementing LMRs as follows: [□]

Note

[□]

LMR implementation amounts are determined by taking prorated amount of LMR availability in each LBA area as compared to total available in the declaration area, and based upon registration profile of each LMR, within the tolerances as set in the MCS-LMR Tool.

- A. **DETERMINE** LMR implementation amounts by MPs. [□]

- B. **PROVIDE** an MW minimum implementation amount to each MP based upon this pro-ratio and profile of registered LMRs via MCS-LMR Tool. [□]

SM

7. **DETERMINE** OE-417 reporting responsibilities per SO-P-NOP-04 MISO Event Reporting Operations Plan. [□]

SM

8. **ENSURE** required notifications are performed per SO-I-NOP-00-448 Event Communications Matrix. [□]

ALL

9. **LOG** actions taken and relevant information in response to the declaration. [□]

4.2.7 Max Gen Event Step 2b - MISO Actions

SM

1. IF starting the declaration at a Max Gen Event Step 2b or escalating from a lower Max Gen level, THEN **DECLARE** Event Step 2b per Section 4.2.1 Max Gen Declaration - MISO Actions. [□]

SM

2. **COMMIT** EDR Resources, in merit order, to alleviate capacity shortages within the declaration area per SO-I-NOP-00-404 Emergency Demand Response Implementation. [□]

ALL

3. **LOG** actions taken and relevant information in response to the declaration. [□]



4.2.8 Max Gen Event Step 2c - MISO Actions

- | | |
|------------|---|
| SM | 1. IF starting the declaration at a Max Gen Event Step 2c or escalating from a lower Max Gen level, THEN DECLARE Event Step 2c per Section 4.2.1 Max Gen Declaration - MISO Actions. ☐ |
| SM/
RC | 2. COORDINATE with neighboring RCs and BAs to determine Emergency Energy available from external sources, either through interruptible firm Load or through Emergency Energy purchases. ☐ |
| SM/
G&I | 3. IMPLEMENT Emergency Energy purchases from neighboring BAs to conserve Operating Reserves per SO-I-NOP-00-479 Purchasing and Selling Emergency Energy. ☐ |



- SM 4. **EVALUATE** opportunities to reduce internal energy usage, such as sending non-essential personnel home, reducing lighting that is non-essential for personnel safety, and reducing large electric Loads. ☐

SM **Note** ☐
DOE Form OE-417 filing requirements for issuing Public Appeals is the responsibility of the LBA.

5. **INSTRUCT** LBAs in the declaration area to issue public appeals to reduce demand per their internal procedures. ☐

- ALL 6. **LOG** actions taken and relevant information in response to the declaration. ☐

4.2.9 Max Gen Event Step 3a - MISO Actions

- SM 1. IF starting the declaration at a Max Gen Event Step 3a or escalating from a lower Max Gen level, THEN **DECLARE** Event Step 3a per Section 4.2.1 Max Gen Declaration - MISO Actions. ☐

- SM 2. **NOTIFY** GOPs via OI in the declaration area with Generators de-rated due to environmental restrictions, instructing them to implement waivers from the appropriate government agencies. ☐

- BAO 3. **IMPLEMENT** use of all spinning and supplemental reserves, as needed and as time permits. ☐

- SM 4. IF Contingency Reserves fall below minimum required (MSSC) for greater than 30 minutes and NO **reasonable** actions exist to restore them within 90 minutes, THEN **DECLARE** an EEA3 per Section 4.2.1 Max Gen Declaration - MISO Actions. ☐

4.2.10 Max Gen Event Step 3b - MISO Actions

- SM 1. IF starting the declaration at a Max Gen Event Step 3b or escalating from a lower Max Gen level, THEN **DECLARE** Event Step 3b per Section 4.2.1 Max Gen Declaration - MISO Actions. ☐

SM **Note** ☐
Reduction MW amounts for each LBA will be determined on a pro-rata basis of the total amount available in the declaration area.

2. **NOTIFY** LBAs, via MCS, of the required Load reduction (in MW of interruptible demands) via LMM – Stage 2. ☐



- ALL 3. **LOG** actions taken and relevant information in response to the declaration. [□]

4.2.11 Max Gen Event Step 4a - MISO Actions

- SM 1. IF starting the declaration at a Max Gen Event Step 4a or escalating from a lower Max Gen level, THEN **DECLARE** Event Step 4a per Section 4.2.1 Max Gen Declaration - MISO Actions. [□]
- BAO 2. **IMPLEMENT** a Reserve Call from Contingency Reserve Sharing Group (CRSG), utilizing MHEB's available contingency reserves. [□]

4.2.12 Max Gen Event Step 4b - MISO Actions

- SM 1. IF starting the declaration at a Max Gen Event Step 4b or escalating from a lower Max Gen level, THEN **DECLARE** Event Step 4b per Section 4.2.1 Max Gen Declaration - MISO Actions. [□]
- RC 2. **COORDINATE** with neighboring RCs and BAs to identify additional available Emergency Energy, including Operating Reserves. [□]
- G&I 3. **IMPLEMENT** Emergency Energy purchases from neighboring BAs per SO-I-NOP-00-479 Purchasing and Selling Emergency Energy. [□]
- SM 4. IF Contingency Reserves fall below minimum required (MSSC) for greater than 30 minutes and NO **reasonable** actions exist to restore them within 90 minutes, THEN **DECLARE** an EEA3 per Section 4.2.1 Max Gen Declaration - MISO Actions [□]
- IRAC 5. **EVALUATE** the exclusion of Regulating Units that have room between Reg Max and Emergency Max from clearing Reg per SO-I-EOP-00-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing. [□]

Note

The SM and IRAC should coordinate to maintain an appropriate amount of Regulating Reserves to avoid shedding firm Load for normal ACE deviations.

- ALL 6. **LOG** actions taken and relevant information in response to the declaration. [□]

**4.2.13 Max Gen Event Step 5 - MISO Actions**

- SM 1. IF starting the declaration at a Max Gen Event Step 5 or escalating from a lower Max Gen level, THEN **DECLARE** Max Gen Event Step 5 and EEA3 per Section 4.2.1 Max Gen Declaration - MISO Actions. ☐
- SM **Note** ☐
Attachment 4 — Slice-of-System PPAs Load/Schedule Curtailment provides additional information regarding sharing of Load shedding with Slice-of-System PPAs.
2. **DETERMINE** manual Load Shedding requirements. ☐
- SM **Note** ☐
Issuing Emergency Operating Instructions for firm Load shed is based on the ratio of LBA forecasted or actual Load to the total forecasted or actual Load of the declaration area, considering applicable transmission security requirements.
- SM **Note**
The Shift Manager will ensure that firm Load Shed points are known and members are prepared to execute Load Shed when reserves are depleted and additional action is required such as increasing Load conditions or ACE recovery from generation loss.
3. **ISSUE** Emergency Operating Instructions to LBAs in the declaration area for MW amounts of Load to shed via the MCS Firm Load Shed Tool or verbally per SO-P-NOP-00-431 Communications Protocol for Operating Instructions. ☐
- UDS 4. WHEN notified by MISO SM, THEN **PERFORM** the following:
- A. In the EMD UDS tab, **CHECK** the appropriate box(es) in the column titled "Is VOLL Price Enforced" for the applicable LBAs, in accordance with SO-I-EOP-00-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing. This action sets LMPs and MCPs to the Value of Lost Load (VOLL). ☐
- B. **SAVE** updates. ☐
- SM 5. IF firm Load Shed is greater than 100 MW, THEN **DETERMINE** OE-417 reporting responsibilities per SO-P-NOP-04 MISO Event Reporting Operations Plan. ☐
- SM 6. **ENSURE** required notifications are performed per SO-I-NOP-00-448 Event Communications Matrix. ☐
- ALL 7. **LOG** actions taken and relevant information in response to the declaration. ☐

**4.2.14 Max Gen Event Downgrade/Termination - MISO Actions**

SM	Note • Steps and levels during Termination may be skipped, as appropriate, based on system conditions and projections. • Emergency steps shall be exited in a controlled and deliberate manner to avoid adversely affecting system reliability, while also minimizing the impact of these Emergency actions on the Load Serving Entities (LSEs).	☐
	1. WHEN actual obligations return below total MISO capability, THEN DOWNGRADE/TERMINATE Max Gen Event as follows:	☐
SM	A. SEND Max Gen Downgrade/Termination to affected members via OI per Section 4.2.1 Max Gen Declaration - MISO Actions.	☐
UDS	B. IF Max Gen Event Step 5 is being terminated, THEN UNCHECK the box(es) in EMD that previously set all LMPs and MCPs to the Value of Lost Load (VOLL).	☐
IRAC/ G&I	C. ENSURE CTS is enabled per SO-I-AOP-00-224 CTS Failure Modes.	☐
UDS	D. UPDATE <u>or</u> TERMINATE Emergency Pricing and Emergency Ranges per SO-I-EOP-00-001, as applicable.	☐
G&I	E. RETURN webTrans E-tag validation to normal mode per SO-I-EOP-00-006 Interchange Scheduling Operations during Emergency Conditions.	☐
G&I	F. TERMINATE any Emergency Energy purchases made during the event, as necessary.	☐
G&I	G. RELOAD any Export curtailments made during the event, as necessary.	☐
IRAC	H. EVALUATE and DECOMMIT any online Emergency generation (AME) that has met its Min Runtime.	☐
SM	I. PERFORM necessary actions to back out of steps taken, in reverse order.	☐
UDS	J. IF an STR requirement override is NOT needed for the remainder of the declared Emergency, THEN REMOVE STR requirement override in EMD from STR Default and STR MSSC Non-Zone and South Zone 8.	☐
SM	2. ENSURE all notifications are performed per SO-I-NOP-00-448 Event Communications Matrix.	☐
ALL	3. LOG actions taken and relevant information in response to the declaration.	☐



4.3 MISO Stakeholder Actions during a Max Gen Emergency

4.3.1 Max Gen Alert Level Actions - MISO Stakeholder Actions

LBA/ TOP/ GOP	Note Deferring generation/transmission maintenance until the Max Gen declaration has been terminated ensures trips are minimized.	[☐]
LBA/ TOP	1. FOLLOW MISO's SO-P-NOP-00-449 Conservative System Operations procedure. 2. DETERMINE potential exclusions of constrained pockets within the declaration area where there is expected to be adequate generation that may NOT be transferred to other parts of the declaration area due to local constraints.	[☐] [☐]
TOP GOP GOP	3. INFORM MISO RC of identified constrained areas. 4. IF generators are de-rated, THEN PERFORM the following: A. INFORM the following stakeholders of capacity-limited facilities:	[☐] [☐] [☐]
GOP MP	5. UPDATE Limits and Offers. Note - Schedules that source from a Resource that is identified as a Capacity Resource in Module E for a MISO LSE must be identified in the tagging process per MISO BPM-007 Physical Scheduling Business Practice Manual Section 16 - Capacity Resource Scheduling. - This also includes a Generation Resource internal to the MBAA that is identified as a Capacity Resource for an external BA.	[☐] [☐]



- | | |
|-----|---|
| MP | 7. ENSURE accuracy of LMR availability and Self-Scheduled/Voluntary Load Management LMRs in the DSRI Tool. ☐ |
| LBA | 8. ENSURE accuracy of Non-LMR Voluntary Load Management/Self-Scheduled LMM information in the MCS-LMR Tool. ☐ |
| TOP | 9. COORDINATE with the MISO RC to determine reconfiguration options to raise transfer capability into the declaration area or to make available Constraint Stranded MW from generation in the declaration area. ☐ |

4.3.2 Max Gen Warning - MISO Stakeholder Actions

- | | |
|----------------------------|--|
| LBA | 1. Based on Load Shed methodology, PREPARE for potential Load Shed during an Event stage. ☐ |
| MP | 2. UPDATE EDR offers for availability and MW amounts for the declaration period. ☐ |
| LBA | 3. SUBMIT LMM availability via MCS per Attachment 3 — Load Management Update Form Example. ☐ |
| MP | 4. ENSURE accuracy of registered LMR availability in the DSRI Tool. ☐ |
| MP | 5. SCHEDULE remaining available External and Internal Resources (Module E Registered Capacity Resources) that are deliverable to the declaration area. ☐ |
| LBA | 6. NOTIFY Interruptible Loads of potential interruption. ☐ |
| LBA/
MP/
TOP/
GOP | 7. LOWER energy use to a minimum using conservative measures. ☐ |
| GOP | 8. DETERMINE whether Generators are de-rated due to environmental restrictions, and request waivers from the appropriate government agencies as directed by MISO. ☐ |
| TOP | 9. IMPLEMENT agreed upon reconfiguration options to raise transfer capability into the declaration area or to make Available Constraint Stranded MW from generation in the declaration area. ☐ |

☐



4.3.3 Max Gen Event Step 1a - MISO Stakeholder Actions

- GOP 1. WHEN notified by MISO, THEN **START** applicable off-line AME Generation Resources. [□]

4.3.4 Max Gen Event Step 1b - MISO Stakeholder Actions

GOP **Note** [□]

- MPs should ensure Emergency Range limits reflect actual Resource capabilities.
- Specific information, limitations, and concerns regarding Emergency Range usage should be communicated to the MISO G&I Operators, as applicable.

- GOP 1. WHEN Resources are dispatched, THEN **ENSURE** Resources move into Emergency Ranges. [□]
- GOP 2. **ENSURE** all co-generation and independent power producers are at maximum output and availability. [□]
- GOP 3. IF additional reliability capacity is available (such as adding additional mills, duct burners, etc.), THEN **COORDINATE** adjustments with the MISO G&I Operator. [□]

**4.3.5** Max Gen Event Step 2a - MISO Stakeholder Actions

- LBA 1. IF in the declaration area and notified by MISO to reduce Load via LMM – Stage 1, THEN **PERFORM** the following: ☐
- LBA A. **REDUCE** Load via LMM – Stage 1. ☐
- LBA **Note** ☐
- Reductions through Load Management are NOT precise to the MW.
 - Determination of individual LMMs to be utilized will be managed at the LBA level.
- B. WHEN Load reduction actions have been implemented, THEN **NOTIFY** MISO. ☐
- MP **Note** ☐
- LMRs should be implemented at NO less than the MW amount scheduled and following the guidelines provided by MISO.
2. WHEN notified by MISO, THEN **IMPLEMENT** LMRs. ☐
- MP 3. **UPDATE** the DSRI Tool as follows: ☐
- A. **NAVIGATE** to the Active Event by selecting one of the following: ☐
- The Scheduling Instruction event banner
 - The Active Event from the dashboard
 - The Events tab
- B. **REVIEW** Event Timeline and LMR Instructions broken down by each LBA. ☐
- C. **ACKNOWLEDGE** LMR Scheduling Instructions. ☐
- D. **NAVIGATE** to the Resource Deployment tab of the Active Event. ☐
- E. **ENTER and SUBMIT** MW Amounts of Resources that will be deployed to meet the LMR Scheduling Instruction obligation per LBA. ☐
- F. Upon receiving the LMR Scheduling Instruction, **UPDATE** the LMR Availability for all Resources designated to respond, ensuring their availability accurately reflects what is now accessible to MISO. ☐

**4.3.6** Max Gen Event Step 2b - MISO Stakeholder Actions

MP

1. WHEN notified by MISO, THEN **COMMIT** EDR

Resources.

[]

4.3.7 Max Gen Event Step 2c - MISO Stakeholder Actions

LBA

Note

[]

- Public appeals to reduce demand is based on internal LBA procedures, system conditions, and Event projections provided by MISO.
- The public appeals should include an educational message on how the public may reduce demand and conserve power.
- DOE Form OE-417 filing requirements for issuing Public Appeals is the responsibility of the LBA.

1. WHEN instructed by MISO, THEN **ISSUE** public appeals to reduce demand per internal procedures.

[]

LBA

2. IF in the declaration area, THEN **PREPARE** to shed Load.

[]

4.3.8 Max Gen Event Step 3a - MISO Stakeholder Actions

GOP

1. IF requested by MISO to dispatch available capacity in Event Step 3a, THEN **DISPATCH** as follows:
 - A. **VERIFY** Generators in the declaration area with de-rates from environmental restrictions.
 - B. IF approved waiver from government regulations, THEN **DISPATCH** available generation.

[]

[]

[]

4.3.9 Max Gen Event Step 3b - MISO Stakeholder Actions

LBA

1. IF in the declaration area and notified by MISO to reduce Load via LMM – Stage 2 during Event Step 3b, THEN **PERFORM** the following:
 - A. REDUCE Load via LMM – Stage 2.

[]

Note

[]

- Reductions through LMMs are NOT precise to the MW.
- Determination of individual LMMs to be utilized will be managed at the LBA level.

- B. WHEN Load reduction actions have been implemented, THEN **NOTIFY** MISO via MCS.

[]

4.3.10 Max Gen Event Step 4a/b - MISO Stakeholder ActionsGOP/
MP

1. **REVIEW Offers.**

[]

GOP/
MP

2. **ENSURE** all available Emergency Ranges and Resources are offered.

[]

GOP/
MP**Note**

[]

All Resources should be committed, producing energy or committed for reserves, except Emergency Ranges on Resources providing Regulating Reserves.

GOP
/MP

3. IF there are available Resources or capacity NOT being utilized, THEN **NOTIFY** the MISO G&I Operator.

[]

4.3.11 Max Gen Event Step 5 - MISO Stakeholder Actions

LBA

Note

[]

In addition to ensuring Load shed schemes are capable of implementation in a time frame adequate for mitigating the Emergency for Load shed directed by MISO, LBAs are responsible for coordinating with TOPs for any Load shed requirements, critical load evaluation in Load shed schemes, and coordinating rotation of selected Loads with any other automatic Load shed schemes such as Underfrequency and Undervoltage. The minimum MISO directed Load shed per LBA should always be maintained until Load restore directions are provided by MISO.

LBA

1. **SHED** firm Loads per MISO issued Emergency Operating Instruction.

[]

2. **CONFIRM** actions taken with the MISO RC via MCS Firm Load Shed Tool or verbally per SO-P-NOP-00-431 Communications Protocol for Operating Instructions.

[]

LBA

3. IF requested by MISO during Event Step 5, THEN **COMPLETE** Department of Energy (DOE) Form OE-417 as follows:

[]

- A. **COMPLETE** DOE Form OE-417 for actions taken to reduce Load via Load Management Procedures per NERC EOP-004-4 and SO-P-NOP-04 MISO Event Reporting Operations Plan.

[]

- B. **SUBMIT** completed DOE Form OE-417 to the following:

[]

- DOE
- NERC

- C. **FORWARD** a copy of the submitted DOE Form OE-417 to the following:

[]

- Regional Entities
- MISO @ RTOpsCompliance@misoenergy.org



LBA/
MP/
TOP/
GOP

4.3.12 Max Gen Event Downgrade/Termination - MISO Stakeholder Actions

1. **PERFORM** requests of the MISO SM or designee to back out of each level.

[□]

5.0. Definitions

1. **Reserve Margin** - The difference between Total Operating Reserves and the Operating Reserve Requirement.
2. **Constraint Stranded MW** - Resource MW that are NOT available to meet Load due to congestion on the electric grid.
3. **Emergency Demand Response (EDR)** - Load reductions, Behind the Meter Generation (BTMG), and other demand resources that are available to reduce demand or increase generation in exchange for guaranteed recovery of costs associated with the response in accordance with Schedule 30 (EDR Provisions) of the Tariff.
4. **Load Management Measures (LMM) Stage 1** – Load management actions that can be taken to reduce demand to preserve or maintain Operating Reserves that are NOT included in EDRs or LMRs.
5. **Load Management Measures (LMM) Stage 2** – Load management actions that can be taken to reduce demand including voltage reductions and reducing Loads that, by contract, CANNOT be interrupted until reserves are being or expected to be depleted and energy from Emergency Offers by Market Participants are being or expected to be depleted. These do NOT include EDRs or LMRs.
6. **Load Modifying Resource (LMR)** - These are either Demand resources or Behind the Meter Generation that have an obligation to reduce demand or increase generation during declared system emergencies.
7. **Maximum Generation (Max Gen) Capacity Advisory** - Provides advanced notice of forecasted capacity shortage and will request stakeholder update data.
8. **Max Gen Alert** - Provides an early alert that system conditions may require the use of MISO's generation Emergency procedures.
9. **Max Gen Warning** - MISO foresees or is experiencing conditions where all available economic Resources are committed to meet Load, firm transactions, and reserve requirements, and is concerned about sustaining required Operating Reserves.



10. **Max Gen Event** – IF MISO's forecasted or real-time energy demand and Operating Reserve Requirements within the MBAA (or Sub-Area due to a transmission constraint) CANNOT be satisfied with Economic Maximum Limits of all available Resources, then, MISO issues a Max Gen Event due to a shortage of economic Resources.

6.0 References

6.1 NERC References

1. EOP-011-4 Emergency Operations
 - R2.2.1[Section 4.1.1 Step 1.]
 - R2.2.2 [Section 4.2.5 Step 1.] [Section 4.2.6 Step 1.] [Section 4.2.13 Step 1.]
 - R2.2.3 [Section 4.1.2]
 - R2.2.4 [Section 4.2.8 Step 5.]
 - R2.2.5 [Section 4.2.9 Step 2.]
 - R2.2.6 [Section 4.2.8]
 - R2.2.7 [Section 4.2.3 Step 6.] [Section 4.2.4 Step 3.] [Section 4.2.6 Step 6.] [Section 4.2.7 Step 2.]
 - R2.2.9 [Section 4.2.13 Step 3.]
 - R2.2.10 [Section 3.1 Note after Step 1]
 - R5 [Section 4.2.1 Step 1.D.]
 - R6 [Section 4.2.5 Step 1.] [Section 4.2.6 Step 1.] [Section 4.2.1] [Section 4.2.13 Step 1.]
2. IRO-014-4 Coordination Among Reliability Coordinators
3. R1 [Section 4.1] [Section 4.2]
4. TOP-001-6 Transmission Operations
 - R2 [Section 4.1] [Section 4.2]

6.2 FERC References

1. MISO Open Access Transmission, Energy, and Operating Reserve Markets Tariff, Section 40.2.20



6.3 MISO References

1. BPM-007 Physical Scheduling Business Practice Manual Section 16 – Capacity Resource Scheduling
2. SO-I-EOP-00-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing
3. SO-I-EOP-00-006 Interchange Scheduling Operations during Emergency Conditions
4. SO-I-AOP-00-224 CTS Failure Modes
5. SO-I-NOP-00-404 Emergency Demand Response Implementation
6. SO-I-NOP-00-441 Operations Real-Time Event Resolution
7. SO-I-NOP-00-448 Event Communications Matrix
8. SO-I-NOP-00-462 Inadvertent Interchange Management
9. SO-I-NOP-00-479 Purchasing and Selling Emergency Energy
10. SO-I-NOP-00-481 MISO-Manitoba Hydro Concurrent EEA
11. SO-I-NOP-00-483 Reliability Coordination Conference Call
12. SO-I-NOP-00-491 FRAC Handoff
13. SO-P-AOP-00-217 MISO and State Officials 24X7 Communication Protocols During Emergencies
14. SO-P-EOP-00-004 Transmission System Emergency
15. SO-P-EOP-11 MISO Emergency Operating Plan
16. SO-P-NOP-00-431 Communications Protocol for Operating Instructions
17. SO-P-NOP-00-449 Conservative System Operations
18. SO-P-NOP-00-455 Balancing Authority Operations
19. SO-P-NOP-04 MISO Event Reporting Operating Plan

**Attachment 1 — Reserve Margin Example Calculations**

1.0 Example 1: Projection for MBAA

Table 1: Calculation

Description	Value
MBAA Peak Load Forecast:	100,000
Operating Reserve Requirement:	2,410
Load plus Operating Reserve Requirement:	102,410
Available Economic Maximum in Area:	97,000
Constraint Stranded MW:	2,000
Available Economic Resources in Area:	95,000
Net Scheduled Interchange (NSI) into Area:	8,000
Reserve Margin = $95,000 + 8,000 - 102,410$	+ 590
Reserve Margin (%) = $(590 / 102,410) * 100$:	+ 0.6%

Assessment: Reserve Margin is forecasted to be +590 MW. Load plus Operating Reserve Requirement is met, however the Reserve Margin is less than 1500 MW. A Max Gen Alert declaration may be necessary.



2.0 Example 2: Projection for South Region

Table 2: Calculation

Description	Value
MBAA Peak Load Forecast:	30,000
Operating Reserve Requirement:	1,500
Load plus Operating Reserve Requirement:	31,500
Available Economic Maximum in Area:	29,000
Constraint Stranded MW:	1,000
Available Economic Resources in Area:	28,000
Net Scheduled Interchange (NSI) into Area (RDT NSI):	400
RDT Import Capability up to RDTL of 3,000	3,000
Reserve Margin = $28,000 + 3,400 - 31,500$	-100
Reserve Margin (%) = $(-100/31,500) * 100$:	- 0.3%

Assessment: Reserve Margin is -100 MW, meaning the South Region Load plus Operating Reserve Requirement is 100 MW short of being met. This means Load will be covered but the 1,500 MW Operating Reserve Requirement will not be. A Max Gen Warning or Event declaration may be necessary.



Attachment 2 — Maximum Generation Declaration Template

Maximum Generation Declaration Type: [Alert/Warning/Event]

The MISO RC is Declaring/Updating a Maximum Generation Alert/Warning/Event effective from [MM/DD/YYYY] [HH:MM] EST and [MM/DD/YYYY] [HH:MM] EST for the following entities:

[List the affected entities within the boundaries of the declaration by LBA. Include any constrained pockets within the declaration area with adequate generation that should be excluded from the Maximum Generation Emergency.]

The reason for the declaration is:

State the reasons: Forced Transmission Outage, Forced Generation Outage, Higher than Forecasted Load, Above/Below Normal Temperatures, Loss of Import Interchange Schedules, Reduction in RDT limit, etc.

Members are to prepare for a Maximum Generation Emergency by performing the applicable MISO Member Maximum Generation [Alert/Warning/Event] Level Actions of SO-P-EOP-002 MISO Market Capacity Emergency procedure.

CTS Suspension: Attention Market Participants: CTS (Coordinated Transaction Scheduling) is Suspended as of [MM/DD/YYYY] [HH:MM] EST. Alternative scheduling methods should be utilized.

Projections (to LBAs and TOPs only):

- Peak hour for Area is Hour Ending [MM/DD/YYYY] [HH:MM] EST.
- Load plus Operating Reserve Requirement for Area: _____
- Amount of available economic Resources in Area: _____
- Imports into Area: _____
- Reserve Margin shortfall(-)/surplus (+) for Area: _____

1. Summary information (only) at the top of the OI Message/template will be communicated to MPs via the following:

- A. OI
- B. MISO public web site – Real Time Notifications Tab via OI View Real-Time Operations Updates at <https://www.misoenergy.org/markets-and-operations/notifications-overview/>



2. Completed OI message/template (summary & projections) will be communicated to TOPs, LBAs, BAs and neighboring BAs, and RCs as follows:
 - A. OI
 - B. RCIS
3. MISO will provide summary information to the following email exploder lists via OI message:
 - [*MISO Alerts BA and TO](#)
 - [*MISO Alerts FERC, State Comm., RRO, Neighboring RCs and BAs](#)
 - [*RT Ops Notification](#)



Attachment 3 — Load Management Update Form Example

Local Balancing Authorities (LBAs) report via MCS or phone to the RC Load reductions that would be available, time permitting, via Load Management should a Maximum Generation Emergency Event be implemented during the same time frame the Warning is effective. MISO will provide the expected notification time* for LBAs to assume when completing form.

Load Management may include but are NOT limited to public appeals, voltage reduction, and interruption of end use Loads in accordance with applicable contracts, demand-side management, utility Load conservation measures, and starting behind the meter generation*.

Load Management is separated into LMM – Stage 1 and LMM – Stage 2.

*Excludes Registered DRR Type 1 and DRR Type 2 Resources

Table 3: LBAs report the following estimated values:

LBA:	
Notification time for Load Management Measures (i.e. less than 4 hours)	
LMM Stage 1 available:	10
LMM Stage 2 available:	5
Total:	15
LBAs should list LMM Stage 1 and LMM Stage 2 that are already or projected to be implemented at the Event time:	
LMM Stage 1:	100
LMM Stage 2:	0
Total:	100

Attachment 4 — Slice-of-System PPAs Load/Schedule Curtailment

- 1.0 Slice-of-System Power Purchase Agreements (PPAs) Curtailed Pro-Rata with Load in the Source Balancing Authority when Source Balancing Authority is in Emergency Procedures
 1. PPAs in this category will continue to qualify as Planning Resources so long as the PPA only will be curtailed pro-rata along with Load in the source Balancing Authority and only when the source Balancing Authority is operating under Emergency Procedures.
 2. Under this situation, a PPA with a 1,000 MW Export schedule from an external Balancing Authority with a 3,000 MW Load will be curtailed pro-rata along with the Load when the external Balancing Authority is operating under Emergency Procedures. That is, curtailment would take place three-quarters to firm Load and one quarter to the firm schedule. This pro-rata treatment is triggered when MISO experiences Emergency Conditions at the same time as the external Balancing Authority.
- 2.0 Slice-of-System PPA in a Balancing Authority that Coordinates Planning Reserve Qualifications and Shares Emergency Responsibilities with MISO's Balancing Authority
 1. In addition to the slice-of-system PPA treatment noted in category (1.0) above, slice-of-system PPAs can continue to qualify as External Resources under this category, and MISO and the external BA will share Load Shedding on a pro-rata basis in proportion to the Load in the area under the Capacity Emergency, so long as the requirements of this category are met.
 2. This qualification category has several requirements for the host BA:
 - A. It must be in MISO's RC area.
 - B. It must share Operating Reserves with the MISO BA.
 - C. It must have a Seams Operating Agreement with MISO containing several features.
 3. Seams Operating Agreement must specify the following:
 - A. The host BA has established planning reserve processes and criteria similar to MISO's.
 - B. Actions that will be taken by both entities – MISO and the host BA – during Emergency Procedures prior to implementing Load Shedding.
 - C. BA responsibilities include:
 - (1.) Submitting Load estimates to MISO in a similar manner as submitted by other Load entities under Module E-1.



- (2.) Providing generator testing data for all resources used to serve firm requirements of the host Balancing Authority.
- (3.) Providing transparency to such resource plans in the form of a Fixed Resource Adequacy Plan, pursuant to Module E-1.
4. With these requirements in place, when both BAs have exhausted other Emergency operating actions and are in a firm Load shedding event, Load shedding is shared on a pro-rata basis in proportion to the Load in the area under the Capacity Emergency.

Example 1

If the load of an external BA in Capacity Emergency is 3,000 MW and the Load of the area in MISO in Capacity Emergency is 17,000 MW, then pro-rata Load shed is 3/20 of the total for the external Balancing Authority and 17/20 for the area in MISO in the Capacity Emergency.

-
5. This treatment is appropriate for BAs that meet the requirements indicated above because MISO can count on the fact that the external BA is planning and testing its resources in an equivalent manner to MISO, is part of MISO's RC area, and is subject to Emergency Procedures it has developed with MISO. It has also agreed to operate its system in a similar manner, including the agreement to share its Operating Reserves with MISO during Emergency Conditions.
- 3.0 When MISO is in an EEA and the external BA with PPA is not, then MISO will determine if the PPA should flow or determine the curtailable MWs of the PPA.
1. $LBA_{NET} \text{ (Excess Capability)} = \sum (LBA_{online} RTmw - LBA_{online} MaxObligation)$
 - Where RTmw = Current RT MWs of Resource
 - Where MaxObligation = The lesser of a resource's Effective ICAP (capacity obligation) and their Real-Time Must Offer availability
 2. Prior to any curtailments, MISO will contact the external BA by phone.
 3. If the BA indicates that the curtailment will cause the BA to enter an EEA, then MISO will initiate SO-I-NOP-00-481.
 4. If the BA indicates that the curtailment will NOT cause the BA to enter an EEA, then MISO will curtail any relevant schedule(s).



Attachment 5 — Additional Information

1.0 Max Gen Emergency

1. MISO may call for a Max Gen Alert, Warning, Event, or EEA level prior to the actual forecasted start time of such Alert, Warning, Event, or EEA level.
 - A. The purpose of this is to communicate forecasted conditions that meet the criteria of these levels, as well as to provide notice of certain implementation steps that require longer notifications times.
 - B. An example would be an LMR which has a 4-hour notification time, requiring implementation instructions to be sent prior to the actual start time of the Event or EEA.
 - C. Due to the dynamic nature of the Bulk Electric System (BES), these preliminary declarations and instructions may be canceled prior to the actual start time of the forecasted Alert, Warning, Event, or EEA as conditions warrant.
 - D. At the Max Gen Alert level, Emergency Pricing - Tier 0 is in effect until termination of the Alert or increasing Max Gen level to Warning level or higher.

2. Max Gen Warning

- A. EDRs may also be registered as LMRs in Module E. If a Market Participant (MP) has decided to offer all or part of their resource as an EDR for an operating day, the MP should reduce the availability of that resource as an LMR in the DSRI Tool for all 24 hours of the same operating day by the maximum MW amount offered for that resource as an EDR. In addition, if an MP has voluntarily implemented any resources registered as an LMR, the MP should adjust the availability of that resource in the DSRI Tool.
- B. Tier I prices are in effect from Max Gen Warning until an Emergency Event Step 2a, when Tier II prices are implemented. This is an ex-post ELMP pricing change and does NOT affect system commitment or dispatch. Emergency Pricing will be utilized as necessary on an LBA basis.

3. Max Gen Event

- A. MISO will implement Emergency Pricing - Tier II during Step 2a of an Emergency Event. This is an ex-post ELMP pricing change and does NOT affect system commitment or dispatch. Emergency Pricing will be utilized as necessary on an LBA basis.

Attachment 6 — Maximum Generation Emergency Overview

The following is an overview of Max Gen Emergency actions and should be used for reference only during an actual event.

Table 4: Maximum Generation Emergency Overview

Level	MISO Major Actions	Stakeholder Major Actions
Declaration	Send OI Declaration message	Prepare to implement this procedure and follow internal procedures for Emergency Conditions
	Declare Conservative System Operations	Follow instructions per Conservative System Operations procedure and declaration
	Increase STR Default if System-Wide or STR MSSC if North/Central or South Region	
Alert		
	Implement Emergency Pricing - Tier 0	LBAs/TOPs provide potential exclusion of constrained pockets within the declaration area
	Raise transfer capability or make Constraint Stranded MW from generation available	TOPs coordinate with MISO RC to identify potential reconfiguration options
	Request MPs/LBAs ensure accuracy of LMM/LMR availability and Self-Scheduled values	LBAs/MPs ensure accuracy of LMM/LMR availability and Self-Scheduled values in MCS/DSRI Tools
	Send LBAs LMM survey	Affected GOPs communicate capacity-limited facilities to MISO and update Limits/Offer

Table 4: Maximum Generation Emergency Overview

Level	MISO Major Actions	Stakeholder Major Actions
Warning	Implement Emergency Pricing - Tier I	
	Suspend CTS	
	Determine EDR availability and MW amounts	MPs update EDR availability and MW amounts
	Obtain updated MW amounts of relief available via Load Management Form in MCS	LBAs update LMM availability via Load Management Form in MCS
	Review LMR availability using MCS-LMR Tool	MPs ensure LMR availability data is correct in the DSRI Tool
	Schedule available Module E Resources into the declaration area	MPs schedule available Module E Resources into the declaration area
	Curtail Export Schedules as required	
	Notify affected GOPs with Generators de-rated due to environmental restrictions to request waivers from appropriate government agencies	Affected GOPs request waivers from the appropriate government agencies for Generators de-rated due to environmental restrictions
	Evaluate options for returning Transmission and Generation services	
	Instruct TOPs to implement reconfiguration options	As directed by MISO RC, implement reconfiguration options
Event Step 1a	Commit AME resources	As directed by MISO, LBAs/GOPs/MPs start AME Resources
Event Step 1b/EEA1	Declare EEA1	MPs review Offers and ensure all available Emergency Ranges and Resources are offered
	Activate Emergency Maximum Limits	



Event Step 2a/EEA2	Declare EEA2	
	Implement Emergency Pricing - Tier II	
	Instruct Load to be reduced via LMMs - Stage 1 and LMRs	As directed by MISO, LBAs reduce Load via LMM - Stage 1
	Implement LMRs	MPs implement LMRs via DSRI Tool
Event Step 2b	Commit EDR Resources	As directed by MISO, MPs commit EDRs

Table 4: Maximum Generation Emergency Overview

Level	MISO Major Actions	Stakeholder Major Actions
Event Step 2c	Implement Emergency Energy purchases	LBAs issue public appeals to reduce demand per internal procedures and OE-417 filings
	Instruct LBAs to issue Public Appeals	
		LBAs in defined Event area shall prepare to shed Load
Event Step 3a	Notify affected GOPs with de-rated Generators to implement waivers for dispatch	Affected GOPs implement waivers to dispatch de-rated Generators
	Implement spinning and supplemental reserves	
Event Step 3b		
	Instruct Load to be reduced via LMMs - Stage 2	Affected LBAs reduce Load via LMM - Stage 2
Event Step 4a	Implement Reserve Call from CRSG	
Event Step 4b	Implement Emergency Energy purchases from neighboring BAs (Operating Reserves)	
Event Step 5/EEA3	Declare EEA3	
	Issue Emergency Operating Instruction to shed Load if Contingency Reserves are depleted or to recover ACE from loss of Generation	LBAs shed Load per MISO instructions and confirm action via MCS Firm Load Shed Tool
	Set LMPs and MCPs to the VOLL	LBAs review OE-417 filing requirements

Attachment 7 — UDS Operator Actions During a MISO Market Capacity Emergency

- If a North/Central declaration is in place and a South declaration is subsequently implemented, Increase STR Default Values as specified in SO-I-EOP-00-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing procedure.
- Implementation of these steps are outlined in SO-I-EOP-00-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing
- Does not include Max Gen Event Downgrade/Termination Actions as noted in section 4.2.1.14
- * STR RPE & STR Default Values are specified in SO-I-EOP-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing procedure

SO-P-EOP-00-002 MISO Market Capacity Emergency - UDS Operator Actions									
		Increase STR RPE MSSC Default Values for Zone 8 (South) if not done in previous declaration*	Increase STR RPE MSSC Default Values for Non-Zone (N/C) if not done in previous declaration*	Increase STR Default Values for System Current (System Wide) if not done in previous declaration*	Implement Emergency Pricing Tier 0	Implement Emergency Pricing Tier 1	Activate Emergency Limits	Implement Emergency Pricing Tier 2	Check Is VOLL Price Enforced in EMD
System Wide Declaration Level	Capacity Advisory								
	Max Gen Alert								
	Max Gen Warning								
	Max Gen Event Step 1a								
	Max Gen Event Step 1b								
	Max Gen Event Step 2a and above								
North/Central Declaration Level	Capacity Advisory								
	Max Gen Alert								
	Max Gen Warning								
	Max Gen Event Step 1a								
	Max Gen Event Step 1b								
	Max Gen Event Step 2a and above								
South Declaration Level	Capacity Advisory								
	Max Gen Alert								
	Max Gen Warning								
	Max Gen Event Step 1a								
	Max Gen Event Step 1b								
	Max Gen Event Step 2a and above								
Single Region (North or Central) Declaration Level	Capacity Advisory								
	Max Gen Alert								
	Max Gen Warning								
	Max Gen Event Step 1a								
	Max Gen Event Step 1b								
	Max Gen Event Step 2a and above								

Figure 1: UDS Operator Actions During a MISO Market Capacity Emergency

Attachment 8 — Summary of Market Capacity Emergency Procedure Steps

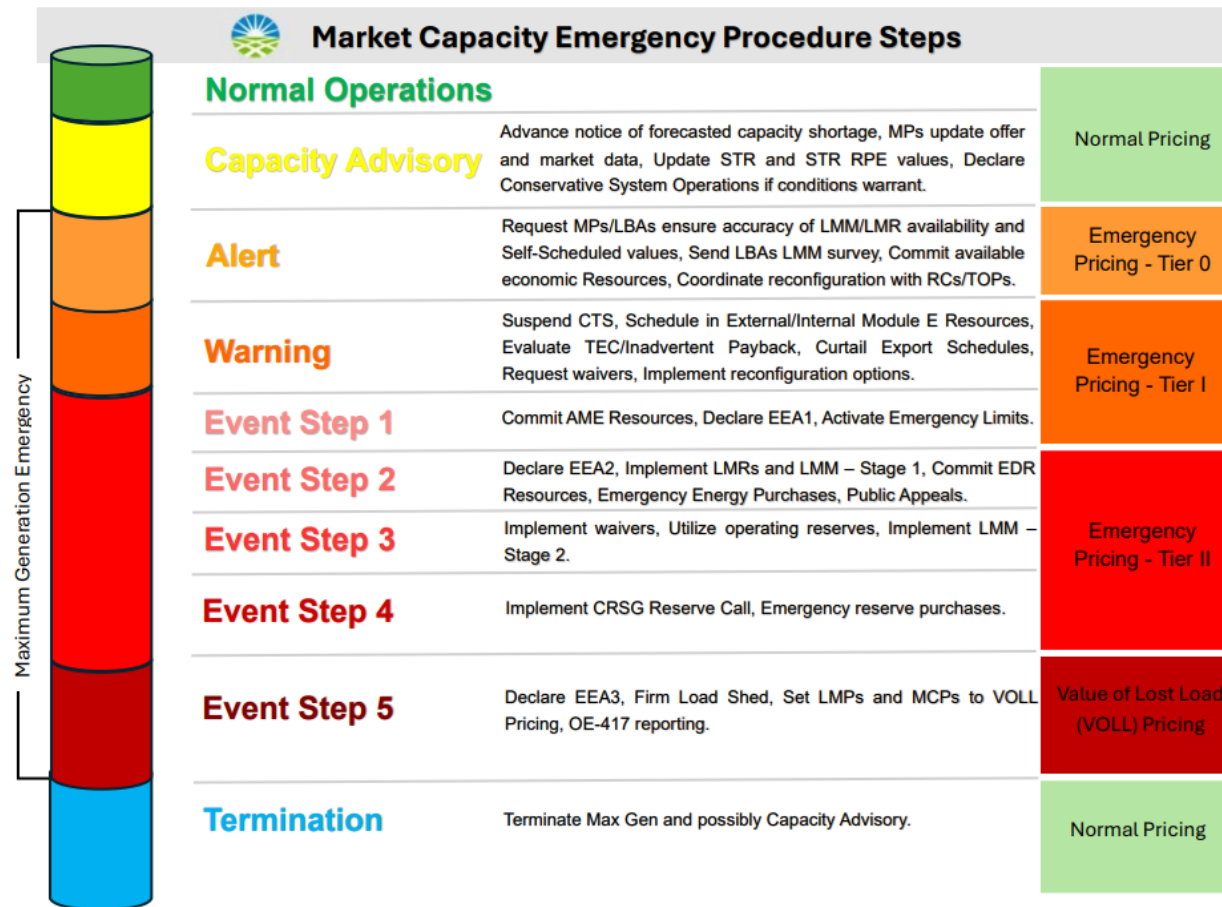


Figure 2: Market Capacity Emergency Procedure Steps