

MISO Emergency Operating Plan

SO-P-EOP-11 Rev: 0

Rev History	Reason for Issue	Revised By	Issue Date	Effective Date
0	New plan. Operating Procedure Owner approval on file.	Mike Carrión/ Becca Skalko/ Bill Puller	03/29/2024	03/29/2024

This document is prepared for informational purposes only, to support the application of the provisions of the MISO Tariff and the services provided thereunder. MISO may revise or terminate this document at any time at its discretion without notice. While every effort will be made by MISO to update this document and inform its users of changes as soon as practicable, it is the responsibility of the user to ensure use of the most recent version of this document in conjunction with the MISO Tariff and other applicable documents, including, but not limited to, the applicable NERC Standards. Nothing in this document shall be interpreted to contradict, amend, or supersede the MISO Tariff. MISO is not responsible for any reliance on this document by others, or for any errors or omissions or misleading information contained herein. In the event of a conflict between this document, including any definitions, and either the MISO Tariff, NERC Standards, or NERC Glossary, the MISO Tariff, NERC Standards, or NERC Glossary shall prevail. In the event of a conflict between the MISO Tariff and the NERC Standards, or NERC Glossary, the MISO Tariff shall prevail until or unless the Commission orders otherwise. Any perceived conflicts or questions should be directed to the Legal Department.



1.0 Purpose	1
2.0 Precautions and Limitations	1
3.0 Roles and Responsibilities	1
4.0 Entry Conditions	2
5.0 Instructions	2
5.1 Preparing for Emergencies	2
5.1.1 General	2
5.1.2 Training	2
5.1.3 Fuel Supply Availability	2
5.1.4 Outage Coordination	3
5.1.5 Unit Commitment and Dispatch	4
5.1.6 Forward Reserve Engineering Support (FRES)	5
5.1.7 Day-Ahead Market Operator	5
5.1.8 Operational Risk Assessment (ORA)	6
5.2 Operational and Sufficiency Coordination	6
5.2.1 SERC RC Coordination Call	6
5.2.2 MISO RC Coordination Call	7
5.2.3 Scorecard Meeting	7
5.2.4 Weekly Sufficiency Meeting	7
5.2.5 Other Coordination	9
5.3 Load and Demand Response Resources	9
5.3.1 General	9
5.3.2 Demand Response Resource (DRR) Type 1 and Type 2	10
5.3.3 Load Modifying Resource (LMR)	10
5.3.4 Emergency Demand Response (EDR)	10
5.4 Pre-Emergency Declarations	11
5.4.1 Capacity Advisory	11
5.4.2 Conservative Operations	11
5.4.3 Severe Weather Alerts	12
5.4.4 Hot Weather Alerts	12
5.4.5 Cold Weather Alerts	12
5.4.6 Maximum Generation Alert	13
5.4.7 Maximum Generation Warning	13
5.5 Maximum Generation Events	14
5.5.1 General	14



5.5.2 Maximum Generation Event Declaration	14
5.5.3 Energy Emergency Alert Level 1 (EEA-1)	15
5.5.4 Energy Emergency Alert Level 2 (EEA-2)	15
5.5.5 Energy Emergency Alert Level 3 (EEA-3)	16
5.6 Transmission System Emergencies	18
5.7 Termination of Emergency	18
5.8 Notifications and Communications	18
5.8.1 General Communication Methods	18
5.8.2 Voice Communications	19
5.8.3 Data Communications	19
5.9 Emergency Operating Plan Reviews.	20
5.10 Event Reporting.	20
6.0 References	21
6.1 NERC References	21
6.2 MISO References.	21
Attachment 1 — MISO Sufficiency Process Flowcharts	23



1.0 Purpose

This Plan establishes MISO's Emergency Operating Plan for its Balancing Authority (BA) Area per NERC Standard EOP-011.

2.0 Precautions and Limitations

1. This Plan is **NOT** inclusive for every emergency scenario; it is solely designed for Capacity and Energy Emergencies.
2. This Plan does **NOT** contain specific action steps for MISO operators or MISO stakeholders. Specific actions to be taken are provided in *SO-P-EOP-00-002 MISO Market Capacity Emergency* and other referenced procedures.

3.0 Roles and Responsibilities

1. General MISO Responsibilities
 - MISO is responsible for determining, declaring, and communicating when a Capacity or Energy Emergency is forecast, occurring, or terminated in the MISO Balancing Authority Area (MBAA).
 - The MISO Shift Manager (SM), Reliability Coordinator (RC), Balancing Authority Operator (BAO), Unit Dispatch Operator, and Unit Commitment Operator have the responsibility and clear decision-making authority to take whatever actions needed to ensure the reliability of its area, and shall exercise specific authority to alleviate Capacity and Energy Emergencies in accordance with *SO-I-ADM-01 MISO Letter of Authority*.
 - Issue operating instructions to Local Balancing Authorities (LBAs), Transmission Operators (TOPs), Generation Operators (GOPs), and Market Participants (MPs) to manage Capacity or Energy Emergencies.
 - Perform sufficiency studies as outlined in Section 5.1 Preparing for Emergencies.
2. MISO Stakeholder Responsibilities
 - Follow operating instructions given by MISO operators unless such actions could violate safety, equipment, regulatory, or statutory requirements.
 - Notify MISO of known issues that will affect generation capacity as soon as practicable, including fuel availability, severe weather, and environmental constraints.

4.0 Entry Conditions

1. **IDENTIFIED** potential sufficiency shortfall during the Multi-Day Reliability Assessment Commitment.
2. **IDENTIFIED** increased weather-based risk to sufficiency such as extreme hot or cold weather, or other severe weather by the Operations Risk Assessment (ORA) team.

5.0 Instructions

5.1 Preparing for Emergencies

5.1.1 General

1. MISO performs a sufficiency analysis for each operating day to validate resource availability, with a goal of having 5% additional generating capability or availability for the MISO footprint (with at least 2000 MW for the South Region) once all obligations, including operating reserves and contingency reserves, have been accounted for.
2. Multiple teams at MISO participate in the process of identifying and preparing for potential sufficiency shortfalls, which could lead to a Capacity or Energy Emergency. The sections that follow give a brief description of the various MISO roles involved.
3. The flowcharts in Attachment 1 show MISO's Capacity and Energy Emergency preparedness process, from identification to declaration.

5.1.2 Training

1. MISO trains operations staff on capacity and energy emergencies. MISO holds an annual Capacity and Energy Emergency Drill for both MISO and Member operators. This drill provides an opportunity to simulate utilizing *SO-P-EOP-00-002 MISO Market Capacity Emergency*, and other related procedures, and to practice giving and receiving operating instructions using proper communications protocols.

5.1.3 Fuel Supply Availability

1. Coal or Fuel Oil Units
 - MISO has a standing fuel/consumables data request for coal and oil fuel units, completed on a weekly to every 3 week basis, depending on time of year, which requests fuel type, and consumables inventory levels. This includes information on how many hours they can operating a max output.

- Units are also expected to report any environmental limitations.
- Operations Risk group puts this info into internal dashboards and posts summary info on misoenergy.org.

2. Natural Gas

- MISO monitors natural gas pipeline bulletin board postings on a daily basis for Operational Flow Orders (OFOs) and other constraints/restrictions that might limit gas generation.
- MISO's external facing web site has a summary of most pipelines that serve generation units within MISO's BA Area.
- The Operations Risk group has an internal dashboard that shows which units are connected to which pipelines and service levels and types of additional services they subscribe too, along with pipeline maps.

3. Fuel Switching

- MISO commercial model identifies dual-fuel units.
- MISO does **NOT** directly monitor a unit's ability to switch between fuels, nor monitor which fuel a unit is utilizing; this is done indirectly via outage tickets (reason codes include lack of fuel, fuel issues, etc.) and market offers.

5.1.4 Outage Coordination

1. MISO utilizes an outage scheduling application to document all transmission and generation outage schedules. Outage scheduling is done in accordance with *BPM-008 Outage Operations Business Practices Manual* and *SO-P-NOP-00-411 Outage Operations*.
2. The submission, maintenance and implementation of outage records is the exclusive responsibility of the GOP and TOP, and **NOT** MISO (with exception of the approval process).
3. Every effort should be made to ensure outage information for the next operating day is reported prior to the close of the Day Ahead Market to ensure availability for the Next Day security studies.
4. MISO will assess the impact of a generator outage request against the maintenance margin criterion for the same period. Maintenance margin is the maximum megawatt of generation that can be taken out of service for planned maintenance for any given time without impacting supply adequacy for MISO's Balancing Authority Area including MISO sub-regions.

5. Maintenance margin is a proactive measure that may provide an early window of opportunity for MISO and GOPs to resolve a potential risk to supply adequacy. If a generator outage request results in the maintenance margin being exceeded (or if the maintenance margin has already been exceeded), THEN MISO will notify the affected GOPs and recommend alternative schedules that lessen the impact on maintenance margin.
6. An outage that has been implemented can be recalled due to system emergency or conservative operations conditions.

5.1.5 Unit Commitment and Dispatch

1. Unit Commitment encompasses a collective group of three operator desks: Unit Dispatch System Operator, Forward Reliability Assessment & Commitment Operator, and Intra-Day Reliability Assessment & Commitment Operator.
 - A. Unit Dispatch System Operator (UDS) performs the following tasks:
 - Real-time Security Constrained Economic Dispatch (SCED) function.
 - Reviews and approves UDS cases on a 5-minute basis.
 - Clears for Energy, Reserves – Regulating, Spinning, Supplemental, Ramp, STR (Short Term Reserves).
 - Coordinates constraint limits with RCs.
 - Take manual actions for changing system conditions.
 - B. Forward Reliability Assessment & Commitment (FRAC)
 - MISO generally begins its Multi-Day Reliability Assessment Commitment (MD RAC) seven days before the operating day. The output of this process can be monitored by MISO staff on internal systems.
 - Ensures adequate generation is scheduled to meet MISO's load and reserve obligations.
 - Ensures forecasted hourly sufficiency meets the necessary reserve margin.

- Generates Next-Day Capability Report which is turned over to SM, IRAC, and FRAC Operators.
 - Commits additional resources as needed to maintain appropriate reserve margins.
- C. Intra-day Reliability Assessment & Commitment Operator (IRAC)
- Assesses current and next operating day reliability.
 - Ensures adequate generation is scheduled to meet load and obligations.
 - Incrementally commits generation in the real time market to meet demand and obligations.
 - Monitors hourly sufficiency and communicate with appropriate operators.
 - Coordinates generation commitments with RCs to relieve binding constraints.
2. If Unit Commitment (UC) Team sees a potential shortfall, they will notify the SM and the Systems Operations team.
 3. The SM, RC, and the UC Team will have internal discussions, reviewing all load pocket requirements, generation planning to return from outage based on data in CROW, and what the transfer capabilities are on the system by performing assessments.
 4. If the results of these discussions determines no improvement to sufficiency for several days, MISO will have an internal sufficiency meeting, hosted by the UC Team.
- 5.1.6 Forward Reserve Engineering Support (FRES)**
1. Two days prior to the Operating Day, MISO's FRES team analyzes expected system configurations ensuring no planned N-1 contingencies have planned mitigation. The Security Report with the results of the N-1 analysis is sent to FRAC department, and the Day Ahead Market Operators.
 2. FRES runs the study again one day before the Operating Day. The results of this next-day analysis are captured in the Next Day Report and sent to System Operations Engineering (SOE).
- 5.1.7 Day-Ahead Market Operator**
1. MISO's Day-Ahead Market closes at 1030 EPT.

2. The Day-Ahead Market Operator reviews energy offers, bids, and Ancillary service offers, and utilizes demand bids from LBAs to meet all load obligations.
3. Utilizes Security Constrained Unit Commitment (SCUC) and SCED processes to determine the most economical outcome of every resource used to meet demand.
4. Coordinates with Outage Coordination, RCs, and FRES to ensure the proper Transmission Security Planning studies are completed satisfactorily with mitigation plans prepared if necessary.

5.1.8 Operational Risk Assessment (ORA)

1. Risk assessed based on wind and solar trends, temperature forecasts, and load forecasts.
2. Studies greater weather patterns (ie, El Niño) and historical weather and load data, to determine what operational risks may be present.
3. There is also a graph that shows historical MISO load versus PJM load and the NSI for specific days.
4. Provides data analysis updates to SM via internal displays.
5. Weather-based risk such as extreme hot or cold weather, even without any immediate sufficiency concerns in the RAC process, could also lead to additional sufficiency meetings.
6. ORA assessments may lead the SM to declare a Severe Weather Alert, Hot Weather Alert, Cold Weather Alert, and/or Conservative Operations . (See Section 5.4.)

5.2 Operational and Sufficiency Coordination

5.2.1 SERC RC Coordination Call

1. Every morning, the MISO SM, or designee, communicates with neighboring RCs during a conference call hosted by SERC.
2. Agenda items include:
 - Peak hour and peak load forecast information.
 - Percentage of load forecast to seasonal peak.
 - Forecasted and required operating reserves.
 - Reliability or weather issues and concerns.

5.2.2 MISO RC Coordination Call

1. The MISO SM, or designee, hosts a reliability conference call each weekday, excluding holidays, using *SO-I-NOP-00-483 Reliability Coordination Conference Call*.
2. During this conference call, SM will review and discuss the following:
 - Pertinent events from the previous day
 - Weather report
 - Peak Hour and Load, Actual Operating Reserves, and Required Operating Reserves for the RC Area as a whole and for the South Region
 - Significant Generation Outages (Units ≥ 300 MW)
 - Significant Transmission Outages (Branches ≥ 345 kV)
 - Current TLRs and/or EEAs in effect at the time of the call
 - Other significant information, including active or expected declarations, major IT work, etc.

5.2.3 Scorecard Meeting

1. Each weekday morning (excluding holidays), the SM, or designee, hosts a meeting for MISO System Operations and support staff to discuss the previous operating day's performance, as well as the current operating day.
2. FRES presents information on significant generation and transmission outages.
3. Changes in gas infrastructure/availability are reported.
4. The ORA team presents a forecast for the current operating day and the next several days for situational awareness. This briefing includes projected weather, load and, wind forecasts, and other risk factors such as major storms/weather events or other atmospheric anomalies which could impact operations.
5. A review of the likely impacts to wind and solar generation are included in the presentation.
6. The Unit Commitment team gives information on the overall sufficiency outlook for MISO for the current and next five days.
7. Any other significant information, including active or expected declarations, and scheduled IT work are discussed.

5.2.4 Weekly Sufficiency Meeting

1. A MISO Operations Sufficiency Meeting will be held if it is determined that there is a severe risk to sufficiency.

2. The SM, or designee, will review Reliability Coordinator Information (RCIS) in preparation of the meeting to determine what discussions may need to occur with MISO's neighboring BAs.
3. All control room functions will be represented, including:
 - Shift Managers
 - Reliability Coordination
 - Balancing Authority Operations
 - Generation & Interchange
 - Unit Dispatch System Operations
 - Unit Commitment Operations
 - Forward Reliability Engineering Support
4. Other operations and support teams will also attend the meeting, including:
 - Day-Ahead Operations
 - Outage Coordination
 - Operational Risk Assessment
 - Forward Reliability Assessment Commitment Operations
 - Market and Operations Analytics (MOA)
 - Locational Marginal Pricing team
 - Strategic Communications
 - Unified Incident Response (UIR)
 - Operations Support
 - Director On-Call
 - Incident Management Team Operations Representatives may attend the meetings if the risk is severe.
5. During this meeting, MISO operations staff review current data for potential capacity shortfall, possible stranded generation due to transmission outages, and weather risk. The SM will discuss real-time trends.
6. ORA will give input on how the weather forecast may impact both load and generation.
7. Outage Coordination team will provide input on both transmission and generation outages that are ongoing, ending soon, or about to start. When appropriate, additional analysis is provided to facilitate further understanding of transmission and generator availability limitations or impacts.

8. The Day-Ahead team will be able to see what the current offers are for the operating day with sufficiency concerns as day-ahead offers are to be submitted by 1030 EPT. They will be able to identify any potential differences between the day-ahead offer and the real-time offers.
9. This meeting may result in action items, such as:
 - Communications to members
 - Declarations
 - Starting units with long lead times
 - Delaying, canceling, or revoking outages
 - Staffing assessments
10. Sufficiency meetings could occur several days in advance of the operating day in concern, and may be held multiple times as the concern draws closer.

5.2.5 Other Coordination

1. In addition to scheduled meetings, other ongoing coordination includes:
 - MISO's internal Event Chat in Microsoft Teams
 - MISO's Daily Sufficiency Outlook channel in Microsoft Teams
 - Various forecast and weather channels
 - In person/video discussions with ORA, Shift Teams, IRAC, and Director on Call

5.3 Load and Demand Response Resources

5.3.1 General

1. Demand Response resources can participate in the MISO Market via several methods outlined in *BPM-002 Energy and Operating Reserve Markets Business Practice Manual* and *BPM-026 Demand Response Business Practice Manual*.
2. The MISO Business Practice Manuals outline the offer and operating characteristics that different demand response resource types shall follow.
3. As part of this Emergency Operating Plan, these different resource types are dispatched in different steps that are primarily dependent on the resource types and their offers.
4. LBAs should work with TOPs to ensure that critical natural gas infrastructure is excluded from Demand Response Resources.

5.3.2 Demand Response Resource (DRR) Type 1 and Type 2

1. These two resource types are in the MISO Market and will be dispatched economically based on their offers via the MISO Unit Commitment Team.
2. Offers for DRR Type 1 and Type 2 are submitted and maintained in the MUI 2.0.
3. Should any DRR have a commitment status of "Emergency," those resources will not become available to MISO System Operations until a Maximum Generation Event Step 1a has been declared per *SO-P-EOP-00-002 MISO Market Capacity Emergency*.

5.3.3 Load Modifying Resource (LMR)

1. Demand Response (DR) and Behind the Meter Generation (BTMG) resources may be offered into MISO as LMRs.
2. Offers for LMRs are submitted by a market participant and maintained in the Demand Side Resource Interface (DSRI).
3. LMRs are deployed via the MCS, and market participants receive an LMR Implementation Message in the MCS and an LMR Scheduling Instruction Event in the DSRI.
4. If MISO has declared at least a Capacity Advisory, then MISO may issue LMR Scheduling Instructions for a future hour in which an EEA-2 declaration is anticipated. An EEA-2 must be declared by MISO by the start time of the issued LMR Scheduling Instruction.

5.3.4 Emergency Demand Response (EDR)

1. Similar to LMRs, EDRs may be made up of DR and BTMG resources. Offers for EDRs are submitted by an MP via Extensible Markup Language (XML).
2. EDRs are deployed via the Market Ops Suite (MOS), and MPs with deployment instructions will receive them via XML.
3. An EEA-2 must be declared prior to issuing the EDR deployments. In accordance with MISO Market Capacity Emergency Procedure, EDRs are deployed after LMRs. *SO-P-NOP-00-449 Conservative System Operations*

5.4 Pre-Emergency Declarations

5.4.1 Capacity Advisory

1. A Capacity Advisory is declared if the forecasted reserve margin is less than
 - 5%
 - 2000MW for MISO's South Region.
2. MISO will send LMR scheduling instructions for a forecasted Maximum Generation Event Step 2a (EEA-2).
3. MISO stakeholders will ensure that all market data is updated with the best available information for the operating day(s) specified in the declaration.
4. MISO actions include increasing STR default if the condition is system wide, or increasing STR MSSC if the declaration is for the North/Central regions and reviewing control center staffing and outage plans.

5.4.2 Conservative Operations

1. MISO will declare Conservative Operations in accordance with *SO-P-NOP-00-449 Conservative System Operations*.
2. The goal of conservative operations is to maximize MISO's ability to operate the BES during periods of heightened risk. Conservative operations could be declared due to capacity shortages, supply issues, threats to the BES, issues with the ability to monitor the BES, or severe weather conditions.
3. During conservative operations, non-essential planned maintenance that could impact generation, transmission, or monitoring capabilities will be suspended. Maintenance includes non-essential planned maintenance, tree trimming, Remote Terminal Unit (RTU) work, protection and control testing, or other maintenance tasks.
4. MISO Members are responsible for reviewing their maintenance and outage plans for generation, transmission, and IT systems. Market participants should also prepare to implement emergency procedures and follow all instructions per the declaration and *SO-P-NOP-00-449 Conservative System Operations*.

5.4.3 Severe Weather Alerts

1. Severe weather can lead to capacity and energy emergencies due to increased load (especially heating and cooling), more severe operating limitations in hot weather, fuel unavailability, and environmental constraints.
2. MISO will declare a Severe Weather Alert per *SO-P-NOP-00-449 Conservative System Operations* when forecasted extreme weather conditions are projected to potentially impact the BES.

5.4.4 Hot Weather Alerts

1. Hot Weather Alerts will be declared when temperatures are projected to near or exceed *SO-P-NOP-00-449 Conservative System Operations*, Table 1: Hot Weather Alert Temperature Criteria, along with high humidity and concerns about capacity and operating reserve requirements.
2. MISO will review system adequacy requirements and contact market participants to determine fuel/environmental limitations and unit availability for the projected Alert period.
3. MISO will coordinate with stakeholders to determine what maintenance or testing actions can be deferred or revoked on a voluntary basis.

5.4.5 Cold Weather Alerts

1. Cold Weather Alerts will be declared when temperatures are projected to be near or fall below *SO-P-NOP-00-449 Conservative System Operations*, Table 2: Cold Weather Alert Temperature Criteria along with severe wind chill factors and concerns about capacity and operating reserve requirements.
2. MISO will review system adequacy requirements and contact market participants to determine fuel/environmental limitations and unit availability for the projected Alert period.
3. MISO will coordinate with stakeholders to determine what maintenance or testing actions can be deferred or revoked on a voluntary basis.
4. MISO stakeholders will implement their plans to winterize generation units to ensure availability during emergency conditions.

5.4.6 Maximum Generation Alert

1. A Maximum Generation Alert will be declared per *SO-P-EOP-00-002 MISO Market Capacity Emergency* if the forecasted reserve margin is either:
 - Less than 1500MW for the MISO BA Area, Region, or Sub-area for the largest single contingency for that sub area; or
 - Less than 500MW for the South Region.
2. A Maximum Generation Alert provides an early indication that system conditions may require the use of MISO's generation emergency procedures. The purpose is to communicate system conditions for operational awareness. An alert indicates that the load or generation balance is tight, but still able to meet requirements.
3. During a Maximum Generation Alert, MISO will review options such as increasing generation, making constrained generation available, and looking for non-firm export schedules that will be utilized in the event of a Maximum Generation Warning.
4. MISO will work with stakeholders to ensure the accuracy of LMM and LMR availability and self-scheduled values in MCS/DSRI tools, as well as availability of Module E resources.
5. MISO will initiate a conference call with affected stakeholders if necessary.
6. Emergency Pricing Tier 0 will be implemented per *SO-I-EOP-00-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing*.

5.4.7 Maximum Generation Warning

1. MISO will issue a Maximum Generation Warning per *SO-P-EOP-00-002 MISO Market Capacity Emergency* when there is indication that Operating Reserve requirements may not be maintained while utilizing normal economic resources.
2. During a Maximum Generation Warning, actions are taken to preserve resources that are dedicated to firm load and to maintain Operating Reserves.
3. MISO will coordinate with stakeholders to implement mitigation actions to increase generation, make constrained generation available, and curtail non-firm export schedules.
4. Emergency Pricing Tier 1 will be implemented per *SO-I-EOP-00-001 Utilizing Emergency Ranges and Emergency and VOLL Pricing*.

5.5 Maximum Generation Events

5.5.1 General

1. MISO declares advisories, warnings, and alerts based on specific entry criteria utilizing the information that is forecasted and MISO's system monitoring in real time operations. Because both MISO's BA and RC functions are integrated into System Operations, MISO does not need to specifically request an Energy Emergency Alert (EEA) declaration.
2. In general, the SM will make the declaration, however, the SM may delegate to another qualified operator at their discretion.
3. Each type of declaration has specific actions that should be taken by MISO and by the Member entities.
4. MISO may call for a Max Gen Alert, Warning or Event level prior to the actual forecasted start time of such Alert, Warning, Event.
5. MISO may declare a higher level Alert, Warning, or Event based on system conditions without the need to escalate through lower level declarations.
6. An energy deficient BA within MISO's RC Area who is not part of MISO's BA Area may also request that an EEA be declared per EOP-011-4 Attachment 1. This will be handled under *SO-P-EOP-00-002-A MISO Non-Market Capacity Emergency*.

5.5.2 Maximum Generation Event Declaration

1. MISO will Declare a Maximum Generation Event per *SO-P-EOP-00-002 MISO Market Capacity Emergency* when the MISO Balancing Authority Area, Region, or Sub-Area actual or forecasted reserve margin is less than zero utilizing economic maximum limits and the actions taken during a maximum generation warning are not sufficient.
2. A Maximum Generation Event is declared prior to MISO meeting the threshold specified in EOP-011 Attachment 1 for an Energy Emergency Alert (EEA) Level 1. This is commonly referred to as EEA-0.
3. MISO will commit AME resources. MISO stakeholders will start AME Resources when directed by MISO. Both MISO and its Stakeholders will perform all other actions necessary in accordance with *SO-P-EOP-00-002 MISO Market Capacity Emergency* for a Maximum Generation Event Step 1a.

5.5.3 Energy Emergency Alert Level 1 (EEA-1)

1. MISO will declare an EEA-1 in accordance with NERC Standard EOP-011 Attachment 1 when all available generation resources are committed to meet firm Load, firm transactions, and reserve commitments, and it is concerned about sustaining its required Contingency Reserves.
2. MISO and its stakeholders will perform actions specified in *SO-P-EOP-00-002 MISO Market Capacity Emergency* for a Maximum Generation Event Step 1b.
3. Emergency Maximum limits will be activated, and Market Participants will review offers and ensure all available Emergency ranges and resources are offered.

5.5.4 Energy Emergency Alert Level 2 (EEA-2)

1. MISO will declare an EEA-2 in accordance with NERC Standard EOP-011 Attachment 1 when it is no longer able to provide its expected energy requirement and is energy deficient within its Balancing Authority Area, but is still able to maintain minimum Contingency Reserve requirements.
2. MISO and its stakeholders will perform actions specified in *SO-P-EOP-00-002 MISO Market Capacity Emergency* for a Maximum Generation Event Step 2a through Step 4b.
3. MISO will Implement Emergency Pricing Tier 2 during this stage.
4. MISO will instruct affected Generator Operators with generator de-rates to request waivers. The affected GOPs will make requests for waivers to environmental constraints from the governmental regulators in their jurisdiction.

Note

MISO Member LBAs are encouraged to voluntarily implement energy reductions and issue public appeals based on their internal procedures, however, MISO's procedures outline when MISO will issue an instruction to LBAs to make public appeals or requests to government agencies.

5. MISO will issue an instruction to the LBAs within the declaration area to have the LBAs make public appeals per their approved Emergency Operating plans and their internal procedures. MISO does not directly make public appeals for voluntary load reductions.

6. MISO will instruct LBAs to make requests to government agencies during an EEA-2 as specified in *SO-P-EOP-00-002 MISO Market Capacity Emergency*. Because MISO's BA Area spans many states, MISO relies on its LBAs to make requests to the government agencies in their local jurisdictions to implement their programs to achieve necessary energy reductions.
7. MISO will evaluate and implement opportunities to reduce internal energy usage, such as reducing lighting not necessary for personnel safety, sending non-essential personnel home, and reducing other large electrical loads.
8. MISO will also instruct LBAs to reduce their internal energy use per their Emergency Operating Plans and internal procedures.
9. During an EEA-2, MISO will issue operating instructions to LBAs to reduce load utilizing interruptible load, curtailable load, and demand response resources such as those outlined in Section 6.3 of this Plan.
10. MISO members can share information on load reduction actions, such as interrupting non-firm and curtailable load via the Load Management tab of the MCS. In the MCS, LBA users can submit Self-Schedule load reduction on an hourly basis, giving MISO insight into their internal processes.
11. MISO may also request LBAs to file OE-417 and EOP-004 reports for actions taken to reduce load via load management procedures. LBAs will make applicable OE-417 filings for having issued public appeals. All reports will be made in accordance with *SO-P-NOP-04 MISO Event Reporting Operations Plan*.

5.5.5 Energy Emergency Alert Level 3 (EEA-3)

1. MISO will declare an EEA-3 if MISO, with coordination from the LBAs and assistance from neighboring BAs is unable to sufficiently increase generation or reduce load by the necessary amount.
2. MISO and its stakeholders will implement the actions specified in *SO-P-EOP-00-002 MISO Market Capacity Emergency* for a Maximum Generation Event Step 5.
3. MISO will coordinate with stakeholders to curtail firm export schedules.
4. MISO will issue operating instructions to shed load utilizing the load shed schemes specified in member Plans.



5. Once the MISO SM, or designee, determines the MW value necessary to mitigate the Capacity Emergency, the MCS Firm Load Shed tool will be leveraged to issue pro-rated load shed obligations to LBAs. MISO Member LBAs will then receive the electronic operating instruction for which they must acknowledge and accomplish as soon as possible not to exceed 30 minutes.

Example 1

MISO is entering a system wide Max Gen Event Step 5 with a system load of 100GW and a single LBA has 6GW, or 6% of the load. If the MISO Shift Manager, or Designee, determines that a 2000MW Firm Load Shed is necessary, then that single LBA will receive a Firm Load Shed obligation of 120MWs, which is 6% of the total load.

6. TOPs within MISO's footprint are responsible for ensuring that their load shed schemes are capable of implementation in a time frame adequate for mitigating the Emergency for load shed directed by MISO.
7. TOP load shed plans must also contain provisions to:
 - Minimize the overlap of circuits that are designated for manual load shed and circuits that serve designated critical loads;
 - Minimize the overlap of circuits that are designated for manual load shed and circuits that are utilized for underfrequency load shed (UFLS) or undervoltage load shed (UVLS); and
 - limit the utilization of UFLS or UVLS circuits for manual load shed to situations where warranted by system conditions.
8. During an EEA3, LBAs are responsible to coordinate with TOPs for any load shed requirements, critical load evaluation in load shed schemes, and coordination including rotation of selected loads, with any other automatic load shed schemes such as Underfrequency and Undervoltage.
9. The minimum MISO directed load shed per LBA shall be maintained until load restoration directions are provided by MISO.
10. MISO may also request LBAs to file OE-417 and EOP-004 reports for actions taken to reduce load via load management procedures. All reports will be made in accordance with *SO-P-NOP-04 MISO Event Reporting Operations Plan*.

5.6 Transmission System Emergencies

1. During the EEA, MISO will be continuously evaluating and mitigating Transmission limitations.
2. MISO will review Transmission outages and work with the TOPs to determine if any Transmission Elements that may relieve the loading on System Operating Limits (SOLs) or Interconnection Reliability Operating Limits (IROLs) may be returned to service.
3. MISO will mitigate Transmission System Emergencies utilizing its procedure *SO-P-EOP-00-004 Transmission System Emergency*.

5.7 Termination of Emergency

1. For each type of Capacity or Energy Emergency alert, warning, or emergency level, when emergency conditions are no longer met, the Shift Manager will send termination update to affected members via OI per *SO-I-NOP-00-448 Event Communications Matrix*.
2. MISO will issue operating instructions necessary to return the system to normal in a controlled and deliberate manner so as to not adversely affect the system.

5.8 Notifications and Communications

5.8.1 General Communication Methods

1. All communications between MISO Real-time Operations and MISO Members that includes Operating Instructions will adhere to *SO-P-NOP-10-431 MISO Communications Protocols for Operating Instructions*.
2. MISO will initiate communication with the Stakeholders within its MISO Balancing Authority Area (MBAA) to properly notify affected areas and to coordinate mitigation plans when deemed necessary. Publicly posted declarations outlined in MISO's internal procedure *SO-I-NOP-00-448 Communication Matrix* will be posted on the MISO Public Website and the MISO Mobile App. The Communication Matrix also outlines times when declarations and messages are posted to the RCIS.
3. In the event that MISO declares an EEA, MISO will notify all BAs and TOPs in its RC Area. MISO, in its capacity as RC will also notify all neighboring RRCs.



4. The MISO SM, Director On-Call, or designee will collect and pass off important Firm Load Shed event information to the MISO External Affairs department in accordance with *SO-P-AOP-00-217 MISO and State Officials 24X7 Communication Protocols During Emergencies*. Contact information of entities to notify can be found on the External Affairs Contact List page of the MISO LiveWire 2.0 site, or under the Miscellaneous Procedures tab in the Diligent application on the laptop.
5. MISO will periodically test all means of communication that are identified as necessary to implement this plan.

5.8.2 Voice Communications

1. Voice over Internet Protocol (VOIP) Telephone – These devices are regularly used by System Operators via the Turret or CISCO phones; no additional testing is performed. This is MISO's primary means of interpersonal communication in accordance with NERC Standard COM-001.
2. Blast Call – Pre-defined conferences calls are set up in advance such that the MISO System Operator will be able to initiate the call via a Turret phone. This system is tested weekly, and each individual Blast Call group is tested quarterly.
3. Satellite Phone – Pre-defined groups are set up in advance such that the MISO System Operator, and members, know in advance what groups they are a part of. This system is tested weekly, and each individual Satellite group is tested monthly. This MISO's designated alternate means of interpersonal communication per NERC Standard COM-001.
4. Cell Phones – MISO System Operators in all physical locations have access to cell phones at their desks. These cell phones are easily accessible, constantly charged, and have MISO Operations and MISO Member contact information. This system is tested weekly.
5. The testing of Blast Calls, Satellite Phones, and Cell Phones are outlined in *RTO-I-OP-089 Telecommunications Testing – Operator Tools Procedure*.

5.8.3 Data Communications

1. MISO has several non-voice communication methods, any of which may be utilized to communicate with MISO members and neighboring Reliability Coordinators:
 - MISO Communication System (MCS),
 - Operator Interface (OI),



- Demand Side Resource Interface (DSRI),
- MISO Public Website,
- MISO Mobile Application,
- Reliability Coordinator Information System (RCIS),
- ICCP communications,
- JSON notifications to Market User Interface (MUI) 2.0.

5.9 Emergency Operating Plan Reviews

1. MISO reviews this Capacity and Energy Emergency Plan at least annually, revising the plan as necessary. Staff familiar with both MISO's Balancing Authority and Reliability Coordination functions assist with the review. The most current revision of this Plan is posted to MISO's public website on the Reliability Operating Procedures page.
2. MISO, in its capacity as a Reliability Coordinator, reviews the Operating Plan(s) to mitigate operating Emergencies submitted by the TOPs and BAs within MISO's RC Area to identify any reliability risks that are between Operating Plans. Operating plans are submitted to MISO via the Help Center on MISO's public website.

5.10 Event Reporting

1. Certain actions taken to mitigate Capacity and Energy emergencies, including public appeals for reduction of energy use and firm load shedding, require making OE-417 and/or NERC EOP-004 reports. MISO will coordinate with the entities in its Balancing Authority Area and Reliability Coordinator Area to make these reports per *SO-P-NOP-04 MISO Event Reporting Operating Plan*.

6.0 References

6.1 NERC References

1. EOP-011-2 Emergency Operations
 - R2.1 [Section 3.0]
 - R2.2.1 [Section 3.0][Section 5.0]
 - R2.2.2 [Section 5.5.1]
 - R2.2.3.1 [Section 5.1.4][Section 5.1.5]
 - R2.2.3.2 [Section 5.1.3]
 - R2.2.3.3 [Section 5.1.3]
 - R2.2.3.4 [Section 5.5.4]
 - R2.2.4 [Section 5.5.4]
 - R2.2.5 [Section 5.5.4]
 - R2.2.6 [Section 5.5.4]
 - R2.2.7 [Section 5.3][Section 5.5.4]
 - R2.2.8 [Section 5.5.5]
 - R2.2.9 [Section 5.1.8]
 - R2.2.9.1 [Section 5.4.5]
 - R2.2.9.2 [Section 5.4.3][Section 5.4.4]

6.2 MISO References

1. SO-I-ADM-01 MISO Letter of Authority
2. SO-I-NOP-00-448 Event Communications Matrix
3. SO-P-AOP-00-217 MISO and State Officials 24X7 Communication Protocols During Emergencies
4. SO-I-NOP-00-448 Event Communications Matrix
5. SO-P-EOP-00-002 MISO Market Capacity Emergency
6. SO-P-AOP-00-201 Telephone System Failure
7. SO-P-NOP-10-431 Communications Protocol for Operating Instructions
8. SO-P-NOP-00-467 Communications for Natural Gas Fuel Supply Availability
9. SOP-NOP-00-449 Conservative System Operations
10. SO-P-NOP-04 MISO Event Reporting Operating Plan
11. SO-I-NOP-00-483 Reliability Coordination Conference Call



12. SO-P-EOP-00-008 TOP and BA Emergency Operations Plan Submittal
13. BPM-008 Outage Operations Business Process Manual
14. SO-P-NOP-00-411 Outage Operations

Attachment 1 — MISO Sufficiency Process Flowcharts

SUFFICIENCY PROCESS DURING MULTI-DAY TIME HORIZON

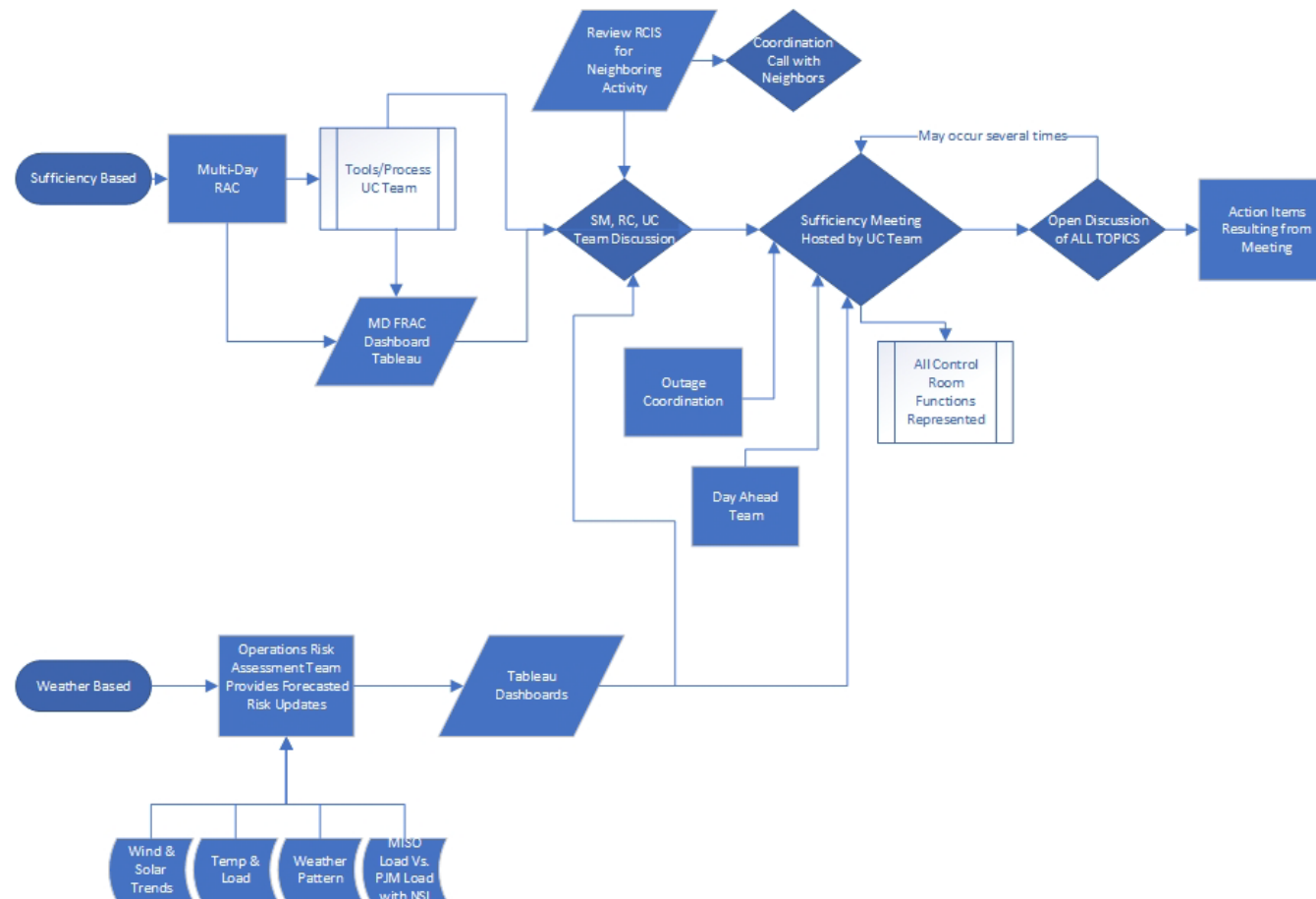


Figure 1: MISO Sufficiency Process Multi-Day

SUFFICIENCY PROCESS DURING NEXT-DAY AND DAY-AHEAD HORIZON

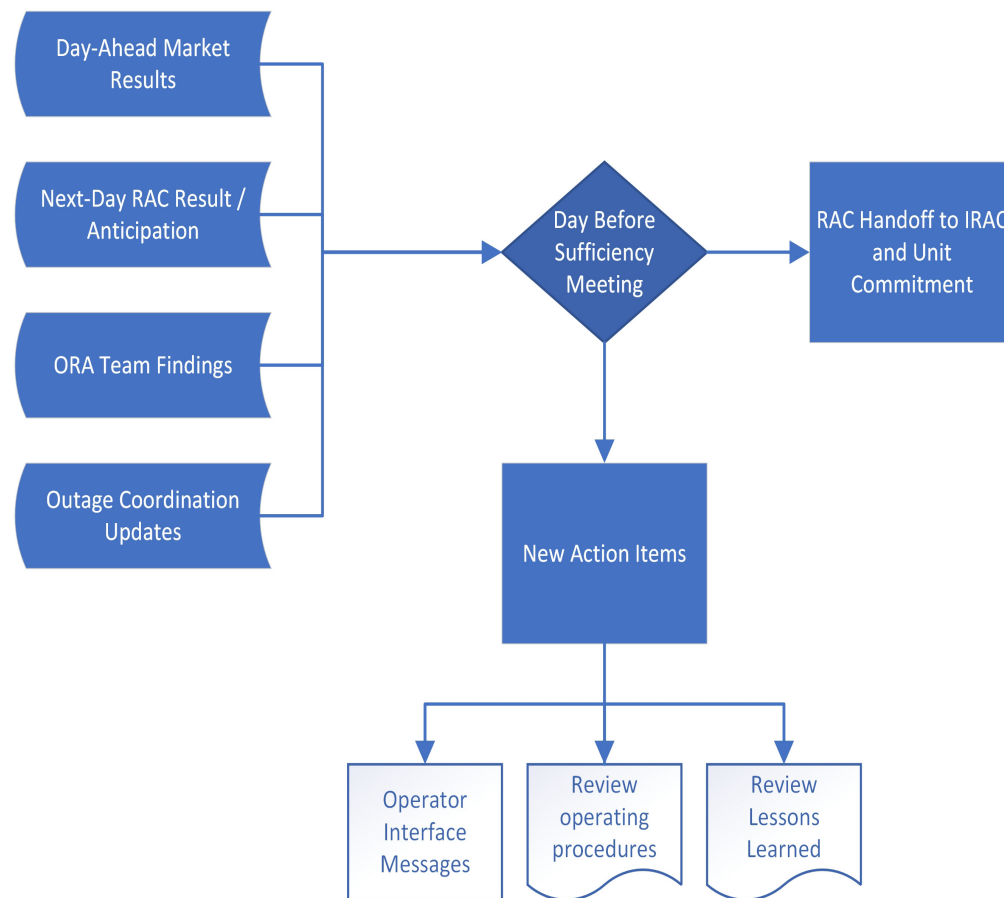


Figure 2: MISO Sufficiency Process Next-Day

SUFFICIENCY PROCESS DURING OPERATING DAY

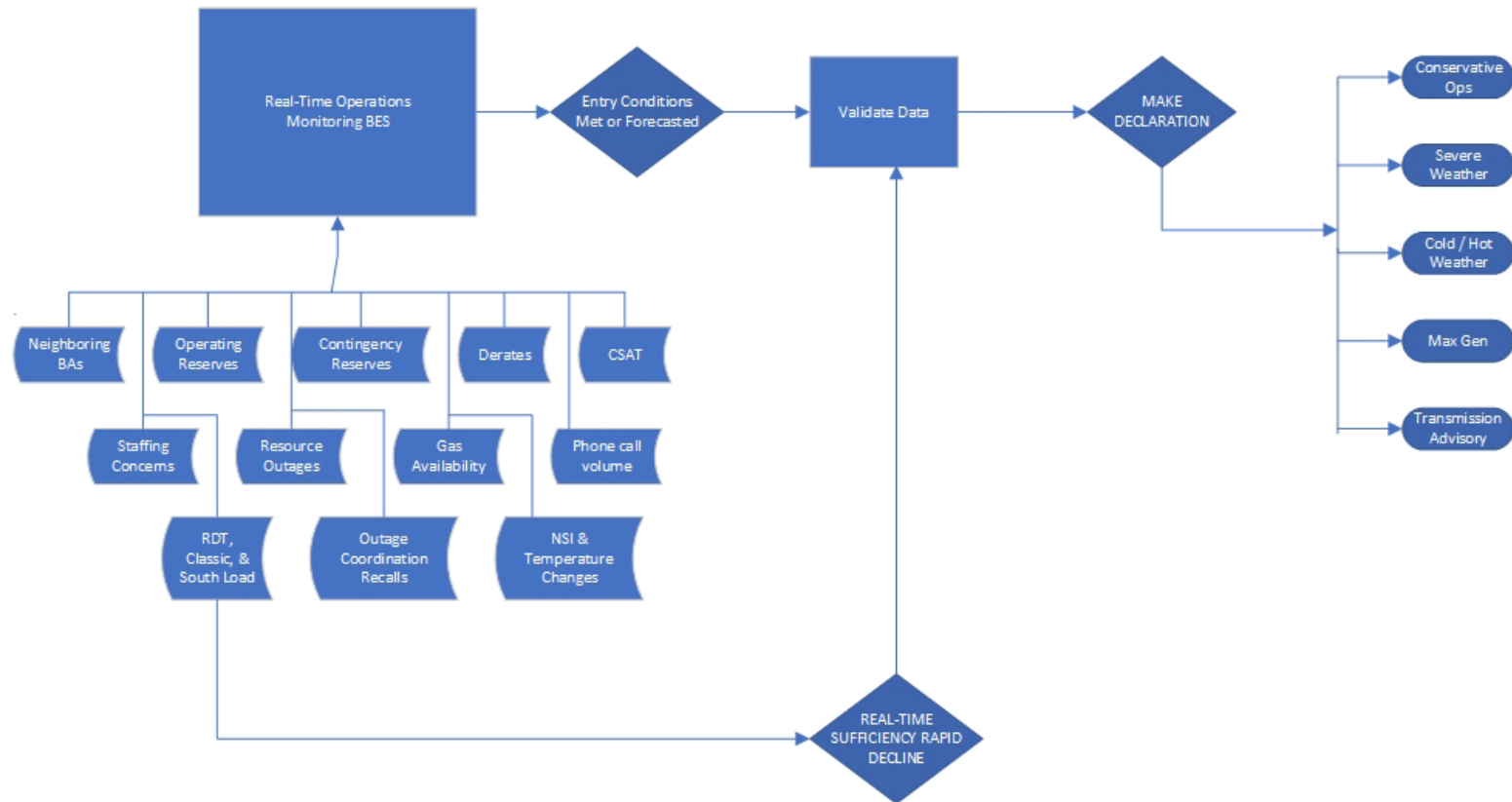


Figure 3: MISO Sufficiency Process Operating Day