



Transmission System Emergency

SO-P-EOP-00-004 Rev: 18

ROLE		ROLE
BAO		SM ☒
IRAC		RC ☒
UDS		G&I ☒
MP		MISO Mgmt ☒
FRAC		DA
SOE ☒		ORA

Rev History	Reason for Issue	Revised By	Issue Date	Effective Date
18	Annual review. Added Transmission Warning instructions and actions (section 3.0-3.4) updates. Additional updates for clarity on terminating TSE (section 4.4). Corrected procedure references (section 2, 4, and 6). Compliance review completed	Clayton Umlor/ Dan Pacilio/ Alessandro Stammes	05/21/2026	06/01/2026
17	Out-of-Cycle review. Remove 15-minute time limit for cascade analysis in Section 4.1. Compliance Review Completed. Operating Procedure Owner approval on file	Dan Pacilio/ John Harmon/ Alessandro Stammes	12/12/2025	12/12/2025

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1.0 Purpose

This procedure provides instructions for mitigating operating emergencies on the Transmission System that have the potential to exceed or have exceeded an Interconnection Reliability Operating Limit (IROL). It also provides guidance for declaring a Transmission Warning, which is intended to increase transparency around elevated risk of load loss due to abnormal transmission system conditions.

2.0 Precautions and Limitations

1. MISO will restrict communications of sensitive information related to reliability to MPs and to the public to protect the integrity of the Bulk Electric System (BES).
2. When a Transmission System Emergency (TSE) occurs within the MISO Reliability Coordinator (RC) Area, immediate and appropriate action shall be taken by the MISO RC and associated Transmission Operators (TOPs), Local Balancing Authorities (LBAs), Balancing Authorities (BAs), or Generation Operators (GOPs) to address the condition.
3. TOPs may determine further action is needed to mitigate loading on facilities that are NOT IROLs and may take mitigating actions including load shedding in coordination with MISO.
4. This procedure does NOT limit TOPs' authority and responsibility, per North American Electric Reliability Corporation (NERC) Standards and contractual obligations, to take action to mitigate System Operating Limits (SOLs) in coordination with MISO.
5. Mitigation of a TSE may result in a capacity or energy emergency which will be managed through SO-P-EOP-11-002 MISO Market Capacity Emergency or SO-P-EOP-11-002-A Non-Market Footprint and Sub-Area Capacity Emergency as appropriate.
6. Resolution of a TSE Event needs to occur in less than 30 minutes or T_v for a defined IROL Flowgate or Interface and temporary IROLs, where T_v is defined as a period less than 30 minutes during which the IROL condition must be addressed to avoid system collapse or cascading outages. T_v for all temporary IROLs determined as 30 minutes throughout this procedure. All Operating Instructions are expected to be implemented promptly.
7. During a TSE Event, MISO RC shall NOT rely on Transmission Loading Relief (TLR) Levels 1-5 or Unit Dispatch System (UDS) Binding.
 - UDS binding or TLR may be implemented simultaneously with emergency actions to release emergency actions in a timely manner.
8. During rapidly changing conditions where an unexpected TSE condition briefly exists and then clears (prior to declaration of a TSE), it is NOT the intent of this procedure to post an after-fact message to MISO communication tools. These after-fact messages may be distracting and inappropriate.

3.0 Transmission Warning Instructions

3.1 Transmission Warning Entry Criteria

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1. A Transmission Warning should be declared when all of the following conditions are met:
 - There is 100MW or more of load at risk
 - Normal congestion management tools have been exhausted and are not sufficient to mitigate risk
 - Available emergency actions are not sufficient to mitigate risk (e.g. emergency ranges of units, emergency only units, LMRs, etc.)
 - At least one of the following applies:
 - Facilities > 100kV have post-contingent flow greater than or equal to 115% of the highest emergency limit
 - The RC determines that system conditions warrant heightened awareness of potential transmission system risk

3.2 Transmission Warning Declaration Actions

RC

1. IF entry conditions have been met, **NOTIFY** the Shift Manager
2. **DECLARE** Transmission Warning as follows:

SM

- **SEND** Transmission Warning declaration via Operator Interface (OI) including the following:
 - **DEFINE** start time (time conditions are met)
 - **SELECT** impacted Region(s), BA(s), LBA(s), TOP(s)
 - **SELECT** declaration reasoning.
 - **IDENTIFY** and **ENTER** geographical location.
 - **ADD** any additional information for all users and/or restricted information for LBA/TO users.
 - **SELECT** appropriate actions for TOPs & LBAs

3.3 Transmission Warning Exit Criteria

1. A Transmission Warning should be ended when one of the following conditions are met:
 - The conditions for entering the Transmission Warning are no longer present.
 - RCs & TOPs agree that the risk no longer poses a significant threat to load shed or load loss

3.4 Transmission Warning Termination Actions



RC

1. IF any of the exit criteria are met, **NOTIFY** the Shift Manager
2. **TERMINATE** Transmission Warning as follows:
 - **SEND** Transmission Warning Declaration Termination via OI:

SM

- **SELECT** appropriate termination time (now or scheduled)
- **ADD** a message to all parties, if appropriate.

4.0 Transmission System Emergency Instructions

4.1 Transmission System Emergency Entry Conditions:

1. IDENTIFY a Transmission System condition that has the potential to exceed or has exceeded a pre-defined or temporary IROL per SO-RA-NOP-01 Methodology for Identification and Implementation of SOLs and IROLs Plan. ☐

4.2 Temporary IROL Verification

RC/SO
E

1. WHEN Real Time Contingency Analysis (RTCA) indicates post contingent loading exceeding 125% of the Emergency thermal rating or projects post contingent voltages less than their applicable Emergency voltage rating, THEN **PERFORM** cascade analysis as follows: ☐
 - **LOAD** real time State Estimator (SE) case into Powerflow. ☐
 - **TRIP** single Contingency as indicated in RTCA. ☐
 - **TRIP** the highest loaded facility or lowest voltage bus. ☐
 - **RUN** Powerflow study. ☐
 - **SAVE** results. ☐
 - **REPEAT** Section 4.1 Step 1.C. and Section 4.1 Step 1.D. until NO facilities exceed 125% of their Emergency thermal rating and NO bus voltages are outside their emergency voltage range. ☐

Note

Studies showing 1000 MW or more of load loss will be considered temporary IROLs only until further studies can be performed to disprove or validate the condition and determine an operating limit. Tv for a temporary IROL starts once the condition has been identified. ☐

- IF 1000 MW or more load is lost, THEN **IDENTIFY** the constraint as a temporary IROL. ☐
- IF less than 1000 MW of load is lost, THEN **TERMINATE** TSE per Section 4.3 TSE Termination Actions. ☐

4.3 TSE Event Actions



RC	Note If consensus CANNOT be reached on the status of jointly monitored facilities with impacted TOPs or neighboring RCs under real-time conditions, the most conservative values shall be used.	☐
RC	1. NOTIFY Shift Manager (SM).	☐
RC	2. CONFIRM a TSE exists as follows:	☐
	• CONFIRM real-time values are accurate.	☐
	• CONFIRM SE and RTCA solutions are reasonable.	☐
	• CONFIRM ratings associated with these values are correct and the availability of short-term emergency ratings/capability.	☐
RC	3. DECLARE TSE as follows:	☐
RC	• DEFINE start time (time condition is met) of TSE.	☐
RC	• NOTIFY SM of impacted parties.	☐
SM	• SEND TSE Declaration via Operator Interface (OI) including the following: - Affected BAs, LBAs, and TOPs - Operator Log - Email Notifications per SO-I-NOP-00-448 Event Communications Matrix - MISO Management	☐
SM	• SEND TSE Declaration summary information via Reliability Coordinator Information System (RCIS).	☐
SM	• NOTIFY MISO management to analyze staffing needs.	☐
Mgmt	• ANALYZE severity of the event, anticipated duration of the event, and staff availability to call in additional MISO personnel and management.	☐
Mgmt	• PROVIDE support and assist the SM in analyzing system conditions or coordinating control room activities until additional MISO personnel and management are brought in to help.	☐
RC	Note - For any Operating Instruction issued in response to exceeding an IROL, the expected implementation time must be less than 30 minutes or Tv for the defined IROL. - Operating Instructions will be issued per SO-P-NOP-00-431 Communications Protocol for Operating Instructions.	☐
	4. IMPLEMENT any of the following to relieve TSE:	☐



RC

- IF an Operating Guide exists for the given condition, THEN **ISSUE** Operating Instruction per applicable Operating Guide. ☐

RC

- **ISSUE** Operating Instruction for emergency redispatch of generation resources per SO-I-NOP-00-443 Manual and Emergency Redispatch within the market area or other generation within the RC area, including starting generation designated as Emergency Only (AME) and using emergency dispatch ranges. ☐

RC

- **ISSUE** Operating Instruction for reconfiguration of the transmission system. ☐

Note ☐

Expected implementation time for Emergency Demand Response (EDR)/ Load Modifying Resources (LMRs) will vary depending on the situation.

RC/G&I

- IF EDR resources are available, THEN **PERFORM** the following: ☐
- **CONTACT** TOP/Market Participant (MP) to determine location and availability of EDRs and offered MW. ☐

SM

Note ☐

Start time will be for a specific resource and MW amount, at a time the resource is available, respecting the total time to start of the resource.

- **ISSUE** a start via Market Ops Suite.

RC/G&I

Note ☐

- Operator Interface (OI) is currently NOT configured to deploy LMR for TSEs.
- All LMR starts for TSEs must be issued verbally.

- **CONTACT** TOP/MP to determine availability and impact of LMRs and offered MW. ☐

RC

- WHEN LMR availability is confirmed, THEN **REQUEST** Resource to come online as soon as possible and remain online until further notice to support a TSE. ☐

RC

- **COORDINATE** with TOP to curtail other non-firm interruptible Loads that could relieve the TSE within an appropriate time. ☐

RC

5. **ISSUE** Operating Instruction for TOP to shed firm load rather than risk an uncontrolled failure of components or cascading outages of the Interconnection. ☐

- IF time permits a targeted calculation, THEN **INSTRUCT** firm load shed per Attachment 1 — Targeted Load Shed Method. ☐

- IF time does NOT permit a targeted calculation, THEN **INSTRUCT** firm load shed as follows: ☐

- **DETERMINE** location and magnitude of required load shed using operator discretion and judgment. ☐



- **INSTRUCT** firm load shed based on the previous step. ☐
- **NOTIFY** SM of location and magnitude of firm load shed. ☐

RC

Note☐

Actions that are expected to take more than 30 minutes or Tv for a defined IROL Flowgate or Interface may still be directed to rescind other more severe actions as quickly as possible.

6. **EVALUATE** actions taken. ☐

RC

7. IF additional actions are necessary to mitigate TSE, THEN **ISSUE** additional actions to resolve the condition. ☐

RC

8. **UPDATE** load shed Operating Instructions as conditions warrant. ☐

RC

9. **COORDINATE** with SM on any necessary notifications per SO-P-NOP-04 MISO Event Reporting Operating Plan. ☐

SM/RC/
G&I

10. **LOG** actions per SO-I-NOP-00-496 Operator Logging and Shift Turnover Checklist. ☐

4.4 TSE Termination Actions

RC

Note☐

TSE declaration should NOT be immediately canceled upon clearing the IROL to ensure system conditions are stable.

1. WHEN IROL has been cleared and flows are consistently below the SOL, THEN **RELEASE** all actions as deemed appropriate, placing a priority on restoration of load per Attachment 1 — Targeted Load Shed Method. ☐

SM

2. **ISSUE** stop via Market Ops Suite. ☐

RC

3. **NOTIFY** TOP the LMR is going to be released. ☐

G&I

4. **NOTIFY** MP of stop and to release the LMR. ☐

RC

5. WHEN all actions implemented by the RC to address the emergency conditions have ended and only normal procedures are being followed, THEN **TERMINATE** TSE Declaration as follows: ☐

SM

- **SEND** TSE Termination Declaration via OI including: ☐

- Affected BAs, LBAs, and TOPs

- Operator Log

- Email Notifications per SO-I-NOP-00-448 Event Communications Matrix

- MISO Management

SM

6. **SEND** email to *Transmission Settlements and *Market Dispute with the following: ☐

- Start time of the resource (when the resource came online/ reduced load).
- Stop time of the resource (when the RC released the resource).
- Resource name.
- Total MW the resource provided.
- To apply a Revenue Sufficiency Guarantee (RSG) exemption for the entities responding to LMR, EDR, or firm load shed due to a TSE.

SM/RC/
G&I

7. **LOG** actions per SO-I-NOP-00-496 Operator Logging and Shift Turnover Checklist. ☐

5.0 Definitions

1. IROL - cascading event with expected load loss where a contingent event would result in loss of 1,000 MW or more of load. This restricts the applicability of the IROL to large area impacts rather than small load areas where load loss is contained.
2. Temporary IROL - when one or more of the following criteria are met for transmission lines rated 100 kV and higher, transformers with at least two windings of 100 kV and higher, or busses 100 kV and higher, except if it is determined that the condition is NOT an IROL violation per criteria in SO-RA-NOP-01:
 - Steady State Conditions of actual voltage less than 95% or greater than 105% of nominal or other value based on an operating study, Operating Guide, mutual agreement/ understanding between the RC and TOP (Reactive Power imbalance).
 - Contingency Related Conditions as follows:
 - Actual flow is beyond a voltage stability or angular stability limit as defined in an Operating Guide.
 - Per SO-RA-NOP-01, when studies indicate a post-contingent loading more than 125% of Emergency rating and subsequent overloading of facilities causing cascading outages that result in loss of 1000 MW or more of load. Analysis is performed using an iterative study process by assuming facilities loaded above 125% of their emergency rating will trip following the initiating Contingency.
 - When post-contingent voltage would be less than 90% or greater than 110% because of a single contingency unless another post-contingent voltage limit is established based on an operating study, Operating Guide, or mutual agreement/understanding between the RC and TOP (Reactive Power imbalance).
 - Other Systems Conditions as follows:

- Any other operating conditions that would jeopardize the reliability of the interconnection as deemed by the RC.
- Any operating condition where it is reasonable for the RC to expect that conditions will worsen and require declaration of a TSE.

6.0 References

6.1 MISO References

1. SO-P-EOP-11-002 MISO Market Capacity Emergency
2. SO-P-EOP-11-002-A Non-Market Capacity Emergency
3. SO-I-NOP-00-443 Manual and Emergency Redispatch
4. SO-I-NOP-00-448 Event Communications Matrix
5. SO-I-NOP-00-496 Operator Logging and Shift Turnover Checklist
6. SO-P-NOP-00-431 Communications Protocol For Operating Instructions
7. SO-P-NOP-04 MISO Event Reporting Operating Plan
8. SO-RA-NOP-01 Methodology for Identification and Implementation of SOLs and IROLs Plan

6.2 NERC References

1. IRO-008-3 Reliability Coordinator Operational Analyses and Real-time Assessments
 - R5 [Section 4.2 Step 3.] [Section 4.2 Step 2.]
 - R6 [Section 4.3 Step 5.]
2. IRO-009-2 Reliability Coordinator Actions to Operate Within IROLs
 - R2 [Section 4.1] [Section 4.2]
 - R3 [Section 4.1] [Section 4.2]
 - R4 [Section 4.2]

Attachment 1 — Targeted Load Shed Method

1. Targeted Load Shed Method (TLSM) is used to quickly shed the highest impacting loads in a TSE where probable voltage collapse or cascading thermal overloads will result if a critical contingency should occur.
2. MISO RC, in coordination with TOPs, LBAs, and BAs, will identify which area or zone (affected by probable voltage collapse or cascading thermal overloads) TLSM is to take place. Each participant with control over transmission facilities must be capable of manually shedding the load as soon as possible per their Load Shedding Plans.
3. TLSM should avoid, if possible, interruption of transmission paths. MISO recognizes that there might be a situation when interruption of transmission paths is unavoidable. In this situation, participants with control over transmission who include such interruptions in Load Shedding Plans must demonstrate from system simulations that transmission interruptions will not degrade interconnected system reliability.
4. In a TSE where Load curtailment becomes imminent, the RC will identify the area susceptible to voltage collapse or cascading thermal overloading and calculate the amount of Load Curtailment by using TLSM. The TLSM identifies the Load that provides the most effective relief to the congested flowgate by implementing Load Shift Factors (LSFs) methodology similarly to generation redispatch that uses the Generation Shift Factors (GSFs) methodology. RC will utilize shift factors provided by CLogger or other appropriate tools. This method's goal is to resolve the emergency conditions while minimizing the magnitude of load curtailment. The method is described as follows:

$$(LoadCurtailment) = (ReliefMWRequired) / (ShiftFactor)$$

5. The calculation method is based on the LSFs of Load buses within the defined area or zone susceptible to voltage collapse or cascading thermal overloading. In general, the LSFs may be approximated utilizing representative Load or Generator bus locations within the defined area or zone. Where multiple Load buses are relatively close (electrically) in terms of impacts on the constraint, a single LSF or GSF will be utilized for those buses and load shed proportionally to their individual Loads.