

***OPERATING PROCEDURE***

***MANUAL***

**Transmission and Security**

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# [1.](#_1._Introduction) Introduction

## 1.1 Purpose

This procedure provides the System Operator assigned to the Transmission and Security Desk with detailed procedures required for performing duties assigned to that position.

The Transmission and Security Operator shall ensure that the transmission system is operated so that instability, uncontrolled separation, or cascading outage will not occur as a result of the most severe single Contingency. The Transmission and Security Operator directs actions or issues Operating Instructions to the ERCOT Transmission Operators or other Market Participants as required while maintaining or restoring the security/reliability of the ERCOT System.

## 1.2 Scope

The instructions contained in this procedure are limited to those required for the Transmission and Security Desk. Instructions for other ERCOT control room positions are contained in separate procedures, one for each position. This procedure does not imply that the duties contained herein are the only duties to be performed by this position. The individual assigned to this position will be required to follow any other instructions and to perform any other duties as required or requested by appropriate ERCOT supervision.

Although the steps within the procedures are numbered, the numbering is for indexing purposes and are not sequential in nature.  The System Operator will determine the sequence of steps, exclude steps, or take any additional actions required to ensure system security based on the information and situational awareness available during both normal and emergency conditions.

# 2. General

## 2.1 System Operator Responsibility and Authority

**Procedure Purpose:** To ensure the System Operators know their roles, responsibility, and authority.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** | **6.5.1.1** | **6.5.1.2(3)** | **6.5.2** | **6.5.3(1)** |
| **Guide Reference** | **4.5.2(1)** |  |  |  |
| **NERC Standard** |  |  |  |  |

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ERCOT ISO as a Transmission Operator (TOP), the single Balancing Authority (BA), and only Reliability Coordinator (RC) registered within the ERCOT Interconnection shares all information between these roles simultaneously and acts concurrently as a single entity, satisfying coordination between the TOP, BA, and RC.

The System Operator (SO) shall, in accordance with NERC Reliability Standards and ERCOT Protocols, have clear decision-making authority to act to address the reliability of its Reliability Coordinator Area by direct actions or by issuing Operating Instructions during both normal and emergency conditions. These actions shall be taken without delay and may include shedding of firm load without obtaining approval from higher-level personnel.

The SO on duty is, in accordance with the ERCOT Protocols, Operating Guides, and NERC Reliability Standards, and acting as the Balancing Authority, Transmission Operator, and Reliability Coordinator shall request and receive information required to continually monitor the operating conditions which will assure security and reliability of the ERCOT system.

The SO issues Dispatch Instructions / Operating Instructions for the Real-Time operation of Transmission Facilities to a TO and to a QSE for the Real-Time operation of a Resource.

The SO shall, on an ERCOT-wide basis, coordinate the ERCOT System Restoration (Black Start) Plan. The SO shall implement the Black Start Plan and shall direct the reconnection efforts of the islands, established by restoration activities.

The SO shall consider all equipment operating limits when issuing Dispatch Instructions / Operating Instructions. During Emergency Conditions, the SO may verbally request QSEs to operate its Resources outside normal operating parameters. If a Dispatch Instruction / Operating Instruction conflicts with a restriction placed on equipment by a TO or QSE to protect the integrity of equipment, ERCOT shall honor the restriction.

The SO performs security analyses on a Day Ahead and real-time basis and ensures all Forced Outages are entered into the Outage Scheduler. The SO shall obtain or arrange to provide emergency energy over the DC Tie(s) on behalf of ERCOT.

The SO shall issue appropriate OCN’s, AAN’s, Advisories, Watches, and Emergency Notices, and coordinate the reduction or cancellation of clearances, re-dispatch of generation, and request, order, or take other action(s) that the SO determines is necessary to maintain safe and reliable operating conditions on the ERCOT System in accordance with ERCOT Protocols, Operating Guides, and NERC Reliability Standards. The SO will implement and terminate ERCOT Time Corrections and will determine the need for and implement the operation of a QSE on Constant Frequency Control for loss of ERCOT’s load frequency control system.

# 2.2 Communication

**Procedure Purpose:** To ensure proper communication is used to reduce the possibility of miscommunication that could lead to action or inaction harmful to the reliability of the grid.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** | **6.5.7.8** |  |  |  |
| **Guide Reference** | **3.1.3** |  |  |  |
| **NERC Standard** | **COM-002-4**  **R5, R7** |  |  |  |

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| **Step** | **Action** |
| --- | --- |
| Three-Part Communication | |
| **Note** | * Operating Instructions and Dispatch Instructions are synonymous, and both require ‘three-part communication’. * Refer to the Communications Protocols document for requirements. |
| **1** | When issuing Operating Instructions, use three-part communication:   * Issue the Operating Instruction * Receive a correct repeat back * Give an acknowledgement |
| **2** | Many scripts have been placed throughout the procedures as a reminder for the three-part communication. However, a script cannot be provided for every scenario. Effective three-part communication skills are mandatory. |
| Hotline Call Communication | |
| **1** | When making Hotline calls, ensure one TO repeats back the message.  **IF:**   * Time and circumstances allow;   **THEN:**   * Review the Consortium Hotline attendance report to verify all TOs were in attendance * Contact the TO using their OPX line or LD line to provide them with the message * Inquire why they were not on the Hotline call * Open a Help ticket if ERCOT’s Telecommunications department is needed to investigate. |
| Master QSE | |
| **1** | Issue the VDI to the Master QSE of a Generation Resource that has been split to function as two or more Split Generation Resources as deemed necessary by ERCOT to effectuate actions for the total Generation Resource for instances when electronic Dispatch Instructions are not feasible. |
| **Log** | Log all actions. |

## 2.3 Site Failovers and Database Loads

**Procedure Purpose:** To provide notice to the TOs when ERCOT is performing updates to their Energy and Market Management Systems.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** |  |  |  |  |
| **Guide Reference** |  |  |  |  |
| **NERC Standard** | **TOP-001-6**  **R9** |  |  |  |

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| **Step** | **Action** |
| --- | --- |
| **EMS**  **Changes** | **Approximately 5 - 30 minutes before a database load, local failover, or EMS migration, make the following Hotline call to TOs:**  **T#15 - Typical Hotline Script for EMS changes** |
| **MMS**  **Changes** | **Approximately 5 - 30 minutes before an MMS migration, make the following Hotline call to TOs:**  **T#16 - Typical Hotline Script for MMS changes** |
| **Site**  **Failover** | **Approximately 5 - 30 minutes before site failover, make the following Hotline call to TOs:**  **T#17 - Typical Hotline Script for Site Failover** |
| **Site**  **Failover**  **Complete** | **T#18 - Typical Hotline Script for Site Failover Complete** |
| **Log** | Log all actions. |

## 2.4 Switching Control Centers

**Procedure Purpose:** To provide notice to the TOs when ERCOT is working from the Alternate Control Center.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** |  |  |  |  |
| **Guide Reference** |  |  |  |  |
| **NERC Standard** |  |  |  |  |

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| **Step** | **Action** |
| --- | --- |
| **Hotline**  **Call** | **When transferring operations from primary site to alternate site (and vice versa). Make the following Hotline call to TOs:**  **T#19 - Typical Hotline Script for working from Alternate site**  **T#20 - Typical Hotline Script for working from Primary site** |
| **ERCOT Website**  **Posting** | Verify with Real-Time operator that posting was made.  **Typical ERCOT Website Posting Script for working from Alternate site**  ERCOT is working from alternate control center.  **Typical ERCOT Website Posting Script for working from Primary site**  ERCOT is working from primary control center. |
| **Log** | Log all actions. |

## 2.5 Suspected Sabotage or Sabotage Events

**Procedure Purpose:** To be aware of cyber intrusions and communicate concerning activity and any unusual occurrences.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** |  |  |  |  |
| **Guide Reference** |  |  |  |  |
| **NERC Standard** |  |  |  |  |

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| **Step** | **Action** |
| --- | --- |
| **ERCOT**  **Event** | **Refer to Cyber Intrusion Guide and Cyber Security Incident Response Plan located in procedure binder.**  **IF:**   * Unusual system behavior is observed;   **THEN:**   * Notify Shift Supervisor |
| **Entity**  **Event** | **IF:**   * A TO or QSE reports an act of suspected sabotage or a sabotage event, including cyber;   **THEN:**   * Notify Shift Supervisor |

# 3. Review and Analyze System Security

## 3.1 System Overview

**Procedure Purpose:** Review, monitor and analyze data to maintain system security.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** | **6.3.2(3)(a)(i)** |  |  |  |
| **Guide Reference** |  |  |  |  |
| **NERC Standard** | **IRO-002-7 R5** | **NUC-001-4**  **R4, R4.1, R4.2, R9, R9.2, R9.2.1, R9.2.2, R9.4, R9.4.1, R9.4.2** | **TOP-001-6**  **R10, R10.1, R10.2, R10.4, R10.5, R10.6** | **VAR-001-5**  **R2** |

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| **Step** | **Action** |
| --- | --- |
| **Review** | REVIEW each of the following as necessary to confirm system reliability status:   * Alarms * State Estimator (SE) * Real Time Contingency Analysis (RTCA) * Transmission Constraint Manager (TCM) * Approved and Forced Outages * Load Forecast * Voltage and Transient Stability Limits * Real Time Monitoring (RTMONI) * Security Constrained Economic Dispatch (SCED) * Real Time Reserve Monitoring |
| **Gap**  **Study** | Run a gap study for the next day’s peak hour to ensure all contingencies can be solved. If necessary:   * Request the Operations Support Engineer to review results and create CMPs as needed * Coordinate with TOs * If both CPSES units are offline, the Auxiliary load will need to be manually adjusted to 45 MW at both units * Refer to Desktop Guide Transmission Desk Section 2.5 Conducting Future Security Analysis * Save study * Log the following: * Study name * Any issues that could not be resolved and actions taken. |
| **STP**  **Lines** | A minimum of two transmission lines should be always in service. The in-service lines should be from at least two of the groups in the table below:  Independent Groups of STP Transmission Lines   |  |  |  | | --- | --- | --- | | Group 1 | Group 2 | Group 3 | |  | STP to Elm Creek 18 (**STPELM18**) | STP to Jones Creek 18 (**JCKSTP18**) | |  | STP to Elm Creek 27 (**STPELM27**) | STP to Refuge 27 and Refuge to Jones Creek 27 **(REFSTP27** and **JCKREF27**) | |  | STP to W.A. Parish 39 (**STPWAP39**) |  |   Note: Transmission lines, STP - Static (**STATIC\_STP1**) to Static - Angstrom (**ANGSTR\_STATIC1**), STP – Blessing 44 (**BLESSING**), STP – HILLJE 64 (**HLJSTP64**), and STP – HILLJE 44 (**CKT\_3124**) (EMS naming convention) are not included in this table because these circuits are not part of STP’s credited offsite sources.  **IF:**   * A minimum of two lines are not in service;   **THEN:**   * Notify the Nuclear Plant’s QSE.   + Explain the event, and an estimate of when expected to return to normal |
| **Dynamic**  **Transmission**  **Limits** | **IF:**   * Any changes in the system that could affect the security and dynamic transmission limits;   **THEN:**  Post message on the ERCOT Website. |

## 3.2 Alarm Processing and Acknowledgement

**Procedure Purpose:** To monitor and acknowledge system alarms.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Protocol Reference** | | **3.10.7.5.1(5)** | **6.5.7.1.6(1)** |  |  |
| **Guide Reference** | |  |  |  |  |
| **NERC Standard** | |  |  |  |  |
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| **Step** | **Action** |
| --- | --- |
| **Note** | The Alarm Displays for ERCOT are primarily used to show changes in equipment status.  The alarms are categorized based on alarm criticality and prioritization on the Alarm Summary Display: |
| **Categories** | Tab 1: 345 KV Transmission Equipment Status  Tab 2: 138 KV Transmission Equipment Status  Tab 3: Generator Breaker, AVR, CAPS, REACTOR and RAS Status  Tab 4: RLC alerts  Tab 5: Transmission Line Overloads - Voltage Violations - Critical Alarms  Tab 6: QKNET alarms  Tab 7: ICCP status  Tab 8: All other alarms |
| **1** | Monitor the Alarm Summary Display pages 3, 6 and 7 as necessary to confirm system reliability status. |
| **2** | Take appropriate action as system conditions warrant. |
| **3** | Coordinate with the Real-Time Operator to clear the alarms approximately every 24 hours or as needed. |

## 3.3 Analysis Tool Outages

**Procedure Purpose:** To notify TOs to monitor SOLs, IROLs and GTCs in their areas during tool outages. Also, to ensure proper notification is made for these failures along with notification for ICCP, ERCOT Website and Outage Scheduler outages on the ERCOT systems.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** | **6.3.3(1)** |  |  |  |
| **Guide Reference** |  |  |  |  |
| **NERC Standard** | **IRO-008-3**  **R4** | **IRO-018-1(i)**  **R2, R2.2** | **NUC-001-4**  **R4, R4.3, R9, R9.3, R9.3.4, R9.4, R9.4.1** | **TOP-001-6**  **R9, R13** |
| **TOP-010-1(1)**  **R3, R3.2** |  |  |  |

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| **Step** | **Action** |
| --- | --- |
| STATE ESTIMATOR/RTCA | |
| **1** | **IF:**   * The SE/RTCA has not solved;   **THEN:**   * Coordinate with the Operations Support Engineer for up to 15 minutes from last successful solution; * Refer to Desktop Guide Transmission Desk Section 2.1 to assist with troubleshooting,   **IF:**   * The SE/RTCA remains partially solved or unsolved;   **THEN:**   * Make notifications, * Continue to monitor the system as possible, * Coordinate with the Operations Support Engineer to ensure a Real-time Assessment (RTA) is performed within 30 minutes of the last SE/RTCA solution and within 30 minutes of each RTA conducted thereafter, * Refer to section 3.7 to ensure congestion management continues with manual RTAs. |
| **2** | **Must be completed within 30 minutes of the tool outage:**  Notify the two master QSEs that represent the Nuclear Plants that ERCOTs [State Estimator/RTCA] is not functioning and is expected to be functional within approximately [# minutes]. |
| **3** | **If the State Estimator/RTCA has NOT solved within the last 30 minutes:**  Make a Hotline call to issue an Advisory to the TOs:  **T#21 - Typical Hotline Script for Advisory for State Estimator/RTCA Not Solved** |
| **4** | Notify Real-Time operator to make Hotline call to QSEs. |
| **5** | Post Advisory message on the ERCOT Website.  **Typical Posting Script:**  Advisory issued due to ERCOT’s [State Estimator/RTCA] is currently unavailable. |
| **6** | **Once the State Estimator/RTCA is operational:**  Make a Hotline call to cancel the Advisory to the TOs:  **T#22 - Typical Hotline Script to Cancel Advisory for State Estimator/RTCA** |
| **7** | Notify the two master QSEs that represent the Nuclear Plants that the [State Estimator/RTCA] is now functional. |
| **8** | Notify Real-Time operator to make Hotline call to QSEs. |
| **9** | Cancel Advisory message on the ERCOT Website. |
| **Log** | Log all actions. |
| Voltage Security Assessment Tool (VSAT) and Transient Security Assessment Tool (TSAT) | |
| **1** | **IF:**   * VSAT and/or TSAT has not run in the last 15 - 20 minutes, **OR** * VSAT and/or TSAT is indicating “Stopped”, “Incomplete”, or “Server Invalid”;   **THEN:**   * Continue to monitor the flows in RTMONI * Rerun the RTNET, RTCA, and RTDCP (VSA) * Notify the Operations Support Engineer |
| **2** | **If VSAT and/or TSAT has NOT solved within the last 30 minutes:**  Make a Hotline call to issue an Advisory to the TOs:  **T#23 - Typical Hotline Script for Advisory for VSAT and/or TSAT Tool outage** |
| **3** | Notify Real-Time operator to make Hotline call to QSEs. |
| **4** | Post Advisory message on the ERCOT Website.  **Typical ERCOT Website Posting:**  Advisory issued due to ERCOT’s Voltage Security Assessment Tool [and/or] Transient Security Assessment Tool is currently unavailable. |
| **5** | **IF:**   * A major topology change occurs while VSAT and/or TSAT is unavailable;   **THEN:**   * Notify and request the Operations Support Engineer to run a manual study to verify limits * Update any limits in RTMONI or manual Real Time Assessments as necessary. * Take action as necessary |
| **6** | **Once VSAT and/or TSAT is operational:**  Make a Hotline call to cancel the Advisory to the TOs:  **T#24 - Typical Hotline Script to Cancel Advisory for VSAT and/or TSAT Tool** |
| **7** | Notify Real-Time operator to make Hotline call to QSEs. |
| **8** | Cancel Advisory message on the ERCOT Website. |
| **Log** | Log all actions. |
| ICCP, ERCOT Website, and Outage Scheduler Outages | |
| **1** | For any planned or unplanned outage of ERCOT’s ICCP, ERCOT Website (affecting COP submissions) or the Outage Scheduler lasting longer than 30 minutes, notifications to TOs are required.  **IF:**   * ERCOT’s ICCP, ERCOT Website (affecting COP submissions) or the Outage Scheduler has a planned or unplanned outage that is expected to last 30 minutes or more;   **THEN:**   * Make a Hotline call to the TOs:   **T#97 - Typical Hotline Script for ERCOT’s ICCP, ERCOT Website, or the Outage Scheduler Planned or Unplanned Outage** |
| **2** | **Once ERCOT operational:**  Make a Hotline call to notify TOs:  **T#98 - Typical Hotline Script for ERCOT’s ICCP, ERCOT Website or Outage Scheduler back to Normal** |
| **Log** | Log all actions. |

## 3.4 Forced Outage Detection

**Procedure Purpose:** To detect forced outages of transmission facilities.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** | **3.1.4.5(2)** | **6.5.7.1.6** |  |  |
| **Guide Reference** |  |  |  |  |
| **NERC Standard** |  |  |  |  |

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| **Step** | **Action** |
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| **Transmission Forced Outages** | |
| **Note** | If the Forced Outage of a Transmission Facility continues for longer than a configurable time (initially 2 hours), and an entry is not made in the Outage Scheduler, the Forced Outage Detector (FOD) will continue to generate a new alarm at a pre-determined interval (initially 15 minutes) until the outage is entered into the Outage Scheduler. |
| **Note** | The TO has up to two hours to enter a forced outage in the Outage Scheduler. |
| **Un-documented**  **Outages** | **WHEN:**   * A FOD alarm is received in the Undocumented Outages section;   **DETERMINE:**   * If the alarm is a valid Forced Outage,   + Telemetry is accurate.   + Alarm is not due to an Approved Outage of less than one hour in duration. * If immediate action needs to be taken. |
| **Immediate Action** | **IF:**   * Alarm is valid and immediate action needs to be taken;   **THEN:**   * Perform a study to determine the effects the outage has on the ERCOT System,   + If the outage will put ERCOT in an emergency condition or RTCA shows post-contingency loading greater than 98% of the “Emergency Rating”, employ congestion management techniques as necessary**.** * Notify TO enter a forced outage in the Outage Scheduler. |
| **Note** | Outages can only be extended one time and the extension must be entered before the outages Planned End time. Outages that are not complete by their Planned End time and will remain in an Outage condition for longer than 60 minutes must be entered into the Outage Scheduler as a Forced Outage. |
| **Extended Outages** | **WHEN:**   * An FOD alarm is received in the Extended Outages section,   **DETERMINE:**   * If the alarm is valid,   + Telemetry is accurate,   + Verify the Alarm is a result of equipment not returned to its normal state at the Planned End Time (plus 30 Minutes) in the Outage Scheduler, * If immediate action needs to be taken, * The estimated time when the Outage will be completed. |
| **Immediate Action** | **IF:**   * The alarm is valid and immediate action needs to be taken;   **THEN:**   * Perform a study to determine the effects the outage has on the ERCOT System,   + If the outage will put ERCOT in an emergency condition or RTCA shows post-contingency loading greater than 98% of the “Emergency Rating”, employ congestion management techniques as necessary**.**   The TO must enter a Forced Outage in the Outage Scheduler. |
| **Log** | Log all actions. |

## 3.5 Geomagnetic Disturbance Notification

**Procedure Purpose:** To disseminate forecasted and current space weather information when a K-7 and greater or G3 and greater GMD storm has entered a Warning and / or Alert.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** |  |  |  |  |
| **Guide Reference** | **4.7** |  |  |  |
| **NERC Standard** | **EOP-010-1**  **R1, R1.1, R2** |  |  |  |

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| **Step** | **Action** |
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| **Note** | * The Geomagnetic Disturbance Reference Document can be found in Section 2.13 of the Common to Multiple Desks Desktop Reference Guide. * An Advisory is issued when a GMD Alert of K-7 or higher is issued, however the Advisory will not be canceled until the GMD Warning is canceled. |
| **1** | **WHEN:**   * Notified by the Shift Supervisor that an Alert from the Space Weather Prediction Center has been issued for a K-7 and greater or G3 and greater;   **THEN:**   * Issue an Advisory by making a Hotline call to TOs * Post message on the ERCOT Website * Notify Real-Time operator to make Hotline call to QSEs   **T#25 - Typical Hotline Script for Advisory for GMD Alert**  **Typical ERCOT Website Posting Script:**  Advisory issued for a geomagnetic disturbance of [state K-Index level] until [time]. |
| **Extend** | **IF:**   * The Alert is extended;   **THEN:**   * Post message on the ERCOT Website and * Cancel the older message   **Typical ERCOT Website Posting:**  The Space Weather Prediction Center has extended the Alert of [state level] until [time]. |
| **K Level**  **Increases / Decreases** | **IF:**   * Notified by the Shift Supervisor that an Alert from the Space Weather Prediction Center has been increased or decreased for a K-7 and greater or G3 and greater;   **THEN:**   * Making a Hotline call to TOs * Update message on ERCOT Website * Notify Real-Time operator to make Hotline call to QSEs   **T#26 - Typical Hotline Script for GMD K- Level Increase/Decrease**  **Typical ERCOT Website Posting Script:**  Advisory issued for a geomagnetic disturbance of [state K-Index level] until [time]. |
| **Mitigating**  **Activities** | When suspected GMD activity is observed or reported by a TO, consider the following:   * Series capacitors are in-service (where installed) * Delay Planned outages and return outaged equipment to service where possible, especially series capacitors * Remove transformer(s) from service if imminent damage due to overheating * Remove transmission line(s) from service especially the lines most influenced by GMD or the lines which show wide voltage swings * Shed load as required |
| **Issues** | **IF:**   * Any TO reports equipment outages, misoperations, etc. from a GMD event;   **THEN:**   * Coordinate an action plan, if necessary, * Report issues to Shift Supervisor |
| **Cancel** | **WHEN:**   * Notified by the Shift Supervisor that the GMD Warning has expired;   **THEN:**   * Cancel the Advisory by making a Hotline call to TOs * Cancel message on ERCOT Website * Notify Real-Time operator to make Hotline call to QSEs.   **T#27 - Typical Hotline Script to Cancel Advisory for GMD** |
| **Log** | Log all actions. |

## 3.6 Resolving Real-Time Data Issues

**Procedure Purpose:** To provide a mutually agreed process for resolving Real-Time data issues between ERCOT and the Entities that provide data to ERCOT.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** | **3.10.7.5.2(2)** |  |  |  |
| **Guide Reference** | **7.3.3** | **7.3.4** | **7.3.5** | **7.3.6** |
| **NERC Standard** | **IRO-018-1(i)**  **R1, R1.3, R2, R2.3** | **TOP-003-5**  **R5, R5.2** | **TOP-010-1 (i)**  **R1, R1.3, R2, R2.3, R3, R3.2, R3.3** |  |

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| **Real-Time Data Issues known by the TO or QSE** | |
| **Note** | * This only applies to data issues that are not affecting the State Estimator solution. * Manually replaced telemetry data is data entered by a QSE or TO on their systems that is transmitted to ERCOT via ICCP in place of the normal points experiencing an issue.     **Refer to Desktop Guide Common to Multiple Desks 2.27 Quality of Real-time Data.** |
| **IROLS** | ERCOT provides read permission to all TSPs for the IROL MW limit and flow via ICCP.  **IF:**   * The ICCP link goes down or for bad telemetry;   **THEN:**   * An alternate method for updating the value of the IROL will be used (i.e., verbal notification, etc.). |
| **Notification of Telemetry**  **Data**  **Issue** | **IF:**   * Notified of a telemetry data issue (telemetry data will not be available or is unreliable for operational purposes);   **THEN:**   * The TO or QSE should correct of the telemetry data as soon as practicable, or, * Manually replace the data, if available. |
| **Cannot**  **Resolve** | **IF:**   * The TO or QSE cannot resolve the telemetry data issue within two Business Day, fix the issue in a timely manner;   **THEN:**   * The TO or QSE shall provide an estimated time of resolution. |
| **Real-Time Data Issues that affect Network Security Analysis** | |
| **Note** | Real-Time telemetry data issues that affect ERCOT’s Network Security Analysis (NSA) are issues that can cause invalid State Estimator (SE) solutions (when the SE has reached the maximum number of iterations without finding a solution) or affect solution quality. |
| **Identify**  **And**  **Notify** | **IF:**   * There is a Real-Time telemetry data issue affecting the State Estimator solution;   **THEN**   * Notify the Operations Support Engineer to help identify the TO or QSE responsible for the data causing the invalid solution. |
| **Notify** | **Once Identified:**   * Notify the TO or QSE responsible for data issue;   **THEN:**   * Request the TO or QSE to address the data issue with either manually replaced telemetry data if secondary sources are available, OR * A correction of the telemetry data issue as soon as practicable. |
| **1** | **IF:**   * The TO or QSE cannot address the issue within 10 minutes of notification;   **THEN:**   * The TO or QSE shall coordinate with ERCOT to verbally agree to the best assumed data value(s). * The TO or QSE shall use verbally agreed data to manually replace the data point to reflect the best assumed data value(s) and update the data as necessary until the Real-Time data issue is resolved. |
| **2** | **IF:**   * The TO or QSE cannot resolve the Real-Time telemetry data issue that is affecting ERCOTs NSA within two Business Days, it shall provide an estimated time of resolution;   **THEN:**   * The TO or QSE shall notify ERCOT when the Real-Time telemetry data issue that was affecting ERCOT’s NSA is resolved. |

## 3.7 Manual Real-time Assessment (RTA)

**Procedure Purpose:** To ensure the IROL, SOLs and GTCs are monitored, and corrective actions are taken for post-contingency overloads and basecase overloads.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** |  |  |  |  |
| **Guide Reference** |  |  |  |  |
| **NERC Standard** | **IRO-008-3**  **R4** | **TOP-001-6**  **R13, R14** |  |  |

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| **Step** | **Action** |
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| **Note** | The Reliability Coordinator must ensure, if analysis tools are unavailable, that an RTA is performed at least once every 30 minutes. The analysis tools applicable are:   * State Estimator * RTCA * RTMONI |
| **Note** | An RTA is an evaluation of system conditions using Real-time data to assess existing (pre-Contingency) and potential (post-Contingency) operating conditions.  The RTA is required to include applicable load, generation output levels, known Protection System and Remedial Action Scheme (RAS) status or degradation, functions, and limitations; Transmission and Generation outages, DC Tie schedules, Facility Ratings, and identified phase angle and equipment limitations.  This RTA must evaluate for all SOL exceedances (e.g., Facility Ratings, voltage limits, and any GTLs). |
| **1** | **WHEN:**   * The Operations Support Engineer performs a manual RTA (at least every 30 minutes) and saves the study;   **THEN:**   * Open the save case to review the results;   **Considerations:**   * If SE/RTCA is not operational due to TO/QSE ICCP data issues, results could be erroneous. Coordination with the appropriate TOs will be necessary. * Use the most limiting parameter when determining corrective actions for SOL exceedances, unless the parameter is determined to be erroneous by both ERCOT and the TO/QSE.   **IF:**   * TCM is operational;   **THEN:**   * The Operations Support Engineer will build manual constraints for SCED to re-dispatch   **IF:**   * TCM in not operational and manual re-dispatch is necessary;   **THEN:**   * Manually re-dispatch using a VDI and notify the appropriate TO   **IF:**   * If SCED is operational;   **THEN:**   * Monitor constraints in SCED to ensure resolution   **UPDATE:**   * RTMONI as necessary for GTLs |
| **2** | **WHEN:**   * Topology changes are reported;   **THEN:**   * Notify the Operations Support Engineer is aware for the manual RTA.   **IF:**   * If requested by Shift Supervisor or Operations Support Engineer to manually replace data/statuses;   **THEN:**   * Replace the topology changes that were reported.   **Other Considerations:**   * System Load changes, * Large generation re-dispatch |
| **3** | **ONCE:**   * The tools are back operational and manual RTAs are no longer needed;   **THEN:**   * Coordinate with the Operations Support Engineer to remove any unneeded manually replace data/statuses. |
| **Log** | Log all actions. |

**3.8 SOL Exceedance Communications**

**Procedure Purpose:** To ensure necessary SOL exceedance, as established in the SOL Methodology, are communicated either electronically or manually to impacted ERCOT TOs.

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| **Protocol Reference** |  |  |  |  |
| **Guide Reference** | **3.7 (2)** |  |  |  |
| **NERC Standard** | **IRO-008-3**  **R5, R6** |  |  |  |

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| **Note** | The SOL Exceedance tool indicates SOL exceedances and the timeframe necessary for manual communication if both the MIS Posting and Grid Geo are unavailable. |
| TO reports its preferred method of SOL Electronic Communication is unavailable | |
| **1** | **IF:**   * A TO reports either the MIS Posting of System Limit Exceedances **OR** Grid Geo is unavailable;   **AND:**   * The MIS Posting of System Limit Exceedances **AND** Grid Geo are available on the ERCOT side;   **THEN:**   * Instruct the TO to utilize the alternate method of SOL Electronic Communication, and * Instruct them to call the ERCOT Service Desk. |
| One Method of SOL Electronic Communication is unavailable | |
| **1** | **IF:**   * The MIS Posting of System Limit Exceedances **OR** Grid Geo is unavailable;   **THEN:**   * Make a Hotline call to TOs:   [**T#116 - SOL Electronic Communications Alternate Method**](https://ercot.sharepoint.com/sites/IDT-NERCProject2015-09/Shared%20Documents/Electronic%20Communication%20of%20SOL/Redline%20Procedures/Draft_SOL%20COMS_Scripts.docx?web=1)  **AND:**   * Contact the Service Desk to issue a ticket and fix immediately. |
| **2** | **ONCE:**   * The MIS Posting of System Limit Exceedances **OR** Grid Geo has returned to service;   **THEN:**   * Make a Hotline call to TOs:   [**T#117 - SOL Electronic Communications Alternate Method Returned**](https://ercot.sharepoint.com/sites/IDT-NERCProject2015-09/Shared%20Documents/Electronic%20Communication%20of%20SOL/Redline%20Procedures/Draft_SOL%20COMS_Scripts.docx?web=1) |
| Both Methods of SOL Electronic Communication are unavailable | |
| **1** | **IF:**   * The MIS Posting of System Limit Exceedances **AND** Grid Geo are unavailable;   **THEN:**   * Make a Hotline call to TOs:   [**T#118 - SOL Electronic Communications Complete Outage**](https://ercot.sharepoint.com/sites/IDT-NERCProject2015-09/Shared%20Documents/Electronic%20Communication%20of%20SOL/Redline%20Procedures/Draft_SOL%20COMS_Scripts.docx?web=1)  **AND:**   * Contact the Service Desk to issue an “X Matters” ticket and fix immediately;   **THEN:**   * Make manual communication to all impacted TOs for SOL exceedances as indicated by the SOL Exceedance tool **AND** within the timeframes established in the “SOL Exceedance Communication Thresholds” below; * Make manual communication to all impacted TOs for mitigated SOL Exceedances as indicated by the SOL Exceedance tool. |
| **2** | **ONCE:**   * The MIS Posting of SOL System Limit Exceedances AND/OR Grid Geo have returned to service;   **THEN:**   * Make a Hotline call to TOs:   [**T#119 SOL Electronic Communications Returned to Service:**](https://ercot.sharepoint.com/sites/IDT-NERCProject2015-09/Shared%20Documents/Electronic%20Communication%20of%20SOL/Redline%20Procedures/Draft_SOL%20COMS_Scripts.docx?web=1)  **THEN:**   * Manual communication to all impacted TOs due to tool outages for SOL exceedances and mitigations are no longer required.   **IF:**   * Either the MIS Posting of System Limit Exceedances OR Grid Geo has not returned to service;   **THEN:**   * Refer to “One Method of Electronic Communication is unavailable”, step 2 above. |
| TO reports both methods of SOL Electronic Communication are unavailable | |
| **1** | **IF:**   * A TO reports both its MIS Posting of System Limit Exceedances AND Grid Geo are unavailable;   **AND:**   * The MIS Posting of System Limit Exceedances **AND** Grid Geo are confirmed to be available;   **THEN:**   * Notify the TO ERCOT will make manual communication of SOL exceedances that are determined to impact them until the TO notifies ERCOT they are able to receive one method of SOL electronic communications; * Request TO to call the ERCOT Service Desk immediately to resolve.   **THEN:**   * Make manual communication to the TO that reported the outage if they are an impacted TO for SOL exceedances as indicated by the SOL Exceedance tool AND within the timeframes established below in the SOL Exceedance Thresholds. * Update the TO when an SOL exceedance has been *mitigated*, as indicated by the SOL Exceedance tool as soon as practical. |
| **2** | **ONCE:**   * The TO reports either the MIS Posting of System Limit Exceedances OR Grid Geo has returned to service, and are receiving SOL exceedance electronic communication;   **THEN:**   * Manual communication to reporting TO of SOL exceedances and mitigation are no longer required unless action is needed by the TO (section 4 of this manual). |
| TO ICCP Links Down | |
| **1** | **IF:**   * An outage of both ICCP links occur for greater than approximately 10 minutes for TO occurs and not anticipated to be restored;   **THEN:**   * Notify the TO ERCOT will make manual communication of IROL and GTC SOL exceedances that are determined to impact the TO;   **THEN:**   * Make manual communication to the TO, if an impacted TO, for IROL/GTC SOL exceedances, as indicated by the SOL Exceedance tool **AND** within the timeframes established in SOL Exceedance Communication Thresholds below; * Make manual communication to the TO, if they are an impacted TO, for mitigated IROL/GTC SOL exceedances as indicated by the SOL Exceedance tool. |
| **2** | **ONCE:**   * ICCP link(s) are restored for a TO **AND** the TO reports ICCP data is being received;   **THEN:**   * Manual communication to the TO, if an impacted TO, of IROL/GTC SOL exceedances and mitigation are no longer required unless action is needed by the TO (section 4 of this manual). |
| SOL Exceedance Communication Thresholds | |
| **15-Min of a valid SOL exceedance** | The following SOL exceedances must be communicated within fifteen minutes of a validated SOL exceedance:   * IROL exceedances (section 4.4 of this manual) * SOL exceedances of stability limits (section 4.5 of this manual) * Pre-Contingency (basecase) thermal SOL exceedances beyond the 15-minute Facility Rating (section 4.1 of this manual) * Post-Contingency thermal or voltage SOL exceedances that indicate risk of instability, cascading, and uncontrolled separation if the contingency were to occur (section 4.3 of this manual), and * Pre-Contingency (basecase) thermal SOL exceedances beyond the Emergency Facility Rating but within the 15-Minute Facility Rating (section 4.1 of this manual). |
| **30-Min of a valid SOL exceedance** | The following SOL exceedances must be communicated within thirty minutes of a valid SOL exceedance.   * Post-Contingency thermal SOL exceedances beyond the Emergency Facility Rating but within the 15-Minute Facility Rating (section 4.1 of this manual) * Pre-Contingency (basecase) SOL exceedances of Normal maximum System Voltage Limits and (section 6 of this manual) * Post-Contingency SOL exceedances of Emergency maximum and minimum System Voltage Limits (section 6 of this manual). |
| **Note** | During an ERCOT ISO declared Watch or Emergency, or if needed due to multiple high priority tasks, an exception to the timeframe of SOL exceedance communication may be utilized. In this circumstance, notify the Shift Supervisor and document this exception in the logs. Continue to make the required communications as timely as possible. |
| **Log** | Log all actions. |

# 4. Manage Transmission Congestion

## 4.1 Transmission Congestion Management

**Procedure Purpose:** To verify and take corrective action for post-contingency overloads for various conditions.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** | **3.10.4(2)** | **6.1(4)** | **6.4.9.1.2(1)** | **6.5.5.2(1)** |
| **6.5.7.1.10** | **6.5.7.6.2.3(1)** | **6.5.7.1.11** | **6.5.7.8** |
|  | **6.5.9(2)** | **6.5.9.2(3)** | **6.5.9.3.3** | **6.5.9.3.4** |
| **Guide Reference** | **2.2.2** |  |  |  |
| **NERC Standard** | **EOP-011-4**  **R1, R1.1, R1.2, R1.2.4** | **IRO-001-4**  **R1** | **IRO-002-7**  **R5** | **IRO-008-3**  **R2, R3, R5, R6** |
| **TOP-001-6**  **R1, R7, R10, R10.1, R10.3, R10.4, R10.6, R14, R18, R25** | **TOP-002-4**  **R2, R3** | **VAR-001-5**  **R2, R3** |  |

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| **Step** | **Action** |
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| **Note** | Although the steps within the procedure are numbered, the numbering is for indexing purposes and are not sequential in nature. The system operator will determine the sequence of steps, exclude steps, or take any additional actions required to ensure system security based on the information and situational awareness available during both normal and emergency conditions. Refer to Section 2.6 of the Transmission & Security Desktop Guide for the contingency solution results legend. |
|  |  |
| **SOL Comms** | If both methods of electronic communication of SOL exceedances are unavailable, refer to section 3.8, “SOL Exceedance Communications Thresholds”, above for criteria of manually communicating SOL exceedances identified below. |
| **Authority** | ERCOT System Operators have the authority to take or direct timely and appropriate real-time action, up to and including shedding firm load to alleviate System Operating Limit (SOL) violations. Following a separation from the Interconnection, and following automatic under-frequency load shedding, System Operators will also instruct TOs to shed additional load manually when there is insufficient capacity to restore system frequency.  To include directing physical operation of the ERCOT Transmission Grid, including circuit breakers, switches, voltage control equipment, and Load-shedding equipment. |
| **Critical**  **Facilities** | Critical facilities are the ERCOT defined contingencies that show up after running Real Time Contingency Analysis (RTCA) as a post-contingency overload. This list is in the EMS and an electronic copy is located on the MIS Secure site:  Select: Grid>Generation>Reliability Unit Commitment>Standard Contingency List’  Select “Standard Contingency List” Open the zip file>Open the CIM file>Select the Standard\_Contingency\_List tab and view the contingencies.  A potential critical facility becomes a critical facility when the contingency appears in RTCA as a post-contingency overload. |
| **Note** | Congestion Management techniques consist of:   * SCED * Phase Shifters (shift factors are on the TCM display) * Remedial Action Plan (RAP) * Pre-Contingency Action Plan (PCAP) * Mitigation Plan (MP) – enacted Post-Contingency * Temporary Outage Action Plans (TOAP) * Building a manual constraint * Non-Spin * ECRS   The electronic and hard copy for the RAPs, PCAPs, and MPs are to be considered current. Should a conflict exist between the electronic and hard copy, the electronic version is to be used.   * This data can be viewed at ERCOT SharePoint > System Operations – Control Center > Quick Links > Remedial Action Schemes (RAS) and/or MP/PCAP/RAP, * OCTOAPs are in the daily Outage Notes. |
| **Caution** | **IF:**   * At any time, the prescribed measures of congestion management techniques within this procedure fail to resolve the congestion, **AND** * The transmission system is in an unreliable state   **THEN:**   * Issue an Emergency Notice * See Operating Condition Script in Section 7.1 * Notify Real-Time operator to make Hotline call to QSEs. * Coordinated with the proper Transmission Operator or QSE to return the system to a reliable state |
| **Log** | Log all actions. |
| **Constraint Shift Factor Cut Off** | Basecase and post-contingency constraints which do not have generator shift factors for units greater than or equal to 2% as indicated in EMS or indicate NOSCED are not activated in SCED.  See Section 4.6 Mitigation Plan for additional details. |
| Review Planned Outage Notes | |
| **Non-Cascading**  **Condition** | **Review daily outage notes:**  **IF:**   * Studies indicate a high post-contingency overload (125% of Emergency rating or greater) due to a Planned outage AND it is not a cascading condition;   **THEN:**   * Allow the outage * Activate the constraint and step the constraint down by adjusting the %Rating (increments of 5%) |
| **Cascading**  **Condition** | **IF:**   * Studies indicate a high post-contingency overload (125% of Emergency rating or greater), AND it is a cascading condition, OR * An unsolved contingency, OR * A Basecase overload;   **THEN:**   * Take pre-posturing measures to reduce the flow before the outage is taken   + Use RTMONI if available on a GTC, OR   + Have a manual constraint created if needed   **IF:**   * Constraint is ineffective   **THEN:**   * Use HDL/LDL overrides as required to pre-posture for an expected Outage as last resort * Post message on the ERCOT Website anytime manual action is taken * Notify Shift Supervisor and send an email to 1 ERCOT Shift Supervisors   **Typical ERCOT Website Posting Script:**  ERCOT is taking manual actions to pre-posture for a [69/138/345] KV outage in the [geographical area].  **ONCE:**   * Studies show that the post-contingency is below 125% of Emergency rating, unsolved contingency, or Basecase overload is resolved   + Give approval for the outage,   + Activate constraint, and   + Release manual override after SCED runs * Cancel ERCOT Website posting. |
| **Log** | Log all actions. |
| Evaluate Real Time Contingency Analysis (RTCA) Results | |
| **1** | **IF:**   * A major topology change has occurred;   **THEN:**   * Re-run RTCA, VSAT and TSAT.   **IF:**   * A constraint needs to be controlled before the next SCED run   **THEN:**   * Manually run RTCA after activating the constraint, AND * Manually execute the SCED process |
| **Log** | Log all actions. |
| Post-Contingency Overloads | |
| **1** | **IF:**   * A post-contingency overload is approaching 98% of its Emergency Rating;   **THEN:**   * Verify the contingency definition associated with the constraint is accurate and appropriate given the current state of the grid * Verify SCADA is of similar magnitude to the pre-contingency value (MW and MVAR flows) * Review the limits in DYNRTG static table to ensure that the telemetry of the lines is within the acceptable range. |
| **2** | **IF:**   * Inaccurate, * Indicate NOSCED, OR * There is not a unit with at least a 2% shift factor;   **THEN:**   * **DO NOT** employ congestion management techniques,   + Notify the Shift Supervisor and Operations Support Engineer to investigate or create a CMP.   + Acknowledge the constraint and list a reason using the drop-down box,   + The comment field should be used for additional information |
| **3** | **IF:**   * Accurate, AND * There is a unit with at least a 2% shift factor;   **THEN:**   * Verify no RAS (identified as RAS in EMS), or RAP exist * Activate constraint   + Lower the value in the % Rating column in TCM to tighten the constraint as needed (minimum of 95%, excluding GTCs)   **IF:**   * A PST can help solve the congestion;   **THEN:**   * Activate the constraint until the PST is studied and moved. |
| **4** | **IF:**   * A post-contingency overload of 98% or greater of the Load Shed Rating exist with a RAP in place;   **THEN:**   * Activate the constraint to reduce the predicted post-contingency loading to no more than 98% of the Load Shed Rating;   **IF:**   * Constraint needs to be controlled within the next 5 minutes;   **THEN:**   * Manually run RTCA after activating the constraint, * Manually execute the SCED process, * Refer to “Managing Constraints in SCED”. |
| Post-Contingency Overloads of Relay Loadability Rating | |
| **1** | **IF:**   * A post-contingency overload is approaching 95% to 98% of its RELAY Loadability Rating (RLAY);   **THEN:**   * Verify SCADA is of similar magnitude to the Actual Basecase value (MW and MVAR flows) * Example: Review the SCADA value with Actual (state estimation value) |
| **2** | **IF:**   * Inaccurate, * Indicate NOSCED, OR * There is not a unit with at least a 2% shift factor;   **THEN:**   * **DO NOT** employ congestion management techniques,   + Notify the Shift Supervisor and Operations Support Engineer to investigate or create a CMP.   + Acknowledge the constraint and list a reason using the drop-down box,   + The comment field should be used for additional information |
| **3** | **IF:**   * Accurate, AND * There is a unit with at least a 2% shift factor;   **THEN:**   * Activate constraint   + Lower the value in the % Rating column in TCM to tighten the constraint as needed to the Emergency limit (2hr rating)   **IF:**   * A PST can help solve the congestion;   **THEN:**   * Activate the constraint until the PST is studied and moved. |
| **4** | **IF:**   * All applicable steps above have been completed, AND constraint is still exceeding its Relay Loadability Rating;   **THEN:**   * Seek to determine what unforeseen change in system condition has arisen and where possible, seek to reverse the action, * Coordinate with Operations Support Engineer to develop a mitigation plan, * Refer to Section 4.3, Closely Monitored SOLs, AND * Notify Shift Supervisor to contact the Director Control Room Operations and/or Designee to investigate further as needed |
| **Log** | Log all actions. |
| Monitoring Sub Synchronous Resonance (SSR) with Capacitor switching action | |
| **CAUTION** | * There are two series Capacitors at Gauss substation. One should remain bypassed all the time. The ERCOT outage monitoring tool will verify these conditions. * Only one set of series capacitors at either Edison or Oersted will be in service at any time. The ERCOT outage monitoring tool will verify these conditions. * Prior to energizing or bypassing any series capacitors from service, ERCOT System Operators should run an STNET power flow study and contingency analysis. |
| **Capacitors**  **With SSR issues** | |  | | --- | | ***Name EMS ID Transmission Operator*** | | Edison EDISON AEP TO | | Orsted OERSTED AEP TO | | Gauss GAUSS AEP TO | | Kirchhoff KIRCHHOF AEP TO | | Ctt\_Cros CTT\_CROS CROSS TEXAS TO | |
| **Note** | * SSR Studies identify the conditions for SSR. These outages are programmed into the EMS monitoring tool. * TO(s) should contact ERCOT System Operations prior to energizing or bypassing any Series Capacitor. * **WARNING:** If the generator plant is three contingencies away from SSR vulnerability, a notification will inform a system operator to review the procedural plan. * **ALARM:** If the generator plant is two or fewer contingencies away from SSR vulnerability, an alarm will inform a system operator to implement the procedural action plan. A Generator is allowed to reside in this condition for 8 hours. * The ERCOT EMS system will be utilized to monitor transmission outages. A double circuit transmission outage is considered as one contingency in Operations. |
| **Output**  **Displays** | **REVIEW REFERENCE DISPLAY:**  **ERCOT EMS Applications>OLNETSEQ – Real-Time Network On-line Sequence**  **Contingency Violation Display**  **SSR Summary Display**  **IF:**   * You receive an SSR alarm, but the impacted Resource is offline.   **THEN:**   * Take action accordingly because the SSR tool does not consider if the unit is planned ON/OFF |
| **Warning** | **IF:**   * EMS SSR Notification (Warning) Three Contingencies away from SSR vulnerability   **THEN:**   * Notify Shift Supervisor * Coordinate with Operations Support Engineer to review Action Plan * Consider restoring planned outages with less than 8 hours restoration times |
| **Alarm** | **IF:**   * EMS SSR Notification (Alarm) Two Contingencies away from SSR vulnerability   **THEN:**   * Notify Shift Supervisor and Operations Support Engineer * Assess system with series Capacitors bypassed   **IF:**   * Congestion is identified during the assessment   **THEN:**   * Activate the Manual Constraint * Bypass Series Capacitors promptly   **Typical Script for TO:**  This is ERCOT operator [first and last name]. At [xx:xx], ERCOT is issuing [TO] an Operating Instruction to bypass the [Edison and Oersted], [Cross and Gauss], or [Kirchhoff] Series Capacitor for SSR mitigation and update the Outage Scheduler. Notify ERCOT when this task is complete. Please repeat this back to me. That is correct, thank you.”   * Post message on the ERCOT Website   **Typical ERCOT Website Posting of the SSR Mitigation:**  “ERCOT is bypassing the [Series Capacitor] for SSR mitigation.”   * Activate Constraint (if any) * Contact affected TOs, inquire if planned/forced outages can be restored within 8 hours |
| **1** | **IF:**   * There are two Contingencies away from SSR vulnerability Series Capacitor cannot be opened or the planned/forced outages cannot be restored within 8 hours   **THEN:**   * Notify Shift Supervisor and Operations Support Engineer * Assess system with [Kendall – Big Hill 345 kV line], [Edith Clarke – Clear Crossing 345 kV line] and/or [Tule Canyon – Tesla 345 kV line], or [Dermott Switch – Clear Crossing 345 kV line] opened   **IF:**   * Congestion is identified during the assessment   **THEN:**   * Activate the Manual Constraint * Instruct TO to open [Kendall – Big Hill 345 kV line], [Edith Clarke – Clear Crossing 345 kV line] and/or [Tule Canyon – Tesla 345 kV line], or [Dermott Switch – Clear Crossing 345 kV line] * Consider RUC De-Commit of a Resource if this action is less restrictive and additional capacity is needed.   **Refer to Desktop Guide Transmission Desk 2.18 Sub-Synchronous Resonance** |
| **2** | **The ERCOT Website posting of the SSR Mitigation MUST be posted prior to SSR Notification (Alarm) One Contingency away from SSR vulnerability.**    **IF:**   * EMS SSR Notification (Alarm) identifies one Contingency away from SSR vulnerability   **THEN:**   * Confirm previous steps have been completed; and * Notify QSE with impacted resource |
| **Normal Operations** | **WHEN:**   * Back to normal operations and there is no SSR vulnerability.   **CANCEL:**   * SSR mitigation message on the ERCOT Website.   **THEN:**   * Assess system with series Capacitors in service * Insert Series Capacitors   **Typical Script for TO:**  This is ERCOT operator [first and last name]. At [xx:xx], ERCOT is issuing [TO] an Operating Instruction to close the [Edison and Oersted], [Cross and Gauss], or [Kirchhoff] Series Capacitor as conditions have improved and there is no reportable SSR condition at this time. Notify ERCOT when this task is complete. Please repeat this back to me. That is correct, thank you.” |
| **Log** | Log all actions. |
| Monitoring Sub Synchronous Resonance (SSR) without Capacitor switching action | |
| **Capacitors**  **With SSR issues** | |  | | --- | | ***Name EMS ID Transmission Operator*** | | North Edinburg NEDIN AEP TO | | Rio Hondo RIOHONDO AEP TO | |
| **Note** | * SSR Studies identify the conditions for SSR. These outages are programmed into the EMS monitoring tool. * TO(s) should contact ERCOT System Operations prior to energizing or bypassing any Series Capacitor. * **WARNING:** If the generator plant is three contingencies away from SSR vulnerability, a notification will inform a system operator to review the procedural plan. * **ALARM:** If the generator plant is two or fewer contingencies away from SSR vulnerability, an alarm will inform a system operator to implement the procedural action plan. A Generator is allowed to reside in this condition for 8 hours. * The ERCOT EMS system will be utilized to monitor transmission outages. A double circuit transmission outage is considered as one contingency in Operations. |
| **Output**  **Displays** | **REVIEW REFERENCE DISPLAY:**  **ERCOT EMS Applications>OLNETSEQ – Real-Time Network On-line Sequence**  **Contingency Violation Display**  **SSR Summary Display**  **IF:**   * You receive an SSR alarm, but the impacted Resource is offline.   **THEN:**   * Take action accordingly because the SSR tool does not consider if the unit is planned ON/OFF |
| **Warning** | **IF:**   * EMS SSR Notification (Warning) Three Contingencies away from a SSR vulnerability   **THEN:**   * Notify Shift Supervisor * Inform QSE resource may be requested offline for Valley SSR mitigation |
| **Alarm** | **IF:**   * EMS SSR Notification (Alarm) Two Contingencies away from a SSR vulnerability   **THEN:**   * Notify Shift Supervisor * Issue QSE operating instruction to order the resource offline   **Typical Script for TO:**  This is ERCOT operator [first and last name]. At [xx:xx], ERCOT is issuing [QSE] an Operating Instruction to take [resource] offline for SSR mitigation. Notify ERCOT when this task is complete. Please repeat this back to me. That is correct, thank you.”   * Post message on the ERCOT Website   **Typical ERCOT Website Posting of the SSR Mitigation:**  “ERCOT is taking manual actions for SSR mitigation.” |
| **1** | **Refer to Desktop Guide Transmission Desk 2.18 Sub-Synchronous Resonance** |
| **2** | **The ERCOT Website posting of the SSR Mitigation MUST be posted prior to SSR Notification (Alarm) One Contingency away from SSR vulnerability.**    **IF:**   * EMS SSR Notification (Alarm) identifies one Contingency away from SSR vulnerability   **THEN:**   * Confirm previous steps have been completed; and * Notify QSE with impacted resource |
| **Normal Operations** | **WHEN:**   * Back to normal operations and there is no SSR vulnerability.   **CANCEL:**   * SSR mitigation message on the ERCOT Website.   **THEN:**   * Notify QSE resource is released to come online   **Typical Script for TO:**  This is ERCOT operator [first and last name]. At [xx:xx], ERCOT is notifying [QSE] [resource] is released to come online. Please repeat this back to me.  That is correct, thank you.” |
| **Log** | Log all actions. |
| Post-Contingency Overloads on the South DC Ties | |
| **Note** | Ensure all available generation has been RUC committed and the constraint binding before curtailing any South DC-Ties. Curtail only enough to maximize the flow across the South DC-Ties at all times. |
| **1** | **IF:**   * A post-contingency overload is approaching 98% of the Emergency Rating with shift factors for a DC-Tie export;   **THEN:**   * Activate the constraint if a 2% or more shift factor exists.   **IF:**   * Shift factors exists for a DC-Tie export only or if activating the constraint does not fully resolve the congestion;   **THEN:**   * Ensure appropriate Resources have been RUC committed, * Request DC-Tie Operator to curtail the appropriate South DC-Tie to a specific MW amount to resolve the overload * Ensure a Mitigation Plan exists for the contingency and review with TO, * If no Mitigation Plan exists, notify Operations Engineer to create one. |
| Basecase Overloads | |
| **1** | **IF:**   * A Basecase exists   **THEN:**   * Verify SCADA is of similar magnitude to the Actual Basecase value (MW and MVAR flows) * Example: Review the SCADA value with Actual (state estimation value) |
| **2** | **IF:**   * Inaccurate, * Indicate NOSCED, OR * There is not a unit with at least a 2% shift factor;   **THEN:**   * **DO NOT** employ congestion management techniques,   + Notify the Shift Supervisor and Operations Support Engineer to investigate or create a CMP.   + Acknowledge the constraint and list a reason using the drop-down box,   + The comment field should be used for additional information |
| **3** | **IF:**   * Accurate, AND * There is a unit with at least a 2% shift factor;   **THEN:**   * Activate constraint   + Lower the value in the % Rating column in TCM to tighten the constraint as needed (minimum of 95%, excluding GTCs)   **IF:**   * A PST can help solve the congestion;   **THEN:**   * Activate the constraint until the PST is studied and moved. |
| **ONTEST** | Resources with a Resource Status of ONTEST, may not be issued dispatch instructions / Operating Instructions except:   * For Dispatch Instructions / Operating Instructions that are a part of the testing; or * During conditions when the Resource is the only alternative for solving a transmission constraint (would need QSE to change Resource Status); or * During Force Majeure Events that threaten the reliability of the ERCOT System. |
| **QSGR** | Market Operation>Real-Time Market>SCED Displays>DSI Displays>DSI Data Processes>DSI Operator Manual Overide HDL And LDL  **IF:**   * A QSGR is needed for voltage support or an unsolved contingency;   **THEN:**   * Override LDL to a level greater than or equal to the COP LSL   + DO NOT override while SCED is running,   + Notify QSE as time permits   + Post message on the ERCOT Website   **Typical ERCOT Website Posting Script:**  ERCOT is taking manual actions for a [Basecase/Unsolved Contingency] in the [geographical area].   * These Resources can be viewed at ERCOT SharePoint > System Operations – Control Center > Quick Links > Approved Quick Start (QSGR) Resources |
| **Not Dispatchable to SCED** | **REVIEW REFERENCE DISPLAY:**  **EMS Applications>Generation Control>Resource Limit Calculation>RLC Unit Input Data and RLC Unit Output Data**  **IF:**   * A QSE has telemetered more A/S on a specific Resource that is greater than their HSL, OR * A Resource is generating more than their telemetered HSL;   **THEN:**   * SCED will set the HDL=LDL=MW making the Resource un-dispatchable, * Request the QSE to make corrections to telemetry (Resource status, Resource limits, A/S responsibilities, etc.) * Disregard IRRs unless transmission constraint is active. |
| **Qualifying**  **Facilities** | **A list of Qualifying Facilities can be found in Desktop Guide Common to Multiple Desk section 2.20**  **IF:**   * A Qualifying Facility (QF) is needed to operate below its LSL, or be ordered off-line to solve congestion;   **THEN:**   * An Emergency must be declared * Issue an electronic Dispatch Instruction confirmation to the appropriate QSE,   + Choose “DECOMMIT or ERCOT REQUESTED QF OPERATE BELOW LSL” as the Instruction Type from Resource level   + Enter contingency name in “other information”   + If DECOMMIT also enter RUC DECOMMIT in “other information”   When issuing a VDI or confirmation, ensure the use of three-part communication:   * + Issue the Operating Instruction   + Receive a correct repeat back   + Give an acknowledgement * Issue an Emergency Notification via Hotline call to TOs, * Coordinate with the Real-Time Operator to make Hotline call to QSEs, * Post message to the ERCOT Website.   **T#28 – Typical Hotline Script for Emergency Notice for instructing Qualifying Facility to operate offline/below LSL** |
| **4** | **IF:**   * All applicable steps above have been completed, AND Basecase is still exceeding its Normal and/or its Relay Loadability Rating;   **THEN:**   * Seek to determine what unforeseen change in system condition has arisen and where possible, seek to reverse the action, * Coordinate with Operations Support Engineer to develop a mitigation plan, * Refer to Section 4.3, Closely Monitored SOLs, AND * Notify Shift Supervisor to contact the Director Control Room Operations and/or Designee to investigate further as needed |
| **Log** | Log all actions. If known, log the outage that is causing the congestion. |
| Basecase of Relay Loadability Rating | |
| **1** | **IF:**   * A Basecase of the Relay Loadability Rating (RLAY) exists;   **THEN:**   * Verify SCADA is of similar magnitude to the Actual Basecase value (MW and MVAR flows) * Example: Review the SCADA value with Actual (state estimation value) |
| **2** | **IF:**   * Inaccurate, * Indicate NOSCED, OR * There is not a unit with at least a 2% shift factor;   **THEN:**   * **DO NOT** employ congestion management techniques,   + Notify the Shift Supervisor and Operations Support Engineer to investigate or create a CMP.   + Acknowledge the constraint and list a reason using the drop-down box,   + The comment field should be used for additional information |
| **3** | **IF:**   * Accurate, AND * There is a unit with at least a 2% shift factor;   **THEN:**   * Activate constraint   + Lower the value in the % Rating column in TCM to tighten the constraint as needed (minimum of 95%, excluding GTCs)   **IF:**   * A PST can help solve the congestion;   **THEN:**   * Activate the constraint until the PST is studied and moved. |
| **4** | **IF:**   * All applicable steps above have been completed, AND Basecase is still exceeding its Relay Loadability Rating;   **THEN:**   * Seek to determine what unforeseen change in system condition has arisen and where possible, seek to reverse the action, * Coordinate with Operations Support Engineer to develop a mitigation plan, * Refer to Section 4.3, Closely Monitored SOLs, AND * Notify Shift Supervisor to contact the Director Control Room Operations and/or Designee to investigate further as needed |
| **Log** | Log all actions. |
| Basecase / Post-Contingency Exceedance of Phase Angle | |
| **1** | **IF:**   * A Phase Angle exceedance exists,   **THEN:**   * Verify SCADA is of similar magnitude to the Actual value (MW and MVAR flows)   Example: Review the SCADA value with Actual (state estimation value) |
| **2** | **IF:**   * Phase Angle exceedance is valid;   **THEN:**   * Notify the appropriate TO and make them aware of the potential that reclosure of breakers could be affected,   **IF:**   * The TO needs assistance from ERCOT to get Phase Angle exceedance adjusted;   **THEN:**   * This could be transmission switching, creation of a manual constraint, bringing on an additional Resource, returning a planned outage, or development of a CMP. |
| **Log** | Log all actions. |
| Post-Contingency Overloads on Private Use Networks (PUNs) or Customer Owned Equipment behind the Meter | |
| **1** | **IF:**   * A post-contingency overload is 100% of its Emergency Rating on a PUN or customer owned equipment;   **THEN:**   * Contact the appropriate QSE/PUN to alert them of the post-contingency overload,   **VERIFY:**   * There is a plan to mitigate the overload if the contingency were to occur. |
| **2** | **IF:**   * It is determined that the QSE/PUN has no way to mitigate or correct the congestion;   **THEN:**   * Instruct the QSE/PUN to take action such as lower/raise generation or load (verbal Operating Instruction only, do not override HDL/LDL or activate constraint in SCED) and * Acknowledge the post-contingency overload in TCM. |
| **3** | **IF:**   * The contingency occurs;   **THEN:**   * Notify the QSE/PUN to ensure action is being taken on the plan. |
| **4** | **IF:**   * A post-contingency overload of 98% or greater of its Emergency Rating on transmission equipment (non-PUN or customer owned equipment), and the only shift factor of 2% or more is a PUN unit;   **THEN:**   * Activate the constraint. |
| **Log** | Log all actions. |
| Managing Constraints in SCED | |
| **Note** | One of the key tasks is to properly monitor and manage transmission constraints. Keep track of non-binding constraints that have flows approaching their limits and be prepared to take action as the constraint approaches its rating. |
| **Output**  **Displays** | REVIEW REFERENCE DISPLAY:  Market Operation>Real-Time Market>SCED Displays>DSP Displays>DSP Constraint Summary  Once SCED has completed its run, check the validity of the binding/exceeded constraints, limits, shadow price, and current real-time flows. |
| **In**  **Series** | It is common for series elements to have nearly identical shift factors for a given contingency. If post-contingency loading of 98% or greater occurs for multiple elements which have been identified as being in series with each other, only the most limiting constraints should be activated to mitigate all the series element congestion.  **Example: Contingency A overloads X, Contingency A overloads Y** |
| **Same**  **Element** | If post-contingency loading of 98% or greater occurs on the same element for multiple contingencies and they have nearly identical shift factors, only one of the most limiting constraints should be activated to mitigate the congestion.  **Example: Contingency A overloads X, Contingency B overloads X** |
| **1** | Verify that the SCED executions are reducing the flows on each constraint that is binding. |
| **2** | When a constraint becomes violated in SCED, which is when it has reached its max shadow price and is exceeding its Emergency rating, review the following bullets to take the appropriate action(s):   * Confirm that pre-determined relevant RAPs are properly modeled in the EMS, * Ensure base points are being followed, * Remove Resource from ONTEST, * Remove A/S to increase capacity available to SCED (see procedure below), * Determine if a unit carrying Off-line Non-Spin could be used,   + Ask Resource Operator to deploy Non-Spin for the specific unit   + The telemetered Non-Spin schedule must be changed to 0 for SCED to dispatch the Resource * Determine if additional units could be RUC committed/decommitted, * Confirm SCED is balancing conflicting constraints * Ensure reactive devices are being utilized |
| **3** | **IF:**   * All applicable steps above have been completed, AND constraint is still exceeding its Emergency Rating;   **THEN:**   * Seek to determine what unforeseen change in system condition has arisen and where possible, seek to reverse the action, * Coordinate with Operations Support Engineer to develop a mitigation plan, * Refer to Section 4.3, Closely Monitored SOLs, AND * Notify Shift Supervisor to contact the Director Control Room Operations and/or Designee to investigate further as needed |
| **Note** | EMP Applications>TCM-Transmission Constraint Manager>Related Displays>Message Log for CAM  **IF:**   * No shift factors are passed for the constraint;   **THEN:**   * Contact Help Desk to issue a ticket to GMS Support to fix immediately. |
| **Log** | Log all action taken including the following:   * Reason for doing a manual override * Any security violations that were ≥ 125% of the Emergency Rating |
| Remove A/S to Increase Capacity available to SCED | |
| **1** | **RLC Unit Input Data display**  **IF:**   * A/S needs to be removed from a specific unit to increase capacity to SCED;   **THEN:**   * Coordinate with the Shift Supervisor and Resource Desk to block or limit A/S on the resource(s) using A/S Capability Manual Override. |
| **Log** | Log all actions. |
| Unsolved Contingencies | |
| **1** | Periodically check the “Contingency Solution Results” display:  **IF:**   * An unsolved contingency exists;   **THEN:**   * Run the State Estimator again, * If unsolved contingency remains, notify the Operations Support Engineer to investigate   **IF:**   * Generation needs to be re-dispatched to solve the contingency   **THEN:**   * Use HDL/LDL override   + Post message on the ERCOT Website anytime manual action is taken   + Log all actions   **IF:**   * EMR Generation needs to be RUC committed such as Hydro   **THEN:**   * Issue an Emergency Notice * Notify the RUC Operator to RUC commit the resource(s) * Log all actions   **IF:**   * It has been determined that a Resource is needed in real-time for a transmission condition after the close of the Adjustment Period (Typically will be short start);   **THEN:**   * Notify the RUC Operator to issue a VDI and an electronic Dispatch Instruction   + Refer to RUC Procedure 3.7 Manual Dispatch of Resources “Manual Commit of a Resource”   + Post message on the ERCOT Website anytime manual action is taken   **Typical ERCOT Website Posting Script:**  ERCOT is taking manual actions for an unsolved contingency in the [geographical area].  **WHEN:**   * Constraint solves and the contingency comes into RTCA   + Activate constraint, and   + Release manual override after SCED runs   + Cancel ERCOT Website posting. |
| **Log** | Log all action taken including the following:   * Reason for unsolved contingency * Actions taken to resolve |
| Unresolvable Congestion with EMR Generation available | |
| **1** | **IF:**   * Post-contingent rating exceedance in excess of 115% of the Emergency Rating, * An unsolved contingency, * Real-time exceedance, OR * A CMP that does not maintain Reliability;   **THEN:**   * Verify the contingency definition associated with the constraint is accurate and appropriate given the current state of the grid   **IF:**   * EMR Generation is available to be dispatched to resolve the Reliability issue,   **THEN:**   * Issue a Transmission Emergency Notice * Post message on the ERCOT Website * Notify Real-Time Desk to make Hotline call to QSEs * Notify the RUC Operator to RUC commit the appropriate EMR resource(s)   **Typical ERCOT Website Posting Script:**  Transmission Emergency Notice has been issued for the [Geographical Area] due to [state issue used in Hotline call].  Edit script as needed to fit situation.  **WHEN:**   * Contingency or Constraint solves and is no longer a Reliability concern   + Release the EMR Generation   + Cancel the Transmission Emergency Notice * Cancel ERCOT Website posting. |
| **Log** | Log all action taken including the following:   * Reason for Transmission Emergency Notice * Actions taken to resolve |
| Model Inconsistencies/Updates | |
| **1** | **IF:**   * Any inconsistencies in ratings, impedance changes, etc. are found;   **THEN:**   * Notify Operations Support Engineer so that they can work with the TO to confirm the correct information and if required, correct it through the NOMCR process. |
| **2** | **IF:**   * There is a difference in an Emergency Facility rating or system voltage limit between ERCOT and a TO;   **THEN:**   * The most limiting rating will be used until the correct rating can be determined, * Notify Operations Support Engineer so that they can work with the TO to confirm the correct information and if required correct it through the NOMCR process. |
| **Log** | Log all actions. |
| QSE Requests to Decommit a Resource | |
| **1** | **IF:**   * Notified by the Resource/RUC Operator of a request to decommit a self-scheduled Resource;   **THEN:**   * Perform a real-time study (if necessary) to determine that no violation of security criteria exist with the Resource off-line and no additional active constraints for SCED will occur, * Notify the Resource/RUC Operator with determination. |
| Phase Shifters | |
| **1** | **IF:**   * A TO calls to requests that a Phase Shifter position be adjusted and there are no longer any known Reliability issues in the area;   **THEN:**   * As time permits, run a study to re-evaluate the phase shifter position; * Coordinate with the TO and adjust the phase shifter as needed to an agreed upon position (preferably as close to neutral as possible). |
| **Log** | Log all actions. |

## 4.2 Transmission/Capacity Issues within the CENACE Area

**Procedure Purpose:** Providing assistance to CENACE.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** | **4.4.4** |  |  |  |
| **Guide Reference** | **2.2.2** |  |  |  |
| **NERC Stadard** |  |  |  |  |

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| --- | --- | --- |
| **Version: 2** | **Revision: 0** | **Effective Date: December 5, 2025** |

| **Step** | **Action** |
| --- | --- |
| **Note** | On the CENACE side of the Railroad DC-Tie, there is an automatic runback scheme that runs back the DC-Tie under CENACE contingency conditions. |
| **1** | **IF:**   * Notified by a DC-Tie Operator that CENACE is unable to maintain reliability and needs to curtail an E-Tag;   **THEN:**   * Verify the MW amount, DC-Tie, and time of the curtailment, * Notify ERCOT DC-Tie Operator with information. |
| **2** | **IF:**   * Notified by a DC-Tie Operator that CENACE is requesting emergency energy;   **THEN:**   * Determine which DC-Tie(s) and amount being requested, * Determine or have the Operations Support Engineer determine that sending emergency energy to CENACE would not put ERCOT in an emergency condition   **IF:**   * ERCOT is able to send CENACE emergency energy;   **THEN:**   * Notify the ERCOT DC-Tie Operator with information for an electronic Dispatch Instruction to be issued. |
| **3** | **WHEN:**   * Notified by a DC-Tie Operator that CENACE no longer needs emergency energy;   **THEN:**   * Notify the ERCOT DC-Tie Operator with information. |
| **Log** | Log all actions. |

## 4.3 Closely Monitored SOLs

**Procedure Purpose:** To identify SOLs that should be closely monitored.

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| **Protocol Reference** | **6.5.7.1.10** | **6.5.9.2** | **6.5.9.3.4(5)** |  |
| **Guide Reference** | **2.2.2** | **4.5.2(2)(b)** |  |  |
| **NERC Standard** | **IRO-001-4**  **R1** | **IRO-002-7**  **R5** | **TOP-001-6**  **R1, R7, R10, R10.1, R10.3, R14** |  |

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| **Step** | **Action** |
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| **Cascading**  **Outages** | Uncontrolled successive loss of system elements – widespread electric service interruption that cannot be restrained from sequentially spreading beyond an area predetermined by studies. |
| **System Instability** | The inability of the Bulk Power System, \* for a given initial operating condition, to regain a state of operating equilibrium after being subjected to a Disturbance1.  1Refers to the remaining portion of the interconnected Bulk Power System, with the exception of the Elements disconnected as a result of the Disturbance. |
| **Relay Loadability Rating** | The MVA rating below which no load-responsive phase-protection relay tripping is expected. The Relay Loadability Rating is calculated based on the trip points of protective devices at the equipment terminals of the affected Transmission Element under a set of operating criteria defined by the Transmission Element owner. |
| **Note** | Considerations for an IROL:   * System Instability * Loss of load in the Cascading or voltage collapse, either through manual action or as a consequence of the event, including loss of load as a result of Under Voltage Load Shedding (UVLS) and Under Frequency Load Shed (UFLS) * Loss of load (manual or auto) is greater than 2000 MW as a result of instability, cascading or uncontrolled separation used in the study |
| **Monitoring** | Monitor for any of the following conditions:   * Basecase Overload * Post-contingent rating exceedance in excess of 125% of the Emergency Rating * An unsolved contingency * A divergent case in VSAT and/or TSAT * Exceedance of a Relay Loadability Rating * Under-voltage condition characterized by bus voltages of less than 90% across three or more related BES facilities * Over-voltage condition greater than 110% across three or more BES facilities |
| **SOL**  **Comms** | If validated off-line study shows a post-contingency cascading or system instability, make verbal communication within 15-minutes to impacted TOs. Refer to section 3.8, “SOL Exceedance Communication Threshold”, for criteria of verbally communicating the SOL exceedance as identified below. |
| **1** | **IF:**   * Any of the above exists;   **THEN:**   * Confirm the appropriate transmission congestion procedures have been completed, * Notify the Operations Support Engineer to perform cascading outage studies |
| **Studies** | If a facility approaches 125% of Emergency Rating, a study for the loss of the contingency element and the overloaded facility will be conducted.   * Manually remove the contingency in the study and run powerflow, and * Manually remove the facility identified to be loaded above 125% of its Emergency Rating (Breaker to Breaker), and * Run powerflow.   **IF:**   * The study results indicate no additional facilities will be overloaded over 125% of their Emergency rating,   **THEN:**   * This is determined to be a localized event and no additional pre-contingency actions will be taken,   **IF:**   * The study results in an additional facility(s) over 125% of its Emergency rating, continue the analysis to also trip the additional facilities (Breaker to Breaker). This analysis will be performed tripping a maximum of 5 study iterations.   **THEN:**   * If the study indicates either a non-converged case OR continues to show facilities exceeding 125% of their Emergency ratings, this will be considered a potential cascade condition. |
| **Localized**  **Event** | **IF:**   * It is determined to be a localized event;   **THEN:**   * A Mitigation Plan should be developed and reviewed with the affected TO(s) |
| **Cascading**  **Condition** | **IF:**   * It is determined to be a cascading condition (not a local radial load pocket);   **VERIFY (time permitting):**  All relevant actions have been implemented:   * All available generation has been brought online * All generation redispatch options have been utilized * No switching action is available * All available load resources have been deployed * All available reactive devices have been deployed or adjusted without exceeding voltage limits * \*All available load management programs have been deployed by the ERCOT TO (if available) * All DC-Tie transactions have been curtailed that negatively impacts * Emergency Energy has been requested or is being imported * Any distribution voltage reduction has been implemented * All necessary public appeals have been made   \* Only applies June through September or when available in EEA 2. EEA 2 and EEA3 implements any available Load management plan to reduce Customer Load.  **THEN:**   * Proceed to the next procedure “Pre-contingency Load Shedding to avoid Post-contingency cascading” AND, * Make verbal communication to impacted TOs within 15 minutes of determination. |
| Pre-contingency Load Shedding to avoid Post-contingency cascading | |
| **1** | **IF:**   * Load shed is the only option to prevent a cascading condition;   **THEN:**   * Obtain the necessary information from the Operations Support Engineer and review with the affected TO   + The amount of load shed should be enough to remain below the load shed rating of the first overloaded facility   + Verify if load shed needed to be location specific * Inform TO that a Transmission Emergency will be issued * Issue Operating Instruction for load shed |
| **2** | **IF:**   * Load shed is 100 MW or greater;   **THEN:**   * Notify the Operations Support Engineer and Shift Supervisor to initiate the NXT for load shed (SO Request for Firm Load) |
| **3** | Issue a Transmission Emergency:   * Make a Hotline call to TOs * Post message on the ERCOT Website. * Notify Real-Time operator to make Hotline call to QSEs   **T#30 – Typical Hotline Script for Transmission Emergency for Cascading Condition**  **Typical ERCOT Website Posting Script:**  “ERCOT issued a Transmission Emergency for an expected cascading condition in the [geographical area].” |
| **4** | **WHEN:**   * Load can be restored;   **THEN:**   * Issue Operating Instruction to restore the load * Make Hotline call to end the Transmission Emergency * Notify Real-Time Operator to make Hotline call to QSEs * Cancel message on ERCOT Website * Notify the Operations Support Engineer and Shift Supervisor to initiate the NXT for restoration of load shed (SO Requested Firm Load restoration) * Make verbal communication to impacted TOs, the SOL exceedance has been mitigated. |
| **Log** | Log all actions. |

## 4.4 Interconnection Reliability Operating Limit (IROL)

**Procedure Purpose:** Maintain transmission Stability using a Generic Transmission Constraint (GTC). The actual flows should not exceed limits. If necessary, the System Operator has the authority to instruct load shedding or removing generation before this IROL has been exceeded.

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| **Protocol Reference** | **6.5.9.1(1)(e)** | **6.5.9.3.4** |  |  |
| **Guide Reference** | **4.2.4(1)** | **4.5.2(2)(b)** |  |  |
| **NERC Standard** | **EOP-011-4**  **R1, R1.1, R1.2, R1.2.4** | **IRO-001-4 R1** | **IRO-002-7**  **R5** | **IRO-008-3**  **R2, R3, R5, R6** |
| **IRO-009-2**  **R1, R1.1, R1.2, R2, R3** | **PER-005-2 R4** | **TOP-001-6**  **R1, R7, R8, R10, R10.1, R12, R14, R25** | **TOP-002-4**  **R2, R3** |

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| **Step** | **Action** |
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| **Note** | Although the steps within the procedure are numbered, the numbering is for indexing purposes and are not sequential in nature. The system operator will determine the sequence of steps, exclude steps, or take any additional actions required to ensure system security based on the information and situational awareness available during both normal and emergency conditions. |
| **IROL**  **Comms** | If ICCP links are down for a TO, or a TO reports bad data, refer to section 3.8, “SOL Exceedance Communications Thresholds”, above for criteria of manually communicating IROL exceedances identified below. |
| **Note** | Utilize the Not to Exceed (%NTE) feature in the Transmission Constraint Manager (TCM) to maintain a more consistent control of the IROL. (see Trans/Sec desktop guide 2.21 for operational guidance) |
| North-Houston Import IROL | |
| **IROL** | The North – Houston VSAT voltage stability limit is an IROL; the actual flow should not exceed its limit. If necessary, the System Operator has the authority to instruct load shedding before this IROL has been exceeded. |
| **VSAT** | **WHEN:**   * VSAT runs and provides an updated limit for the North to Houston;   **THEN:**   * Update RTMONI.   **WHEN:**   * The North to Houston flow is approaching 85% of the limit;   **THEN:**   * Activate the North to Houston constraint at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 93%. |
| **North-Houston**  **345kV Circuit Outage** | **IF:**   * Any of the 345kV lines going into the Houston area has a forced outage;   **THEN:**   * Manually run the entire sequence of RTNET, RTCA, and RTDCP (VSA) immediately and proceed to the Monitor step in this procedure. |
| **Monitor** | Monitor each of the following Reliability Margins:     * N-H G * N-H L   If any of these Reliability Margins fall below the following pre-defined limits, take the appropriate corrective action for each limit, and notify the Shift Supervisor. |
| **Reliability Margin** | **IF:**   * Reliability Margin ≤500 MW   **THEN:**   * Instruct TOs in the affected Houston area to increase voltages by placing capacitor banks in-service and turning off reactors near the weak busses that are available without exceeding high voltage SOLs.   **T#95 North – Houston Reliability Margin ≤500 MW** |
| **≤400MW** | Activate the appropriate constraint(s) such as:   * Thermal constraint(s) * North to Houston constraint   + For an unsolved contingency scenario or the Reliability margin is approaching 400, activate the North to Houston (N\_TO\_H) constraint to get the contingency to solve.   + This may require setting the % Rating lower than 90% to get the constraint to bind. |
| **≤300MW** | Coordinate with the Resource Operator to deploy Non-Spin using the N\_TO\_H constraint or the Coast Weather Zone (WZ\_COAST) in the A/S Manager and remove any A/S from resources as needed to Increase Capacity available to SCED   * Issue a Transmission Watch by making a Hotline call and posting on the ERCOT Website * Coordinate with the Real-Time Operator to make Hotline notification to QSEs   **T#31 – Typical Hotline Script for Watch for North to Houston Interface** |
|  |  |
| **≤200MW** | VDI QSGR in the Houston area that were not bid in as Non-Spin. Determine QSGR in the Coast Weather Zone (WZ\_COAST)   * Request RUC Operator to issue electronic Dispatch Instruction to RUC commit |
| **≤100MW** | * Notify the Resource Desk Operator to deploy Load Resources providing ECRS or RRS in Houston. Prioritize NCLR’s providing ECRS only without UFR. * Issue a Transmission Emergency Notice by making a Hotline call and posting on the ERCOT Website * Notify Real-Time Operator to make Hotline notification to QSEs   **T#32 – Typical Hotline Script for Emergency Notice for North to Houston Interface** |
| **<25MW** | * Instruct CenterPoint to drop firm load in 100 MW blocks. * Continue Transmission Emergency Notice by making a Hotline call and posting on the ERCOT Website * Notify Shift Supervisor to make NXT notification   **Typical Script for CenterPoint:**  This is ERCOT operator [first and last name]. At [xx:xx], ERCOT is issuing CenterPoint an Operating Instruction to drop [\*\*\* MW] of firm load for the North – Houston interface. Notify ERCOT when this task is complete. Please repeat this back to me. That is correct, thank you.”  **T#33 – Typical Hotline Script for Emergency Notice for North to Houston Interface, Firm Load Shed** |
| **Cancel** | Make appropriate cancellations when back to normal operations. |
| **Log** | Log all actions. |

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| Valley Import IROL | |
| **IROL** | The Valley Import stability limit is an IROL; the actual flow should not exceed its limit. If necessary, the System Operator has the authority to instruct load shedding before this IROL has been exceeded. |
| **Note** | DC Tie exports shall not be curtailed during the Adjustment Period, or for more than one hour at a time, except for the purpose of maintaining reliability. |
| **RUC/**  **Future**  **Studies** | **IF:**   * HRUC or off-line studies indicate the need to RUC commit Valley Resources;   **THEN:**   * RUC Commit for timeframe needed   **IF:**   * If studies show high probability of load shed with all available Valley Resources committed, exports on DC-R curtailed, available emergency energy from DC-R, and any outages that can be returned to service within timeframe needed;   **THEN:**   * Issue a transmission emergency for the hours projected to be in this condition |
| **Topology**  **Change** | **IF:**   * A topology change occurs;   **THEN:**   * Re-run RTCA and VSAT.   **IF:**   * A constraint needs to be controlled before the next SCED run   **THEN:**   * Manually run RTCA after activating the constraint, AND * Manually execute the SCED process |
| **Reliability Margin** | **IF:**   * Reliability Margin ≤350 MW   **THEN:**   * Instruct TOs in the affected Rio Grande Valley area to coordinate with generators and TOs to increase voltages by placing capacitor banks in-service and turning off reactors near the weak busses that are available without exceeding high voltage SOLs.   **T#93 Rio Grande Valley Reliability Margin ≤350 MW**  **Example of stations:**  COFFPORT GARZA LA\_PALMA NEDIN RANGERVL RIOHONDO RIO\_GRAN RIO\_RICO STEWART WESLACO |
| **1** | **IF:**   * A post-contingency overload is approaching 98% of the Emergency Rating with shift factors for a DC-Tie export;   **THEN:**   * Activate the constraint if a 2% or more shift factor exists.   **IF:**   * Shift factors exists for a DC-Tie export only or if activating the constraint does not fully resolve the congestion;   **THEN:**   * Ensure appropriate Resources have been RUC committed, * Issue a Transmission Watch   + Make Hotline call to TOs   + Post message on the ERCOT Website   + Notify Real-Time Desk to make Hotline call to QSEs * Coordinate with the Shift Supervisor and Resource Desk to remove any A/S to increase capacity available to SCED using the AS Capability Manual Override. * Deploy any available non-spin using VALIMP constraint in A/S Manager * Request DC-Tie Operator to curtail the Railroad DC-Tie to a specific MW amount to resolve the overload and post a DC Tie Curtailment Notice (DCTCN) on the ERCOT Website * Ensure a Mitigation Plan exists for the contingency and review with TO, * If no Mitigation Plan exists, notify Operations Engineer to create one.   **T#89 – Typical Hotline Script for Transmission Watch for the Rio Grande Valley Import**  **Typical ERCOT Website Posting Script:**  A Transmission Watch has been issued for the Rio Grande Valley due to the Rio Grande Valley Import. |
| **2** | **WHEN:**   * VSAT runs and provides an updated limit for the Valley Import;   **THEN:**   * Update RTMONI.   **WHEN:**   * The Valley Import is approaching 85% of the limit, OR * The Reliability margin is approaching 150;   **THEN:**   * Activate the Valley Import constraint.   OR  **WHEN:**   * There is a transmission outage on a 345kV into the Valley (refer to Operations Support Engineer for limit);   **THEN:**   * Ensure RTMONI is updated with the limit.   **WHEN:**   * The Valley Import is approaching 85% of the limit,   **THEN:**   * Activate the Valley Import constraint at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 90%.   **Note:** For an unsolved contingency scenario or the Reliability margin is approaching 150, activate the Valley Import (VALIMP) constraint to get the contingency to solve. This may require setting the %Rating lower than 85% to get the constraint to bind. |
| **3** | **IF:**   * One of the following conditions exist without a generation solution:   + Unsolved contingency   + Post-contingency loss of a 345kV to the Valley overloads a 345kV   + Post-contingency overload above 125%   + Valley Import is above 90%   + Reliability margin is below 95;   **THEN:**   * Issue a Transmission Emergency Notice   + Make Hotline call to TOs   + Posting message on the ERCOT Website   + Notify Real-Time Desk to make Hotline call to QSEs   **T#29 – Typical Hotline Script for Transmission Emergency for the Rio Grande Valley or Laredo Area**  **Typical ERCOT Website Posting Script:**  Transmission Emergency Notice has been issued for the Rio Grande Valley due to [state issue used in Hotline call].  Edit script as needed to fit situation. |
| **4** | **IF:**   * The Transmission Emergency is issued, AND * One of the following conditions exist without a generation solution:   + Unsolved contingency   + Post-contingency loss of a 345kV to the Valley overloads a 345kV   + Post-contingency overload above 125%   + Valley Import is above 90%   + Reliability margin is below 95;   **THEN:**   * Request Resource Operator to deploy Load Resources in the Valley that have an obligation. |
| **5** | **IF:**   * The Transmission Emergency is issued, AND * One of the following conditions exist without a generation solution:   + Unsolved contingency   + Post-contingency loss of a 345kV to the Valley overloads a 345kV   + Post-contingency overload above 125%   + Valley Import is above 95%   + Reliability margin is below 85;   **THEN:**   * Request DC-Tie Operator to curtail any exports on the Railroad DC-Tie * Request emergency energy from the appropriate DC-Tie Operator across the Railroad DC-Tie.   **IF:**   * CENACE is able to send emergency   + Notify the ERCOT DC-Tie Operator with information for an electronic Dispatch Instruction to be issued |
| **6** | **IF:**   * There are no exports schedules to curtail, or exports have been curtailed and the transmission area is in an unreliable condition without a generation solution and includes one of the following:   + Unsolved contingency   + Post-contingency loss of a 345kV to the Valley overloads a 345kV   + Post-contingency overload above 125%   + Valley Import is above 100%   + Reliability margin is below 25;   **THEN:**   * Follow the Valley Import Mitigation Plan for load shed. |
| **Cancel** | Make appropriate cancellations when back to normal operations. |
| **Log** | Log all actions. |

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| West Texas Export IROL | |
| **IROL** | The West Texas Export stability limit is an IROL; the actual flow should not exceed its limit. If necessary, the System Operator has the authority to instruct removing generation before this IROL has been exceeded. | |
| **Note** | Due to topology changes greater than the element table (identified in Desktop Guide Transmission Desk 2.12) manual studies are preformed to protect against an uncontrolled outage. A more conservative limit may be required by engineering based on their studies. The new limit will be posted on the GTC Outage Coordination Wiki page. If necessary, an OCN will be issued. | |
| **1** | **IF:**   * An outage has occurred on the identified element in the table (identified in Desktop Guide Transmission Desk 2.12);   **THEN:**   * Refer to the constraint limit from table to set the value (identified in Desktop Guide Transmission Desk 2.12); * Update RTMONI from table; | |
| **2** | **WHEN:**   * The BASECASE WESTEX flow is approaching 85% of the limit;   **THEN:**   * Activate the BASECASE WESTEX constraint at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 93%. | |
| **3** | **IF:**   * BASECASE WESTEX is approaching 95%;   **THEN:**   * Tighten constraint to at least 85%, * Rerun SCED, * Call QSEs beginning with those which have the largest IRR base point deviations and issue Operating Instruction as appropriate   **Typical Script to appropriate QSE:**  “This is ERCOT operator [first and last name]. The West Texas export IROL flow is approaching its stability limit; At [xx:xx] ERCOT is issuing an Operating Instruction for [unit name] to immediately follow their basepoint. [QSE] please repeat this back to me.”  If repeat back is CORRECT, “That is correct, thank you.”  If INCORRECT, repeat the process until the repeat back is correct. | |
| **4** | **IF:**   * BASECASE WESTEX has met or surpassed 95%;   **THEN:**   * Instruct QSEs, beginning with those which continue to have the largest IRR base point deviation, to zero immediately (violate ramp rate), * Issue electronic VDI as time permits, * Confirm with Market Participant electronic VDI received.   When issuing a VDI or when confirming the receipt of an Electronic VDI ensure the use of three-part communication:   * + Issue the directive   + Receive a correct repeat back   + Give an acknowledgement * Notify the control room staff.   **Typical Script to appropriate QSE:**  “This is ERCOT operator [first and last name]. The West Texas export IROL flow is approaching its stability limit; At [xx:xx] ERCOT is issuing an Operating Instruction to take [unit name] to zero effective immediately, which means you may violate your ramp rate. I will be sending you an electronic VDI shortly. [QSE] please repeat this back to me.”  If repeat back is CORRECT, “That is correct, thank you.”  If INCORRECT, repeat the process until the repeat back is correct. | |
| **5** | **IF:**   * BASECASE WESTEX is approaching 97%;   **THEN:**   * Verify SCADA control with TO(s) to open IRR breaker(s) | |
| **6** | **IF:**   * BASECASE WESTEX is approaching 99%;   **THEN:**   * Issue Operating Instruction to TO(s) to open IRR breaker(s), beginning with those which have the largest IRR base point deviation, * Notify the control room staff. | |
| **Log** | Log all actions. | |

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| Panhandle Export IROL | |
| **IROL** | The Panhandle Export stability limit is an IROL; the actual flow should not exceed its limit. If necessary, the System Operator has the authority to instruct removing generation before this IROL has been exceeded. |
| **Note** | The most limiting of the real-time VSAT steady-state voltage stability limit and the dynamic voltage stability limit, is used when determining limits in real-time. |
| **Note** | Due to topology changes greater than the element table (identified in Desktop Guide Transmission Desk 2.12) manual studies are preformed to protect against an uncontrolled outage. A more conservative limit may be required by engineering based on their studies. The new limit will be posted on the GTC Outage Coordination Wiki page. If necessary, an OCN will be issued. |
| **1** | **WHEN:**   * VSAT runs and provides an updated limit for the Panhandle Stability;   **THEN:**   * Update RTMONI.   **IF:**   * VSAT results indicates a lower matrix limit;   **THEN:**   * Verify dynamic voltage stability limit from table identified in Desktop Guide Transmission Desk 2.12 * Update limit on RTMONI |
| **Topology**  **Change** | **IF:**   * A topology change occurs;   **THEN:**   * Re-run RTCA and VSAT.   **IF:**   * A constraint needs to be controlled before the next SCED run   **THEN:**   * Manually run RTCA after activating the constraint, AND * Manually execute the SCED process |
| **2** | **WHEN:**   * The BASECASE PNHNDL flow is approaching 85% of the limit;   **THEN:**   * Activate the BASECASE PNHNDL constraint at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 93%. |
| **3** | **IF:**   * BASECASE PNHNDL is approaching 95%;   **THEN:**   * Tighten constraint to at least 85%, * Rerun SCED, * Call QSEs beginning with those which have the largest IRR base point deviations and issue Operating Instruction as appropriate.   **Typical Script to appropriate QSE:**  “This is ERCOT operator [first and last name]. The Panhandle export IROL flow is approaching its stability limit; At [xx:xx] ERCOT is issuing an Operating Instruction for [unit name] to immediately follow their basepoint. [QSE] please repeat this back to me.”  If repeat back is CORRECT, “That is correct, thank you.”  If INCORRECT, repeat the process until the repeat back is correct. |
| **4** | **IF:**   * BASECASE PNHNDL has met or surpassed 95%;   **THEN:**   * Instruct QSEs, beginning with those which continue to have the largest IRR base point deviation, to zero immediately (violate ramp rate), as long as exceedance exists * Issue electronic VDI as time permits, * Confirm with Market Participant electronic VDI received.   When issuing a VDI or when confirming the receipt of an Electronic VDI ensure the use of three-part communication:   * + Issue the directive   + Receive a correct repeat back   + Give an acknowledgement * Notify the control room staff.   **Typical Script to appropriate QSE:**  “This is ERCOT operator [first and last name]. The Panhandle export IROL flow is approaching its stability limit; At [xx:xx] ERCOT is issuing an Operating Instruction to take [unit name] to zero effective immediately, which means you may violate your ramp rate. I will be sending you an electronic VDI shortly. [QSE] please repeat this back to me.”  If repeat back is CORRECT, “That is correct, thank you.”  If INCORRECT, repeat the process until the repeat back is correct. |
| **5** | **IF:**   * BASECASE PNHNDL is approaching 97%;   **THEN:**   * Verify SCADA control with TO(s) to open IRR breaker(s) |
| **6** | **IF:**   * BASECASE PNHNDL is approaching 99%;   **THEN:**   * Issue Operating Instruction to TO(s) to open IRR breaker(s), beginning with those which have the largest IRR base point deviation, * Notify the control room staff. |
| **Log** | Log all actions. |

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| McCamey Export IROL | |
| **IROL** | The McCamey Export stability limit is an IROL; the actual flow should not exceed its limit. If necessary, the System Operator has the authority to instruct removing generation before this IROL has been exceeded. |
| **1** | **IF:**   * An outage has occurred on the identified element in the table (identified in Desktop Guide Transmission Desk 2.12);   **THEN:**   * Refer to the constraint limit from table to set the value (identified in Desktop Guide Transmission Desk 2.12); * Update RTMONI from table; |
| **2** | **WHEN:**   * The BASECASE MCCAMY flow is approaching 85% of the limit;   **THEN:**   * Activate the BASECASE MCCAMY constraint at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 93%. |
| **3** | **IF:**   * BASECASE MCCAMY is approaching 95%;   **THEN:**   * Tighten constraint to at least 85%, * Rerun SCED, * Call QSEs beginning with those which have the largest IRR base point deviations and issue Operating Instruction as appropriate   **Typical Script to appropriate QSE:**  “This is ERCOT operator [first and last name]. The McCamey export IROL flow is approaching its stability limit; At [xx:xx] ERCOT is issuing an Operating Instruction for [unit name] to immediately follow their basepoint. [QSE] please repeat this back to me.”  If repeat back is CORRECT, “That is correct, thank you.”  If INCORRECT, repeat the process until the repeat back is correct. |
| **4** | **IF:**   * BASECASE MCCAMY has met or surpassed 95%;   **THEN:**   * Instruct QSEs, beginning with those which continue to have the largest IRR base point deviation, to zero immediately (violate ramp rate). * Issue electronic VDI as time permits, * Confirm with Market Participant electronic VDI received.   When issuing a VDI or when confirming the receipt of an Electronic VDI ensure the use of three-part communication:   * + Issue the directive   + Receive a correct repeat back   + Give an acknowledgement * Notify the control room staff.   **Typical Script to appropriate QSE:**  “This is ERCOT operator [first and last name]. The McCamey export IROL flow is approaching its stability limit; At [xx:xx] ERCOT is issuing an Operating Instruction to take [unit name] to zero effective immediately, which means you may violate your ramp rate. I will be sending you an electronic VDI shortly. [QSE] please repeat this back to me.”  If repeat back is CORRECT, “That is correct, thank you.”  If INCORRECT, repeat the process until the repeat back is correct. |
| **5** | **IF:**   * BASECASE MCCAMY is approaching 97%;   **THEN:**   * Verify SCADA control with TO(s) to open IRR breaker(s) |
| **6** | **IF:**   * BASECASE MCCAMY is approaching 99%;   **THEN:**   * Issue Operating Instruction to TO(s) to open IRR breaker(s), beginning with those which have the largest IRR base point deviation, * Notify the control room staff. |
| **Log** | Log all actions. |
| South Texas Export Interface | |
| **IROL** | The South Texas Export VSAT voltage stability limit is an IROL; the actual flow should not exceed its limit. The South Texas Export Interface consists of the following elements in RTMONI:   * E\_PASP * E\_PATA   If necessary, the System Operator has the authority to instruct load shedding before exceeding the IROL. |
| **Monitor** | Monitor the appropriate constraint(s) such as:   * Thermal constraint(s) * Basecase * Unsolved Contingencies |
| **VSAT** | **WHEN:**   * VSAT runs and provides an updated limit for the South Texas Export;   **THEN:**   * Update RTMONI.   **WHEN:**   * Either South Texas Export Interface flows are approaching 85% of its limit and forecasted to be above and stay above 85%;   **THEN:**   * Activate the appropriate South Texas Export Interface constraint at 85% of its limit, * Match the Not to Exceed (NTE) percentage to the activated percent rating, * Adjust the NTE percentage before the activated percent rating to maintain and control up to 90%. |
| **South Texas**  **345kV Circuit Outage** | **IF:**   * Any of the 345kV lines in the South Texas area has a forced outage;   **THEN:**   * Manually run the entire sequence of RTNET, RTCA, and RTDCP (VSA) immediately and proceed to the Monitor step in this procedure. |
| **South Texas Export Interface**  **90%** | **IF:**   * Either South Texas Export Interface flows are approaches 90% of its limit and cannot maintain 90% or below:   **THEN:**   * Issue a Transmission Watch by making a Hotline call and posting on the ERCOT Website, * Coordinate with the Real-Time Operator to make Hotline notification to QSEs.   **T#104 Transmission Watch for South Texas Export Interface / [Deploy Non-Spin]**  **Typical GCC Posting:**  ERCOT is issuing a Transmission Watch for the South Texas Export interface. ERCOT will be utilizing A/S services and taking manual actions on specific resources to alleviate the condition.  **THEN:**   * Implement South Texas Export (PCAP), if not already complete,   **IF:**   * Additional actions are needed to control the export flow:   **THEN:**   * Deploy Non-Spin as needed using the E\_PATA or E\_PASP constraint in the A/S Manager.   **IF:**   * Additional actions are needed to control the export flow:   **THEN:**   * Coordinate with the Shift Supervisor and Resource Desk to remove A/S adversely impacting the congestion using the AS Capability Manual Override, * Utilize HDL Overrides to take manual actions to reduce flow on the congestion, * Reduce Customer Load by using distribution voltage reduction measures, if deemed beneficial. * Curtail South Texas DC Tie Imports. Coordinate with DC Tie Desk to post a DC Tie Curtailment Notice (DCTCN) on the ERCOT Website. * Coordinate with the RUC operator to commit RMR resources, if available. |
|  |  |
| **South Texas Export Interface 95%** | **IF:**   * Either South Texas Export Interface approaches 95% of its limit and cannot maintain 95% or below:   **THEN:**   * Issue a Transmission Emergency by making a Hotline call and posting on the ERCOT Website * Coordinate with the Real-Time Operator to make Hotline notification to QSEs. * Notify the Resource Desk Operator to deploy Load Resources.   **Typical GCC Posting:**  ERCOT is issuing a Transmission Emergency Notice for the South Texas Export interface. Load Resources are being deployed to help mitigate the issue.  **T#105 Transmission Emergency Notice for South Texas Export Interface** |
| **Note** | Continue to Monitor PRC and System Conditions. There is a potential risk of EEA. |
| **South Texas Export Interface**  **100%** | **IF:**   * Either South Texas Export Interface approaches 100% of its limit and cannot maintain 100% or below:   **THEN:**   * Instruct TO’s to drop firm load using the ERCOT Load Shed table in XXX MW blocks, * Notify Shift Supervisor to make NXT notification.   **Typical GCC Posting:**  **ERCOT has shed XXX MW’s of firm load due to the South Texas Export Interface.**  **T#106 Transmission Emergency Notice for South Texas Export Interface, Firm Load Shed** |
| **Cancel** | Make appropriate cancellations when back to normal operations. |
| **Log** | Log all actions. |
| South Texas Import Interface | |
| **IROL** | The South Texas Import VSAT voltage stability limit is an IROL; the actual flow should not exceed its limit. The South Texas Import Interface consists of the following elements in RTMONI:   * I\_PASP * I\_KALO   If necessary, the System Operator has the authority to instruct load shedding before exceeding the IROL. |
| **Note** | South DC Tie exports shall not be curtailed during the Adjustment Period, or for more than one hour at a time, except for the purpose of maintaining reliability. |
| **RUC/**  **Future**  **Studies** | **IF:**   * HRUC or off-line studies indicate the need to RUC commit South Texas Resources;   **THEN:**   * RUC Commit for timeframe needed   **IF:**   * If studies show high probability of load shed with all available South Texas Resources committed, future exports on South DC Ties may be curtailed, available emergency energy from South DC Ties should be requested as needed, and any outages that can be returned to service within timeframe needed;   **THEN:**   * Issue a Transmission Advisory for the hours projected to be in this condition   **T#109 Transmission Advisory for South Texas Import Interface**  **Typical ERCOT Website Posting Script:**  A Transmission Advisory has been issued for the South Texas Import Interface. |
| **Topology**  **Change** | **IF:**   * A topology change occurs;   **THEN:**   * Re-run RTCA and VSAT.   **IF:**   * A constraint needs to be controlled before the next SCED run   **THEN:**   * Manually run RTCA after activating the constraint, AND * Manually execute the SCED process |
| **South Texas Import Interface 85%** | **IF:**   * Either South Texas Import Interface flows are approaching 85% of its limit and forecasted to be above and stay above 85%;   **THEN:**   * Activate the appropriate South Texas Import Interface constraint at 85% of its limit, * Match the Not to Exceed (NTE) percentage to the activated percent rating, * Adjust the NTE percentage before the activated percent rating to maintain and control up to 90%. |
| **South Texas Import Interface at 90%** | **IF:**   * Either South Texas Import Interface is at 90% of its limit and cannot maintain 90% or below;   **THEN:**   * Ensure appropriate Resources have been RUC committed in the South Texas Area, * Issue a Transmission Watch   + Make Hotline call to TOs   + Post message on the ERCOT Website   + Notify Real-Time Desk to make Hotline call to QSEs * Coordinate with the Shift Supervisor and Resource Desk to remove any A/S to increase capacity available to SCED such as ECRS using the AS Capability Manual Override, * Deploy any available Non-Spin in South Texas area using I\_PASP or I\_KALO constraints in the A/S Manager, * Request DC-Tie Operator to curtail export schedules on the South DC-Ties as needed to resolve the overload and post a DC Tie Curtailment Notice (DCTCN) on the ERCOT Website   **T#110 Transmission Watch for South Texas Import Interface / [Deploy Non-Spin]**  **Typical ERCOT Website Posting Script:**  A Transmission Watch has been issued for the South Texas Import Interface. |
|  |  |
| **South Texas Import Interface at 95%** | **IF:**   * The following conditions exist without a generation solution: * Either South Texas Import Interface flows are approaches 95% of its limit and forecasted to stay above 95%;   **THEN:**   * Coordinate with the Resource Operator to deploy Load Resources in South Texas area as needed. * Issue a Transmission Emergency Notice   + Make Hotline call to TOs   + Posting message on the ERCOT Website   + Notify Real-Time Desk to make Hotline call to QSEs   **T#111 Transmission Emergency Notice for South Texas Import Interface / [Deploy Load Resources]**  **Typical ERCOT Website Posting Script:**  Transmission Emergency Notice has been issued for the South Texas Import Interface. |
| **CENACE DC Ties** | **IF:**   * The Transmission Emergency is issued, AND one of the following conditions exist without a generation solution: * Either South Texas Import Interface flows are above 95% of its limit and forecasted to stay above 95%;   **THEN:**   * Request DC-Tie Operators to curtail any exports on the South DC-Ties * Request emergency energy from the appropriate DC-Tie Operator across the South DC-Ties.   **IF:**   * CENACE can send emergency assistance:   **THEN:**   * Notify the ERCOT DC-Tie Operators with information for an electronic Dispatch Instruction to be issued |
| **South Texas Import Interface 100%** | **IF:**   * There are no exports schedules to curtail, or exports have been curtailed and the transmission area is in an unreliable condition without a generation solution, AND: * Either South Texas Import Interface flows are approaching 100% of its limit and cannot maintain 100% or below;   **THEN:**   * Follow the South Texas Import Interface Mitigation Plan for load shed. * Notify Shift Supervisor to make NXT notification.   **T#112 Transmission Emergency Notice for South Texas Import Interface, Firm Load Shed** |
| **Cancel** | Make appropriate cancellations when back to normal operations. |
| **Log** | Log all actions. |

## 4.5 GTC Stability Limits

**Procedure Purpose:** Maintain transmission stability within the ERCOT region when there is a Generic Transmission Constraint (GTC).

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| --- | --- | --- | --- | --- |
| **Protocol Reference** | **3.10.7.6(2)** | **6.5.9.1(1)(e)** |  |  |
| **Guide Reference** | **2.2.2** | **4.5.2(2)(b)** |  |  |
| **NERC Standard** | **EOP-011-4**  **R1, R1.1** | **IRO-001-4**  **R1** | **IRO-002-7**  **R5** | **IRO-008-3**  **R2, R3, R5, R6** |
| **TOP-001-6**  **R1, R10, R10.1, R14, R25** | **TOP-002-4**  **R2, R3** |  |  |

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| **Step** | **Action** |
| --- | --- |
| **Note** | Although the steps within the procedure are numbered, the numbering is for indexing purposes and are not sequential in nature. The system operator will determine the sequence of steps, exclude steps, or take any additional actions required to ensure system security based on the information and situational awareness available during both normal and emergency conditions. |
| **SOL Comms** | If ICCP links are down for a TO, or a TO reports bad data, refer to section 3.8, “SOL Exceedance Communications Thresholds”, above for criteria of manually communicating GTC exceedances identified below. |
| **Note** | Utilize the Not to Exceed (%NTE) feature in the Transmission Constraint Manager (TCM) to maintain a more consistent control of the GTC. (see Trans/Sec desktop guide 2.21 for operational guidance) |
| Nelson Sharpe – Rio Hondo 345kV Stability | |
| **Note** | All lines are in-service, Rio Hondo 345 kV Series Cap in-service and improved reactive controls (capacitor switching scheme at Texas Gulf Wind is available) there is no local voltage stability issue in South Texas near Ajo. |
| **1** | **IF:**   * An outage has occurred on any of the identified elements in the table;   **THEN:**   * Refer to the constraint limit,   **WHEN:**   * The BASECASE NELRIO is approaching 85% of the limit;   **THEN:**   * Activate the BASECASE NELRIO constraint at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| **2** | If there is more than one line out of service or AEP is unable to manage the reactors at Ajo to control voltages, use the most restrictive limit in RTMONI. With more than one line out of service, this becomes more of a thermal issue and RTCA will most likely be more binding than the GTC. |
| **Log** | Log all actions. |
| North Edinburg – Lobo Stability | |
| **1** | **IF:**   * An outage has occurred on the identified element in the table (identified in Desktop Guide Transmission Desk 2.12);   **THEN:**   * Refer to the constraint limit from table to set the value (identified in Desktop Guide Transmission Desk 2.12); * Update RTMONI from table;   **WHEN:**   * The BASECASE NE\_LOB flow is approaching 85% of the limit in TCM   **THEN:**   * Activate the BASECASE NE\_LOB constraint in TCM * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| **Log** | Log all actions. |
| East Texas Stability | |
| **Note** | When all lines are in-service, there is no local voltage stability issue. |
| **Note** | | When all lines are in-service, a transient stability issue may occur due to the usage of reactive devices and unit output in the area. |
| **1** | **WHEN:**   * VSAT and/or TSAT runs and provides an updated limit for the East Texas Stability (EASTEX);   **THEN:**   * Update RTMONI with the more conservative limit. |
| **2** | **WHEN:**   * The BASECASE EASTEX flow is approaching 85% of the limit in TCM   **THEN:**   * Activate the BASECASE EASTEX constraint in TCM at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| **Log** | Log all actions. |
| Treadwell Stability | |
| **Note** | When all lines are in-service, there is no local voltage stability issue. |
| **1** | **IF:**   * An outage has occurred on the identified element in the table (identified in Desktop Guide Transmission Desk 2.12);   **THEN:**   * Refer to the constraint limit from table to set the value (identified in Desktop Guide Transmission Desk 2.12); * Update RTMONI from table;   **WHEN:**   * The BASECASE TRDWEL flow is approaching 85% of the limit in TCM   **THEN:**   * Activate the BASECASE TRDWEL constraint in TCM at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| **Log** | Log all actions. |
| Raymondville – Rio Hondo Stability | |
| **Note** | When all lines are in-service, there is no local voltage stability issue. |
| **Note** | | When all lines are in-service, a transient stability issue may occur due to the usage of reactive devices and unit output in the area. |
| **1** | **WHEN:**   * TSAT runs and provides an updated limit for the Raymondville / Rio Hondo Stability (RV\_RH); AND/OR * An outage has occurred on the identified element in the table (identified in Desktop Guide Transmission Desk 2.12);   **THEN:**   * Refer to the constraint limit from table to set the value (identified in Desktop Guide Transmission Desk 2.12); * Reference the TSAT limit; * Update RTMONI with the most conservative limit;   **WHEN:**   * The BASECASE RV\_RH flow is approaching 85% of the limit in TCM   **THEN:**   * Activate the BASECASE constraint in TCM at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| **Log** | Log all actions. |
| Culberson Stability | |
| **Note** | When all lines are in-service, there is no local voltage stability issue. |
| **1** | **WHEN:**   * The BASECASE CULBSN flow is approaching 85% of the limit in TCM   **THEN:**   * Activate the BASECASE CULBSN constraint in TCM at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| Valley Export Stability | |
| **1** | * **IF:** * An outage has occurred on the identified element in the table (identified in Desktop Guide Transmission Desk 2.12);   **THEN:**   * Refer to the constraint limit from table to set the value (identified in Desktop Guide Transmission Desk 2.12); * Update RTMONI from table;   **WHEN:**   * The BASECASE VALEXP flow is approaching 85% of the limit in TCM   **THEN:**   * Activate the BASECASE VALEXP constraint in TCM at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| **Log** | Log all actions. |
| Zapata\_Starr Stability | |
| **Note** | When all lines are in-service, there is no local voltage stability issue. |
| **1** | * **IF:** * An outage has occurred on the identified element in the table (identified in Desktop Guide Transmission Desk 2.12);   **THEN:**   * Refer to the constraint limit from table to set the value (identified in Desktop Guide Transmission Desk 2.12); * Update RTMONI from table;   **WHEN:**   * The BASECASE ZAPSTR flow is approaching 85% of the limit in TCM   **THEN:**   * Activate the BASECASE ZAPSTR constraint in TCM at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| **Log** | Log all actions. |
| Williamson – Burnet Stability | |
| **Note** | When all lines are in-service, there is no local voltage stability issue. |
| **1** | * **IF:** * An outage has occurred on the identified element in the table (identified in Desktop Guide Transmission Desk 2.12);   **THEN:**   * Refer to the constraint limit from table to set the value (identified in Desktop Guide Transmission Desk 2.12); * Update RTMONI from table;   **WHEN:**   * The BASECASE WILBRN flow is approaching 85% of the limit in TCM   **THEN:**   * Activate the BASECASE WILBRN constraint in TCM at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| **Log** | Log all actions. |
| Wharton Stability | |
| **Note** | When all lines are in-service, there is no local instability issue. |
| **1** | **IF:**   * An outage has occurred on the identified element in the table (identified in Desktop Guide Transmission Desk 2.12);   **THEN:**   * Refer to the constraint limit from table to set the value (identified in Desktop Guide Transmission Desk 2.12); * Update RTMONI from table;   **WHEN:**   * The BASECASE WHARTN flow is approaching 85% of the limit in TCM   **THEN:**   * Activate the BASECASE WHARTN constraint in TCM at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| **Log** | Log all actions. |
| Hamilton Stability | |
| **Note** | When all lines are in-service, there is no local voltage stability issue. |
| **1** | **WHEN:**   * TSAT runs and provides an updated limit for the Hamilton Stability (HMLTN); AND/OR * An outage has occurred on the identified element in the table (identified in Desktop Guide Transmission Desk 2.12);   **THEN:**   * Refer to the constraint limit from table to set the value (identified in Desktop Guide Transmission Desk 2.12); * Reference the TSAT limit; * Update RTMONI with the most conservative limit;   **WHEN:**   * The BASECASE HMLTN flow is approaching 85% of the limit in TCM   **THEN:**   * Activate the BASECASE HMLTN constraint in TCM at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| **Log** | Log all actions. |
| Kinney Stability | |
| **Note** | When all lines are in-service, there is no local voltage stability issue. |
| **1** | **IF:**   * An outage has occurred on the identified element in the table (identified in Desktop Guide Transmission Desk 2.12);   **THEN:**   * Refer to the constraint limit from table to set the value (identified in Desktop Guide Transmission Desk 2.12); * Update RTMONI from table;   **WHEN:**   * The BASECASE KINNEY flow is approaching 85% of the limit in TCM   **THEN:**   * Activate the BASECASE KINNEY constraint in TCM at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| **Log** | Log all actions. |
| Uvalde County Stability | |
| **Note** | When all lines are in-service, there is no local voltage stability issue. |
| **1** | **IF:**   * An outage has occurred on the identified element in the table (identified in Desktop Guide Transmission Desk 2.12);   **THEN:**   * Refer to the constraint limit from table to set the value (identified in Desktop Guide Transmission Desk 2.12); * Update RTMONI from table;   **WHEN:**   * The BASECASE UVALDE flow is approaching 85% of the limit in TCM   **THEN:**   * Activate the BASECASE UVALDE constraint in TCM at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| **Log** | Log all actions. |
| Sam Switch Stability | | |
| **Note** | | When all lines are in-service, there is no local stability issue. |
| **1** | | **IF:**   * An outage has occurred on the identified element in the table (identified in Desktop Guide Transmission Desk 2.12);   **THEN:**   * Refer to the constraint limit from table to set the value (identified in Desktop Guide Transmission Desk 2.12); * Update RTMONI from table;   **WHEN:**   * The BASECASE SAMSW flow is approaching 85% of the limit in TCM   **THEN:**   * Activate the BASECASE SAMSW constraint in TCM at 85% of the limit. * Match the Not to Exceed (NTE) percentage to the activated percent rating. * Adjust the NTE percentage before the activated percent rating to maintain and control up to 98% as the flow stabilizes. |
| **Log** | | Log all actions. |

## 4.6 RAS, AMP, RAP, PCAP, MP, and TOAP

**Procedure Purpose:** To verify and take corrective action for post-contingency overloads for various conditions.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** | **6.5.7.1.10(3)** | **6.5.9.3.3** |  |  |
| **Guide Reference** | **2.2.2(3)(b)** | **4.2.3(3)** | **4.3.1** |  |
| **NERC Standard** | **EOP-011-4**  **R1, R1.1, R1.2, R1.2.3** | **IRO-001-4**  **R1** | **IRO-002-7**  **R5** | **IRO-008-3**  **R2, R3, R5, R6** |
| **TOP-001-6**  **R1, R10, R10.1, R10.2, R10.5, R11, R14, R25** | **TOP-002-4**  **R2, R3** |  |  |

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| **Step** | **Action** |
| --- | --- |
| **Note** | MPs and PCAPs information are included in the EMS, refer to Desktop Guide Transmission Desk section 2.7  Electronic copies for the RASs, RAPs, PCAPs, and MPs can be found on SharePoint.  ERCOT SharePoint > System Operations – Control Center > Quick Links > Post-Contingency Overloads and/or MP/PCAP/RAP |
| **Note** | Remedial Action Schemes (RAS) (identified as RAS in EMS) **OR** Remedial Action Plans (RAP)   * EXAMINE the results of RTCA, * If the background has a color indicating a RAS or RAP,   + Refer to Desktop Guide Transmission Desk Section 2.7 for explanation of colors and for actions to be taken based on the color of the background. |
| **SOL Comms** | If electronic communication of SOL exceedances is unavailable, refer to section 3.8, “SOL Exceedance Communications Thresholds”, for criteria of manually communicating SOL exceedances. |
| **Log** | Log all actions. |
| Remedial Action Schemes (RAS) | |
| **Note** | Real-time Contingency Analysis (RTCA) indicates a Post Contingent overload(s) on a Contingency in which the RAS will not mitigate all the overloaded elements automatically. In this case, Congestion Management techniques will be utilized to return the system to the state in which the RAS was designed to automatically relieve the overload. |
| **Note** | **Use caution when the tolerance setting is <100% in RTCA.** If the post-contingency loading on an element monitored by an RAS is above the tolerance threshold, but below the activation point of the RAS (100%), the contingency associated with the RAS will show in the Transmission Constraint Manager (TCM) display. When this occurs, the result will be a light blue highlighted background identifying the device ID on the TCM display. In this scenario, congestion management is not needed until the criteria in Desktop Guide Transmission Desk Section 2.7, is met. |
| **Monitor** | Each RAS will be displayed on the “Real Time Values” spreadsheet, as the RAS activation threshold increases the display changes color as follows:   * Greater than 80% but less than 90% turns **Orange** * Greater than 90% turns **Red** |
| **1** | Typically, RASs are to solve post-contingency overloads on the Transmission System.  **IF:**   * The Transmission system topology has temporarily changed due to outages (planned or forced) that affects an RAS;   **THEN:**   * Utilize congestion management techniques to prevent any known RAS from operating in a pre-contingent state. |
| **2** | **IF:**   * RTCA indicates a post-contingency overload(s) on a contingency in which the RAS will not mitigate all the overloaded elements automatically; Example: (Light blue or Salmon highlighted background and above 100% loading)   **THEN:**   * As system conditions warrant, activate congestion management techniques to relieve the overload. |
| **3** | **IF:**   * No reliability issues will arise as a result of a RAS’s operation;   **THEN:**   * At the Operator’s discretion, allow the RAS to perform its function. |
| **4** | **IF:**   * An RAS operates;   **THEN:**   * Notify affected TO to reset RAS as system conditions warrant |
| **RAS**  **Posting** | All RASs are considered in-service unless otherwise notified by the TO.  **IF:**   * An RAS is taken out of service and/or removed from RTCA;   **THEN:**   * Post the information on the ERCOT Website   **WHEN:**   * The RAS is placed back in service,   **THEN:**   * Cancel the message.   **Typical ERCOT Website Posting:**  The [name] RAS has been [taken out of service/removed from RTCA]. |
| **Status**  **Change** | Monitor RAS Summary for status changes.  Refer to Desktop Guide Transmission Desk Section 2.14,  **WHEN:**   * Status changes for any type;   **THEN:**   * Acknowledge alarm   If notified that a RAS has changed status (taken out or placed in service):   * Send e-mail for notification and have RTCA updated,   + “OPS Support Engineering”   + “1 ERCOT System Operators”   + “DAMTeam” |
| **Basecase continuous RAS Triggering** | Continual triggering of a RAS during Basecase operations should be managed utilizing manual constraints created in TCM (only applies to manual reset of RAS controls causing a reliability issue).  **IF:**   * A RAS is continually triggered during Basecase operations;   **THEN:**   * Verify that an associated manual constraint exists for this RAS in TCM and activate the manual constraint in SCED.   **IF:**   * A manual constraint does not exist for this RAS in TCM;   **THEN:**   * Coordinate with the Operations Support Engineer to build a manual constraint for the RAS action in TCM. |
| **Log** | Log all actions. |
| Automatic Mitigation Plan (AMP) | |
| **Note** | There is current no AMPs. |
| Remedial Action Plan (RAP) | |
| **1** | **IF:**   * A RAP exists for the contingency;   **THEN:**   * Confirm that the relevant RAP is properly modeled, * Review the RAP with the impacted TO, * Notify the Shift Supervisor of the anticipated actions. |
| **2** | **IF:**   * A RAP is used to alleviate the identified problem regardless of the contingency listed on the RAP;   **THEN:**   * Make log entry. |
| **3** | **IF:**   * A RAP exists for the contingency **AND** does not solve the contingency **OR** the pre-RAP overload exceeds the 15 MN rating;   **THEN:**   * RTCA does not pass the 15MN (15 minute) rating to TCM, only the EMGY (2-hour emergency) rating. To properly constrain for RAP-associated elements, the % Rating column in TCM may need to be increased so that the constraint limit matches the 15MN value.   + Increase the value in the % Rating column in TCM to loosen the constraint (maximum 100% of 15MN value). |
| **4** | **IF:**   * RTCA indicates a post-contingency overload(s) on a contingency in which the RAP will not mitigate all the overloaded elements automatically; Example: (Light blue or Yellow highlighted background and above 100% loading)   **THEN:**   * Activate constraint if a 2% shift factor exists. |
| **5** | **IF:**   * The contingency anticipated by the RAP takes place;   **THEN:**   * Instruct the implementation of the RAP, * Respond to requests made by the TO in accordance with the RAP, * If necessary, continue to use additional congestion management methods, * Notify the TO when the contingency clears. |
| **6** | **IF:**   * A RAP will not work as designed and needs to be disabled due to topology changes in the area;   **THEN:**   * Notify the affected TO of actions |
| **RAP**  **Posting** | All RAPs are considered in-service unless otherwise notified by ERCOT or the TO.  **IF:**   * A RAP is taken out of service and/or removed from RTCA;   **THEN:**   * Post the information on the ERCOT Website   **WHEN:**   * The RAP is placed back in service,   **THEN:**   * Cancel the message.   **Typical ERCOT Website Posting:**  The [name] RAP has been [taken out of service/removed from RTCA] due to a [Planned/Forced Outage]. |
| **Status**  **Change** | If the RAP has changed status (taken out or placed in service):   * Send e-mail for notification and have RTCA updated,   + “OPS Support Engineering”   + “1 ERCOT System Operators”   + “DAMTeam” |
| **Log** | Log all actions. |
| Pre-Contingency Action Plan (PCAP) | |
| **Caution** | Pre-Contingency Action Plans (PCAPs) are designed to be enacted before the contingency occurs. |
| **1** | **WHEN:**   * RTCA shows a post-contingency overload and a PCAP exists to resolve it;   **THEN:**   * Review the PCAP with the impacted Transmission Operator, * Notify the Shift Supervisor of the anticipated actions, * Instruct the execution of the PCAP with the impacted Transmission Operator.   **Typical Script to appropriate TO:**  “This is ERCOT Operator [first and last name]. At [xx:xx], ERCOT is giving an Operating Instruction [TO] to implement the \*\*\*\*PCAP and [open/close] [breaker(s)]. [TO] please repeat this back to me.”  If repeat back is **CORRECT**, “That is correct, thank you.”  If **INCORRECT**, repeat the process until the repeat back is correct. |
| **Note** | If necessary, use congestion management methods for post contingency loading after initiating the PCAP. |
| **2** | **WHEN:**  A PCAP is no longer needed; **THEN:**   * Instruct the impacted Transmission Operator to return the system to: * Its normal status, OR * Its status prior to implementation of the PCAP. |
| **3** | **IF:**   * A PCAP is used to alleviate the identified problem regardless of the contingency listed on the PCAP;   **THEN:**   * Make log entry. |
| **Log** | Log all actions. |
| Mitigation Plan (MP) | |
| **Note** | Mitigation Plans (MPs) are pre-determined actions to be taken associated with the occurrence of a specific contingency event if congestion management methods cannot resolve the post-contingency overload. MPs are designed to be enacted Post-Contingency. They are NOT pre-emptive congestion management actions.   * A MP is developed when SCED cannot fully resolve the constraint, OR * A MP is developed when there are no generator shift factors greater than or equal to 2% as indicated in EMS, * If a MP is used to alleviate the identified problem regardless of the contingency listed on the MP, make a log entry. |
| **SCED**  **unable to**  **fully resolve**  **constraint** | **IF:**   * SCED is unable to resolve a constraint;   **THEN:**   * Keep constraint active in SCED, * Verify a MP or TOAP exists for the contingency, and review the MP or TOAP with the impacted TO   **IF:**   * No MP or TOAP exists for the constraint;   **THEN:**   * Keep constraint active in SCED, * Coordinate with Operations Support Engineer to develop a MP   + If constraint exists due to an outage, a TOAP should be developed (see TOAP procedure), * Issue a Transmission Watch if the MP or TOAP has not been developed within 30 minutes and the constraint remains violated in SCED. |
| **< 2%**  **Absolute**  **Shift**  **Factors** | **IF:**   * A constraint exists for which there are no generator shift factors greater than or equal to 2% as indicated in EMS;   **THEN:**   * DO NOT activate the constraint in SCED * Verify a MP or TOAP exists for the contingency, and review the MP or TOAP with the impacted TO   **IF:**   * No MP or TOAP exists for the constraint;   **THEN:**   * Coordinate with the Operations Support Engineer to develop MP   + If contingency exists due to an outage, a TOAP should be developed (see TOAP procedure) * Issue a Transmission Watch if the MP or TOAP has not been developed within 30 minutes. |
| **TO**  **Issue** | **IF:**   * Notified by a TO that it will take more time to implement the MP than is identified on the MP;   **THEN:**   * Notify the Operations Support Engineer to restudy and modify MP, * Log actions taken |
| **Issue**  **Watch** | When issuing a Transmission Watch for an unsolved post-contingency overload (and waiting on MP or TOAP to be developed:   * Make Hotline call to TOs * Coordinate with the Real-Time Operator to call QSEs * Post message on the ERCOT Website   **T#34 – Typical Hotline Script for Transmission Watch for Post-Contingency Overload**  **Typical ERCOT Website Posting Script:**  At [xx:xx] a Transmission Watch was issued due to the post-contingency overload in the [geographical area], [ manual actions are being performed to reduce the post-contingency overload] a [mitigation plan/temporary outage action plan] is being developed. |
| **Cancel**  **Watch** | When the MP or TOAP has been developed, cancel the Watch:   * Make Hotline call to TOs * Coordinate with the Real-Time Operator to call QSEs * Cancel message on ERCOT Website   **T#35 – Typical Hotline Script to Cancel Transmission Watch for Post-Contingency Overload** |
| **Contingency**  **Occurs** | **IF:**   * The anticipated contingency takes place;   **THEN:**   * Instruct (if necessary) the implementation of the MP or TOAP to the impacted TO, * Respond as quickly as possible to requests made by the TO in accordance with the MP, * If necessary, continue to use congestion management methods for post-contingency loading after initiating the MP. * Notify the TO when the system can be returned to normal. |
| **Log** | Log all actions. |
| Temporary Outage Action Plan (TOAP) | |
| **Note** | TOAPs are temporary since they are outage related   * A TOAP is developed when there is no generation shift factors greater than or equal to 2% as indicated in EMS, OR * A TOAP is developed when SCED cannot fully resolve the constraint |
| **Planned**  **Outage** | **IF:**   * A post-contingency overload is due to a planned outage on a transmission line(s) or a transmission facility;   **THEN:**   * Locate the TOAP in the Outage Notes, * Follow the same process as a MP outlined above. |
| **Forced**  **Outage** | **IF:**   * A post-contingency overload is due to a forced outage or planned outage not recognized by Outage Coordination on a transmission line(s) or a transmission facility;   **THEN:**   * Follow the same process as a MP outlined above. |
| **Log** | Log all actions. |

## 4.7 Manual Dispatch of Resources

**Procedure Purpose:** Manually Dispatch Resources as necessary to ensure system security.

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| **Protocol Reference** | **6.5.7.8** | **6.5.9(3)** |  |  |
| **Guide Reference** | **4.1.(1)** |  |  |  |
| **NERC Standard** |  |  |  |  |

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| **Step** | **Action** |
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| **Note** | ERCOT shall honor all Resource operating parameters in Dispatch Instructions / Operating Instructions under normal conditions and Emergency Condition. During Emergency Conditions, ERCOT may verbally request QSE’s to operate its Resources outside normal operating parameters. If such request is received by a QSE, the QSE shall discuss the request with ERCOT in good faith and may choose to comply with the request. |
| Manual Dispatch to take a Unit Off-Line | |
| **1** | **IF:**   * A manual Dispatch Instruction / Operating Instruction will result in the unit being dispatched off-line (i.e., less than the minimum operating limit for that Resource);   **THEN:**   * Request RUC Operator to issue the VDI and electronic Dispatch Instruction. |
| Manual RUC Commit of a Resource | |
| **1** | **IF:**   * It has been determined that a Resource is needed in real-time for a transmission condition;   **THEN:**   * Request RUC Operator to RUC commit the Resource |
| **Log** | Log all actions. |

## 4.8 Responding to Diminishing Reserves

**Procedure Purpose:** Monitor the Physical Responsive Capability (PRC) for issuing advance notice of diminishing Responsive Reserve. Steps within this procedure are intended to keep ERCOT from progressing into EEA.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** | **3.17.3(2)** | **6.5.7.6.2.3** | **6.5.9.4.1** |  |
| **Guide Reference** | **4.5.3.1(d)** | **4.5.3.1(e)** |  |  |
| **NERC Standard** | **TOP-001-6**  **R8** |  |  |  |

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| **Step** | | | **Action** | |
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| **Media**  **Appeal** | | | An appeal through the public news media for voluntary energy conservation may be issued any time at ERCOT’s discretion. Make Hotline call.  **T#39 Typical Hotline Script for Media Appeal** |
| **TCEQ** | | | The Texas Commission on Environmental Quality (TCEQ) may exercise enforcement discretion for exceedances of emission limits and operational limits for Resources that exceed air permit limits in order to maximize generation when entering a capacity shortage. A Market Notice will be sent to Market Participants. Make Hotline call.  **T#87 Typical Hotline Script for TCEQ Notice of Enforcement Discretion** |
| **Request Large Load Curtailment Program** | | | **WHEN:**   * Notified by the ERCOT Shift Supervisor that the Large Load Voluntary Curtailment Program Participants were requested to curtail consumption;   **THEN:**   * Make Hotline call to notify TO’s that the Large Load Voluntary Curtailment Program Participants were requested to curtail consumption. * Coordinate with Resource operator for posting message.   **T#63 Typical Hotline Script for ERCOT Large Load Voluntary Curtailment Program** |
| **Large Load Curtailment Program Ended** | | | **WHEN:**   * Notified by the ERCOT Shift Supervisor that the Large Load Voluntary Curtailment Program Participants requested to curtail consumption ended;   **THEN:**   * Make Hotline call to notify TO’s that the Large Load Voluntary Curtailment Program Participants requested to curtail consumption ended.   **T#64 Typical Hotline Script for ERCOT Large Load Voluntary Curtailment Program Ended** |
| **Log** | | | Log all actions. |
| Watch | | | | |
| **Issue**  **Watch** | | | **IF:**   * PRC < 3000 MW and not expected to return > 3000MW within 30 minutes   **THEN:**   * Using the Hotline, issue an Watch * After the repeat, give TOs an update of system conditions, including chances of proceeding into an EEA. * Reduce Customer Load by using Distribution voltage reduction measures, if deemed beneficial and EEA3 load shed is not anticipated * If not already completed, coordinate with the Resource Operator to post Distribution Voltage Reduction messages on the ERCOT Website.   **T#1 – Typical Hotline Script for Watch PRC <3000 MW** | |
| **Log** | Log all actions. | | |
| **Evaluate**  **Constraints** | | | **IF:**   * PRC is expected to continue to drop to the progression of an EEA 2;   **THEN:**   * Proceed to section 7.2, Congestion Management during EEA Levels. | |
| **Cancel**  **Watch** | | | **WHEN:**   * PRC > 3000 MW;   **THEN:**   * Using the Hotline, cancel the Watch. * If Distribution voltage reduction measures where requested, notify Transmission Operators to return Distribution Voltage Reduction back to normal * If not already completed, coordinate with the Resource Operator to post Transmission Operators have been requested to return Distribution Voltage Reduction to normal operation.   **T#2 – Typical Hotline Script to Cancel Watch for PRC<3000 MW** | |
| **Log** | | | Log all actions. | |

## 4.9 Creation of new GTC in Real-time

**Procedure Purpose:** Unexpected change to system conditions that result in a new Generic Transmission Constraint or modified (GTC).

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| **Protocol Reference** | **3.10.7.6 (6)** |  |  |  |
| **Guide Reference** |  |  |  |  |
| **NERC Standard** |  |  |  |  |

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| **Step** | **Action** |
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| **GTC** | If an unexpected change to system conditions occurs that result in a new or modified GTC (one that had not previously been defined and posted):   * Declare an OCN * Make Hotline call to TOs * Notify Real-Time operator to make Hotline call * Post message on the ERCOT Website   **T#36 – Typical Hotline Script for OCN for new Generic Transmission Constraint**  **Typical ERCOT Website Posting Script:**  “An OCN has been issued due to ERCOT developing a [new/modified] Generic Transmission Constraint due to [reason].” |
| **Note** | If a OCN has been issued due to ERCOT developing a [new/modified] Generic Transmission Constraint   * Send e-mail for notification,   + 1 ERCOT System Operators   + OPS Support Engineering   + OPS Outage Coordination |
| **Log** | Log all actions. |

# 5. Manage Outages

## 5.1 Outages

**Procedure Purpose:** Monitor and respond to various types of equipment outages, both Transmission and Generation, to maintain reliability of the ERCOT Grid.

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| **Protocol Reference** | **3.1.4.2** | **3.1.4.4** | **3.1.4.5** | **3.1.4.6** |
| **3.1.5.1** | **3.1.5.5** | **3.1.5.7** | **3.1.5.11** |
| **3.1.6.9** | **3.1.6.11** | **6.5.7.1.6** | **6.5.9.3.1.1** |
| **Guide Reference** | **2.4** |  |  |  |
| **NERC Standard** | **EOP-011-4**  **R1, R1.1, R1.2, R1.2.2** | **IRO-008-3**  **R2, R3** | **TOP-002-4**  **R2, R3** |  |

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| **Step** | **Action** |
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| **Note** | ERCOT Operators can only make the following changes in the Outage Scheduler:   * Remove actual start/end time if it is within 2 hours of the time the MP entered the outage, * Change status, * Add notes   If a MP needs assistance or is unable to enter their outages, direct them to Outage Coordination. Outage Coordination has an “Impersonation” certification that will allow them to make the needed changes. |
| **Note** | Forced Outages should be verbally communicated to ERCOT and must be entered into the Outage Scheduler if it is to remain an Outage for longer than two hours. |
| **1** | **IF:**   * An Emergency Condition is declared;   **THEN:**   * Determine if Outages can be returned to service if causing negative impacts to reliability, * Coordinate with the appropriate TO. |
| Monitor Mode | |
| 1 | **IF:**   * Any outages, either planned or forced, that may require additional monitoring;   **THEN:**   * Mark the outages in the Outage Scheduler OS Monitored Outage display as deemed necessary, * Verify that the marked outages are in monitor mode, * Continue to monitor the marked outages. |
| Forced and Unavoidable Extensions | |
| 1 | **IF:**   * A Forced or Unavoidable Extension is received, review the outage details;   **THEN:**   * Monitor congestion and make appropriate changes as necessary, * Determine if it will have an effect on previously approved outages which may need to be withdrawn. |
| Remedial Switching Action | |
| **Definition** | “Remedial Switching Action” is a Forced Outage sub-type in the Outage Scheduler. ERCOT must approve all Remedial Switching Actions prior to implementation by TOs. |
| **< 3 Days in length** | Remedial Switching Actions are limited to a maximum of 3 days. |
| **> 3 Days in length** | If the Remedial Switching Action is required to remain active for longer than 3 days, a Planned Outage must be submitted to change the position of effected breakers and switches. |
| **Approve** | **IF:**   * No issues identified;   **THEN:**   * Approve the Outage as received. |
| **Reject** | **IF:**   * Reliability issues;   **THEN:**   * Notify Operations Support Engineer; * Reject the outage to ensure system reliability. |
| **Restoration** | Breakers and switches in a Remedial Switching Action must be able to be returned to their normal position within 4 hours or less (this allows for drive time for remote switches w/o SCADA). |
| **Log** | Log all actions. |
| Maintenance Outages | |
| **Definition** | * Level 1- Equipment that must be removed from service within 24 hours to prevent a potential Forced Outage; * Level 2 - Equipment that must be removed from service within 7 days to prevent a potential Forced Outage; and * Level 3 - Equipment that must be removed from service within 30 days to prevent a potential Forced Outage. |
| **Maintenance Outage with start time ≤ 24 Hours** | **IF:**   * A Maintenance Outage is received, review the outage if the scheduled start time is within the next 24 hours;   **THEN:**   * Run a study to determine if the outage will cause any reliability issues. |
| **Approve**  **Maintenance Outage with start time ≤ 24 Hours** | **IF:**   * No reliability issues identified;   **THEN:**   * Approve the Maintenance Outage. |
| **Coordinate Maintenance Outage with start time ≤ 24 Hours** | **IF:**   * Reliability issues exist;   **THEN:**   * Coordinate the start of the outage with the TO to ensure system reliability if the outage is allowed to start within 24 hours, AND * Approve the Maintenance Outage. |
| **Coordinate**  **Maintenance Level 2 and 3 Outage ≤ 24 Hours** | **IF:**   * Maintenance Level 2 and 3 outages are received with a start time of less than the next 24 hours, AND * Reliability issues exist;   **THEN:**   * Coordinate the start of the outage with the TO to ensure system reliability if the outage is within the allowed Maintenance Level 2 (7 Days) and 3 (30 Days) outage criteria, * ERCOT Outage Coordination group may help coordinate a new start time,   **IF:**   * Reliability issues continue,   **THEN:**   * REQUEST the Operations Support Engineer investigate the development of a MP or TOAP (see section 4.7 Mitigation Plan), * Approve the Maintenance Outage after coordination. |
| **Maintenance Level 2 and 3 Outages** | **IF:**   * Maintenance Level 2 and 3 outages are received with a start time of greater than the next 24 hours;   **THEN:**   * The ERCOT Outage Coordination group has a process to review all Maintenance Level 2 and 3 outages without further action. |
| **Log** | Log all actions. |
| Consequential Outages | |
| **1** | **WHEN:**   * A TO enters the breaker and switch statuses associated with an Electrical Bus;   **THEN:**   * A downstream topology processor will evaluate the breakers and switches associated with the applicable Electrical Bus to determine if the Electrical Bus is consequentially outaged, and to thereby designate the status of the Electrical Bus. |
| **Evaluate** | **IF:**   * The TO has submitted the outage in the Outage Scheduler;   **THEN:**   * As time permits, perform a study to determine the effects the outage has on the ERCOT system and evaluate the request and verify the Outage meets the applicable requirements. |
| **No**  **Violations** | **IF:**   * NO, violations of applicable reliability standards exist;   **THEN:**   * Approve the request in the Outage Scheduler. |
| **Yes**  **Violations** | **IF:**   * YES, violations of applicable reliability standards exist;   **THEN:**   * Reject the request in the Outage Scheduler. |
| **Log** | Log all actions. |
| Returning from Planned Outage Early | |
| **1** | Before an early return from an Outage, a Resource Entity or QSE may inquire of ERCOT whether the Resource is expected to be RUC decommitted by ERCOT upon its early return.  **IF:**   * A QSE is notified by ERCOT that the Resource will be RUC decommitted if it returns early and the Resource Entity or QSE starts the Resource within the previously accepted or approved Outage period;   **THEN:**   * The QSE representing the Resource will not be paid any RUC decommitment compensation. |
| Guidelines for Withdrawal of an Outage | |
| **1** | **IF:**   * Security analysis and/or Operator experience indicates that an “Approved” or “Active” outage may have an adverse impact on system reliability;   **THEN:**   * Review the restoration time of the outage, * Coordinate with the Entity, * Withdraw the outage, if necessary, OR * Request assistance from ERCOT Outage Coordination. |
| **2** | **WHEN:**   * ERCOT withdraws an outage via the Outage Scheduler;   **THEN:**   * Enter an explanation in the “Reviewers Notes” listing the reliability concerns that caused the withdrawal, * Notify the following, by e-mail, as soon as possible: * OPS Outage Coordination * OPS Support Engineering * 1 ERCOT Shift Supervisors * Include the following information:   + From Station – To Station (if applicable)   + The planned Start and End date of the outage. |
| **3** | **IF:**   * A TO or QSE reports that the outage in question has progressed to a point that withdrawal is not practicable within the outages designated restoration time;   **THEN:**   * Record this information in the “Outage Scheduler Reviewer’s Notes”, * Log the outage in the Transmission Security Log, * Inform the Shift Supervisor, * Continue monitoring system security, * Request Operations Support Engineer to develop Mitigation plan if necessary. |
| Approval of an Outage on Transmission Devices of More than one hour duration | |
| 1 | **IF:**   * A verbal request for permission to remove a transmission device from service for more than one hour is received;   **THEN:**   * Verify with the TO that the work being done will not prevent the device from being placed back in service immediately if needed, * As time permits, determine that such operation will not affect the reliability of the Transmission System, * If outage will cause reliability issues, go to Step 2 * If no impact to the system, go to 3. |
| **2** | **IF:**   * System reliability is impacted;   **THEN:**   * Discuss with the TO the possibility of postponing the outage to a later time OR deny the request. |
| **3** | **IF:**   * There is no reliability issue;   **THEN:**   * Verbally approve for the TO to remove a transmission device from service. * Instruct TO to make notification when device is place back in service. |
| **Log** | Log all actions. |
| Simple Transmission Outage | |
| **Note** | A Simple Transmission Outage is a classification of outage that can be removed from service without effecting LMP prices or causing congestion. The Outages are limited to the following 3 basic descriptions:   * Expanded Bus Outage * Generator Breaker Maintenance * Open-ended Lines   Refer to Desktop Guide Transmission Desk Section 2.2. |
| **1** | **IF:**   * The outage meets the requirements of a Simple Transmission Outage, which are: * Has been submitted between 1 and 2 days in advance, * Cannot exceed 12 hours in duration, **AND** * Has a restoration time of 1 hour or less;   **THEN:**   * ERCOT will approve or reject within 8 business hours after receipt. |
| Opportunity Outages | |
| **Definition** | An Outage that may be accepted by ERCOT when a specific Resource is Off-Line due to an Outage. |
| **1** | Opportunity Outages for Resources are a special category of Planned Outages that may be approved by ERCOT when a specific Resource has been forced Off-Line due to a Forced Outage and the Resource has been previously accepted for a Planned Outage during the next eight days. |
| **2** | When a Forced Outage occurs on a Resource that has an accepted or approved Outage scheduled within the following eight days, the Resource may remain Off-Line and start the accepted or approved Outage earlier than scheduled. The QSE must give as much notice as practicable to ERCOT. |
| **3** | Opportunity Outages of Transmission Facilities may be approved by ERCOT when a specific Resource is Off-Line due to a Forced, Planned or Maintenance Outage. A TO may request an Opportunity Outage at any time. |
| **4** | When an Outage occurs on a Resource that has an approved Transmission Facilities Opportunity Outage request on file, the TO may start the approved Outage as soon as practical after receiving authorization to proceed by ERCOT. ERCOT must give as much notice as practicable to the TO. |
| Rescheduled High Impact Outage (RO) | |
| **Definition** | **An Outage on a High Impact Transmission Element (HITE) that was:**   * Originally submitted and Approved as a Planned Outage with greater than 90 days’ notice * Being considered for rescheduling due to withdrawal of the original Planned Outage or subsequent Rescheduled Outage(s) |
| **1** | **IF:**   * The outage meets the requirements of a High Impact Outage (HIO) Outage * The Outage interrupts flow on a High Impact Transmission element (HITE) * The Outage was submitted with greater than 90 days’ notice * The Outage needs to be Withdrawn or Rescheduled * The Requesting TO wants to Reschedule the Outage   **THEN:**   * Go to the Outage Detail Page and select “Reschedule Outage”. Select one element in the Group Outage converts the entire Group |
| **2** | **IF:**   * The requesting TO does NOT want to reschedule the Outage.   **THEN:**   * Withdraw the outage |
| **Log** | Log all actions. |

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| Advance Action Notice (AAN) | |
| **Definition** | Advance Action Notice (AAN)  Outage Adjustment Evaluation (OAE)  Outage Schedule Adjustment (OSA)  A type of Operating Condition Notice (OCN) that identifies a possible future Emergency Condition and describes future action ERCOT expects to take to address that condition unless the need for ERCOT action is alleviated by Qualified Scheduling Entity (QSE) and/or Transmission Service Provider (TSP) actions or by other system developments. |
| **Note** | ERCOT may issue an Advance Action Notice (AAN) in anticipation of a possible Emergency Condition. Any AAN will identify actions ERCOT expects to take to address the possible Emergency Condition unless the need for ERCOT action is alleviated by QSE and/or TSP actions taken, or by other system developments that occur before a time stated in the AAN. |
| **Time Periods** | ERCOT shall issue the AAN a minimum of 24 hours prior to performing an OAE. Additionally, unless impracticable, the OAE should not be performed until eight Business Hours have elapsed following issuance of the AAN. ERCOT shall not issue an OSA under this Section unless it has first completed an OAE. |
| **1** | **IF:**   * ERCOT forecasts an inability to meet applicable transmission reliability standards and has exercised all other reasonable options AND; * There are Resources with approved or accepted Resource Outages, whose approval or acceptance could be withdrawn to meet the applicable transmission reliability standards.   **THEN:**   * As instructed by the Shift Supervisor and in coordination with System Operations Management, Outage Coordination Management and Operations Support Management, issue an AAN. |
| **Hotline Issue AAN** | Notify TOs of an AAN Notice.  **T#101 –Typical Hotline Script for an AAN** |
| **Post** | Coordinate with the Resource Operator for the posting of the notice on the ERCOT Website  **Typical Posting Script:**  ERCOT issued an AAN due to a possible future Emergency Condition of [reserve capacity deficiency or reliability problem] beginning [date HE XX] until [date HE XX].  [Summary of actions ERCOT may take].  ERCOT may seek [amount of capacity] from an OAE and then make the OSA.  On [date] at [xx:xx] ERCOT will execute an OAE if deemed necessary. |
| **2** | **IF:**   * Conditions change   **THEN:**   * Update the AAN |
| **Hotline Update AAN** | Notify TOs of an AAN Update Notice.  **T#102 –Typical Hotline Script for an Update of an AAN** |
| **Updated Post** | Coordinate with the Resource Operator for the posting of the notice on the ERCOT Website  **Typical Posting Script:**  ERCOT has updated an AAN due to conditions changing and a possible future Emergency Condition of [reserve capacity deficiency or reliability problem] beginning [date HE XX] until [date HE XX].  [Summary of actions ERCOT may take].  ERCOT may seek [amount of capacity] from an OAE and then make the OSA.  On [date] at [xx:xx] ERCOT will execute an OAE if deemed necessary. |
| **OSA** | **WHEN:**   * Notified by the Shift Supervisor the OSA has executed.   **THEN:**   * Notify TOs of executing the OSA process.   **T#88 Outage Scheduler Adjustment (OSA)** |
| **Hotline Cancel AAN** | **WHEN:**   * ERCOT determines that the possible Emergency Condition has been alleviated by QSE or TSP action, by ERCOT action, or by other system developments;   **THEN:**   * Using the Hotline, cancel the AAN   **T#103 –Typical Hotline Script to cancel an AAN** |
| **Cancel**  **Posting** | **WHEN:**   * ERCOT determines that the possible Emergency Condition has been alleviated by QSE or TSP action, by ERCOT action, or by other system developments.   **THEN:**   * Coordinate with the Resource Operator to cancel the ERCOT Website message(s). |
| **Log** | Log all actions. |

## 5.2 Protective Relay Outages

**Procedure Purpose:** Be aware and respond if needed to protective relay system failures when notified by a QSE or TO.

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| **Protocol Reference** |  |  |  |  |
| **Guide Reference** | **6.2.4** |  |  |  |
| **NERC Standard** |  |  |  |  |

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| **Step** | **Action** |
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| **Note** | * Protective relay maintenance that ERCOT ISO has been made aware of can be found on the Outage Calendar located on the System Operations SharePoint. * Protective relay systems include relays, associated communications systems, voltage and current sensing devices, station batteries, and DC control circuitry. |
| **Planned**  **Outage** | **IF:**   * Notified that a relay is going to be removed from service (Planned);   **THEN:**   * Verify or enter information on the Outage Calendar located on the System Operations SharePoint Site, * A relay can’t be removed from service unless there are secondary/back up relays that will be functional and no system degradation will occur;   **IF:**   * Secondary/back up relays in place;   **THEN:**   * Notify the TO they can proceed with work. |
| **Protective**  **Relay**  **or**  **Equipment**  **Failure** | When notified by a QSE or TO that a protective relay or equipment failure reduces system reliability:   * Ask the QSE or TO how it reduces system reliability and what corrective actions have been taken, * Ask the QSE or TO if notifications have been made to any other affected TOs, * Notify the Operations Support Engineer to verify that system reliability has been affected. If so, a corrective action must be taken within 30 minutes. Corrective action could include re-dispatching as studies dictate, possible reconfiguration, or firm Load shed, * Determine if other TOs are affected by this failure and make notification by phone. |
| **Forced**  **Outage** | **IF:**   * Notified that a primary relay has been removed from service (forced);   **THEN:**   * Ask if the secondary/back up relay is functional;   **IF:**   * There is no secondary/back up relay;   **THEN:**   * The equipment will need to be removed from service since it is no longer protected. |
| **Log** | Log all actions. |

# 6. General Voltage Guidelines

## 6.1 Voltage Control

**Procedure Purpose:** Ensure adequate voltage levels are maintained throughout the ERCOT grid to prevent a potential voltage collapse.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** | **3.15.1(3)** | **6.5.7.1.10(3)(h)** | **6.5.7.7(2)** | **6.5.7.7(6)** |
| **Guide Reference** | **2.2.5(1)** | **2.2.6(2)** | **2.2.10** | **2.7.2** |
| **2.7.3** | **2.7.4** |  |  |
| **NERC Standand** | **IRO-001-4**  **R1** | **IRO-002-7**  **R5** | **IRO-008-3**  **R5, R6** | **NUC-001-4**  **R4, R4.1, R4.2, R9, R9.2, R9.2.1, R9.4, R9.4.2** |
| **TOP-001-6**  **R1, R7, R10, R10.1, R10.3, R10.6, R14** | **VAR-001-5**  **R2, R3** |  |  |

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| **Step** | **Action** |
| --- | --- |
| **Note** | The intent of this procedure is to verify and take corrective action for voltage issues. Although the steps within the procedure are numbered, the numbering is for indexing purposes and are not sequential in nature. The system operator will determine the sequence of steps, or any additional actions required to prevent voltage collapse. |
| **Note** | ERCOT posts the "Seasonal Voltage Profiles" desired voltage for each generation interconnection. The current profiles for generators may be found in the  ERCOT Market Information System (MIS) Secure site.  Select: Grid> Transmission>Voltage and Dynamic Ratings>Voltage Profiles  Select “Voltage Profiles” Open the current file>Open the xls file. |
| **Note** | **All Operating Instructions shall be in a clear, concise, and definitive manner. Ensure the recipient of the Operating Instruction repeats the information back correctly. Acknowledge the response as correct or repeat the original statement to resolve any misunderstandings.** |
| Voltage Issues at Nuclear Power Plants | |
| **Note** | ERCOT and TOs shall maintain the switchyard voltage at each operating nuclear power plant at a value that does **not** violate its licensing basis with the Nuclear Regulatory Commission. |
| **Comanche**  **Peak**  **Voltage**  **Table** | **For Comanche Peak:**   |  |  |  | | --- | --- | --- | | **System** | **345 kV** | **138kV** | | Nominal Voltage | 352 kV | 141 kV | | Tolerance | +2.56% or -3.40% | +2.13% or -4.26% | | Maximum Voltage | 361 kV | 144 kV | | Minimum Voltage | 340 kV | 135 kV |   Decordova and Wolf Hollow are points at which generation voltage adjustments can be expected to impact control of Comanche Peak voltage. |
| **STP**  **Voltage**  **Table** | **For South Texas Project:**   |  |  |  | | --- | --- | --- | | **Plant Configuration** | **Maximum kV** | **Minimum kV** | | Normal line up | 362.25 | 339 | | Alternate line up | 362.25 | 339 |   The STP Switchyard Facilities’ steady state voltage should be maintained within the ranges above. This could become more difficult with both STP units off-line.  Calaveras (Spruce), Braunig (Von Rosenberg), DOW, and WAP are points at which generation voltage adjustments can be expected to impact control of STP voltage.  **Note:** It is the STP QSEs responsibility to notify ERCOT when STP is in an alternate line up. |
| **1** | **IF:**   * Voltage levels exceed the limits as stated above in the voltage tables;   **THEN:**   * Notify the appropriate Nuclear Plant’s QSE   + Explain the event and an estimate of when voltage is expected to return to normal, to the extent possible * Notify CenterPoint if related to STP * Coordinate the appropriate voltage control action with the affected TO and QSE. |
| **2** | **WHEN:**   * Voltage is back to normal range;   **THEN:**   * Notify the appropriate Nuclear Plant QSE, and * Notify the affected TO and CenterPoint (if related to STP) |
| Real-Time Voltage Issues | |
| **Note** | * Post-Contingency low voltage alarms beyond the emergency operating low voltage limit could trigger Automatic Under-Voltage Load Shedding if the contingency were to occur. Detailed information on the amount of load on Automatic Under-Voltage Load Shedding Schemes (UVLS) can be found in Desktop Guide Transmission Section 2.9. * ERCOT, shall instruct QSEs having Generation Resources or Energy Storage Resources (ESRs) required to provide Voltage Support Service (VSS), to adjust for voltage support within the Unit Reactive Limit (URL) provided by the QSE to ERCOT. * Generation Resources or ESRs required to provide VSS may not reduce high reactive loading on individual units during abnormal conditions without the consent of ERCOT unless equipment damage is imminent. * Major transmission lines shall be kept in service during Light Load as much as possible. Lines should only be removed after all applicable reactive controls are implemented and studies are performed showing that reliability will not be degraded. |
| **Note** | ERCOT Nominal Voltage Levels are 345kV, 230kV, 138kV, 115kV and 69kV.  The general voltage guidelines are as follows (listed in kV):   |  |  |  |  | | --- | --- | --- | --- | | Nominal Voltage | Normal Operating Limits | Emergency Operating Limits | Ideal Voltage Range | | 345 | 327.75 – 362.25 | 310.5 – 379.5 | 345 – 359 | | 230 | 218.5 – 241.5 | 207 – 253 | 230 – 240 | | 138 | 131.1 – 144.9 | 124.2 – 151.8 | 138 – 144 | | 115 | 109.25 – 120.75 | 103.5 – 126.5 | 115 – 120 | | 69 | 65.55 – 72.45 | 62.1 – 75.9 | 69 – 71.5 |   Some TOs utilize different Normal (Basecase) and Emergency (Post-Contingency) voltage operating limits than the general voltage guidelines. These limits can be seen under the Network Limits display. |
| **SOL Comms** | If electronic communication of SOL exceedances is unavailable, refer to section 3.8, “SOL Exceedance Communications Thresholds”, for criteria of manually communicating SOL exceedances. |
| **1** | **Monitor the voltage contingency violations and Basecase voltage violation displays in RTCA**  **WHEN:**   * Indicated by SCADA alarms, RTCA or by a TO of voltage concerns;   **THEN:**   * Determine if the SCADA is of similar magnitude to the pre-contingency value.   + Example: Review nearby kV measurements   + Review “Voltage Tracking Issues Spreadsheet” on SharePoint to ensure the Basecase/contingency is not listed   + If listed, no further action needed.   **IF:**   * Inaccurate;   **THEN:**   * Notify the Shift Supervisor and Operations Support Engineer to investigate. * Log in “Voltage Tracking Issues” on SharePoint * Make log entry. |
| **2** | **IF:**   * Accurate;   **THEN:**   * Discuss the voltage concern with the appropriate TO   + Has the TO utilize all static reactive power resources? (capacitors, reactors, change transformer taps)   **Typical Script to appropriate TO:**  “This is ERCOT Operator [first and last name]. At [xx:xx], ERCOT is instructing [TO] to [Raise/Lower] voltage at [specify bus] by [Closing/Opening/Adjusting] [Cap/Reactor/Transformer Tap] to resolve a [Basecase Voltage Violation/RTCA Voltage Contingency Violation]. [TO] please repeat this instruction back to me.”  If repeat back is **CORRECT**, “That is correct, thank you.”  If **INCORRECT**, repeat the process until the repeat back is correct.  **IF:**   * Additional reactive support or coordination is needed to clear the violation;   **THEN:**   * Discuss with the appropriate TO and come to an agreement as to the proper action. This could be transmission switching, adjusting voltage at a nearby Generation Resource or ESR, bringing on an additional Resource, returning a planned outage, or development of an CMP   **IF:**   * The TO needs assistance from ERCOT to get voltage adjusted at a Resource;   **THEN:**   * Instruct the appropriate QSE to raise or lower bus voltage, * The QSE should complete the requested in no more than five minutes.   **Typical Script to appropriate QSE:**  “This is ERCOT Operator [first and last name]. At [xx:xx], ERCOT is instructing [QSE] to [raise or lower] voltage at [specify bus] by [+1 or 2kV or -1 or 2kV] for a target of [target kV]. [QSE] please repeat this instruction back to me.”  If repeat back is **CORRECT**, “That is correct, thank you.”  If **INCORRECT**, repeat the process until the repeat back is correct. |
| **3** | When voltage issue has been resolved notify the impacted TO. |
| East HVDC Tie Voltage Limits | |
| **Note** | The East HVDC tie has voltage limits depending on the tie condition.  See **Desktop Guide Transmission Desk** 2.19 |
| **1** | **WHEN:**   * Notified by AEP TOP that Reactors have been placed in/out of service on the East DC tie   **THEN:**   * Notify the DC tie desk operator |
| **Log** | Log all actions. |
| Future Voltage Studies or Issues | |
| **NOTE** | **Each hour run a STNET study for Two hours out (example it is 0100, run study for 0300) to review voltage violations.** |
|  | **WHEN:**   * Notified by the Alternate Control Center or RUC Operator of future voltage violations;   **THEN:**   * Review the “Voltage Tracking Issues” on SharePoint. If it is reoccurring, the solution may be listed on the “Resolutions” tab   **IF:**   * Any capacitors or reactors are **AVAILABLE** that can address the violation;   **THEN:**   * Ensure the capacitor or reactor clears the violation   **IF:**   * Additional reactive support or coordination is needed to address the violation;   **THEN:**   * Discuss the identified future voltage violations with the appropriate TO and come to an agreement as to the proper action. This could be transmission switching, development of a CMP, making reactive devices available, or RUC commitment of additional generation   **IF:**   * An Off-Line Resource is needed to resolve the voltage violation;   **THEN:**   * Coordinate with the RUC Operator to RUC commit the Resource |
| **Voltage Contingencies** | **IF:**   * Voltage contingencies exist;   **THEN:**   * Check “Voltage Tracking Issues” spreadsheet on SharePoint to ensure the contingency is not listed. * If not listed, convey the voltage violations to the Transmission and Security Operator with the potential resolution * Validate the resolution * Create a savecase, use naming convention “SC\_TRAN (HE)\_(DATE) * Make at least one detailed log entry per shift that the studies are being executed. If any new voltage violations are identified that do not have a solution, log the information and notify the Transmission and Security Operator of the new violation(s) * Update the “Voltage Tracking Issues” spreadsheet listing the new voltage violation with the contingency resolution.   **IF:**   * Unsolved contingencies exists;   **THEN:**   * Communicate any unsolved contingency to the Shift Engineer and Transmission Security Desk Operator with potential solutions. * Some potential solutions could be transmission switching, creation of a manual constraint, bringing on an additional Resource, returning a planned outage, or development of a CMP. * Validate the resolution * Update the “Voltage Tracking Issues” spreadsheet listing the new unsolved contingency with the contingency resolution. |
| **Violated**  **Constraints** | **REVIEW REFERENCE DISPLAYS:**  Market Operation>Reliability Unit Commitment>HRUC Displays>DSP Displays> DSP Binding Constraint Summary  Market Operation>Reliability Unit Commitment>HRUC Displays>DSP Displays> DSP Constraint Summary  **REVIEW:**   * Violated constraints. If needed, notify Operations Support Engineer to determine the validity;   **IF:**   * Invalid, no further action is required;   **IF:**   * Valid; AND * Related to a phase shifter tap settings,   **THEN:**   * Notify Operations Support Engineer to determine and determine if adjusting a Phase Shifter would reduce the flow, * Create Suggestion Plan for Constraint, * Manually RUC commit resources as needed |
| **Phase Angles** | **Monitor phase angles during the 2 hour ahead voltage studies**  **IF:**   * Phase angle exceedances exists;   **THEN:**   * Communicate any phase angle exceedances to the Shift Engineer and Transmission Security Desk Operator for potential solutions. * Some potential solutions could be transmission switching, creation of a manual constraint, bringing on an additional Resource, returning a planned outage, or development of a CMP. |
| **Log** | Log all actions. |
| ERCOT requesting Resource to operate beyond URL | |
| **Exceeding**  **URL or**  **Reducing**  **Output** | If ERCOT determines that a Generation Resource or ESR should be instructed to provide additional MVAr beyond its URL or that a Generation Resource’s real power output should be decreased to allow the Generation Resource to provide additional Reactive Power beyond the URL, ERCOT shall issue a Resource-specific Dispatch Instruction / Operating Instruction requiring any change in Reactive Power and/or real power output, except that ERCOT may not require a Generation Resource to exceed its excitation limits.  **IF:**   * A QSE communicates that an ERCOT or TO voltage instruction requires the Generation Resource or ESR to exceed its Unit Reactive Limit (URL) or the Resource must reduce MW;   **THEN:**   * Request the QSE to follow the instruction and inform them that Operations Analysis will make the verification and either an electronic Dispatch Instruction for settlements will be issued or a call with an explanation will be followed up on the next business day * Send e-mail to Operations Analysis and shiftsupv with the following information:   + Resource name   + Specific voltage set point.   + Start time   + End time |
| **QSE**  **Performance** | Maintain a log of QSEs acknowledgements of Dispatch Instructions / Operating Instructions concerning scheduled voltage or scheduled Reactive output requests. QSEs responding in less than two minutes from the time of issuance shall be deemed satisfactory. |
| Voltage Security Assessment Tool (VSAT) | |
| **Note** | VSAT and RUC perform full AC analysis of all contingencies. |
| **1** | **IF:**   * Any of the monitored VSAT scenario results approaches the Reliability margins listed in the table below;   **THEN:**   * Manually rerun the entire sequence of RTNET, RTCA, and RTDCP (VSA) * Confirm VSAT indicates either “Normal” or “Pending”  |  |  | | --- | --- | | **Reliability Margin Table** | | | **Scenario Name** | **Margin** | | LAREDO | 25MW | | ***N-H\_G*** | 200MW | | ***N-H\_L*** | 200MW | | PNHNDL | 50MW | | O-VAL\_L | 100MW |   **For *N-H\_G* and *N\_H\_L*:**  Refer to section 4.4 North-Houston Voltage Stability Limit of this procedure. |
| **2** | **IF:**   * VSAT indicates that a Reliability Margin may be exceeded;   **THEN:**   * Determine if the current Reliability Margin pre-contingency value is less than the Margin on the table in the previous step. * If no, no further action is required. * If yes, go to Step 3. |
| **3** | Determine the contingency status in RTCA (solved/unsolved).  **IF:**   * **Solved,** * Have Operations Support Engineer verify if the problem is real, * If real, request information on weak bus, * Request the TO in the affected area turn on capacitor banks and turn off reactors near the weak busses. * If not real, no further action is required. * **Unsolved,** * Notify Shift Supervisor and Operations Support Engineer * Manually dispatch fast ramp generators to increase generation in weak bus area. * If all online units are at maximum capacity * Coordinate with the RUC Operator to RUC commit additional resources in the weak bus area that are available. |
| **4** | **WHEN:**   * Capacitor banks are placed in service;   **THEN:**   * Rerun VSAT with new topology. |
| **5** | Determine if the current Reliability Margin pre-contingency value is greater than the Margin Value from the table above.  **IF:**   * The current Reliability Margin pre-contingency value is greater than the Margin;   **THEN:**   * No further action is required.   **OR**  **IF:**   * The current Reliability Margin pre-contingency value is less than the Margin;   **THEN:**   * Determine if there are more units available in the affected area, AND * Repeat the process starting with Step 3.   If no additional generation is available, continue. |
| **6** | **IF:**   * No additional generation is available;   **THEN:**   * Notify Operations Support Engineer to create a Mitigation Plan. |
| Power System Stabilizers (PSS) & Automatic Voltage Regulators (AVR) | |
| **Note** | Each QSE’s Generation Resource or ESR providing VSS shall operate with the unit’s Automatic Voltage Regulator (AVR) in the voltage control mode unless specifically instructed to operate in manual mode by ERCOT. |
| **Note** | The status of each PSS and AVR can be viewed at EMP applications>SCADA>Unit AVR/PSS Summary EMS Display. |
| **1** | Monitor each QSE’s Generation Resource or ESR AVR status.  **WHEN:**   * A discrepancy is identified;   **THEN:**   * Verify the discrepancy with the QSE or TO   **IF:**   * Determine if the AVR is in manual or in Power Factor Mode;   **THEN:**   * Instruct the QSE or TO to manually adjust VAR output as required to maintain voltage set-point until the AVR is back in service,   **NOTIFY:**   * The appropriate TO of the status, if not already done so by QSE, * Enter the status change information into the ERCOT Logs,   + Log type of “AVR”.   + Include the company name, the name of the person spoken with, and reason (if device is being placed in or taken out of service).   + Include that the TO has been notified of change in status   + Copy and paste the log entry into an e-mail and send to     - “Operations Analysis”     - “OPS Support Engineering”     - “OPS Advanced Network Applications”     - “1 ERCOT System Operators” |
| **2** | **WHEN:**   * Notified by a QSE or TO of a PSS or AVR in manual or in Power Factor Mode;   **THEN:**   * Instruct the QSE or TO to manually adjust VAR output as required to maintain voltage set-point until the AVR is back in service,   **NOTIFY:**   * The appropriate TO of the status, if not already done so by QSE, * Enter the status change information into the ERCOT Logs,   + Log type of either “PSS” or “AVR”.   + Include the company name, the name of the person spoken with, and reason (if device is being placed in or taken out of service).   + Include that the TO has been notified of change in status   + Copy and paste the log entry into an e-mail and send to     - “Operations Analysis”     - “OPS Support Engineering”     - “OPS Advanced Network Applications”     - “1 ERCOT System Operators” |
| **3** | **WHEN:**   * Notified by a QSE that the PSS or AVR is in Auto and back in service;   **NOTIFY:**   * The appropriate TO of the status, if not already done so by QSE, * Enter the status change information into the ERCOT Logs,   + Log type of either “PSS” or “AVR”.   + Include the company name, the name of the person spoken with, and reason (if device is being placed in or taken out of service).   + Include that the TO has been notified of change in status   + Copy and paste the log entry into an e-mail and send to     - “Operations Analysis”     - “OPS Support Engineering”     - “OPS Advanced Network Applications”     - “1 ERCOT System Operators” |
| **Log** | Log all actions. |
| Generator Voltage Set Points | |
| **Note** | TOs may change Voltage Set Points for Generators different than in the seasonal Voltage Profiles as necessary. TOs are required to telemeter Voltage Set Point targets and measurements at the POI for each Generation Resource or ESR. Generation Resources or ESR (greater than 20 MVA) are required to maintain the voltage at the POI within its KV based tolerance band of the target. |
| **Note** | The current status of each Voltage Set Point target and measurement can be viewed at EMP applications>SCADA> Voltage Set Point Display. (ERCOT to QSE communication) Additionally, after going to Unit Voltage Set Point Display (Voltage Set Point tab), >Related Displays>Voltage Set Point Communication Display. (TO ERCOT communication) |
| **Note** | Generators have up to 5 minutes to respond (make adjustments) to a new Voltage Set Point Instruction even if the Generator is within the tolerance band of the new Voltage Set Point.  If a Generator cannot maintain the POI voltage within the tolerance band of the Voltage Set Point, it must notify it’s TO within 15 minutes of a new Voltage Set Point instruction OR within 30 minutes of an existing Voltage Set Point instruction OR notify ERCOT within 15 minutes of a VSS Dispatch Instruction from ERCOT. |
| **Note** | When a Voltage Set Point target is entered outside of a reasonability range (.95 to 1.05 pu), the EMS will hold the last good target and identify the target as “Unreasonable”. |
| **1** | **IF:**   * A Generation Resource or ESR is not maintaining voltage at the POI within its KV based tolerance band (checked as “Violated”).   + 345KV = +/- 4 KV of target   + 230KV = +/- 3 KV of target   + 138KV = +/- 2 KV of target   + 115KV = +/- 2 KV of target   + 69KV = +/- 1 KV of target   **THEN:**   * Instruct the TO to utilize available static reactive devices and if still necessary, coordinate with the resources to make adjustments to maintain the voltage at the POI at the Voltage Set Point target within its tolerance band. |
| **2** | **IF:**   * A Voltage Set Point Target is checked as “Unreasonable”;   **THEN:**   * Contact the appropriate TO, * State that ERCOT has received an unreasonable Voltage Set Point target (outside of .95 to 1.05 pu), * Instruct TO to enter the correct Voltage Set Point target. |
| **Log** | Log all actions. |

# 7. Emergency Operations

## 7.1 Market Notifications

**Procedure Purpose:** Guidelines for issuing Emergency Conditions and the four possible levels: Operating Condition Notices (OCN), Advisories, Watches, and Emergency Notices.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** | **3.1.4.6** | **6.5.9.3** | **6.5.9.3.1** | **6.5.9.3.2** |
| **6.5.9.3.3** | **6.5.9.3.4** |  |  |
| **Guide Reference** | **4.2.1** | **4.2.2** | **4.2.3** | **4.2.4** |
| **NERC Standard** |  |  |  |  |

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| **Step** | **Action** |
| --- | --- |
| **Note** | * ERCOT is in an Emergency Condition whenever ERCOT Transmission Grid status is such that a violation of security criteria presents the threat of uncontrolled separation or cascading Outages and/or large-scale service disruption to Load (other than Load being served from a radial transmission line) and/or overload of a Transmission Element, and no timely solution is obtainable through SCED or CMPs. * Consider the severity of the potential Emergency Condition prior to the issuance of a notification. The severity of the Emergency Condition could be limited to an isolated local area, or the condition might cover large areas affecting several entities, or the condition might be an ERCOT-wide condition potentially affecting the entire ERCOT System. * The sequence of notifications issued may vary due to changing system conditions or other operational issues and it may be necessary to skip certain notifications due to the severity of the situation. |
| Operating Condition Notice (OCN) | |
| **Note** | OCN’s are used to inform Market Participants of a possible future need for more Resources due to conditions that could affect ERCOT System reliability. OCNs are for informational purposes only and may solicit additional information to determine whether the issuance of an Advisory, Watch, or Emergency Notice is warranted. OCNs serve as a reminder to QSEs and TSPs that some attention to the changing conditions may be warranted. |
| **1** | As instructed by the Shift Supervisor or when appropriate, issue an OCN. The OCN can be issued for any of the following reasons:   * Insufficient Resources to meet forecasted conditions * There is a projected reserve capacity shortage in DRUC that could affect reliability and may require more Resources * When extreme cold weather is developing and forecasted to impact the ERCOT Region * When extreme hot weather is forecasted to impact the ERCOT Region * When a Hurricane or Tropical Storm is developing and forecasted to impact the ERCOT Region * Unplanned transmission Outages that may impact reliability   When anticipated adverse weather conditions are forecasted, ERCOT may confer with TOs and QSEs regarding the potential for adverse reliability impacts and contingency preparedness. |
| Advance Action Notice (AAN) | |
| **Note** | Outage Adjustment Evaluation (OAE)  Outage Schedule Adjustment (OSA)  An AAN is a type of OCN, ERCOT may issue an AAN in anticipation of a possible Emergency Condition. An AAN will identify actions ERCOT expects to take to address the condition unless the need for ERCOT action is alleviated by QSE and/or TSP actions or by other system developments. |
| **1** | As instructed by the Shift Supervisor and in coordination with Outage Coordination and Operations Support, issue an AAN. The AAN can be issued for any of the following reasons:   * Insufficient Resources to meet forecasted conditions * There is a projected reserve capacity shortage in DRUC that could affect reliability and may require more Resources * When extreme cold weather is developing and forecasted to impact the ERCOT Region * When extreme hot weather is forecasted to impact the ERCOT Region * When a Hurricane or Tropical Storm is developing and forecasted to impact the ERCOT Region * Unplanned transmission Outages that may impact reliability   When anticipated adverse weather conditions are forecasted, ERCOT may confer with TOs and QSEs regarding the potential for adverse reliability impacts and contingency preparedness. |
| Advisory | |
| **1** | As instructed by the Shift Supervisor or when appropriate, issue an Advisory. The Advisory can be issued for any of the following reasons:   * When the probability of an approaching Hurricane or Tropical Storm impacting the ERCOT Region increases, and concerns exist to escalate awareness * When the probability of extreme cold weather impacting the ERCOT Region increases, and concerns exist to escalate awareness * When the probability of extreme hot weather impacting the ERCOT Region increases, and concerns exist to escalate awareness * When conditions are developing or have changed and more Ancillary Services will be needed to maintain current or near-term reliability * ERCOT exercises its authority to increase Ancillary Service requirements above the quantities originally specified in the Day-Ahead Market in accordance with ERCOT procedures * When extreme weather or ERCOT System conditions require more lead-time than the normal Day-Ahead Market allows * Transmission system conditions are such that operations within security criteria are not likely or possible due to Forced Outages or other conditions unless a CMP exists * Loss of communications or control condition is anticipated or significantly limited * ERCOT may require information from QSEs representing Resources regarding the Resources’ fuel capabilities. Requests for this type of information shall be for a time period of no more than seven days from the date of the request |
| Watch | |
| **1** | As instructed by the Shift Supervisor or when appropriate, issue a Watch. The Watch can be issued for any of the following reasons:   * A reserve capacity shortage is projected with no market solution available that could affect reliability * When an approaching Hurricane or Tropical Storm is imminent and anticipated to have an adverse impact on the ERCOT Region * When impacts from extreme cold weather is imminent and anticipated to have an adverse impact on the ERCOT Region * When impacts from extreme hot weather is imminent and anticipated to have an adverse impact on the ERCOT Region * Conditions have developed such that additional Ancillary Services are needed in the Operating Period * Insufficient Ancillary Services or Energy Offers in the DAM * Market-based congestion management techniques embedded in SCED will not be adequate to resolve transmission security violations * Forced Outages or other abnormal operating conditions have occurred, or may occur that would require ERCOT to operate with active violations of security criteria as defined in the Operating Guides unless a CMP exists * ERCOT varies from timing requirements or omits one or more Day-Ahead or Adjustment Period and Real-Time procedures. * ERCOT varies from timing requirements or omits one or more scheduling procedures in the Real-Time process * The SCED process fails to reach a solution, whether ERCOT is using one of the measures in Failure of the SCED Process. * The need to immediately procure Ancillary Services from existing offers * ERCOT may instruct TOs to reconfigure transmission elements as necessary to improve the reliability of the system * ERCOT may require information from QSEs representing Resources regarding the Resources’ fuel capabilities. Requests for this type of information shall be for a time period of no more than seven days from the date of the request |
| Emergency Notice | |
| **1** | As instructed by the Shift Supervisor or when appropriate, issue an Emergency Notice. The Emergency Notice can be issued for any of the following reasons:   * Loss of Primary Control Center Functionality * Load Resource deployment for North-Houston voltage stability * Load Resource deployment for South Texas IROL’s. * ERCOT cannot maintain minimum reliability standards (for reasons including fuel shortages) during the Operating Period using every Resource practically obtainable from the market * Immediate action cannot be taken to avoid or relieve a Transmission Element operating above its Emergency Rating * ERCOT forecasts an inability to meet applicable Reliability Standards and it has exercised all other reasonable options * A transmission condition has been identified that requires emergency energy from any of the DC-Ties or curtailment of schedules * The Transmission Grid is such that a violation of security criteria as defined in the Operating Guides presents the threat of uncontrolled separation or cascading outages, large-scale service disruption to load (other than Load being served from a radial transmission line) and/or overload of Transmission Elements, and no timely solution is obtainable through SCED or CMPs * When extreme cold weather is beginning to have an adverse impact on the ERCOT System * When extreme hot weather is beginning to have an adverse impact on the ERCOT System * When a Hurricane or Tropical Storm is beginning to have an adverse impact on the System |
| Operating Condition Scripts | |
| **Hotline** | Communications must specify the severity of the situation, the area affected, the areas potentially affected, and the anticipated duration of the Emergency Condition.  **T#37 – Typical Hotline Script for Operating Condition [OCN/Advisory/Watch/Emergency]** |
| **Post** | All notices must be posted on the ERCOT Website using Grid Conditions Communications (GCC) Notices.   * For “free form” messages, the “Notice priority” will be specified as follows: * Operational Information/OCN type messages – low priority * Advisory/Watch type messages – medium priority * Emergency type messages – high priority |
| **Hotline Cancellation** | **T#38 – Typical Hotline Script to Cancel Operating Condition [OCN/Advisory/Watch/Emergency]** |
| **Log** | Log all actions. |
| Specific Scripts for QSE’s | |
| **Note** | At times, the Real-Time, Resource or RUC operator takes the lead on the issuance of Hotline calls for specific procedures they have. The following scripts are to help guide you when specific procedures don’t exist for the T/S operator. |
| **Deployment of Load Resources** | **T#40 - Deployment of Load Resources to Maintain a Minimum 500MW of Generation RRS** |
| **SCED**  **Or**  **RLC**  **Failure** | Note: RLC can fail independently of AGC; this same script will also be used for a RLC failure. If RLC is failed, SCED will have invalid results.  **T#41 - Typical Hotline Script for Watch for SCED/RLC Failure**  **T#42 - Typical Hotline Script to Cancel Watch for SCED/RLC Failure** |
| **EMMS**  **(LFC and RLC/SCED)**  **Failure** | **T#43 - Typical Hotline Script for Emergency Notice for LFC/EMS and SCED Failure**  **T#44 - Typical Hotline Script to Cancel Emergency Notice for LFC/EMS Functioning, SCED valid** |
| **DAM Timeline**  **Deviation** | **T#53 - Typical Hotline Script for Advisory for DAM Timeline Deviation**  **T#54 - Typical Hotline Script to Cancel Advisory for DAM Timeline Deviation** |
| **DAM Failure** | **T#55 - Typical Hotline Script for Watch for DAM Failure**  **T#56 - Typical Hotline Script to Cancel Watch for DAM Failure** |
| **DRUC Delay or Timeline Deviation** | **T#57 - Typical Hotline Script for Advisory for DRUC Timeline Deviation**  **T#58 - Typical Hotline Script to Cancel Advisory for DRUC Timeline Deviation** |
| **DRUC Timeline not Met** | **T#59 - Typical Hotline Script for Watch for DRUC not completing by 18:00**  **T#60 - Typical Hotline Script to Cancel Watch for DRUC not completing by 18:00** |
| **HRUC Failure or Timeline Deviation** | **T#61 - Typical Hotline Script for Watch for HRUC Failure / Timeline Deviation**  **T#62 - Typical Hotline Script to Cancel Watch for HRUC Failure/Timeline/Deviation** |
| **DRUC**  **Committed**  **For Capacity**  **Shortage** | **T#63 - Typical Hotline Script for OCN for Projected Reserve Capacity Shortage**  **T#64 - Typical Hotline Script to Cancel OCN for Projected Reserve Capacity Shortage** |
| **Excess Generation** | **T#65 - Typical Hotline Script for OCN for Projected Excess Reserve Capacity**  **T#66 - Typical Hotline Script to Cancel OCN for Projected Excess Reserve Capacity** |
| **Projected Reserve Capacity Shortage with no market solution** | **T#67 - Typical Hotline Script for Watch for Projected Reserve Capacity Shortage with No Market Solution**  **T#68 - Typical Hotline Script to Cancel Watch for Projected Reserve Capacity Shortage with No Market Solution** |
| **RMR Projected Reserve Capacity Shortage** | **T#69 - Typical Hotline Script for Watch for Projected Reserve Capacity Shortage with No Market Solution, RMR recommended**  **T#70 - Typical Hotline Script to Cancel Watch for Projected Reserve Capacity Shortage with No Market Solution, RMR recommended** |
| **BAAL Firm Load Shed** | **T#8 EEA3 Firm Load Shed**  **T#10 EEA3/BAAL Restore All Firm Load** |
| **Unannounced Constant Frequency Control Test** | **T#99 QSE on Constant Frequency Control for Unannounced Constant Frequency Control Test**  **T#100 Cancel QSE on Constant Frequency Control for Unannounced Constant Frequency Control Test** |

## 7.2 Congestion Management during EEA Levels

**Procedure Purpose:** To provide a mechanism to manage constraints in EEA 2 or 3 to higher Facility ratings when applicable for those constraints identified as limiting generation output; and reconsiders use of double-circuit contingencies.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** | **6.5.9.3.2(5)** | **6.5.9.4** |  |  |
| **Guide Reference** | **4.2.2** | **4.5.2** | **4.5.3** |  |
| **NERC Standard** | **EOP-011-4**  **R2, R2.1** |  |  |  |

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| **Step** | | **Action** |
| --- | --- | --- |
| When in an Watch and system conditions expected to deteriorate into an EEA 2 or 3 | | |
| **Evaluate**  **Constraints** | **IF:**   * PRC is expected to continue to drop to the progression of an EEA 2;   **THEN:**   * Evaluate constraints active in SCED and determine which constraints are limiting generation output.   **IF:**   * Such a constraint is identified, work with Operations Support Engineering and coordinate with the TO that operates the overloaded facility associated with the constraint   **THEN:**   * Determine if any of the following can be done in the expected time frame of the EEA event:   + Transmission element restored   + Reconfigure the transmission system   + Adjust phase angle regulator tap positions   **IF:**   * The above options are not viable;   **THEN:**   * Continue to the next step | |
| **15-Minute**  **Rating**  **Available** | **IF:**   * ERCOT and the TO agree to use a 15-minute Rating if an EEA 2 is entered;   **THEN:**   * Ensure post-contingency actions can be taken within 15 minutes to return the flow to within the Emergency Rating, or * Post-contingency loading of the transmission facility is expected to be at or below the Normal Rating within two hours. | |
| **Double-**  **Circuit**  **Contingency** | **IF:**   * ERCOT and the TO determine that there is a low risk of the double-circuit contingency occurring due to system conditions, which may include severe weather forecasted in the vicinity of the double-circuit, weather conditions that indicate a high risk of insulator flashover on the double-circuit, repeated Forced Outages of the individual circuits that are part of the double-circuit in the preceding 48 hours, or fire in progress in the right of way of the double-circuit;   **THEN:**   * ERCOT will de-activate the appropriate double-circuit contingency and constrain on the single-circuit contingency to make more generation available as required if an EEA 2 is entered. | |
| Returning to Normal Operations | | |
| **Emergency**  **Rating/**  **Double-**  **Circuits** | **When:**   * PRC is restored to 3,000 MW or the EEA has ended;   **THEN:**   * Restore control to the post-contingency flow to within the Emergency Rating for those constraints that utilized the 15-Minute Rating * Enforce double-circuit contingencies | |
| **Log** | Log all actions. | |

## 7.3 Implement EEA Levels

**Procedure Purpose:** To provide for maximum possible continuity of service while maintaining the integrity of the ERCOT system to reduce the chance of cascading outages.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** | **6.5.9.3.4(6)** | **6.5.9.4** | **6.5.9.4.2** |  |
| **Guide Reference** | **4.5.3** | **4.5.3.1** | **4.5.3.2** | **4.5.3.3** |
| **4.5.3.4** |  |  |  |
| **NERC Standard** | **EOP-011-4**  **R2, R2.1, R2.2, R2.2.4, R2.2.7, R2.2.8** | **IRO-001-4**  **R1** | **TOP-001-6**  **R1, R8** |  |

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| **Step** | **Action** |
| --- | --- |
| **Note** | ERCOT **MAY** immediately implement EEA Level 2 when clock-minute average system frequency falls below 59.91 Hz for 15 consecutive minutes.  ERCOT **MAY** immediately implement EEA Level 3 any time the clock-minute average system frequency falls below 59.91 Hz for 20 consecutive minutes **OR** when steady-state frequency falls below 59.8 Hz for any duration of time.  ERCOT **SHALL** immediately implement EEA Level 3 any time the steady-state frequency is below 59.5 Hz for any duration. |
| **Note** | ERCOT will declare an EEA Level 1 when PRC falls below 2,500 MW and is not projected to be recovered above 2,500 MW within 30 minutes without the use of the following actions that are prescribed for EEA Level 1 |
| **Note** | Confidentiality requirements regarding transmission operations and system capacity information will be lifted, as needed to restore reliability. |
| **ESR** | Energy Storage Resources (ESR) will be required to suspend charging during an Energy Emergency Alert (EEA) except in limited circumstances, including Security-Constrained Economic Dispatch (SCED), Load Frequency Control (LFC) Dispatch, or a manual instruction. An exception to this provision is if an ESR is co-located with onsite generation that would be incapable of exporting additional power to the ERCOT System. |
| **Media**  **Appeal** | When an ERCOT-wide appeal through the public news media for voluntary energy conservation is made. Notify the TOs by Hotline.  **T#39 - Typical Hotline Script for Media Appeal** |
| **TCEQ** | The Texas Commission on Environmental Quality (TCEQ) will exercise enforcement discretion for exceedances of emission limits and operational limits for Resources that exceed air permit limits in order to maximize generation for the duration of an EEA event.  A Market Notice will be sent to Market Participants. Make Hotline call.  **T#87 Typical Hotline Script for TCEQ Notice of Enforcement Discretion** |
| Implement EEA Level 1 | |
| **1** | **IF:**   * PRC < 2500 MW and is not projected to be recovered above 2500 MW within 30 minutes without the use of EEA Level 1;   **THEN:**   * Using the Hotline, notify the TOs to implement **EEA 1**.   **T#5 - Typical Hotline Script for EEA1**  After the repeat, give TOs an update of system conditions, including chances of proceeding into an EEA 2. |
| **Log** | Log all actions. |
| Implement EEA Level 2 | |
| **Note** | ERCOT MAY immediately implement EEA Level 2 when the clock-minute average system frequency falls below 59.91 Hz for 15 consecutive minutes. |
| **1** | **IF:**   * PRC < 2000 MW or unable to maintain system frequency at 59.91 Hz and is not projected to be recovered above 2000 MW within 30 minutes without the use of EEA Level 2;   **THEN:**   * Using the Hotline, notify the TOs to implement **EEA 2** and any measures associated with EEA 1, if not already implemented. * If the energy conservation call has not been made previously, it can be combined with this call. * Reduce Customer Load by using distribution voltage reduction measures, if deemed beneficial. If not requested from previous steps. * When available implement any available Load management plans to reduce Customer Load if not already implemented.   **T#7 - Typical Hotline Script for EEA2 Media Appeal/Voltage Reduction**  After the repeat, give TOs an update of system conditions, including chances of proceeding into an EEA 3. Notify TO’s which load shed table will be used in the event of EEA 3 load shed. [winter/summer] Firm Load Shed. |
| **Log** | Log all actions. |

|  |  |
| --- | --- |
| Implement EEA Level 3 | |
| **Note** | ERCOT ***may*** declare an EEA Level 3 when the clock-minute average system frequency falls below 59.91 Hz for 20 consecutive minutes **OR** when steady-state frequency falls below 59.8 Hz for any duration of time. |
| **1** | ERCOT ***will*** declare an EEA Level 3 when PRC cannot be maintained above 1,500 MW or when the clock-minute average system frequency falls below 59.91 for 25 consecutive minutes.  Using the Hotline, notify the TOs to implement any measures associated with EEA 1 and 2, if not already implemented. |
| **2** | **IF:**   * PRC < 1500 MW and is not projected to be recovered above 1,500 MW within 30 minutes, or when the clock-minute average frequency falls below 59.91 Hz for 25 consecutive minutes;   **THEN:**   * Using the Hotline, notify the TOs to implement EEA 3 [winter/summer]Firm Load Shedand any measures associated with EEA 1 and 2, if not already implemented * \*Request deployment of Load Management Programs   \* When available in EEA 2 if not already deployed, EEA 2 and EEA3 implements any available Load management plan to reduce Customer Load.  **T#8 - Typical Hotline Script for EEA3 Firm Load Shed** |
| **Log** | Log all actions. |

## 7.4 Restore EEA Levels

**Procedure Purpose:** To restore the ERCOT grid to normal state as system conditions warrant while recovering from an EEA event.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** | **6.5.9.4(3)(g)** | **6.5.9.4.3** |  |  |
| **Guide Reference** | **4.5.3.5** |  |  |  |
| **NERC Standard** |  |  |  |  |

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| **Step** | **Action** |
| --- | --- |
| Restore Firm Load | |
| **RESERVES** | 1500 MW of PRC ***must*** be restored within 90 minutes. |
| **1** | **IF:**   * Sufficient Regulation Service exist to control to 60 Hz, **AND** * PRC – Regulation Up Responsibility is ≥ 1500 MW for the last 15 minutes;   **THEN:**   * Using the Hotline, notify the TOs of firm load restoration.   **T#9 - Typical Hotline Script EEA3 Restore a Portion of the Firm Load**  **OR**  **T#10 - Typical Hotline Script EEA3/BAAL Restore All Firm Load** |
| **Log** | Log all actions. |
| Move from EEA Level 3 to EEA Level 2 | |
| **1** | **IF:**   * Sufficient Regulation Service exist to control to 60 Hz, **AND** * PRC is ≥ 2000 MW, **AND** * All firm load has been instructed to be restored;   **THEN:**   * Using the Hotline, notify the TOs of the reduction from **EEA 3 to EEA 2:** * Notify the TOs that Load Resources are being restored   **T#11 - Typical Hotline Script to move from EEA3 to EEA2** |
| **Log** | Log all actions. |
| Move from EEA Level 2 to EEA Level 1 | |
| **1** | **IF:**   * The System can maintain PRC ≥ 2500 MW **AND** * All Load Resources have been instructed to be restored;   **THEN:**   * Using the Hotline, notify the TOs of the reduction from **EEA 2 to EEA 1**, * If BLTs were implemented, restore   **T#12 - Typical Hotline Script to move from EEA2 to EEA1** |
| Move from EEA Level 1 to EEA 0 | |
| **1** | **IF:**   * The System can maintain PRC ≥ 3000 MW, **AND** * All RUC committed units secured in EEA can be released, **AND** * Emergency energy from the DC Ties is no longer needed;   **THEN:**   * Using the Hotline, notify the TOs of the termination of **EEA**.   **T#13 - Typical Hotline Script Terminate EEA1** |
| Cancel Watch | |
| **1** | **WHEN:**   * Requested by the Real-Time Operator;   **THEN:**   * Cancel Watch   **T#2 - Typical Hotline Script to cancel Watch for PRC <3000 MW** |

## 7.5 Block Load Transfer

**Procedure Purpose:** To transfer loads, located in ERCOT to a Non-ERCOT system or from a Non-ERCOT system to ERCOT during emergency conditions.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** | **6.5.9.5** | **6.5.9.5.1** | **6.5.9.5.2** |  |
| **Guide Reference** | **4.4** |  |  |  |
| **NERC Standard** |  |  |  |  |

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| **Step** | **Action** |
| --- | --- |
| **Note** | * Restoration of service to outage customers using BLT’s will be accomplished as quickly as possible if the transfers will not jeopardize the reliability of the ERCOT Interconnection. * BLTs that are comprised of looped systems may be tied to the non-ERCOT Control Area’s electrical system(s) through multiple interconnection points at the same time. Transfers of looped configurations are permitted only if all interconnection points are registered and netted under a single Electric Service Identifier (ESI ID) and represented by a single TSP or DSP or netted behind Non-Opt-in Entity (NOIE) metering points. * Notify Shift Supervisor for coordination on transfer of ERCOT Control Area load and non-ERCOT Control Area load. * Determine if BLT is for an Emergency or Non-Emergency condition with non-ERCOT Control Area. |
| ERCOT picks up Load for Non-ERCOT System | |
| **1** | **IF:**   * ERCOT is requested to pick up load for CENACE, MISO or SPP;   **THEN:**   * Consult with Operations Support Engineer to ensure the load pick up will not create a reliability concern,   **IF:**   * No reliability concern exists   **THEN:**   * Grant the approval |
| **Electronic**  **Dispatch**  **Instruction**  **Confirmation Non-Emergency** | **IF:**   * The BLT is registered (refer to Desktop Guide Common to Multiple Desks Section 2.5):   + Issue electronic Dispatch Instruction confirmation to the QSE listed   + Determine the amount of load being transferred into ERCOT   + From Verbal Dispatch Instructions [Transmission Desk]   + Choose QSE level tab   + Choose [Proper QSE from Desktop Guide] for Participant Name   + Leave “Current State” and “Final State” blank   + Choose “OTHER For QSE” for Instruction Type   + In text, state “BLT - ERCOT picks up load from [SPP, MISO or CENACE], non-emergency”   When issuing a VDI or the confirmation, ensure the use of three-part communication:   * + Issue the Operating Instruction   + Receive a correct repeat back   + Give an acknowledgement |
| **E-mail** | **SEND:**   * E-mail to the “BLT” distribution list   **INCLUDE:**   * The following information: * RC Notified * TO area * Was BLT registered or not * Was an electronic Dispatch Instruction confirmation sent * Was BLT modeled * Non-Emergency BLT |
| **Electronic**  **Dispatch**  **Instruction**  **Confirmation Emergency** | **IF:**   * The BLT is registered (refer to Desktop Guide Common to Multiple Desks Section 2.5):   + Issue electronic Dispatch Instruction confirmation to the QSE listed   + Determine the amount of load being transferred into ERCOT   + From Verbal Dispatch Instructions [Emergency]   + Choose BLT tab   + Choose [Proper QSE from Desktop Guide] for Participant Name   + Choose appropriate BLT for BLT Name   + Enter the amount of load being transferred to ERCOT in Up-To MW   + Choose IMPLEMENT BLT DURING EMERGENCY - LOAD TO ERCOT as Instruction Type   When issuing a VDI or the confirmation, ensure the use of three-part communication:   * + Issue the Operating Instruction   + Receive a correct repeat back   + Give an acknowledgement |
| **E-mail** | **SEND:**   * E-mail to the “BLT” distribution list   **INCLUDE:**   * The following information: * RC Notified * TO area * Was BLT registered or not * Was an electronic Dispatch Instruction confirmation sent * Was BLT modeled * Emergency BLT |
| **2** | For BLTs that are done in an emergency and are not modeled in the Network Operations Model, the responsible TO will notify ERCOT as soon as practicable after the event. |
| **3** | **IF:**   * Congestion issues arise from switching variations due to the BLT;   **THEN:**   * Employ congestion management procedures,   **IF:**   * Congestion management cannot maintain the reliability of the system,   **THEN:**   * Terminate the BLT. |
| Non-ERCOT System picks up Load for ERCOT | |
| **1** | **IF:**   * CENACE, MISO or SPP picks up load for ERCOT;   **THEN:**   * Ensure the RC in the other grid has given approval for the load to be transferred to them |
| **Electronic**  **Dispatch**  **Instruction**  **Confirmation Non-Emergency** | **IF:**   * The BLT is registered (refer to Desktop Guide Common to Multiple Desks Section 2.5):   + Issue electronic Dispatch Instruction confirmation to the QSE listed   + Determine the amount of load being transferred out of ERCOT   + From Verbal Dispatch Instructions [Transmission Desk]   + Choose QSE level tab   + Choose [Proper QSE from Desktop Guide] for Participant Name   + Leave “Current State” and “Final State” blank   + Choose “OTHER For QSE” for Instruction Type   + In text, state “BLT – [SPP, MISO or CENACE] picks up load for ERCOT, non-emergency”   When issuing a VDI or the confirmation, ensure the use of three-part communication:   * + Issue the Operating Instruction   + Receive a correct repeat back   + Give an acknowledgement |
| **E-mail** | **SEND:**   * E-mail to the “BLT” distribution list   **INCLUDE:**   * The following information: * RC Notified * TO area * Was BLT registered or not * Was an electronic Dispatch Instruction confirmation sent * Was BLT modeled * Non-Emergency BLT |
| **Electronic**  **Dispatch**  **Instruction**  **Confirmation Emergency** | **IF:**   * The BLT is registered (refer to Desktop Guide Common to Multiple Desks Section 2.5):   + Issue electronic Dispatch Instruction confirmation to the QSE listed   + Determine the amount of load being transferred from ERCOT   + From Verbal Dispatch Instructions [Emergency]   + Choose BLT tab   + Choose [Proper QSE from Desktop Guide] for Participant Name   + Choose appropriate BLT for BLT Name   + Enter the amount of load being transferred from ERCOT in Up-To MW   + Choose IMPLEMENT BLT DURING EMERGENCY - GEN TO ERCOT as Instruction Type   When issuing a VDI or the confirmation, ensure the use of three-part communication:   * + Issue the Operating Instruction   + Receive a correct repeat back   + Give an acknowledgement |
| **E-mail** | **SEND:**   * E-mail to the “BLT” distribution list   **INCLUDE:**   * The following information: * RC Notified * TO area * Was BLT registered or not * Was an electronic Dispatch Instruction confirmation sent * Was BLT modeled * Emergency BLT |
| **2** | For BLTs that are done in an emergency and are not modeled in the Network Operations Model, the responsible TO will notify ERCOT as soon as practicable after the event. |
| **3** | **IF:**   * Congestion management issues that arise from switching variations due to the BLT;   **THEN:**   * Employ congestion management procedures,   **IF:**   * Congestion management cannot maintain the reliability of the System,   **THEN:**   * Terminate the BLT. |
| **Note** | If the Alamito Creek (ALMC) to Presidio (PRES) 69 kV transmission line trips, CENACE has the ability to pick up approximately 2 MW of load on the Presidio/Gonzales BLT. If AEP TO informs you that this happened, follow step 1 above. |

## 7.6 Blank

**Procedure Purpose:**

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| --- | --- | --- | --- | --- |
| **Protocol Reference** |  |  |  |  |
| **Guide Reference** |  |  |  |  |
| **NERC Standard** |  |  |  |  |

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| **Version: 2** | **Revision: 0** | **None** |

| **Step** | **Action** |
| --- | --- |

# 8. Weather Events

## 8.1 Hurricane or Tropical Storm

**Procedure Purpose:** To ensure TOs are prepared for an approaching

Hurricane or Tropical Storm that could impact system reliability.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** | **3.1.4.6** | **6.3.2(3)(a)(ii)** | **6.5.9.3.1** | **6.5.9.3.2(3)** |
| **6.5.9.3.4** |  |  |  |
| **Guide Reference** | **4.2.1** | **4.2.2** | **4.2.3** | **4.2.4** |
| **NERC Standard** | **EOP-011-4**  **R1, R1.1, R1.2, R1.2.2, R1.2.6, R1.2.6.2, R2, R2.1, R2.2, R2.2.10, R2.2.10.2** | **TOP-001-6**  **R8** |  |  |

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| **Step** | **Action** |
| --- | --- |
| **Note** | * Hurricane or Tropical Storm notifications can be called when there is a probability of landfall in the ERCOT Region (<http://www.nhc.noaa.gov>) * The ERCOT Meteorologist may provide forecasts to supplement other Weather Service data information * The sequence of actions taken, or notifications issued may vary due to system conditions or other operational issues and it may be necessary to skip actions due to the severity of the situation. To the extent possible, and when prudent, actions that were skipped may be implemented later * Operations Support and Outage Coordination will analyze the situation and make recommendations as to Resource requirements and transmission topology |
| **OCN** | When a Hurricane or Tropical Storm is developing and forecasted to impact the ERCOT Region, using the Hotline, issue an OCN to the TOs:  **T#72 - Typical Hotline Script for OCN for Hurricane/Tropical Storm**  Coordinate with Outage Coordination for the review of existing, planned, and future outages to be withdrawn/rejected and/or restored.  Coordinate with Operations Support as they may make recommendations on the situation based on the Resource requirements and transmission topology. |
| **Advisory** | When the probability of an approaching Hurricane or Tropical Storm impacting the ERCOT Region increases and concerns exist to escalate awareness, using the Hotline, issue an Advisory to the TOs:  **T#73 - Typical Hotline Script for Advisory for Hurricane/Tropical Storm** |
| **Watch** | When impacts from an approaching Hurricane or Tropical Storm is imminent and anticipated to have an adverse impact on the ERCOT Region, using the Hotline, issue a Watch to the TOs:  **T#74 - Typical Script for Watch for Hurricane/Tropical Storm** |
| **Emergency** | When a Hurricane or Tropical Storm is beginning to have an adverse impact on the ERCOT Region, using the Hotline, issue an Emergency Notice to the TOs:  **T#75 - Typical Hotline Script for Emergency for Hurricane/Tropical Storm** |
| **Post** | Coordinate with the Real-Time and Resource Operator for the posting of the notices on the ERCOT Website. |
| **Cancel**  **Posting** | Coordinate with the Real-Time and Resource Operator for the cancelation of the postings on the ERCOT Website. |
| **Log** | Log all actions. |

## 8.2 Extreme Cold Weather

**Procedure Purpose:** To ensure TOs are prepared for extreme cold weather operations that could impact system reliability.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** | **3.1.4.6** | **6.3.2(3)(a)(ii)** | **6.5.9.3.1** | **6.5.9.3.2(4)** |
| **6.5.9.3.4** |  |  |  |
| **Guide Reference** | **4.2.1** | **4.2.2** | **4.2.3** | **4.2.4** |
| **NERC Standard** | **EOP-011-4**  **R1, R1.1, R1.2, R1.2.2, R1.2.6, R1.2.6.1, R1.2.6.2, R2, R2.1, R2.2, R2.2.10, R2.2.10.1, R2.2.10.2** | **TOP-001-6**  **R8** |  |  |

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| --- | --- | --- |
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| **Step** | | **Action** |
| --- | --- | --- |
| **Note** | | * Extreme cold weather notifications can be issued when temperatures are forecasted to be 25°F or below in the North Central and in the South-Central weather zones. Wind chill also has an impact on how the temperature feels due to the flow of lower temperature air. When the wind chill is forecasted to be 20°F or below in the North Central and in the South-Central weather zones, consider a notification. This criterion has been developed for guidance when the temperature or wind chill are expected to be below freezing for several continuous hours which may abnormally impact load levels or generation availability * For such events, additional reserves may be necessary * The ERCOT Meteorologist may provide forecasts to supplement other Weather Service data information * The sequence of actions taken, or notifications issued may vary due to system conditions or other operational issues and it may be necessary to skip actions due to the severity of the situation. To the extent possible, and when prudent, actions that were skipped may be implemented at a later time or date |
| **OCN** | | When extreme cold weather is developing and forecasted to impact the ERCOT Region, using the Hotline issue an OCN to the TOs:  **T#76 - Typical Hotline Script for OCN for Extreme Cold Weather**  Coordinate with Outage Coordination for the review of existing, planned, and future outages to be withdrawn/rejected and/or restored.  Coordinate with Operations Support as they may make recommendations on the situation based on the Resource requirements and transmission topology. |
| **Advisory** | | When the probability of extreme cold weather impacting the ERCOT Region increases and concerns exist to escalate awareness, using the Hotline issue an Advisory to the TOs:  **T#77 - Typical Hotline Script for Advisory for Extreme Cold Weather** |
| **Watch** | | When impacts from extreme cold weather is imminent and anticipated to have an adverse impact on the ERCOT Region, using the Hotline issue a Watch to the TOs:  **T#78 - Typical Hotline Script for Watch for Extreme Cold Weather** |
| **Emergency**  **Notice** | When extreme cold weather is beginning to have an adverse impact on the ERCOT Region, using the Hotline issue an Emergency Notice to the TOs:  **T#79 - Typical Hotline Script for Emergency for Extreme Cold Weather** | |
| **Post** | Coordinate with the Real-Time and Resource Operator for the posting of the notices on the ERCOT Website. | |
| **Cancel**  **Posting** | Coordinate with the Real-Time and Resource Operator for the cancelation of the postings on the ERCOT Website. | |
| **Log** | Log all actions. | |

## 8.3 Extreme Hot Weather

**Procedure Purpose:** To ensure TOs are prepared for extreme hot weather operations that could impact system reliability.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** | **3.1.4.6** | **6.3.2(3)(a)(ii)** | **6.5.9.3.1** | **6.5.9.3.2(4)** |
| **6.5.9.3.4** |  |  |  |
| **Guide Reference** | **4.2.1** | **4.2.2** | **4.2.3** | **4.2.4** |
| **NERC Standard** | **EOP-011-4**  **R1, R1.1, R1.2, R1.2.2, R1.2.6, R1.2.6.2, R2, R2.1, R2.2, R2.2.10, R2.2.10.2** | **TOP-001-6**  **R8** |  |  |

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| **Step** | | **Action** |
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| **Note** | | * Extreme hot weather notifications can be issued when temperatures are forecasted to be 103°F or above in the North Central and South-Central weather zones.   – OR –  When temperatures are forecasted to be 94°F or above in the North Central and South-Central weather zones during the following months (October – May).   * For such events, additional reserves may be necessary * The ERCOT Meteorologist may provide forecasts to supplement other Weather Service data information. * The sequence of actions taken, or notifications issued may vary due to system conditions or other operational issues and it may be necessary to skip actions due to the severity of the situation. To the extent possible, and when prudent, actions that were skipped may be implemented at a later time or date. |
| **OCN** | | When extreme hot weather is forecasted to impact the ERCOT Region, using the Hotline issue an OCN to the TOs:  **T#80 - Typical Hotline Script for OCN for Extreme Hot Weather**  Coordinate with Outage Coordination for the review of existing, planned, and future outages to be withdrawn/rejected and/or restored.  Coordinate with Operations Support as they may make recommendations on the situation based on the Resource requirements and transmission topology. |
| **Advisory** | | When the probability of extreme hot weather impacting the ERCOT Region increases and concerns exist to escalate awareness, using the Hotline issue an Advisory to the TOs:  **T#81 - Typical Hotline Script for Advisory for Extreme Hot Weather** |
| **Watch** | | When impacts from extreme hot weather are imminent and anticipated to have an adverse impact on the ERCOT Region, using the Hotline issue a Watch to the TOs:  **T#82 - Typical Hotline Script for Watch Extreme Hot Weather** |
| **Emergency**  **Notice** | When extreme hot weather is beginning to have an adverse impact on the ERCOT Region, using the Hotline issue an Emergency Notice to the TOs:  **T#83 - Typical Hotline Script for Emergency for Extreme Hot Weather** | |
| **Post** | Coordinate with the Real-Time and Resource Operator for the posting of the notices on the ERCOT Website. | |
| **Cancel**  **Posting** | Coordinate with the Real-Time and Resource Operator for the cancelation of the postings on the ERCOT Website. | |
| **Log** | Log all actions. | |

## 8.4 Significant Weather Events

**Procedure Purpose**: Monitor severe weather conditions for the ERCOT Region and regions outside of ERCOT which can arise with little or no warning that could potentially impact system reliability.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** | **3.1.4.6** | **6.3.2(3)(a)(ii)** | **6.5.9.3.1** | **6.5.9.3.2(4)** |
| **6.5.9.3.4** |  |  |  |
| **Guide Reference** | **4.2.1** | **4.2.2** | **4.2.3** | **4.2.4** |
| **NERC Standard** | **EOP-011-4**  **R1, R1.1, R1.2, R1.2.2, R1.2.6, R1.2.6.2, R2, R2.1, R2.2, R2.2.10, R2.2.10.1, R2.2.10.2** | **TOP-001-6**  **R8** |  |  |

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| **Step** | **Action** |
| --- | --- |
| **Note** | * Significant weather events are those that do not meet the criteria of the extreme hot, extreme cold, hurricane, or tropical storm procedures * Significant weather events can consist of, but are not limited to the following: * Tornados * Strong straight-line winds * Flooding * Freezing precipitation * Wild Fires * The ERCOT Meteorologist may provide forecasts to supplement other Weather Service data information. * The sequence of actions taken, or notifications issued may vary due to system conditions or other operational issues and it may be necessary to skip actions due to the severity of the situation. To the extent possible, and when prudent, actions that were skipped may be implemented at a later time or date. |
| **OCN/**  **Advisory/**  **Watch** | When a significant weather event arises that could or does impact the ERCOT Region, using the Hotline, issue a notification to the TOs:  **T#84 - Typical Hotline Script for OCN/Advisory/Watch for other Weather Events** |
| **Note** | Coordinate with Outage Coordination, as needed, for the review of existing and planned outages to be withdrawn/rejected and/or restored.  Coordinate with Operations Support, as needed, as recommendations may be needed on the situation based on the Resource requirements and transmission topology. |
| **Post** | Coordinate with the Real-Time and Resource Operator for the posting of the notices on the ERCOT Website. |
| **Cancel**  **Posting** | Coordinate with the Real-Time and Resource Operator for the cancelation of the postings on the ERCOT Website. |
| **Log** | Log all actions. |

# 9. Communication Testing

## 9.1 Weekly Hotline Test

**Procedure Purpose:** To perform a weekly communications test of the ERCOT Hotline phone system.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** |  |  |  |  |
| **Guide Reference** | **7.1.3 (c)** |  |  |  |
| **NERC Standard** | **COM-001-3**  **R1** |  |  |  |

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| **Step** | **Action** |
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| **Note** | * In the event of a failure of the Forum Conference Client software, the most recent printout of the Hotline log may be used to perform a manual roll call of the TOs * Ensure all invalid Hotline “Lost Souls” are cleared prior to call * If a Hotline call was made between 0630 and 1100 on Monday, it is not necessary to conduct this test |
| **Advisory**  **Levels** | Confirm with Shift Supervisor the Advisory level, which can be viewed at the following link:  <http://www.dhs.gov/files/programs/ntas.shtm>  The definitions for the Advisory levels are listed in the Security Alert Plan. |
| **1** | Test the ERCOT Hotline:   * Each Monday between 0630 and 1100, AND * When working from the Alternate Control Center during the monthly scheduled dates. |
| **2** | Using the Hotline, notify the TOs of the purpose of the call.   * When TOs have answered the Hotline, **print** Hotline participants.   **T#85 - Typical Hotline Script for Weekly TO Hotline Test** |
| **3** | **IF:**   * Updates are made to the ERCOT procedures or scripts;   **THEN:**   * Inform the TOs during the Hotline call along with the effective date of the changes. |
| **4** | **IF:**   * A TO did not answer;   **THEN:**   * Contact them using their OPX line or LD line to inquire why they were not on the Hotline call; * Open a Help ticket if ERCOT’s Telecommunications department is needed to investigate. |
| **5** | **IF:**   * The TO “Blast dial failed” portion is not included on the printout;   **THEN:**   * Open a Help ticket for ERCOT’s Telecommunications department to investigate. |
| **6** | Place printout in the appropriate folder in the file in the back of the room. |
| **Log** | Log all actions. |

## 9.2 Monthly Testing of Satellite Phone Conference Bridge

**Procedure Purpose:** To ensure ERCOT maintains communication capability via the Satellite phone system.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** |  |  |  |  |
| **Guide Reference** |  |  |  |  |
| **NERC Standard** |  |  |  |  |

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| **Step** | **Action** |
| --- | --- |
| Primary Control Center | |
| **Note** | When a participant dials into the conference bridge before the moderator dials in, they will hear music and be placed on hold. |
| **Note** | On the first weekend of each month, between the hours of 0000 Saturday and 0500 Monday, the **Satellite Phone System Conference Bridge** will be tested with the TOs. As the Shift Supervisor makes the call to the individual TO, they will set a time that the ERCOT Operator will call the **Satellite Phone System Conference Bridge** and establish communication with the appropriate TO. |
| **Note** | Use the ERCOT Satellite Phone User Guide (See Desktop Guide Common to Multiple Desks Section 2.7) for a list of the TOs that will be contacted by the ERCOT Operator and instructions on how to place a Satellite Phone System Conference Bridge call. |
| **Note** | The numbers for the ERCOT Operator to call into the Conference Bridge are Desk specific.  **Select:**  SATELLITE directory or go to page 41 to view the programmed numbers on the Turret phone for each Bridge:   * BLACKSTRT RUC – RUC Desk * BLACKSTRT RRD -Reliability Risk Desk * BLACKSTRT RES – Resource Desk * BLACKSTRT REAL – Real-Time Desk * BLACKSTRT TS#1 – Transmission Desk (Island Coordination) * BLACKSTRT TS#2 – Transmission Desk |
| **1** | **IF:**   * The preprogrammed number does not function correctly;   **THEN:**   * Open a helpdesk ticket and cc “shiftsupv” * Refer to the ERCOT Satellite Phone User Guide (See Desktop Guide Common to Multiple Desks Section 2.7.2)for the appropriate conference number and continue with this procedure. |
| **2** | **When prompted:**   * Enter the Moderator Pass Code, * If necessary, allow five minutes for Participants to dial in, * As each Participant connects, record the following:   + Name of Participant   + Company Name   + Any problems identified with the connection process |
| **3** | **IF:**   * One or more of the TOs fails to connect to the Bridge call;   **THEN:**   * Follow up with the TO to determine the cause:   + Reason for inability to connect   + Establish a time for a retest of the TOs not able to connect in the initial test. |
| **4** | Inform the Shift Supervisor when test is complete indicating any issues identified. |
| **Log** | Log all actions. |

# 10. Perform Miscellaneous

## 10.1 Respond to Miscellaneous Issues

**Procedure Purpose:** To record when TO operate from their backup Control Centers.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Protocol Reference** |  |  |  |  |
| **Guide Reference** |  |  |  |  |
| **NERC Standard** |  |  |  |  |

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| **Step** | **Action** | | |
| --- | --- | --- | --- |
| Backup/Alternate Control Center Transfer | | | |
| **1** | When notified by a TO that they will be transferring to or from their backup/alternate control center,   * Identify the [TO] in the email notification * Send e-mail to” 1 ERCOT System Operators” * Make log entry. | | |
| **2** | If experiencing issues with communications, ICCP, etc. contact the Help Desk. | | |
| QSE Issues | | | |
| **1** | | If a MP is not satisfied with ERCOT Operations responses to their issues, refer them to their Wholesale Client Representative for clarification/resolution. |
| **2** | | If the issue is with ERCOT systems applications (ICCP down, etc.), notify the ERCOT Help Desk. |
| **3** | | If a MP is having an issue with ERCOT system applications (unable to access the portal, outage scheduler, etc.), instruct them to call the ERCOT Help Desk. |
| **4** | | As time permits notify the Shift Supervisor of any actions taken and unresolved issues. |
| **Log** | | Log all actions. |
| Missing Data from ERCOT Website Postings | | |
| **1** | | **IF:**   * A call is received about data missing or data being incorrect;   **THEN:**   * Transfer call to the Help Desk, and * Notify the Operations Support Engineer. |
| **Log** | | Log all actions. |

# Primary Control Center Functionality

## 11.1 Loss of Primary Control Center Functionality

Procedure Purpose: Provide instructions for responding to conditions that cause the primary control center to become inoperable or uninhabitable while continuing to meet its obligations with regard to the reliable operations of the ERCOT system and ensuring the safety of control center personnel.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** |  |  |  |  |
| **Guide Reference** |  |  |  |  |
| **NERC Standard** | **EOP-008-2**  **R1, R1.2, R1.2.1, R1.4 R1.6, R1.6.1, R1.6.2, 1.6.3, R4** | **TOP-001-5**  **R9** |  |  |

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| **Step** | **Action** |
| --- | --- |
| **Contact Security** | **IF:**   * Unable to reach any Operator at the PCC (also trying Alternative Interpersonal Communication capability);   **THEN:**   * Check the control center video camera to determine the status of the PCC and personnel, * Contact Security at the ACC   + Notify them of the situation **AND**   + Have them attempt to make contact with Security at PCC.   + Have them contact you with information acquired **OR**   **IF:**   * Notified by the PCC that they are evacuating and/or transferring sites **OR** * control center video and Security confirms evacuation;   **THEN:**   * Continue with procedure. |

| **Step** | **Action** |
| --- | --- |
| **IROL** | Monitor and take actions on all IROL’s; the actual flow ***MUST NOT*** exceed its limit.  If necessary, the System Operator has the authority to direct load shedding before the IROL has been exceeded |
| **3-Part** | When issuing an Operating Instruction, follow three-part communication:   * Issue the Operating Instruction * Receive a correct repeat back * Give an acknowledgement |
| Systems are Functional | |
| **Call in Additional Operators** | Coordinate with the DC-Tie operator and activate the NXT scenario to call in additional shift personnel, which includes a Shift Supervisor.  **SELECT:**   * SO Loss of Control Room at Taylor, OR; * SO Loss of Control Room at Bastrop.   An email will be received after 10 minutes with a report of who has responded along with their estimated time of arrival. |
| **TO**  **Hotline**  **Call** | **T#91 - Typical Hotline Script** Emergency Notice Loss of Primary Control Center (Systems are Functional) |
| **Additional Notifications** | The Director Control Room Operations and/or Designee will notify the following:   * Help Desk (to notify GMS Support and IT Infrastructure (Telecommunications and Data Center) * Engineering Support   These phone numbers are also programmed into the control room cell phone. |
| **ERCOT Website**  **Posting** | As time permits, post the Emergency Notice on the ERCOT Website.  **Typical Posting Script:**  ERCOT has issued an Emergency Notice for the loss of the primary control center, all systems are functioning. |
| **Respond to TO’s** | Monitor frequency and re-run SCED/use (manual offset) as needed.  **IF:**   * TO’s call in with questions about operational timelines or non real-time issues;   **THEN:**   * Notify the TO’s that timelines and non real-time issues will be addressed when additional staff arrive, * Document TO’s calls to pass along to the appropriate Operators as they arrive. |
| **Real-time Contingency Analysis (RTCA)** | **Operations Support will assist in monitoring the RTCA functionality including results and may communicate suggested actions as needed.** |
| **Respond to TOs Thermal/ Voltage Limits Reached** (**SOL**) | **IF:**   * Thermal limits have reached their continuous rating, OR * Notified by Operations Support or a TO that thermal limits have reached their continuous rating;   **THEN:**   * Activate associated constraint, OR * Seek a recommendation from Operations Support or the appropriate TO as to what actions will alleviate the situation, * Issue unit specific Operating Instructions as necessary to QSE. (Follow-up with electronic Dispatch Instruction confirmation as time permits), * Continue to monitor to determine the effect of the plan.   ERCOT Nominal Voltage Levels are 345kV, 230kV, 138kV, 115kV and 69kV.  The general voltage guidelines are as follows (listed in kV):   |  |  |  |  | | --- | --- | --- | --- | | Nominal Voltage | Normal Operating Limits | Emergency Operating Limits | Ideal Voltage Range | | 345 | 327.75 – 362.25 | 310.5 – 379.5 | 345 – 359 | | 230 | 218.5 – 241.5 | 207 – 253 | 230 – 240 | | 138 | 131.1 – 144.9 | 124.2 – 151.8 | 138 – 144 | | 115 | 109.25 – 120.75 | 103.5 – 126.5 | 115 – 120 | | 69 | 65.55 – 72.45 | 62.1 – 75.9 | 69 – 71.5 |   Some TOs utilize different Normal (Basecase) and Emergency (Post-Contingency) voltage operating limits than the general voltage guidelines. These limits can be seen under the Network Limits display.  **WHEN:**   * Indicated by SCADA alarms, OR * Notified by Operations Support or a TO of voltage concerns;   **THEN:**   * Initiate a solution in collaboration with Operations Support and the appropriate TO and QSE in the area.   **WHEN:**   * TOs have utilized all Static Reactive Power Resources (capacitors, reactors, change in transformer taps) and a voltage issue still remains;   **THEN:**   * Instruct a QSE to raise or lower bus voltage, * The QSE should complete the requested in no more than five minutes.   **Typical Script:**  “This is ERCOT Operator [first and last name]. At [xx:xx], ERCOT is instructing [QSE] to [raise or lower] voltage at [specify bus] by [+1 or 2kV or -1 or 2kV] for a target of [target kV]. [QSE] please repeat this instruction back to me. That is correct, thank you.” |
| **GTCs** | **IF:**   * Any of the GTCs is approaching 85%, OR * Notified by Operations Support or a TO that a GTC (this includes the IROL) is approaching 85%;   **THEN:**   * Activate the associated “BASECASE” constraint in TCM   + Update RTMONI with new limit each time it changes |
| **Log** | Make log entry of events. |
| Systems are not Functional | |
| **NOTE** | Market Participants must be notified of unplanned outages of **30 minutes or more,** of telemetering, monitoring and assessment capabilities, and associated communication channels between affected entities. |
| **Monitor Frequency** | The ability to view an adequate Frequency source may be limited during a site-failover, database load, or if AGC is temporarily unavailable. To view the System Frequency during these conditions you may monitor the following sources.   * **ERCOT control room digital wall frequency displays** * **PI ProcessBook → ERCOT → TrueTime Frequency (Taylor) and/or** * **PI ProcessBook → ERCOT → TrueTime Frequency (Bastrop)**   It may be necessary to reload the PI ProcessBook “ERCOT Main Summary” display to show the historical data. |
| **Call in Additional Operators** | Coordinate with the DC-Tie operator and activate the activate the NXT scenario to call in additional shift personnel, which includes a Shift Supervisor.  **SELECT:**   * **SO Loss of Control Room at Taylor, OR;** * **SO Loss of Control Room at Bastrop.**   An email will be received after 10 minutes with a report of who has responded along with their estimated time of arrival. |
| **TO**  **Hotline**  **Call** | * **T#92 - Typical Hotline Script** Emergency Notice Loss of Primary Control Center (Systems are NOT Functional) * If either Hotlines are inoperable, phone numbers can be found on SharePoint under OPX & LD Numbers. |
| **ERCOT Website**  **Posting** | As time permits, post the Emergency Notice on the ERCOT Website.   * Typical Posting Script:   ERCOT has issued an Emergency Notice for the loss of the primary control center, systems are not functioning. |
| **Additional Notifications** | * The Director Control Room Operations and/or Designee will notify the following: * Help Desk (to notify GMS Support and IT Infrastructure (Telecommunications and Data Center) * Engineering Support   These phone numbers are also programmed into the control room cell phone. |
| **Real-time Contingency Analysis (RTCA)** | **Operations Support will be responsible for the State Estimator and RTCA functionality and ensuring an RTA is performed at least every 30 minutes. They will communicate results and any suggested actions as needed.** |
| **Respond to TOs Thermal/ Voltage Limits Reached** (**SOL**) | **IF:**   * Notified by Operations Support or a TO that thermal limits have reached their continuous rating;   **THEN:**   * Seek a recommendation from Operations Support or the appropriate TO as to what actions will alleviate the situation, and issue unit specific Operating Instructions to appropriate QSE.   + Continue to monitor to determine the effect of the plan.   ERCOT Nominal Voltage Levels are 345kV, 230kV, 138kV, 115kV and 69kV.  The general voltage guidelines are as follows (listed in kV):   |  |  |  |  | | --- | --- | --- | --- | | Nominal Voltage | Normal Operating Limits | Emergency Operating Limits | Ideal Voltage Range | | 345 | 327.75 – 362.25 | 310.5 – 379.5 | 345 – 359 | | 230 | 218.5 – 241.5 | 207 – 253 | 230 – 240 | | 138 | 131.1 – 144.9 | 124.2 – 151.8 | 138 – 144 | | 115 | 109.25 – 120.75 | 103.5 – 126.5 | 115 – 120 | | 69 | 65.55 – 72.45 | 62.1 – 75.9 | 69 – 71.5 |   Some TOs utilize different Normal (Basecase) and Emergency (Post-Contingency) voltage operating limits than the general voltage guidelines. These limits can be seen under the Network Limits display.  **WHEN:**   * Notified by Operations Support or a TO of voltage concerns;   **THEN:**   * Initiate a solution in collaboration with Operations Support and the appropriate TO and QSE in the area.   **WHEN:**   * TOs have utilized all Static Reactive Power Resources (capacitors, reactors, change in transformer taps) and a voltage issue still remains;   **THEN:**   * Instruct the appropriate QSE to raise or lower bus voltage, * The QSE should complete the requested in no more than five minutes.   **Typical Script:**  “This is ERCOT Operator [first and last name]. At [xx:xx], ERCOT is instructing [QSE] to [raise or lower] voltage at [specify bus] by [+1 or 2kV or -1 or 2kV] for a target of [target kV]. [QSE] please repeat this instruction back to me. That is correct, thank you.” |
| **GTCs** | **IF:**   * Notified by Operations Support or a TO that a GTCs (which includes the IROL) is approaching 85% and is continuing to trend upward;   **THEN:**   * Seek a recommendation from Operations Support or the appropriate TO as to what actions will alleviate the situation, * Issue unit specific Operating Instructions as necessary to QSE, (Follow-up with electronic Dispatch Instructions as time permits). * Continue to monitor to determine the effect of the plan. |
| **Thermal Limits Reached** (**SOL**) | **IF:**   * Notified by Operations Support or a TO that thermal limits have reached their emergency rating and are continuing to trend upward,   **THEN:**   * Seek a recommendation from Operations Support or the appropriate TO as to what actions will alleviate the situation, and issue unit specific Operating Instructions as necessary (Follow-up with electronic Dispatch Instruction as time permits) * Continue to monitor to determine the effect of the plan. |
| **Electronic**  **Dispatch**  **Instruction** | When issuing a VDI or confirmation, ensure the use of three-part communication:   * + Issue the Operating Instruction   + Receive a correct repeat back   + Give an acknowledgement |
| **Log** | Log all actions. |

## 11.2 Restoration of Primary Control Center Functionality

**Procedure Purpose:** To be performed once additional staff has reported to the alternate Control Center and Grid can return to normal operations.

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| --- | --- | --- | --- | --- |
| **Protocol Reference** |  |  |  |  |
| **Guide Reference** |  |  |  |  |
| **NERC Standard** |  |  |  |  |

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| **Step** | **Action** |
| --- | --- |
| **NOTE:** | As additional Operators arrive, communicate any pertinent information that will assist them in getting their specific functions ready for normal operation. |
| **NOTE:** | Before normal operation can be restored, be sure to communicate with the other desks to determine the current state of the grid and any communications that may have taken place with TOs. |
| **Congestion Management** | Continue with congestion management either manually or with systems. Check with other Operators to determine if any VDIs were issued. |
| Notification of Additional Operators | **WHEN:**   * Fully staffed;   **THEN:**   * Make notification using the NXT - SO Loss of CC Operations Resumed. |
| **Return to**  **Normal**  **TO**  **Notification** | When ready to resume normal operation, place the following Hotline call to the TOs:  **T#71 - Typical Hotline Script to Cancel Emergency Notice and Restore Primary Control Center** |
| **Nuclear**  **Plants** | Notify the appropriate Nuclear Plant’s QSE and inform them that they should notify the plants that ERCOT has canceled the Emergency Notice and RTCA and State Estimator are now functional. |
| Help  Desk | Make notification to Help Desk that the Control Room is now back to normal operations from the alternate. |
| Contact Security | Notify Security that the transition of Operations to the ACC has been completed. |
| Log | Log all actions. |

Document Control

## Preparation

| **Prepared by** | **Role** | **Date Completed** |
| --- | --- | --- |
| Hartmann, Cyphers, Luker, and Smith | Procedure writers and editors | December 1, 2025 |

## Manual Change History

|  |  |  |  |
| --- | --- | --- | --- |
| **Procedure** | **Ver/**  **Rev** | **Reason for Issue** | **Effective Date** |
| All Sections | 2.0 / 0 | RTC+B | December 5, 2025 |