# ISO New England Operating Procedure No. 20 - Analysis and Reporting of Power System Incidents

**Effective Date: December 12, 2022**

**Review By Date: December 12, 2024**

**REFERENCES:**

1. U.S. OMB No. 1901-0288 – Electric Emergency Incident and Disturbance Report. (Reporting forms are available at: http://www.oe.netl.doe.gov/oe417.aspx
2. NERC Reliability Standard EOP-004 - Event Reporting (EOP-004)
3. NERC Reliability Standard MOD-033 - Steady-State and Dynamic System Model Validation (MOD-033)
4. NERC Reliability Standard PRC-006-NPCC - Automatic Underfrequency Load Shedding
5. NPCC Regional Reliability Reference Directory #4 - Bulk Power System Protection Criteria (NPCC Directory #4)
6. ISO New England Operating Procedure No. 10 - Emergency Incident and Disturbance Notifications (OP-10)
7. Transmission Operating Guides – Remedial Action Scheme/Automatic Control Schemes (RAS/ACS) documents
8. Transmission Operating Guide – NPCC RAS SPS List Guide

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## I. INTRODUCTION

The interconnected Bulk Electric System (BES) is being operated at an ever-increasing capacity factor. This increased duty has resulted in greater power system sensitivity to faults, losses of equipment, and/or equipment malfunctions. Accordingly, it is essential that power system behavior be carefully analyzed following abnormal operations. These operations include **not** only severe system disturbances, but also incidents that fall into the "near miss" or abnormal (versus emergency) category.

This Procedure establishes responsibilities for conducting analyses of power system incidents, including abnormal events, system conditions or disturbances that impact the reliability of the BES as well as physical, cyber and communication system sabotage / attack events. This Procedure also establishes responsibilities for the distribution of reports resulting from such analyses. The reports resulting from these analyses may also be used to fulfill the reporting requirements of the Department of Energy (DOE), state regulatory bodies, the Northeast Power Coordinating Council Inc. (NPCC), and the North American Electric Reliability Corporation (NERC), as applicable.

## II. EVENTS REQUIRING ANALYSES AND REPORTS

**NOTE**

Reporting of emergency incident and disturbance events by ISO New England (ISO), Market Participants (MPs), Local Control Centers (LCCs) and Transmission Owners (TOs) to DOE, NERC and NPCC is performed in accordance with applicable NERC Reliability Standards, NPCC Procedures and in accordance with the process detailed in ISO New England Operating Procedure No. 10 - Emergency Incident and Disturbance Notifications (OP-10).

ISO, considering input that may be provided by LCCs, TOs, MPs, and NPCC, will determine whether it will conduct an analysis and prepare a report for the following types of power system incidents:

1. Incidents that are reported to DOE, NERC, and NPCC, including but **not** limited to:

   a. System events resulting in system frequency excursions below the initializing set points of the Under Frequency Load Shedding (UFLS) program, as described in NERC Reliability Standard PRC-006-NPCC - Automatic Underfrequency Load Shedding

   b. Disturbances or unusual occurrences that jeopardize the operation of the BES, or result in system equipment damage or customer interruptions, as described in NERC Reliability Standard EOP-004 - Event Reporting (EOP-004)

   c. Unforeseen failures of ISO critical operating tool(s), as described in EOP-004

2. Incidents involving the successful or unsuccessful operation of a special relay protection system listed in the NPCC RAS SPS List Guide.
3. Incidents that, in the judgment of the Master/Local Control Center Heads (M/LCC Heads), warrant review and analysis. These include, but are **not** limited to:

    - Prolonged (sustained) oscillations
    - Severe voltage excursions
    - Multiple and simultaneous loss of large generators and/or transmission system elements
    - Loss of significant customer load

4. Incidents that ISO determines must be analyzed for NERC Reliability Standard MOD-033 - Steady-State and Dynamic System Model Validation (MOD-033) to compare simulations using planning model cases to Real-Time system performance

## A. Conducting Analyses And Developing And Distributing Reports

1. Responsibilities;

    - ISO is responsible for determining the need to conduct analyses and prepare reports of power system incidents. The severity of the incident determines the depth of the analysis and the type of report (brief and general or lengthy and detailed)
        - With the exception of system wide events, ISO may assign this responsibility to the M/LCC Heads.
    - ISO is responsible for assigning responsibilities for conducting analyses and developing reports of power system incidents, in accordance with the following guidelines:
        - Assigned entities could include personnel from ISO, the LCCs, TOs or MPs
        - The nature of the particular power system incident will normally determine the make-up of the group assigned to participate in the development of the analysis and report for the incident.
        - TOs and MPs affected by the power system incident will always be assigned to participate in the development of the analysis and report for that incident.
        - Lead responsibility for the development of the analysis and report for a power system incident may be assigned to ISO, an LCC, TO, or MP.

- ISO is responsible for providing actual system behavior data for MOD-033 analysis (or a written response that it does **not** have the requested data) to other Planning Coordinators within 30 calendar days of a written request. Examples of actual system behavior data may include, but are **not** limited to state estimator cases or other Real-Time data (including disturbance data recordings).

- Each LCC is responsible for providing actual system behavior data for MOD-033 analysis (or a written response that it does **not** have the requested data) to ISO or other Planning Coordinators within 30 calendar days of a written request. Examples of actual system behavior data may include, but are **not** limited to fault type and impedance data.

- Each TO and MP is responsible for providing any power system incident or pre-incident data (or a written response that it does **not** have the requested data) to ISO within 30 calendar days of a written request. Examples of actual system behavior data may include, but are **not** limited to, sequence of events and fault recorder data.

2. Scope of Analysis and Time Schedule for Analyses and Reports:

   - The scope of analysis and level of detail in the report will be determined by ISO, or the M/LCC Heads if assigned the responsibility by ISO, in accordance with applicable NERC Standards.

   - The time schedule for conducting the analysis and developing the report will be determined by ISO, or the M/LCC Heads if assigned the responsibility by ISO, in accordance with applicable NERC Standards.

3. Contents of Report

   The report will include comments pertaining to the following, as applicable:

   - Dates and times of events

   - Executive summary of analysis

   - Pre-incident BES conditions (weather, load, generation patterns, outages of generation and transmission prior to incident, inter-area transfers, inter-regional transfers, frequency schedules, key bus voltages)

   - Immediate post-incident BES conditions (similar to pre-incident items)

   - Amounts of load/generation lost

   - Potential items for analysis:

     - Relay operations - correct; correct but undesirable; incorrect

     - Damaged equipment

- Causes
- Injuries
- Reliability of system (pre; post)
- Comparison of actual behavior and simulation
- Violations of established Procedures, Criteria, Rules and Standards, etc.
- Lessons learned
- Recommendations

- Action Items, as applicable:
  - MPs
  - LCCs
  - TOs
  - ISO

4. Final Report Distribution

   Final reports will normally be distributed to the NEPOOL Reliability Committee (RC), LCC Operating Committees, M/LCC Heads and personnel, and the NPCC Task Force on Coordination of Operations (TFCO). The RC may authorize other distributions as determined by the nature of the incident and contents of the report.

## OP-20 REVISION HISTORY

**Document History** (This Document History documents action taken on the equivalent NEPOOL Procedure prior to the RTO Operations Date as well revisions made to the ISO New England Procedure subsequent to the RTO Operations Date.)

| Rev. No. | Date | Reason |
|---|---|---|
| Rev 0 | 11/04/05 | New procedure describing the follow up incident reporting |
| Rev 1 | 02/03/06 | Updated link for new DOE Reporting Form OE-417 |
| Rev 2 | 10/13/06 | Revised SOP title referenced in this OP |
| Rev 3 | 04/13/07 | Revised reporting requirements |
| Rev 4 | 11/15/13 | Biennial review by procedure owner;<br>Global reformatted by placing data in tables, changed font, replace page numbers with Page X of Y format. Added disclaimer to 1st page Footer, added "Hard Copy is Uncontrolled" to all Footers, globally defined acronyms consistent with current practices and management expectations;<br>References replaced link for U.S.OMB No. 1901-0288 forms location, corrected NERC Standards EOP-004 and PRC-009 titles, Correct NPCC Directory #4 title, added NPCC Document C-17, corrected NPCC C-42 title, added OP-10 & CROP.50001 and added NSTAR LLC Instruction to list;<br>LCC Instruction No. listing section, modified applicable document titles to reflect current titles;<br>Section I, 1st paragraph, replaced bulk power system with Bulk Electric System (BES) and used this defined acronym in all following instances, modified 1st and 2nd paragraphs;<br>Section II added new NOTE, deleted 1st paragraph and modified 2nd paragraph, step 1 added new steps II.1.a, b & c, deleted various steps and sub-steps, Modified sub-section A title and extensively modified steps II.A.1 and sub-steps, modified step II.A.2 and sub-steps, modified some Step II. A.3 sub-steps, modified step II. A.4;<br>Removed "other" before TO globally throughout the document |
| Rev 5 | 11/06/15 | Biennial review by procedure owner;<br>Corrected typo in title on title page;<br>Add NPCC to PRC-006 reference<br>Deleted NPCC Document C17 & C42 References;<br>Deleted CROP.50001 from References:<br>Deleted PRC-009 and added PRC-006-NPCC;<br>Changed title for NERC Reliability Standard EOP-004 to Event Reporting in References:<br>Changed title for Maine Operating Procedure No. 10 to Iberdrola USA Energy Control Center Reporting and Notification Procedure in LCC Instruction No; |
| Rev 6 | 07/03/17 | Biennial review by procedure owner;<br>References Section, added NERC Reliability Standard MOD-033 - Steady-State and Dynamic System Model Validation;<br>Section II.A.1, added power system incidents for which ISO would conduct analyses (compare simulations using planning model cases to real-time system performance, for MOD-033);<br>Section II.A.1, added bullet for responsibility for ISO to provide actual system behavior data to other Planning coordinators per MOD-033;<br>Section II.A.1, added bullet for LCCs to provide actual system behavior data to ISO or other Planning Coordinators for MOD-033 analysis, as requested;;<br>Section II.A.1, added bullet for responsibility for TOs and MPs to provide any power system incident or pre-incident data to ISO, as requested; |
| Rev 6.1 | 02/26/19 | Biennial review completed by procedure owner requiring no changes;<br>Made administrative changes required to publish a Minor Revision (including deleting the listing of LCC Instructions in the References section); |
| Rev 6.2 | 01/22/21 | Periodic Review. Made administrative changes required to publish a Minor Revision;<br>Section II.2. Revised document title. |

| Rev. No. | Date | Reason |
|---|---|---|
| Rev 6.3 | 12/12/22 | Biennial review completed by procedure owner requiring no intent changes;<br>In reference section, updated Transmission Operating Guides – Remedial Action Scheme/Automatic Control Schemes (RAS/ACS) documents and added Transmission Operating Guide – NPCC RAS SPS List Guide;<br>In section II.A.1 sub-bullet, added clarification;<br>In section II.A.4, added NEPOOL. |