



Operating Procedures

ISO New England Operating Procedure No. 7

Action In An Emergency

Effective Date: June 26, 2011

Revision No. 8

ISO New England Operating Procedure No. 7 Action in an Emergency (OP-7)

Effective Date: June 26, 2011 (June 26, 2011 through June 25, 2012, based upon NPCC Directory #12 Implementation Plan criteria)

NOTE

Some Transmission Owners (TO) may be permitted to meet UFLS criteria requirements in advance of deadlines identified in NPCC Directory #12 Implementation Plan (June 26, 2009 through June 26, 2015)

References:

1. NPCC Directory #12 UFLS Program Requirements
2. NPCC Directory #2 Emergency Operations
3. NPCC Directory #4 System Protection Criteria
4. NERC Reliability Standard EOP-003 - Load Shedding Plans
5. NERC Reliability Standard PRC-007 - Assuring Consistency of Entity Underfrequency Load Shedding Programs
6. ISO New England Operating Procedure No. 1 - Central Dispatch Operating Responsibility and Authority of ISO New England, The Local Control Centers and Market Participants (OP-1)
7. ISO New England Operating Procedure No.19 - Transmission Operations (OP-19)
8. ISO New England Operating Procedure No. 4 - Action During a Capacity Deficiency (OP-4)
9. ISO New England Operating Procedure No. 6 - System Restoration (OP-6)
10. ISO New England Operating Procedure No. 12 - Voltage and Reactive Control (OP-12)

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11. ISO New England Operating Procedure No. 21 - Action During An Energy Emergency (OP-21)

12. ISO Master/Local Control Center Procedure No. 4 (M/LCC 4) - Emergency Load Reduction Plans for Mitigating IROL Violations

Local Control Center Instruction No. :

CONVEX: Operating Instruction #0007 - Action in an Emergency

MAINE: MAINE Operating Procedure No.7 - Action in an Emergency

NEW HAMPSHIRE: OP 0007 Action During An Emergency

NSTAR OP-7 - Actions in an Emergency

REMVEC II: Operating Procedure 7 - Actions in an Emergency

VELCO: VELCO Operating Procedure 7 - Actions In An Emergency

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Appendix A - Instructions for Implementation of Manual Load Shedding

PART I - INTRODUCTION

This Operating Procedure (OP) establishes criteria to be followed in the event of an operating emergency involving **unusually low frequency, equipment overload, capacity or energy deficiency, unacceptable voltage levels, or any other emergency that ISO New England (ISO) deems appropriate** in an isolated or widespread area of New England. The objectives in establishing these emergency actions are:

1. To protect reliable operation of the Eastern Interconnection.
2. To restore balance between customers' load and available generation in the shortest practicable time.
3. To minimize risk of damage to equipment.
4. To minimize interruption of customer service.

PART II - RESPONSIBILITY

I. ISO NEW ENGLAND RESPONSIBILITY

ISO has the responsibility and authority, in accordance with North American Electric Reliability Corporation (NERC) Reliability Standards, Northeast Power Coordinating Council, Inc. (NPCC) Directories and/or documents and ISO Operating Procedures to direct the actions that may be required for the implementation of this OP, such as load shedding or opening of circuits, when the emergency situation involves:

- A. An overall capacity or energy deficiency in the New England Reliability Coordinator Area/Balancing Authority Area (RCA/BAA) or in any area within the New England RCA/BAA.
- B. The New England RCA/BAA interconnections with adjacent RCA/BAA systems.
- C. Conditions on facilities external to New England caused by operations or conditions within the New England RCA/BAA.
- D. Transmission and/or generating facilities within the New England RCA/BAA.
- E. Any other emergency conditions where ISO deems it appropriate.

II. LOCAL CONTROL CENTER RESPONSIBILITY

The Local Control Centers (LCCs) have the responsibility and authority, in accordance with ISO New England Operating Procedure No.1 - Central Dispatch Operating Responsibility and Authority of ISO New England, The Local Control Centers and Market Participants (OP-1) to direct the actions that may be required for the implementation of this OP when the emergency condition involves:

- A. A capacity or energy deficiency in an area wholly within one LCC.
- B. The transmission and/or generating facilities under the operating jurisdiction of a single LCC.
- C. The risk of damage to equipment under the operating jurisdiction of a single LCC when accompanied by a loss of communications with ISO.

PART III - PROCEDURE

I. PREPARATION FOR IMPLEMENTATION

Normally, the potential need for emergency actions prescribed by this OP should be determined well in advance of the time the actions must be implemented. This OP may be implemented before, during or after action taken under ISO New England Operating Procedure No. 4 - Action During A Capacity Deficiency (OP-4) or ISO New England Operating Procedure No. 21 - Action During An Energy Emergency (OP-21) depending on the circumstances of the emergency. However, OP-4 will normally precede implementation of this OP.

When system conditions indicate that implementation of this OP may be required, ISO and the LCCs will establish and, if appropriate, maintain continuous communication in preparation for an ISO directive to implement this OP. Prompt action may provide time to be more selective in the application of this OP.

If any LCC and ISO are unable to establish prompt communication, the LCC will proceed to implement this OP independently.

When time and circumstances allow, ISO and the LCCs shall discuss the emergency conditions and reach consensus on the actions to be taken and the timing of those actions.

When operating circumstances do not allow time for consensus decisions, ISO and/or the LCC will initiate the necessary actions prescribed by this Procedure with the understanding that actions resulting in the higher level of reliability will be taken.

II. PROCEDURES FOR LOW FREQUENCY CONDITIONS

In an emergency characterized by a frequency drop, identification of the deficient RCA/BAA or RCAs/BAAs is vital to expedite corrective action. The ISO Control Room Staff shall establish communications with other interconnected RCAs/BAAs, as follows, to determine, if possible, the cause of the frequency decline and the action required to restore frequency to 60.00 Hz.

- A. When the cause of the declining frequency is outside of the New England RCA/BAA:
- Confirm existing interchange schedules with adjacent NPCC BAAs.
 - Regulate the New England RCA/BAA ties to maintain the frequency-biased interchange schedules.
 - Increase the amount of synchronized reserve to be able to adjust the interchange schedule further, if needed.
 - Make known to external RCAs/BAAs the amount of emergency capacity ISO can make available.
 - Actions described in Section II.B below may be implemented when external RCAs/BAAs request assistance from ISO. Please note that some of these actions will occur automatically regardless of the RCA/BAA causing the frequency decline.
- B. When the cause of the declining frequency is due to a deficiency in the New England RCA/BAA:
- Confirm existing interchange schedules with adjacent NPCC BAAs.
 - Request assistance from external RCAs/BAAs up to the emergency transfer limit of the interconnection tie lines.
- C. When the frequency reaches 59.90 Hz:
- Disconnect any pumped storage Dispatchable Asset Related Demand(s) (DARDs) operating in the pumping mode. They will be automatically disconnected at 59.65 Hz.
 - Order fast-start non-synchronized Generators into service as required.
- D. When the frequency reaches 59.80 Hz:
- Automatic Generation Control (AGC) will be tripped automatically.
 - Direct all Generators to Economic Maximum Limits (Eco Max) at maximum response rates, as appropriate. Note that transmission limitations or other reliability criteria may not allow the dispatch of all Generators to Eco Max.

- E. When the frequency reaches 59.50 Hz:
- Underfrequency relays will provide 7% load relief.
- F. When the frequency reaches 59.30 Hz:
- Underfrequency relays will provide an additional 7% load relief.
- G. When the frequency reaches 59.10 Hz:
- Underfrequency relays will provide an additional 3% load relief.
- H. When the frequency reaches 58.80 Hz:
- Underfrequency relays will provide an additional 8% load relief.
- I. If the load shedding by automatic underfrequency relays does not stabilize the frequency and it continues to decline below 58.50 Hz:
- If currently synchronized to the Eastern Interconnection, order Manual load shedding in accordance with Appendix A of this OP to the extent necessary to restore ACE to zero. Note that 50% of the New England RCA/BAA load, including the 25% that is shed automatically, can be shed manually. Details of the manual load shedding procedure and statements to be used by operators are included in Appendix A.
 - If NOT currently synchronized to the Eastern Interconnection, order manual load shedding in accordance with Appendix A of this OP to the extent necessary to restore frequency to 60.00 Hz. Note that 50% of the New England RCA/BAA load, including the 25% that is shed automatically, can be shed manually. Details of the manual load shedding procedure and statements to be used by operators are included in Appendix A.
 - All Generators shall take necessary action per NPCC Directory # 2 Emergency Operations, including separating Generators from the system, to preserve generation and minimize damage and service interruptions. Per NPCC Directory #12 - UFLS Program Requirements, Figure 1, Standards for setting underfrequency trip protection for generators, the Generator underfrequency relays shall operate between 57.00 Hz and 59.00Hz depending upon the length of time exposed to low frequency.

III. PROCEDURES FOR A TRANSMISSION EMERGENCY

Operation of the transmission system under emergency conditions shall be governed by ISO New England Operating Procedure No. 19 - Transmission Operations (OP-19). Emergency Actions, including the switching of transmission elements, implementing voltage reductions, and the shedding of firm load, can be taken by ISO and the LCCs to maintain reliability.

ISO and the LCC operators are responsible to keep appropriate Supervisors at ISO and the LCCs advised as to conditions that might necessitate management review of the need to implement Emergency Actions on a pre-contingency basis.

IV. PROCEDURES FOR UNACCEPTABLE VOLTAGE CONDITIONS

ISO New England Operating Procedure No. 12 - Voltage and Reactive Control (OP-12) and various voltage guides define criteria and establish guides for action to be taken to insure that desirable levels of voltage are maintained on the transmission system. The LCCs shall make every effort to correct unacceptable voltage conditions and shall coordinate actions with ISO.

When unacceptable voltage conditions occur and corrective actions described in OP-12 and/or the voltage guides are not effective, the ISO Control Room Staff and/or LCC operators should take Emergency Actions, as defined in OP-19, to correct the situation.

The ISO Control Room Staff and Local Control Center operators are responsible to keep appropriate Supervisors at ISO and the LCCs advised as to conditions that might necessitate management review of the need to implement Emergency Actions on a pre-contingency basis.

V. RESTORATION OF LOAD

ISO will direct the restoration of any load shed under this OP when system conditions permit.

OP 7 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 1	07/08/98	
Rev 2	04/05/02	
Rev 3	02/01/05	Updated to conform to RTO
Rev 4	05/06/05	Update for initiation of VELCO Local Control Center and NERC Version 0 Standards
Rev 5	04/13/07	Revised load shedding objective per NERC audit finding
Rev 6	08/18/08	Added NSTAR to LCC OP References; Modified the list of Attachments in the TOC; Modified bullets under Part III, step II.B 4 th , 5 th and 6 th paragraphs dealing with retiring Appendix A and B and converting Appendix C to the new Appendix A
Rev 7	06/26/10	Annual review by procedure owner; Globally: format changes, added uncontrolled disclaimer to 1 st page footer, added "Uncontrolled" to all page footers, corrected punctuation, grammar and made consistent use of headings to allow automatic updating of TOC ; Defined acronyms ISO for ISO New England, LCC for Local Control Center, and RCA/BAA for Reliability Coordinator Area/Balancing Authority Area at 1 st use and used the acronyms for subsequent instances; Updated references Added new UFLS set point 59.5 ,7% load, modified 59.3 load shed to 3% Added language to indicate generator Underfrequency setpoint @57.00Hz Added page 1 NOTE regarding early compliance of Directory 12 Implementation Plan
Rev 8	06/26/11	Annual review by procedure owner; changed pagination format to "X of Y"; updated implementation dates per NPCC Directory 12 ; Corrected Reference 5.; replaced PART I 1 and modified 4; modified 59.3 load shed to 7%; added new UFLS set point 59.1, 3%, modified 58.8 load shed to 8%; clarified language Part III, Section II, Steps E,F,G,H