

# Operating Procedures

ISO New England Operating Procedure No. 13

*Standards for Voltage Reduction and Load  
Shedding Capability – Appendix C –  
Underfrequency Load Shedding Program  
Implementation Plan*

Effective Date: June 22, 2010  
Revision No. 0

## Appendix C - Underfrequency Load Shedding Program Implementation Plan

Market Participants, with control over transmission/distribution facilities, with 100 MW or more of end-use load connected to its facilities shall implement a UFLS program with the following attributes within the time allowances specified by this Implementation Plan.

### UFLS Implementation Plan for the Eastern Interconnection Portion of NPCC

#### NOTE

Each implementation plan year (0-6 in column 1) runs from Hour 0000 on June 26 to Hour 2400 the following June 25 for the applicable years in parenthesis.  
Following the below table, see explanations for the data contained in the table.

| End Of Year | Conversions/Modifications   | Original Remaining            | Total   | Remarks  |
|-------------|---|-------------------------------|---|--|
| <b>0</b>    |   |                               | 10% - 59.3 Hz<br>15% - 58.8 Hz  |  |
| <b>1</b>    | 7% of the 10% block to 59.5 Hz  | 3% - 59.3 Hz<br>15% - 58.8 Hz | 7% - 59.5 Hz<br>3% - 59.3 Hz<br>15% - 58.8 Hz   | Setting changes only. Total clearing time of 300 ms can be implemented if possible   |
| <b>2</b>    | 4% of the 15% block to 59.3 Hz<br>3% of the 15% block to 59.1 Hz  | 3% - 59.3 Hz<br>8% - 58.8 Hz  | 7% - 59.5 Hz<br>7% - 59.3 Hz<br>3% - 59.1 Hz<br>8% - 58.8 Hz  | Setting changes only. Leave original 3% at 59.3 Hz. Total clearing time of 0.3 seconds can be implemented if possible  |
| <b>3</b>    | 4% of the 15% block to 59.1 Hz<br>3% of the 15% block to 58.9 Hz<br>Add UFLS capacity of 2% at 58.9 Hz with total time delay of 0.3 sec.  | 3% - 59.3 Hz<br>1% - 58.8 Hz  | 7% - 59.5 Hz<br>7% - 59.3 Hz<br>7% - 59.1 Hz<br>3% - 58.9 Hz<br>2% - 58.9 Hz (fast)<br>1% - 58.8 Hz               | 1st year of adding 2% portion of the new UFLS capacity. New capacity will have total clearing time of 300 ms.<br><br>1st year of decreasing total time if not already done so. Clearing time changes must be implemented if not done already in year 1 and 2 |
| <b>4</b>    | 1% of the 15% block to 58.9 Hz<br>Change time of 1st block (59.5 Hz) to total of 0.3 sec.<br>Add UFLS capacity of 1% at 58.9 Hz with total time delay of 0.3 sec<br>Add UFLS capacity of 2% Anti-stall block at 59.5 Hz with total time delay of 10 sec |                               | 7% - 59.5 Hz (fast)<br>7% - 59.3 Hz<br>7% - 59.1 Hz<br>3% - 58.9 Hz<br>4% - 58.9 Hz (fast)<br>2% - 59.5 Hz (10 s) | Adding anti-stall block.   |

| End Of Year | Conversions/Modifications  | Original Remaining | Total  | Remarks                          |
|-------------|--|--------------------|--|----------------------------------|
| 5           | Change time of 2nd block (59.3 Hz) to total of 0.3 sec.  |                    | 7% - 59.5 Hz (fast)<br>7% - 59.3 Hz (fast)<br>7% - 59.1 Hz<br>3% - 58.9 Hz<br>4% - 58.9 Hz (fast)<br>2% - 59.5 Hz (10 s) | Continue with time delay changes |
| 6           | Change time of 3rd block (59.1Hz) to total of 0.3 sec.<br>Change time of remaining 4th block (58.9 Hz) to total of 0.3 sec |                    | 7% - 59.5 Hz (fast)<br>7% - 59.3 Hz (fast)<br>7% - 59.1 Hz (fast)<br>7% - 58.9 Hz (fast)<br>2% - 59.5 Hz (10 s)          | Program complete.                |

**Table explanations and clarifications:**

1. All percentages are approximate.
2. Conversions and modifications are to be dispersed geographically throughout an Area, as much as practical.
3. All conversions include the modifications necessary to achieve a total clearing time (UFLS relay operating time, aux relay time, and breaker time) of 300 ms. The 300 ms total clearing time can be taken as an average value. The regional standard could be written to require an average total clearing time plus or minus some standard deviation, such as 50 ms.
4. A minimum UFLS relay operating time shall not be less than 100 ms.
5. Final percentages of recommended program will be the end of year 6.
6. Market Participants with control over transmission/distribution facilities with end use peak load of < 100 MW connected to its facilities, and who were initially granted a deferment from this implementation plan by their Balancing Authority, shall implement the changes as prescribed in Sections 5.2.2 and 5.2.3 of Directory #12 within 36 months of March 3, 2010.

**OP 13 APPENDIX C 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    | 06/22/10 | Initial Version |
|          |          |                 |