



Operating Procedures

ISO New England Operating Procedure No. 5

*Generator and Dispatchable Asset Related
Demand Maintenance and Outage
Scheduling – Appendix A – Operable
Capacity Calculations*

Effective Date: December 1, 2010
Revision No. 7

Appendix A - OPERABLE CAPACITY CALCULATIONS

References:

- ISO New England Capacity, Energy, Loads, and Transmission (CELT) Report
- ISO New England Operating Procedure No. 8 - Operating Reserve and Regulation (OP-8)
- SOP-OUTSCH.0030.0010 - Evaluate Generator and DARD Outage Requests
- Capacity Supply Obligation / Nominated Consumption Limit Reports

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DEFINITIONS

Peak Load Exposure (PLE):

PLE represents a projection of the New England Reliability Coordinator Area/Balancing Authority Area (RCA/BAA) possible weekly peak load, which has a 50% chance of occurring. The weekly PLEs are derived from ratios relating the projected weekly peak load to the seasonal peak load. The seasonal peak loads are projected within the annual April 1st publication of the ISO New England Capacity, Energy, Loads, and Transmission (CELT) Report.

The summer PLE period is thirteen (13) weeks, starting from the first full week of June through the last full week of August, not inclusive of the Labor Day holiday. The winter PLE period is three (3) weeks, starting from the first full week in January, not inclusive of the week with the New Year's Holiday. PLEs for all other weeks are represented as fractional ratios of those projected seasonal peaks. The NEPOOL Operations Committee (NOC) approved the methodology used to develop weekly PLEs in September of 1996.

The fractional ratios used to compute weekly PLEs are based on historical peak load data. The analysis of NEPOOL weekly peak loads for the period 1988-1995 was deemed most appropriate because it: encompassed the most current data available at the time; was of sufficient duration to mitigate the effects of abnormal weather; and was coincident with the New England RCA/BAA post-recession period. The historical weekly peak loads were "standardized" by first assigning week twenty-seven (27) to coincide with the 4th of July week in each of the years. The reconstituted weekly maximum load for a five (5) week rolling window, centered on the reported week, was then related to the weather normalized, seasonal peak load as follows: weeks one (1) through eighteen (18) seasonal winter peak, weeks nineteen (19) through thirty-nine (39) seasonal summer peak, weeks forty (40) through fifty-two (52) succeeding seasonal winter peak. These weekly to seasonal peaks are represented as fractions. Judgment based on review of historic weather patterns and seasonal peak occurrence was applied to the curves.

Long Term Operable Capacity Margin (LTOCM):

The Long Term Operable Capacity Margin (LTOCM) is a measure of the New England RCA/BAA projected weekly capacity margin. A positive value of LTOCM indicates a potential surplus of operable capacity over and above the estimated load plus operating reserve requirement. A negative value indicates that active Real-time Demand Response Resources would need to be dispatched and the magnitude of the negative value may indicate a potential operable capacity deficiency. The Long Term Operable Capacity Margin and its components are defined below:

LTOCM = A+B-C-D-E-F+G where:

- A is the Capacity Supply Obligation of all Generators and Nominated Consumption Limits of Dispatchable Asset Related Demands (DARDs) including any expected Generator/DARD reactivations and new commercial Generators/DARD.
- B is the sum of the external Import Capacity purchases
- C is the forecast 50/50 Peak Load Exposure (PLE).
- D is the Operating Reserve Requirement as defined in ISO New England Operating Procedure No. 8 - Operating Reserve and Regulation (OP-8).
- E is the total of Generator/DARD Planned Outages for the period. This value would also include any known long-term Forced Outages.
- F is the allowance for Unplanned Outages as defined within SOP-OUTSCH.0030.0040 - Perform Generation Outage Coordination - Long Term.
- G is an adjustment for Generators offering in excess of their Capacity Supply Obligation.

For the First Future Year, the Capacity Supply Obligation (CSO) for all Generators and Nominated Consumption Limits (NCLs) for all DARDs will be used in accordance with the most recently published monthly Capacity Supply Obligation / Nominated Consumption Limit Reports and adjusted using the most recent information for new Generators/DARDs. The PLE used in the First Future Year will be based upon the most recently published CELT Report.

Locational Operable Capacity Margin (LOCM):

The Locational Operable Capacity Margin (LOCM) is a measure of the projected weekly operable capacity margin on a sub-area basis. A positive LOCM value indicates a projected surplus of operable capacity available to respond to a second contingency event within a sub-area. A negative value indicates that active Real-Time Demand Response Resources would need to be dispatched to avoid a potential operable capacity deficiency. LOCM analyses are performed in addition to the full New England RCA/BAA analysis and are based on data included in both the Current Year and First Future Year Annual Maintenance Schedules.

LOCM = A-B-C+D-E-F+G where:

- A is the CSO of all Generators and NCL of all DARDs that are currently in service. Generator/DARD reactivations and new commercial Generators/DARDs that are included in the 3rd annual FCM re-configuration Auction shall be included in the LOCM calculations.
- B is the total of Planned Outages during the period for all Generators/DARD in the sub-area. This value includes any known long-term Forced Outages.
- C is a reliability adjustment reflecting the historical performance of combustion turbines.
- D is the Import Capability for the sub-area for the week.
- E is the forecast load for the sub-area, which is calculated by multiplying the New England RCA/BAA 50/50 Peak Load Exposure by the sub-area percentage of system seasonal peak load.
- F is the largest single source, which is defined as the largest available Generator in the sub-area during the period.
- G is an adjustment for Generators offering in excess of their CSO.

Short Term Operable Capacity Margin (STOCM):

The Short Term Operable Capacity Margin (STOCM) is a measure of the New England RCA/BAA projected capacity margin looking ahead 14 days or less. STOCM is calculated using the components defined below. A positive value of STOCM indicates a potential surplus of operable capacity over and above the estimated capacity requirement. A negative value indicates a potential operable capacity deficiency and that Real-Time Demand Response Resources would need to be dispatched.

STOCM = A+B-C-D-E-F+G where:

- A is the CSOs of all Generators and NCLs of all DARDs that are currently in service.
- B is the sum of the external Import Capacity Resource purchases.
- C is the forecast load. For future days 7-14 the 50/50 Peak Load Exposure is used. For future days 1-6 the ISO short term load forecast is used. This forecast is based on the forecasted weather.
- D is the Operating Reserve Requirement as defined in OP-8.
- E is the total of Generators and DARDs actually out-of-service for Planned or Maintenance Outages, or scheduled or known to be out-of-service in the future period of 14 days or less.
- F is a reliability factor to adjust the overall STOCM by considering Forced Outages, changes in load, etc. The reliability factor will be 1500 MW for day 1 through 6 and 2000 MW for day 7 through 14 of the short-term look-ahead period.
- G is an adjustment for Generators offering in excess of their CSO.

Short Term Locational Operable Capacity Margin (STLOCM):

The Short Term Locational Operable Capacity Margin (STLOCM) is a measure of the projected capacity margin looking ahead 14 days or less on a sub-area basis. The STLOCM is calculated using the components defined below. A positive STLOCM value indicates a projected surplus of operable capacity available to respond to a second contingency event within a sub-area. A negative STLOCM value indicates a potential operable capacity deficiency and that Real-Time Demand Response Resources would need to be dispatched.

STLOCM = A-B-C+D-E-F+G where:

- A is the CSOs of all Generators and NCLs of all DARDs in the sub-area that are currently in service.
- B is the total of Planned Outages during the period for all Generators/DARDs in the sub-area. This value includes any known long-term Forced Outages.
- C is a reliability adjustment reflecting the historical performance of combustion turbines.
- D is the Import Capability for the sub-area.
- E is the forecast load for the sub-area. For future days 7-14 the 50/50 Peak Load Exposure is multiplied by the sub-area percentage of the system load. For future days 1-6 the short-term daily peak load (based on forecasted weather) is multiplied by the sub-area percentage of the system load.
- F is the largest single source, which is defined as the largest available Generator in the sub-area during the period.
- G is an adjustment for Generators offering in excess of their CSO.

OP 5 APPENDIX A 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	02/01/05	Updated to conform to RTO terminology
Rev 2	03/02/05	Revised for compliance with the March 2 FERC Order
Rev 3	06/24/05	Renamed to Appendix A since former Appendix A has been terminated
Rev 4	06/02/06	Added how Locational Operable Capacity Margin is derived
Rev 5	10/01/06	Revised for ASM Phase II
Rev 6	12/11/09	<p>The following changes have been made to accommodate FCM and DRI</p> <ol style="list-style-type: none"> 1. Added a line item (G) to LTOCM, LOCM, STOCM and STLOCM calculation to reflect generator offers in excess of their Capacity Supply Obligation. 2. Added a Short-Term Locational Operable Capacity Margin calculation definition. 3. Changed all reference to Seasonal Claimed Capability to Capacity Supply Obligation. 4. Removed the June, July and August requirement that the LTOCM >0 MW. 5. Added language in the LOCM to include re-activations and new generation and DARD if they are included in the 3rd ARA. 6. Added language in the STOCM and STLOCM to define the load forecast used in the calculation. <p>Note: OP-5 Appendix A Revision 5 will remain effective in parallel with OP-5 Appendix A Revision 6 through 5/31/2010. Revision 5 applies to outages occurring before 6/1/2010 and Revision 6 applies to outages occurring on or after 6/1/2010.</p>
Rev 7	12/01/10	<p>Entire document, changed font to Arial, defined acronyms and used acronyms where applicable, minor editorial and format changes, added References section, titled major sections and added Table of contents, added uncontrolled disclaimer to 1st page footer and "Hard Copy is Uncontrolled" to each page footer, changed page number format to Page X of Y</p> <p>Replaced unplanned outage numbers with reference to the SOP where the data is located.</p>