SOP-RTMKTS.0050.0005
Determine Reliability Commitment for Real-Time

Contents

1. Objective

The intent of this procedure is to define the business process that is performed to determine which Generators need to be committed to meet system or local reliability concerns.

2. Background

ISO performs a Reserve Adequacy Assessment (RAA) and if necessary will commit Generators to meet system wide and/or local reliability requirements including:

- Voltage support (VSUL) or control (VSUH)
- 1st contingency transmission (TCU)
- 2nd contingency transmission (RMR)
- Special Constraint Resource (SCR)

Additional commitments for system-wide requirements are defined in SOP-RTMKTS.0050.0010 – Perform Reserve Adequacy Assessment. They include:

- Regulation
- Spinning Reserve
- Operating Reserve

3. Responsibilities

1. The Forecaster is responsible for:

   - Determining the reliability commitment to meet the following requirements:
     - Voltage support (VSUL) and control (VSUH)
     - 1st Contingency Transmission (TCU)
     - 2nd Contingency Transmission (RMR)
     - Special Constraint Resources (SCR)
   - Entering commitment information into the ISO Outage Scheduling software, the Forecast Daily Report and the Operations Event Logserver as applicable.

2. The Manager, Control Room Operations or designee is responsible for reviewing a sample of the Reliability Must Run (RMR) Calculation Worksheets on a Quarterly basis.

3. The Short-Term Outage Coordinator designated, as D1 is responsible for determining the Generation Requirements for Transmission (GRT) limits in accordance with SOP-OUTSCH.0030.0020 - Perform Short-Term Outage Coordination.

4. When any additional Generator/DARD is committed for reliability, the Generator Operator is responsible for notifying the Forecaster of the need to enter the appropriate Generator/DARD information (flag) in the ISO Outage Scheduling software.

4. Controls

- The Forecaster uses the most up-to-date GRT spreadsheet
- The Forecaster uses the most up-to-date Transmission Operating Guides (TOG) at: http://isoweb.iso-ne.com/satellite/transmission_procedures/
- The Forecaster uses the RMR Calculation Worksheet (Excel Spreadsheet)
- The Forecaster uses the APF/MOI Reliability Assessment Priority List Report

5. Instructions

5.1 Determine Eligible Generators for Reliability Commitment

NOTE

Generators that **do not** meet the criteria defined below, are not available to ISO New England (ISO) for commitment and dispatch under normal conditions. These units are identified in the SCRA FCM Compliance Report (available in the RAA software).

1. The Forecasters are authorized to commit Generators that meet one of the following:

   A. Generators that have a Capacity Supply Obligation (CSO) that is greater than zero MW.

      1) These Generators are eligible for commitment at the greater of the following:
         a. CSO (Monthly)
         b. Economic Minimum Limit (Eco Min)
         c. DAM offered Economic Maximum Limit (Eco Max), if greater than items in steps A. 1) a. and A. 1) b. above (known by 1200 for next Operating Day)

   B. Generators that do not have a CSO, hereafter known as Non-CSO Generators, can be eligible for commitment if the Generator:

      1) Did not clear energy in the Day Ahead Market (DAM) but has been offered as a Supplemental Availability Designation resource for the Operating Day.
         a. The Generator is available for commitment and dispatch for all hours of the operating day based on the Generator DAM offer, subject to modifications made during the Re-offer Period.

      2) Did not clear energy in the DAM but has been assigned a Forward Reserve Market obligation for any hour of the Operating Day.
         a. The Generator is available for commitment and dispatch for all hours of the operating day based on the Generator DAM offer, subject to modifications made during the Re-offer Period,

3) Did not clear energy in the DAM but is enrolled in the Schedule 2 VAR Cost Compensation Program.
   a. The Generator is **only** available for commitment to meet system or local reactive requirements (Voltage control/support) in accordance with:
      i. Section 5.5 - Determine RT Generator Commitment for Voltage Support / Control, and
      ii. Section 5.6 - Determine Generator Commitment for Local Transmission 1st Contingency, and
      iii. Section 5.7 - Determine Generator Commitment for Congestion Area 1st and 2nd Contingency

NOTE

A Generator may have an agreement with a TO/TOP to enable dispatch under certain conditions for reliability, however the Generator is under no obligation except as required under OP-4 Action 7.

4) Did not clear in the DAM but has been requested by the Transmission Operator or Local Control Center (LCC) to be committed as a Special Constraint Resource in accordance with Section 5.8 - Receive Requests to Commit Special Constrain Resources.
5) Did clear energy in the DAM for the Operating Day.
   a. The Generator is available for commitment and dispatch for all hours of the Operating Day based on the Generator DAM offer, subject to modifications made during the Re-offer Period.
6) Did Self Schedule (S/S) energy in the Real-time Market.
   a. The Generator is considered on-line and available for dispatch up to the offered Eco Max limit only for the hours the Generator is S/S.

5.2 Determine Time of Reliability Commitment

NOTE

Descriptions of settlement flags and flagging policy are contained in SOP-RTMKTS.0110.0015 - Flagging for RT Market Settlements.

1. The Forecaster shall normally begin assessment of local area commitment requirements for the next Operating Day when the Load Forecast is completed in accordance with SOP-OUTSCH.0040.0010 - Create Demand Forecast.

2. The Forecaster may advance the assessment time of local area commitment requirements when it is recognized that required Generators have long notification and start-up times.

3. The Forecaster shall finalize the commitment of Generators for Real Time (RT) during the RAA process in accordance with SOP-RTMKTS.0050.0010 - Perform Reserve Adequacy Assessment.

4. The Forecaster shall make modifications to reliability commitments throughout the Operating Day as required based on system conditions.

5.3 Verify Changes Due to Temporary, New or Updated Guides

1. When a temporary guide is issued, updated, or retired, as part of the Forecaster sign-off, the Forecaster shall enter any changes in generation requirements or restrictions associated with the temporary guide into the ISO Outage Scheduling software.

2. When a new text guide is issued or an existing guide is updated, or an existing text guide is retired, as part of the Forecaster sign-off, the Forecaster shall:

   - Incorporate any generation requirements or restrictions associated with the guide into Attachment A of this procedure
   - Enter any generation requirements or restrictions associated with the guide into the ISO Outage Scheduling software.

5.4 Determine Day-Ahead Supplemental Commitment

1. The Forecaster shall determine Generators needed to meet the real-time voltage control requirements as defined in the Transmission Operating Guides located at: http://isoweb.iso-ne.com/satellite/transmission_procedures/

2. The Forecaster shall include the RT voltage control/support reliability commitments in the ISO Outage Scheduling software for the DAM as follows:

   a) Reference Attachment A - Load/Generation Considerations to account for various load scenarios and special considerations.

3. If the RT requirement can be met by more than one combination of eligible Generators.

   a) No Generators will be identified on the Day Ahead Supplemental Commitment (DASC) report.

4. When the RT requirement can only be met by a unique set of eligible Generators (i.e., CSO and non-CSO as defined in Section 5.1), flag the Generator(s) as VSUH or VSUL in the ISO Outage Scheduling software for the DA Market.

NOTE

The DASC report contains the RT voltage control/support reliability commitments and is retrieved by the DA Market Administrator from the ISO Outage Scheduling software.

3. The Forecaster shall document reliability commitment data per Section 5.10

5.5 Determine RT Generator Commitment for Voltage Support/Control

NOTE

The actual process of flagging Generators is described in SOP-RTMKTS.0110.0015 - Flagging for RT Market Settlements.

1. The Forecaster shall conduct a review and determine the Generators that cleared in the DAM or S/S during the Re-Offer Period.

2. The Forecaster shall determine if additional Generators will be needed to meet the RT voltage control requirements as defined in the TOGs located at:

   http://isoweb.iso-ne.com/satellite/transmission_procedures/

3. If more than one eligible Generator is capable of meeting the voltage control requirement the Forecaster shall perform an economic analysis to determine the least cost eligible Generator(s) that can meet the requirement.

NOTE

A Generator committed to meet voltage guide requirements is flagged as VSUH or VSUL in the ISO Outage Scheduling software.

4. The Forecaster shall document the reliability commitment data per Section 5.10.

5.6 Determine Generator Commitment for Local Transmission 1st Contingency

1. The Forecaster shall conduct a review and determine the Generators that cleared in the DAM or S/S during the Re-Offer Period.

2. The Forecaster shall determine if additional Generators will be needed to support the RT local transmission maintenance schedule as defined in the individual transmission outage applications maintained in the ISO Outage Scheduling software.

> **NOTE**
>
> Transmission line maintenance may require Generators to be on-line to protect remaining in-service transmission elements for either thermal overload of the element (i.e., no settlement flag applied), or voltage reactive support to prevent voltage collapse (i.e., Flagged for VSUL).

3. If more than one eligible Generator is capable of meeting the local transmission 1st contingency requirement the Forecaster shall perform an economic analysis using the APFMOI Reliability Priority List to determine the least cost eligible Generator that can meet the requirement and:

   - If Generator commitment prevents a post-contingency thermal overload, flag the Generator as TCU in the ISO Outage Scheduling software
   - If Generator commitment prevents a post contingency voltage decline or collapse, flag the Generator as VSUL in the ISO Outage Scheduling software

4. The Forecaster shall document reliability commitment data per Section 5.10.

5.7 Determine Generator Commitment for Congestion Area 1st and 2nd Contingency

NOTE

Generators that are determined to be needed for Local Second Contingency Protection are flagged Reliability Must Run (RMR) for Settlements.

1. The Forecaster shall determine each Generator needed to meet the Real-Time congestion area 1st and 2nd contingency interface transfer limits for the following areas using the RMR Calculation Worksheet (Excel spreadsheet).
   - Boston
   - East-West
   - Connecticut
   - SW Connecticut
   - Norwalk-Stamford
   - Western Connecticut
   - Maine
   - North Western Vermont
2. The Forecaster shall enter the following interface limits into the Boston, East-West, Norwalk-Stamford, SW Connecticut, Western Connecticut, Connecticut, Maine, and North Western Vermont reserve zones:
   - N-1 Interface LRR limit
   - N-2 Generation Interface limit
   - N-2 Line Interface limit
3. The Forecaster shall enter the approved load shed value from the GRT Spreadsheet into the 2nd line analysis of the RMR worksheet.
4. The Forecaster shall enter Generators that cleared in the DAM or S/S during the Re-Offer Period into the RMR Calculation Worksheet (Excel spreadsheet).
5. The Forecaster shall enter any Local Second Contingency Commitment (LSCC) transactions that have been scheduled in the DAM and have been flagged as "capacity backed" as an addition to the Congestion Area load in the RMR Calculation Worksheet (Excel spreadsheet)

NOTE

If commitment is necessary to meet a 1st or 2nd contingency requirement, the Reliability Assessment Priority List is utilized to determine the least cost capacity to commit.

6. The Forecaster shall review and determine if 1st and 2nd contingency coverage is satisfied and perform the following:
   - If 1st and 2nd contingency coverage is satisfied no more Generators need to be committed.
   - If required to meet 1st contingency coverage, commit the required Generator(s) and perform the following applicable action:
     - If the commitment is made to meet a thermal interface limit, the Generator shall be flagged as TCU
     - If the commitment is made to meet a voltage reactive limit, the Generator shall be flagged as VSU (L or H as appropriate)
   - If required to meet 2nd contingency coverage, commit the required Generator(s) and perform the following applicable action:
     - If the commitment is made to meet a thermal interface limit, the Generator shall be flagged as RMR
     - If the commitment is made to meet a voltage reactive limit, the Generator shall be flagged as VSU (L or H as appropriate) and RMR
7. The Forecaster shall save the RMR Spreadsheet to the Forecast Folder "SavedCapAnalysis" for later review.
8. The Forecaster shall also commit any eligible Generators needed for 2nd contingency coverage for any other local areas not covered by the RMR Calculation Worksheet, based on special studies performed in accordance with SOP-OUTSCH.0050.0020 - Perform Complex Studies and:
   - If commitment is made to meet a thermal interface limit, the Generator shall be flagged as RMR
   - If the commitment is made to meet a voltage reactive limit, the Generator shall be flagged as VSU (L or H) and RMR

9. The Forecaster shall document reliability commitment data per Section 5.10.
10. If the Short-Term Outage Coordinator, designated as D1, changes the transfer limit for any of the nine congestion areas (listed in Step 5.7.1), the Forecaster shall return to Step 5.7.2 and go through the process until 1st and 2nd contingency coverage for each area is satisfied and the transfer limit is accurate for the scheduled Generators.

5.8 Receive Requests to Commit Special Constraint Resources

NOTE

Requests for Special Constraint Resources (SCRs) may be received by Control Room System Operators prior to being passed on to the Forecaster.

1. The Forecaster shall receive eligible Generator commitment requests for SCRs from Transmission Owner or Distribution Companies.

   - If ISO would have committed the eligible Generator for a reliability requirement other than that requested by the Transmission Owner/Distribution Company, the SCR flag shall **be removed** / **not applied** and the appropriate commitment flag, if any, shall be entered in the ISO Outage Scheduling software.
   - If the Transmission Owner/Distribution Company commitment request for SCR displaces a lower cost eligible Generator that would have been committed to meet a non-SCR reliability requirement, the SCR flag shall **be entered** into the ISO Outage Scheduling software

2. If the request comes from a LCC or is received by the Control Room System Operators, the Forecaster shall ensure the Transmission Owner or Distribution Company concurs prior to entering the SCR flag into the ISO Outage Scheduling software.

3. After reviewing and accepting such requests, the Forecaster shall document reliability commitment data per Section 5.10.

5.9 Request Reliability Energy

1. When OP-4 Action 7 is forecast for a future hour (or hours), the Forecaster shall review anticipated OP-4 Actions with the Operations Shift Supervisor prior to issuing a request for Reliability Energy.

   a) When the Forecaster and Operations Shift Supervisor agree that OP-4 Action 7 will be necessary to maintain 10 minute reserve, the Forecaster shall call the units listed on the FCM compliance report that are required to satisfy the anticipated deficiency and specify the hours for the requested NON-CSO MWs.

2. When OP-4 Action 7 is declared in Real-Time, the Senior System Operator shall use the Emergency Notification System (ENS) software to request Generators voluntarily make available physical capability not subject to a CSO.

5.10 Document Reliability Commitment

NOTE

Flags are assigned by Reliability Regions but are selected by Dispatch Zone in the ISO Outage Scheduling software. Refer to Attachment B for correlation information to be used to flag a Generator for a Settlement Reliability Region.

1. For all **Day-Ahead** reliability commitments the Forecaster shall enter a Day Ahead application into the ISO Outage Scheduling software that includes the following information:
   - The Generator name
   - The hours the Generator is committed
   - The commitment reason: VSUH or VSUL
   - A Dispatch Zone that correlates to the applicable Reliability Region
   - As necessary, add text comments to clarify any operating restrictions.

2. For all **Real-Time** reliability commitments the Forecaster shall enter a Real Time application into the ISO Outage Scheduling software that includes the following information:
   - The Generator name
   - The hours the Generator is committed
   - The commitment reason: VSUH, VSUL, SCR, or RMR
   - A Dispatch Zone that correlates to the applicable Reliability Region
   - As necessary, add text comments to clarify any operating restrictions.

3. For each reliability commitment, enter the following information in the Operations Event Log:
   - Generator name
   - Commitment reason code (VSUH, VSUL, SCR or RMR)

4. As necessary, enter each Generator committed for reliability reasons in the Reserve and Scheduling Commitment (RSC) case (or subsequent SCRA cases) in accordance with SOP-RTMTKS.0050.0010 - Perform Reserve Adequacy Assessment.

5.11 Review RMR Calculation Worksheet

1. Each Quarter the Manager, Control Room Operations (or designee) shall select a random sampling of RMR Calculation Worksheets for review.

2. The Manager, Control Room Operations (or designee) shall:

   A. Review the RMR Calculation Worksheets for accuracy and selection of correct Generator to provide 1st and 2nd contingency coverage as described in Section 5.6 above

   B. Document any problems found and corrective action taken.

6. Performance Measures

- A random sampling of RMR calculation worksheets are reviewed quarterly and corrective actions are taken

7. References

ISO New England Operating Procedure No. 4 - Action During a Capacity Deficiency (OP-4)

ISO New England Operating Procedure No. 12 - Voltage and Reactive Control, Appendix A - Voltage and Reactive Documents in the ISO New England Transmission Operating Guides

OP-OUTSCH.0030.0020 - Perform Short-Term Outage Coordination.

SOP-OUTSCH.0040.0010 - Create Demand Forecast

SOP-OUTSCH.0050.0020 - Perform Complex Studies

SOP-RTMTKS.0050.0010 - Perform Reserve Adequacy Assessment

SOP-RTMKTS.0110.0015 - Flagging for RT Market Settlements

8. Revision History

Rev. No.	Date	Reason	Contact
0	1/07/04	Original	Joe Mercer
1	01/18/05	Revised to clarify RMR flag and 1st and 2nd contingency coverage commitment, changed procedure owner. Identified TRAGO as RT-TRAGO	Seamus McGovern
2	02/01/05	Updated SOP for RTO terminology	Seamus McGovern
3	03/09/05	Revised to clarify RMR/SCR/VAR NOTE	Seamus McGovern
4	06/02/05	Revised to reflect new flagging process, revised procedure name.	Seamus McGovern
5	09/30/05	Revised to address Forecast Audit. Added saving RMR calc worksheet. Added section for Supervisor review of RMR calc worksheets.	Seamus McGovern
6	05/05/06	Updated for Control Room Forecaster Split	Steve Weaver
7	06/05/06	Revised to remove step to document DA reliability commitment for voltage control with a unique set of resources from section 5.3 (in 5.2). Added step to include RMR units determined by special studies	Steve Weaver
8	06/21/06	Revised to include changes to the SAM Db	Steve Weaver
9	10/01/06	Revised for ASM Phase II	Steve Weaver
10	04/04/07	Added Attachment for information on commitments for reliability and revised as part of annual review	Steve Weaver
11	05/17/07	Revised data entries made during Real-Time reliability commitments	Steve Weaver
12	09/14/07	Clarified flagging documentation	Steve Weaver
13	04/28/08	Various grammatical and terminology changes Add Western Connecticut to steps 5.5.1&5.5.2 Delete the following table rows in ATT A: 1st Any Load; 21,600 MW;24,600 MW;27,000 MW	Steve Weaver
14	06/06/08	Added new Section 5.2 directing actions for dealing with new, revised, & temporary TOGs/Text Documents; added new step 5.6.3 to include directions concerning Load Shed and Demand Response values from GRT to be input to RMR worksheet; added TOGs Text documents to References	Steve Weaver

Rev. No.	Date	Reason	Contact
15	07/01/08	Corrected reference to perform actions in step 5.8 in various locations. Added new step 5.8.1 providing direction for the Forecaster to notify settlements when a Resource is committed in the DASC for high voltage control. Deleted NOTES that were in step 5.8.1. Minor editorial changes.	Steve Weaver
16	11/25/08	Changed "Review Due Date" to "Valid Through: mm/dd/yyyy (24 months from effective date) " Changed step 5.5.2 from "…maintained in Outage Scheduler database." To "maintained in the ISO Outage Scheduling software." Steps 5.6.1 and 5.6.2 added Maine, & North Western VT Step 5.6.10 changed congestion areas to 9 and listed step to 5.6.1 References added NVI Limit Guide	Steve Weaver
17	03/16/09	Added ,12,000 MW row to Attachment A	Steve Weaver
18	11/25/09	2nd bullet of Step 5.6.1. and 5.6.2 deleted Lower Southeast Mass; References Section, deleted Lower Southeast Massachusetts Area Operations Guide, Cape Cod Low Voltage Guide, & duplicate version of SOP-RTMKTS.0050.0010; Attachment A deleted the ,11,000 MW and 25,000 MW rows	Steve Weaver
19	06/01/10	Added the Forecast Daily Report to Section 3 2nd bullet; Added new Section 5.1 Determine Eligible Generators for Reliability Commitment; Changes to the following Sections to reflect reliability commitment of eligible generators (including new section numbers): 5.4, 5.5, 5.6, 5.7, 5.8 and 5.10; Added a new Section 5.9 Requesting Reliability Energy	Steve Weaver
20	07/28/10	Replaced Steps 5.9.1 and 5.9.2	Steve Weaver
21	08/31/10	Deleted section 5.7.3 2nd bullet	Steve Weaver
22	01/06/11	Updated Header copyright date; Update for replacement of the SAM Db with the ISO Outage Scheduling software.	Steve Weaver
23	02/23/11	Globally make minor editorial and grammar changes; Inserted 5.1.B.3 to define commitment eligibility for Non-CSO generators that are enrolled in the Schedule 2 VAR CC Program Added new NOTE prior to Step 5.1.1.B.4); Modified 5.1.B.4 to permit TO or LCC to request Non-CSO Generators to be committed as a Special Constraint Resource (SCR); Modified step 5.7.3; Modified step 5.7.11 Deleted step 5.10.B.1.1), 2) & 3) and made sup-steps 5.10.1.B part of step 5.10.1; Modified Section 9 references Attachment A updated 4th line MW value & 5th line MW value	Steve Weaver

Rev. No.	Date	Reason	Contact
24	11/03/11	Biennial review by procedure owner; Header updated Procedure Owner; Global replaced title of Short Term Outage Specialist with Short Term Outage Coordinator; Added new step 3.4; Modified sub-Step 5.1.1.B.4); Modified step 5.5.1; Modified step 5.6.1; Globally replaced self schedule with S/S; Grammar changes in Step 5.7.1 through 5,,; Modified step 5.7.6 by rewording and adding 2 new NOTES and last sub-bullet replaced VSUL with VSU (L or H as appropriate) Deleted Step 5.7.10, renumbered following step; Added new NOTE prior to Step 5.8.1 2nd bullet; Step replaced Local Control Center with LCC; Section 5.8 step 5.8.1 2nd bullet deleted last phrase ; Section 5.10 added new NOTE, modified steps 5.10.1 & bullets, 5.10.2 and 5.10.4; Modified former steps 5.11.2 & 5.11.3 to make these steps into one step with 2 sub-steps; Section 6 added "A random sampling…" Attachment A change is CONFIDENTIAL	Steve Gould

9. Attachments

Attachment A - Load/Generation Considerations (Confidential)

Attachment B - Correlation of Dispatch Zones to Settlement Reliability Regions

Attachment A - Load/Generation Considerations (Confidential)

The information contained in this Attachment is Confidential.

Attachment B - Correlation of Dispatch Zones to Settlement Reliability Regions

The ISO Outage Scheduling software only lists Dispatch Zones. Settlements use Settlement Reliability Regions, not Dispatch Zones. To flag a Generator for a Settlement Reliability Region, one of the associate Dispatch Zones is selected in ISO Outage Scheduling software and the flag for the appropriate Reliability Region will be transferred to Settlements.

For example: To flag a Generator as RMR for ME, select any one of the following Dispatch Zones: Bangor Hydro, or Maine, or Portland Maine in the ISO Outage Scheduling software and Settlements will see that Generator flag as RMR for ME

Table 1

ISO Outage Scheduling software Dispatch Zones	Settlements Reliability Regions
Eastern CT Northern CT Norwalk-Stamford Western CT	CT
Bangor Hydro Maine Portland Maine	ME
Boston North Shore	NEMASS & B
New Hampshire Seacoast	NH
Rhode Island	RI
Lower SEMA SEMA	SEMASS
Northwest Vermont Vermont	VT
Central MA Springfield MA Western MA	WCMASS