

# *Transmission and Dispatching Operations Manual*

*April 2016*

---

### 3.1.3 Reserve Calculation

The NYISO monitors NYCA reserve every five minutes (Reserve Monitor Program using actual generation). These reserve calculations indicate the reserve available for the NYCA. Corrective action is taken by the NYISO only if the NYCA is deficient in reserve. Reserve calculations and constraints are also performed by RTC and RTD.

#### ***Minimum Operating Reserve Requirement***

The Minimum Operating Reserve Requirement of the NYCA is defined as:

1. Sufficient Synchronized Reserve Available in 10 minutes to replace one-half of the operating capability loss caused by the most severe contingency observed

under Normal Transfer Criteria multiplied by the contingency reserve adjustment factor.

2. Sufficient Reserve Available in 10 minutes (which includes synchronous reserve available in 10 minutes) to replace the operating capability loss caused by the most severe contingency observed under Normal Transfer Criteria multiplied by the contingency reserve adjustment factor.
3. Sufficient Reserve Available in 30 minutes (which includes reserve available in 10 minutes) equal to one and one-half times the operating capability loss caused by the most severe contingency observed under Normal Transfer Criteria.
4. Sufficient Reserve in 10 minutes to return the system to a Normal State following the most severe transmission contingency multiplied by the contingency reserve adjustment factor.

At all times sufficient 10 Minute Reserve shall be maintained to cover 1) the energy loss due to the most severe Normal Transfer Criteria contingency within NYCA or 2) the energy loss associated with recallable import transactions from another control area, whichever is greater.

### 3.1.6 Response to Normal State Conditions

#### ***NYISO Actions***

The NYISO shall monitor NYS Power System conditions at all times, and determine and apply the applicable actions listed below that are necessary to remain in the Normal State:

1. Coordinate actions with TOs and other Control Areas.
2. Initiate one or more of the following actions:
  - a. Adjust phase angle regulators.
  - b. Shift or start generation by NYISO request to obtain additional reactive power (MVar) control.
  - c. Activate reserves.
  - d. Adjust reactive sources and transformer taps.
  - e. Perform Generation shifts.
  - f. Modify Interchange Schedules.
  - g. Request NYS Transmission System facilities that are out of service for maintenance to be returned to service.
  - h. For high voltage conditions only, request NYS Transmission System facilities that are in service to be removed from service where appropriate.
  - i. Implement manual voltage reduction.
  - j. May call for a reserve pickup to return to schedule if the NYISO Area Control Error exceeds 100 MW.
  - k. Take actions to maintain operating reserve, in accordance with the procedures described in this Manual.

#### ***Transmission Owner Actions***

NYISO operational contact is generally with the TO. The TOs are responsible for controlling or coordinating the operation of Generators connected to their systems, as follows:

1. Coordinate and implement corrective actions, as requested by the NYISO Shift Supervisor.
2. Monitor conditions with respect to their own systems.

3. Perform the following actions when the NYCA is operating in the Normal State and Normal State Criteria are not met:
  - a. Notify the NYISO Shift Supervisor.
  - b. Request assistance from the NYISO Shift Supervisor, as required.
  - c. Initiate unilateral corrective action, if the violation is severe enough to require immediate action.

**Other Considerations**

1. All schedule changes should be analyzed in advance of implementation in an effort to avoid violation of the Normal State criteria.
2. The NYISO shall dispatch the system such that the removal of any facility for scheduled work will not result in the violation of these criteria in the Normal State. Transmission Owners are responsible for providing appropriate advance notice of such switching.
3. During periods when adverse conditions such as tornadoes or hurricanes exist, or are forecast to occur within the service area of the NYISO Systems, it may be necessary to take steps in addition to those procedures normally followed to maintain system security.
4. It is the responsibility of the NYISO to monitor weather conditions and forecasts issued by the National Weather Service. Should local adverse conditions occur or if they are predicted to occur, it is the responsibility of the TO to inform the NYISO. If a situation involving impending severe weather exists, the NYISO shall notify all TOs and consider declaration of the Alert State.
5. The actual voltage on all busses listed in [Table A.2](#) and [Table A.3](#) shall be monitored by the NYISO and TOs. It shall be the TO responsibility to maintain voltage levels within limits specified in [Table A.2](#) and [Table A.3](#) and to coordinate actions, which would affect voltage levels on busses of other TOs or Neighboring Systems.

If the NYISO anticipates conditions, which would cause the voltage at any bus listed in [Table A.2](#) and [Table A.3](#) to violate Normal State Criteria, the NYISO shall notify the TOs, and together they shall formulate a corrective strategy. If implementation of the corrective strategy does not produce the desired result, and the NYISO determines that further corrective action is necessary to remain in the Normal State, the NYISO shall request such actions in accordance with Normal State Responses. TOs must coordinate and implement corrective actions as requested by the NYISO.

6. It may be necessary to schedule energy transactions from neighboring control areas for reliability reasons in accordance with Interconnection Agreements.

### 3.1.7 Response to Warning State Conditions

#### ***NYISO Actions***

The NYISO shall monitor system conditions at all times and determine the action(s) listed below that are necessary to return the system to the Normal State:

1. Coordinate actions with TOs and other Control Areas.
2. Initiate one or more of the following actions:
  - a. Adjust phase angle regulators.
  - b. Shift or start generation by NYISO request to obtain additional reactive power (MVar) control.
  - c. Activate reserves.
  - d. Adjust reactive sources and transformer taps.
  - e. Perform Generation shifts.
  - f. Modify Interchange Schedules.
  - g. Request NYS Transmission System facilities that are out of service for maintenance to be returned to service.
  - h. For high voltage conditions only, request NYS Transmission System facilities that are in service to be removed from service where appropriate.
  - i. Implement manual Voltage Reduction.
  - j. May call for a reserve pickup to return to schedule if the NYISO Area Control Error (ACE) exceeds 100 MW.
  - k. Take actions to maintain operating reserve, in accordance with the procedures described in this Manual.
  - l. Curtail non-essential TO and Generation Owner load.
  - m. Order Generation to full operating capability.
3. Take the following actions if the above measures are insufficient to comply with Normal Transfer Criteria within 30 minutes or Operating Reserve cannot be delivered due to transmission limitations for 30 minutes:
  - a. Notify all TOs, via the Hotline communications system, that Emergency Transfer Criteria are in effect for the facility (ies) involved.
  - b. Take actions, as required, to stay within Emergency Transfer Criteria.
  - c. Confer with TOs that will have Post-Contingency loading or voltage conditions that exceed allowable limits. Jointly develop strategies to be followed in the event a contingency occurs, including preparation for a rapid Voltage Reduction and/or Load Shedding.
4. If following the implementation of the actions listed above all Normal State criteria cannot be achieved, satisfy as many of the Normal State criteria as possible.

#### ***Transmission Owner Actions***

Transmission Owners shall perform the following actions:

- a. Coordinate and implement corrective actions, as requested by the NYISO Shift Supervisor.
- b. Monitor conditions with respect to their own systems.
- c. Perform the following actions when the NYCA is operating in the Warning State and Warning State Criteria are not met:
- d. Notify the NYISO.
- e. Request assistance from the NYISO, as required.
- f. Initiate unilateral corrective action, if the violation is severe enough to require immediate action.

***Other Considerations***

1. For all contingencies that would result in a violation of the Warning State criteria, corrective action that would be necessary if the contingency occurs shall be determined through coordination between the NYISO and the affected TO.
2. If the NYISO foresees an extended period of operation in the Warning State, a canvass of the TO Systems shall be made to determine if assistance can be provided.
3. If the situation involving impending adverse conditions exists, the NYISO shall notify all TOs and consider declaration of the Alert State.

### 3.2 Daily Operation for Monitoring Operating Reserve

The NYISO Shift Supervisor will monitor the Operating Reserve both as forecast for the expected system peak each day and under actual conditions as the day progresses.

#### ***Peak Load Forecast***

The NYISO Shift Supervisor (or designee) shall prepare the NYISO daily status report twice daily, in anticipation of the morning peak and evening peak as indicated in this Manual.

If a shortage of energy, reserves, or Ancillary Services is projected, the NYISO will take actions as directed in the *NYISO Emergency Operations Manual*, available from the NYISO Web site at the following URL:

[http://www.nyiso.com/public/markets\\_operations/documents/manuals\\_guides/index.jsp](http://www.nyiso.com/public/markets_operations/documents/manuals_guides/index.jsp)




### 6.3.7 Locational Reserves

Operating reserves will be locationally priced and the locational reserve requirements will be determined by the NYISO. There are locational reserve requirements for the NYCA, the Eastern New York area, the Southeastern New York area, and the Long Island area.

Reserves are scheduled as part of each RTD run and are co-optimized, nominally every five minutes, along with energy and regulation schedules. These reserves may be converted to energy in any normal dispatch or during a Reserve Pickup and replacement reserves scheduled on other available resources. During a reserve pickup event, dispatchable suppliers will be dispatched upward at the higher of their normal response rate curve or their emergency response rates. During a Reserve Pickup, the NYISO will notify the TOs, who in turn will notify dispatchable resources that a Reserve Pickup is taking place. A RPU “flag” will be sent with the basepoints via ICCP.

With respect to 30-minute Reserves, Reserve Pickup will dispatch 30-minute Spinning Reserve Upward but not 30-minute non-synchronized Reserve. This would be done at the next RTC execution or through a Supplemental Resource Evaluation (SRE).

### 6.3.8 Reserve Comparator

The Reserve Comparator (RC) function executes nominally every five minutes and resides on the on-line EMS to track actual system reserves and system reserve requirements. The purpose of the RC program is to monitor the locational reserves and capability in the real time system and for interchange evaluation in the NYCA. RC monitors NYCA reserves in three categories: 10-minute synchronous reserve, total 10-minute reserve, and total 30-

minute reserve. Currently it also calculates the reserves and capability from units and transactions for each Zone and the NYCA.

### 6.3.9 Reserve Calculations

The following reserve calculations are implemented for the LBMP Market:

1. Reserves are calculated on a locational basis.
2. There are reserve requirements for each of the locational reserve areas with the appropriate alarming.
3. Non-synchronous reserve can only be counted on units that have an accepted bid and have been committed for non-synchronous reserve. This applies for both 10-minute and Operating Reserve.

All dispatchable (on-line) units are counted towards 10-minute synchronous reserve, whether or not they have an accepted reserve availability bid.

### 6.3.10 Simultaneous Activation of Reserves

The Simultaneous Activation of Reserves (SAR) is a mutual agreement among the following participating areas to provide 10-minute reserve assistance:

- Ontario
- New England/New Brunswick
- NYISO
- PJM

The NYISO acts as the central coordinator for the SAR procedure and will ensure that SAR allocations assigned to the participating areas are within their response capabilities. The SAR allocation for an area is the additional amount of energy it is assigned to provide in response to a SAR request.

#### **Procedure**

The following is a summary of the SAR procedure, which is described in greater detail in the [NPCC Regional Reliability Directory#5 Section 5.8 and Appendix#4 \(December 2, 2010\)](#).

1. **Preliminary Reserve Assignment:** On a continuing basis, Maritimes, ISO-NE, Ontario, and PJM dispatchers shall keep the NYISO informed of the largest, single generation or energy purchase contingency on their respective system and changes thereof.  
  
Information pertaining to an Area's inability to participate, reserve limitations (such as "bottled" reserve or reserves used to deliver economy energy sales) and transmission limitations shall be reported to Maritimes, ISO-NE, Ontario, and PJM by the NYISO Shift Supervisor as those conditions arise.
2. **Notification of Contingency:** Immediately following a sudden loss of generation or energy purchase in the Maritimes, ISO-NE, NYISO, Ontario, or

PJM, the Area experiencing the loss (Contingency Area) shall indicate whether SAR is being requested and report the following information to the NYISO via the interregional direct telephone lines:

- Name of generation or purchase lost.
- Total number of megawatts lost.
- Time that contingency occurred (time zero T+0).
- Any transmission or security problems within the Contingency Area that affect SAR allocations to Assisting Areas.

3. **Activation of Reserve:** After receiving notification of the SAR request and the specific contingency, the NYISO Shift Supervisor shall:

- Determine each Area's SAR allocation in accordance with NPCC Regional Reliability Directory#5 Section 5.8 and Appendix#4 (December 2, 2010).
- By the direct inter-Area telephone lines, immediately inform each Area of its SAR allocation, the time that the schedule change is effective, and the time that the contingency occurred.

The SAR allocation shall become part of the interchange schedule and shall be implemented immediately following notification.

4. **Provision of Reserve Assistance:** Assisting Areas shall respond as quickly as possible, assuming the same obligation as if the contingency occurred within its Area. Assisting Areas shall complete a report that documents the Reserve Assistance provided.

The Contingency Area shall initiate immediate action to provide its share of reserve to recover from the generation or energy purchase loss, prepare for the replacement of the reserve assistance assigned to assisting Areas, and proceed to re-establish 10-minute reserve at least equal to its next largest contingency.

5. **Termination of Simultaneous Reserve:** As soon as the Contingency Area has provided its SAR allocation, it will notify the NYISO. The NYISO shall establish a conference call between all participating Areas and confirm the time that the assistance shall be terminated. Revised interchange schedules will be mutually established as required to ensure that the Assisting Areas properly recall assistance. The Contingency Area shall replace the reserve assistance assigned to assisting Areas in a manner consistent with mutually established interchange schedules.

In the event that a Contingency Area is not prepared to replace the remaining portion of its reserve obligation within time zero + 30 minutes, the Contingency Area shall arrange for additional assistance in accordance with applicable policies and agreements covering interchange and emergency assistance.

In the event that the security of an Assisting Area becomes jeopardized, that Area may cancel all or part of its allocation by notifying the NYISO, which will then request the Contingency Area to pick up the required additional amounts of reserve. The Contingency Area shall complete a report that documents the recovery provided for the contingency.

6. ***Subsequent Contingencies:*** In the event that a subsequent loss of generation or energy purchase, regardless of the size of the contingency, occurs during the period when a reserve pick-up is in progress, the second Contingency Area may, at its discretion, withdraw assistance and request the NYISO to reallocate the assistance in accordance with the provisions of this simultaneous activation of reserve procedure.

Upon such notification, the NYISO will notify the first Contingency Area of the amount of withdrawal. Both Contingency Areas will immediately enter new interchange schedules that reflect the loss of the assistance, using a zero time ramp.

In the event that the second Contingency Area experiences a contingency that qualifies for simultaneous activation of reserve, the NYISO will allocate assistance from the remaining Assisting Areas in accordance with this procedure, upon the request of that Area.

If the second contingency occurs in the Area that has incurred the first contingency, that Area may request assistance, in accordance with this procedure, regardless of the size of the contingency.

7. ***Disturbance Control Standard (DCS) Reporting of Simultaneous Activation Reserve Events:*** The evaluation of DCS compliance for an Area shall utilize the NERC Disturbance Recovery Period applicable at the time of the reportable event (15 minutes). The evaluation of compliance for the purpose of determining Area synchronized reserve requirements shall utilize a recovery period established by the NPCC (15 minutes).

### ***NYISO Operator Action***

The NYISO Operator interacts with SAR as follows:

1. The NYISO Operator calls up the SAR display and enters the following information:
  - Neighboring SAR area
  - MW amount of SAR
  - Activation (Immediate) or Termination (Immediate or Scheduled Time)
2. When a SAR is activated, the SAR MW value shall immediately take on the Operator entered SAR MW amount, regardless of any existing SAR value or if termination was already in progress,
3. When a SAR is terminated, the current (or scheduled) SAR value shall be ramped to zero over a 10-minute period, even if termination was already in progress.
4. SAR MW values are automatically converted to 1-minute values for input to the RTD/RTD-CAM and AGC programs.
  - RTC will not have a direct SAR MW input.
  - AGC will record the application of the SAR MW inputs.