

# *Emergency Operations Manual*

*July 2016*

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## 4.4 Operating Reserve Deficiency

### *Daily Operation*

It is the responsibility of the NYISO to monitor Operating Reserve, both in a forecasted mode for the expected system peak for the day- ahead, in day, and as the day progresses.

### Shortage Operating Reserve – Day-Ahead Forecast

If the Security Constrained Unit Commitment (SCUC) program indicates that NYISO will be short of Operating Reserves in the DAM, or if SCUC has already been completed and conditions then change such that the forecast indicates there will be an Operating Reserve deficiency, the NYISO will determine the action(s) listed below that are necessary:

In all of the following steps where additional capacity resources are being evaluated, the NYISO shall determine if each step is sufficient to eliminate the deficiency. In addition, all notifications made to TOs shall include approximate next-day starting time and duration associated with each curtailment step.

1. Initiate an e-mail to all Market Participants requesting additional (bids) generation for the specific category required.
2. Perform a Supplemental Resource Evaluation (SRE) Request from the Market Information System (MIS) database of unaccepted/uncommitted bids for additional Reserve for the hours specified and commit/schedule the generation.
3. Determine the amount of energy available from external NYCA Installed Capacity (ICAP) providers that were not selected in the DAM. Count energy associated with these ICAP providers from other Balancing Authorities to NYCA and NYISO Operating Reserve. Advise the affected external Reliability Coordinator accordingly.
4. Count energy associated with external energy sales by NYCA ICAP providers as NYISO Operating Reserve. Advise the affected external Reliability Coordinator accordingly.
5. Notify NYISO Stakeholder Services of predicted day-ahead system conditions.
6. Direct the TOs to notify the appropriate Market Participants to be prepared for the potential dispatch to UOLe for the next day.
7. Notify the appropriate Market Participants to prepare to make Special Case Resources (ICAP) resources available for the next day and count expected relief.
8. Notify the appropriate Market Participants to prepare to make the EDRP resources available for the next day and count expected relief.
9. Initiate an Emergency Energy Alert in accordance with NERC Standard EOP 002 for the next day via the RCIS; follow NPCC notification requirement, and notify NYISO External Affairs, PSC, and the NYS Department of Environmental Conservation (DEC).
10. Request the TOs to prepare to curtail non-essential company loads for the next day and to notify appropriate Market Participants to prepare to curtail non-essential company load for the next day.
  - Request the TOs to notify interruptible customers in accordance with contractual agreements to prepare to make interruptible load available for curtailment for the next day.
  - Request the TOs with Manual Voltage Reduction equipment to prepare to initiate procedures to reduce voltage by 5% for the next day.
  - Request the TOs to contact large industrial and commercial customers to request voluntary curtailment of load the next day.
  - Request the TOs to make general radio and TV appeals to the public to request voluntary curtailment of electric power.
11. Count Load Relief that can be implemented within 10 minutes using Quick Response Voltage Reduction as NYISO 10-minute reserve.

#### 4.4.1 Shortage Operating Reserve New York City – Day-Ahead Forecast

##### ***New York State Reliability Council Reliability Rules***

I-R2. Locational Reserves (New York City) Sufficient *ten (10) minute operating reserves* shall be maintained in the New York City (NYC) *zone* as follows:

- a. The *ten (10) minute operating reserve* for NYCA shall be determined in accordance with Reliability Rules.
- b. A percentage of the *ten (10) minute NYCA operating reserves* equal to the ratio of the NYC *zone peak load* to the statewide peak Load shall be required to be selected from *resources* located within the NYC *zone*.
- c. NYC *zone ten (10) minute operating reserves* shall be maintained at all levels of dispatch, except as necessary to alleviate *emergency* conditions.

SCUC produces a daily report provided to the NYISO which indicates if the NYC zone is deficient in 10-Minute Reserve. The report is distributed with the daily SCUC documents within the NYISO. In the event that the NYISO sees a deficiency, the NYISO will notify Consolidated Edison of the operating day and hours that SCUC indicates a shortage of NYC 10-Minute reserve.

Actions that may be taken to establish NYC reserves for the hours of the deficiency:

- Initiate an SRE request e-mail soliciting bids for 10-Minute Reserve or energy for the hours deficient in NYC reserve.
- Determine if neighboring Reliability Coordinators have sufficient reserve and energy to support transaction to NYCA so that NYC reserves can be reestablished.
- Once bids are received, contact Consolidated Edison and have them SRE any additional units necessary to meet requirements.
- In the case there are insufficient bids to meet the NYC reserve requirement, make appropriate notifications to SCR and EDRP resources for the operating day in the NYC Zone to allow these resources to be counted.
- If the actions above do not satisfy the NYC reserve requirement, notify Consolidated Edison that Voltage Reduction is being counted to meet the NYC reserve requirement.

#### 4.4.2 Shortage Operating Reserve – In Day

The NYISO will monitor the total operating capacity in day. The NYISO shall prepare the NYISO daily status report twice daily in anticipation of the morning peak and evening peak load. If deficiency in Operating Reserves is still forecasted, or if Real-Time Commitment (RTC) forecasts a shortage of reserve or energy for the next hour, the NYISO will take the steps not taken in the DAM that time permits to meet reserve requirements. Additionally, the NYISO will take any or all of the following actions as required based on the category of Operating Reverse Shortage:

In all of the following steps where additional capacity resources are being evaluated, the NYISO shall determine if each step is sufficient to eliminate the deficiency. In addition, all notifications made to TOs shall include approximate starting time and duration associated with each curtailment step.

1. Initiate an e-mail to all Market Participants requesting additional (bids) generation for the specific category required.
2. Perform an SRE Request from the MIS database of unaccepted/uncommitted bids for additional Reserve for the hours specified and commit/schedule the generation.

**Declare Warning State**

1. Determine the amount of energy recallable from external ICAP resources that was not selected in the DAM. Count energy available from external NYCA ICAP providers from other Reliability Coordinators to NYCA as NYISO Operating Reserve. Advise the affected Reliability Coordinators accordingly.
2. Count energy associated with exports from NYCA to other Reliability Coordinators by NYISO ICAP providers as NYISO Operating Reserve. Advise the affected Reliability Coordinators accordingly.
3. Notify NYISO Special Case Resources (ICAP) that they are counted toward NYISO Operating Reserves, and may be required to be activated during a specified period of time. (Estimated start and end time as announced.)
4. Notify EDRP participants that they are counted toward NYISO Operating Reserves, and may be requested to be activated during a specified period of time. (Estimated start and end time as announced.)
5. Notify NYISO Market Relations of predicted system conditions.
6. Notify the Market Participants to be prepared for the potential of using UOLe operation for the day and direct all Market Participants to follow basepoints.
7. Initiate an Emergency Energy Alert in accordance with NERC Standard EOP 002 for today via the Reliability Coordinators Information System (RCIS); Notify natural gas pipelines via notification requirements, follow DOE and NPCC notification requirements, notify NYISO External Affairs, PSC, and DEC.
8. Notify Market Participants to activate Special Case Resources (ICAP) to start at XXXX hrs and end at XXXX hrs.
9. Notify Market Participants to activate EDRP to start at XXXX hrs and end at XXXX hrs.

**Declare Alert State**

1. Request the TOs, via Emergency Hot Line, to curtail non-essential company loads and to notify appropriate Market Participants to curtail non-essential company loads.
  - Request the TOs, via Emergency Hot Line, to curtail interruptible customers in accordance with contractual agreements.
  - Request the TOs with Manual Voltage Reduction equipment, via Emergency Hot Line, to begin procedures to reduce voltage by 5%.

- Request the TOs, via Emergency Hot Line, to contact large industrial and commercial customers to request voluntary curtailment of load.
  - Request the TOs, via Emergency Hot Line, to make general radio and TV appeals to public to request voluntary curtailment of electric power.
2. Count Load Relief that can be implemented within 10 minutes using Quick Response Voltage Reduction as NYISO 10-minute reserve.

#### **4.4.3 Shortage Operating Reserve – Real Time**

The NYISO will monitor the total Operating Reserve using the reserve monitor programs. If an operating shortage occurs, the NYISO will count SCR and EDRP available from prior notification and take any of the following steps that have not already been taken. Additionally, the NYISO will take any or all of the following actions as required based on the category of reserve shortage:

##### ***Following a Contingency***

*Based on the New York State Reliability Council rules:*

Following a *contingency*, the *ten (10) minute operating reserve* shall be restored within thirty (30) minutes of the time that the *contingency* occurred or sooner if possible.

##### ***A Non-Contingency Based Shortage***

*Based on NPCC policy:*

Each *Area* shall restore its *ten-minute reserve* as soon as possible, and within 90 minutes if it becomes deficient and the deficiency is not a result of a contingency that is a *reportable event*.

Each *Area* shall restore its *thirty-minute reserve* within four hours if it becomes deficient.

##### ***Declare Alert State***

1. If deficient of 10-minute synchronized reserve direct all Market Participants to convert 30-minute non-synchronized reserve or 10-minute non-synchronized reserve to energy or 10-minute synchronized reserve.
2. If deficient of 10-minute reserve:
  - Direct all Market Participants to convert 30-minute reserve to energy or 10-minute reserve.
  - Count or curtail energy associated with exports from NYCA to other Reliability Coordinators by NYISO ICAP providers as NYISO Operating Reserve based on the Reliability Coordinator's ability to have the transaction curtailed. Advise the affected external Reliability Coordinator accordingly.
  - Count the load reduction available from Quick Response Voltage Reduction as 10-minute reserve.
  - Activate use of UOLe limits,

- Direct TOs, via Emergency Hot Line, to notify the appropriate Market Participants that the NYISO is dispatching to UOLe and that they are to follow basepoints and to make all generator capability available
  - Purchase Emergency Energy from sources outside NYISO.
3. If deficient of 30-minute reserve:
- Count or curtail energy associated with exports from NYCA to other Reliability Coordinators by NYISO ICAP providers as NYISO Operating Reserve based on the Reliability Coordinator's ability to have the transaction curtailed. Advise the affected external Reliability Coordinator accordingly.
  - Count the load reduction available from Quick Response Voltage Reduction as 10-minute reserve to increase 10 minute reserve thus increasing 30 minute reserve.
  - Activate use of UOLe Limits
  - Direct TOs, via Emergency Hot Line, to notify the appropriate Market Participants that the NYISO is dispatching to UOLe and that they are to follow basepoints and to make all generator capability available
  - Purchase Emergency Energy from sources outside NYISO

***Declare Major Emergency***

Initiate an Emergency Energy Alert in accordance with NERC standard EOP 002 for today via the RCIS; follow NPCC notification requirement notify NYISO External Affairs, PSC, DEC, Gas Pipelines, and the Department of Energy(DOE) with form OE 417.

1. Notify the TOs via Emergency Hot Line and the appropriate Market Participants via the NYISO notification manager software that the NYISO has activated Special Case Resources (ICAP) if possible.
2. Notify the TOs via Emergency Hot Line and the appropriate Market Participants via the NYISO notification manager software that the NYISO has activated EDRP.
3. Alert other TOs, and Reliability Coordinators if applicable, that a sharing of reserves may be required.

**4.4.4 Shortage of Meeting Load (Including the Inability to Reach a "0" ACE) – Real Time**

***Declare Major Emergency***

1. Initiate an Emergency Energy Alert in accordance with NERC Standard EOP 002 for today via the RCIS; follow NPCC notification requirement notify NYISO External Affairs, PSC, DEC, Gas Pipelines, and the Department of Energy(DOE) with form OE 417
2. Direct TOs, via Emergency Hot Line, to notify the appropriate Market Participants to go to UOLe limits, follow basepoints, and that the NYISO is in a generation alert.
3. Recall external energy sales provided by NYCA ICAP providers.

4. Notify the appropriate Market Participants to activate NYISO Special Case Resources, if possible.
5. Notify the appropriate Market Participants to activate EDRP, if possible.
6. Direct TOs, via Emergency Hot Line, to notify the appropriate Market Participants to go to UOLe limits and to continue to follow basepoints
7. Purchase Emergency Energy from sources outside NYISO.
8. Direct TOs, via Emergency Hot Line, to implement 5% Quick Response Voltage Reduction on a system wide basis.
9. Request neighboring Reliability Coordinators to implement Voltage Reduction to supply Emergency Energy, provided transmission loading permits.
10. Direct all TOs, via Emergency Hot Line, to notify appropriate Market Participants that the NYSDEC air emissions waiver is in effect and to go to generator maximum capability even it if may result in temporary exceedance of NOx RACT air emission limits and opacity requirements.
11. Direct all TOs, via Emergency Hot Line, to shed load immediately in sufficient amounts to maintain tie loadings within limits, return the NYCA ACE to zero within 10 minutes attempting to return the system frequency to 60 hertz in accordance with NYISO criteria.



## 8.4 Abnormal Operating Conditions

This section describes the general guidelines, authority, command structure, and market suspension criteria used during abnormal NYISO and/or Transmission Owner operations.

### 8.4.1 General Guidelines

The procedures presented in this Manual are based on the following minimum set of conditions and requirements:

- Power system security is the primary objective.
- All Transmission Owner Power Control Centers (PCCs) must be capable of operating and dispatching the resources physically located in their control areas and responsible for regulating the control error for that area.
- Transmission Owner PCCs can provide basic system reliability monitoring, which the NYISO normally provides, if and when, the NYISO is unable to perform that function
- The dispatching, billing, and documentation tasks that would otherwise be accomplished by a fully functional NYISO computer system are greatly simplified during abnormal NYISO and/or TO operations.
- In order to afford independent operational control of the generation, Transmission Owner Control Area boundaries are defined by their pre-NYISO territorial and electrical configurations. These boundaries do not necessarily coincide with LBMP Zonal boundaries.
- All accounting and billing issues are addressed in the *NYISO Accounting and Billing 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)).

Two general scenarios have been developed and are addressed by this Manual:

- The Loss of NYISO functionality (see Section 8.8), and
- The Loss of Transmission Owner communication or Control Center functionality (see Section [8.14](#)).

### **8.4.2 NYISO Authority**

The NYISO Shift Supervisor always applies his/her best judgment when considering Operation during Abnormal conditions. All situations need to be evaluated on a case-by case-basis by the NYISO Shift Supervisor.

The NYISO operates all functions that it is capable of handling under emergencies. The Transmission Owners assist in handling other functions.

### **8.4.3 Market Suspension Criteria**

In the event of a loss of NYISO functionality, it may be necessary to suspend portions of the NYISO markets. System reliability criteria can be met by the activation of Interim Control Operation (ICO) until functionality is restored or the NYISO ACC has been established. The NYISO evaluates the status of the NYISO functionality to determine when to re-establish NYISO markets.

All decisions made by the NYISO, and the reasons for making such decisions, are logged by the NYISO. The actions are reviewed by NYISO Operations Management after-the-fact, to determine if the actions were proper, and to verify that the initial causes were properly addressed.

### **8.4.4 Transmission Owner Dispatching Guidelines**

Under normal operating conditions, the NYISO is responsible for the centralized dispatch of generators and loads, and the coordination and scheduling of the bilateral energy markets within, out of, and into the NYCA. This means that all essential scheduling information for generators and loads is handled exclusively by the NYISO. This also means that the Transmission Owners computer control systems lack the necessary on-line information to take over extended NYCA dispatching duties in case of loss of NYISO functionality.

In order to provide the Transmission Owner's computer control systems with the ability to assume dispatching duties under Section 8.8 of this Manual, the NYISO must provide the Transmission Owners with the necessary and most current dispatching information. This information is contained in the NYISO Master Generator Files or MGFs that reside within the NYISO computer system.

Each successful run of the SCUC and the RTS programs creates a pre-MGF file that contains all the data necessary to dispatch the NYCA for the current day and the next day (after SCUC completes for the day). SCUC runs produce data for the next day, and RTC updates that data on a 15-minute basis for the next 2.5-hour horizon in 15-minute periods. Once each Transmission Owner computer control system gets this information, each Transmission Owner can dispatch the generating units assigned to its jurisdiction for ICO purposes. The following requirements apply to the various modes of Transmission Owner NYCA dispatch described in Section 8.8:

1. Each Transmission Owner must be capable of operating as an independent control area, and is responsible for regulating the control error for that area.

2. The Transmission Owners will have access to the NYISO-produced pre-Master Generator Files (pre-MGF) that contain the necessary information to allow control of the NYCA.
3. Pre-MGF data are based on the last good RTC or SCUC (Day-Ahead) run.
4. The Transmission Owners may have a mechanism to input their corresponding pre-MGF data into their own computer control systems, thus giving them the ability to dispatch the NYCA when required to maintain system reliability without regard to economics.
5. The individual Transmission Owners must maintain operating reserves based on system data transmitted from the NYISO to the Transmission Owners. This data identifies the reserve allocated to resources in that control area. Should reserves in any category (spinning, 10-minute, 30-minute, and regulating reserves) fall below the allocated level by the NYISO, the Transmission Owner will immediately notify the NYISO or Designated NYCA Coordinator. The NYISO or Designated NYCA Coordinator will reestablish the required reserve in accordance with the initial allocation provided and revise the Desired Net Interchanges (DNIs) accordingly.
6. If reserve pick-ups are required, they are performed by Transmission Owner control area resources as directed by the NYISO or Designated NYCA Coordinator, in accordance with the 10-minute reserves allocations described above.
7. If during this time a major unit is lost within a Transmission Owner's control area, it may be necessary for the Transmission Owner or the Designated NYCA Coordinator to reassess the Transmission Owner's capability of maintaining previously established DNI values. If necessary, the Designated NYCA Coordinator must adjust the DNIs. The DNI adjustments are coordinated between the Upstate New York (UPNY) and Southeast New York (SENY) Area Coordinators as described in Section [8.11.2](#) of this Manual.