NEW YORK INDEPENDENT SYSTEM OPERATOR

MANUAL 29

Outage Scheduling Manual

July 2015

2.2 Transmission Facilities Outage Scheduling Procedures

To provide the NYISO with enough time to perform the required studies and verify power system thermal, voltage, and stability criteria, all transmission facilities outage requests are subject to the following procedures.

2.2.1 General Procedures for Annual Schedules

These are the general procedures for submitting information and reports, general NYISO verifications, and rescheduling of outages to develop the annual schedules.

NYISO Actions

1. Review the Two-Year (current year and next year) Annual Transmission Facilities Outage Schedules submitted by TOs by November 1 of each year.
2. Determine impact on NYISO monitored reliability and transfer criteria, if a conflict exists that violates system reliability criteria.
3. Notify TOs and coordinate changes to the proposed schedule.
4. Post approved outages on the NYISO Open Access Same Time Information System (OASIS) site.
5. Make revisions of the approved Outage Schedules and post the updates on the NYISO OASIS site.

Transmission Owner Actions

1. Submit the proposed Two-Year (current year and next year) Transmission Facilities Outage Schedules by October 1 for each year in written form via available means.
2. Reschedule rejected requests in periods offered by the NYISO.
3. Submit updates to the Two-Year (current year and next year) Transmission Facilities Outage Schedules for NYISO Scheduling Department approval.

2.2.2 NYISO Analysis Procedure

The following procedure defines the applicable rules for scheduling outage requests in consideration of NYISO reliability.

NYISO Actions

1. Perform the contingency analysis evaluation, as required.
2. Apply the System Reliability and Transfer Criteria described in section 2.3 of this manual.

2.2.3 Facility Outage Scheduling Procedures

All outage requests for Facilities under NYISO Control or Facilities Requiring NYISO Notification that are not considered Emergencies by NYISO are processed according to the following procedure.

NYISO Actions

1. Receive and acknowledge TOs' facilities outage requests. The NYISO will approve outages in the order received.
2. The NYISO will determine if reliability violations will occur so that TOs can be advised as soon as possible to help manage their outages.

3. The NYISO will defer, postpone, or cancel requested transmission outages of Facilities under NYISO Operational Control if a contingency on a NYISO monitored facility will result in a reliability criteria violation.
4. The NYISO will disapprove/reject the requested outage if notification is not received within the minimum notification time requirements. Otherwise, the NYISO will approve the requested outage, or reschedule the outage as agreed to by the requesting TO.
5. Prepare and issue the following reports every calendar day:
   a. NYISO Daily Outage Schedule
   b. NYISO Transfer Limitations
   c. Daily Outages Notification for each TO (NYISO business days only)
   d. Daily Scheduled Outages Report for the NYISO Power Control Center.

Transmission Owner Actions

Transmission Outage Scheduling

1. Submit via telephone, facsimile, or other means available the outage requests, based on best available information, within minimum notification time and requirements as provided in this *Outage Scheduling Manual*:
   a. Facilities expected to impact system Transfer Capability of the NYISO secured system: No later than 30 calendar days before the first day of the operative TCC month with the exception of:
      i) Outage requests that the NYISO and TO agree cannot prudently be delayed, based on reliability concerns, to the next or later operative TCC month(s), or
      ii) Outage requests for weekend, NYISO observed holiday, or weekday off-peak periods, or
      iii) Outage requests for a period within an operative TCC month throughout which significant congestion is not expected to occur in the judgment of the NYISO.

      Facility outage requests that are expected to impact system Transfer Capability of the NYISO secured system may be submitted more than 30 calendar days before the first day of the operative TCC month and, if necessary, revised by the TO provided the revision is submitted no later than 30 calendar days before the first day of the operative TCC month.
   b. Facilities Under NYISO Control expected to impact system Transfer Capability less than 150 MW: At least five calendar days before the proposed scheduled time and date.
   c. Facilities Requiring NYISO Notification: At least two calendar days before the proposed scheduled time and date.
2. Specific facility notification times are identified in Attachment A of this manual. The 30 calendar day notification requirement is in advance of the first day of the

operative TCC month. For example, all facility outage requests during the month of June that are expected to impact system Transfer Capability of the NYISO secured system must be submitted by May 1.

Transmission Outage Scheduling Affecting Local Reliability Commitment

1. Transmission Owners in the New York Control Area (NYCA) must coordinate scheduling of transmission facility outages with the NYISO. This includes verifying that a specific generator is available for commitment, if required during the transmission outage.
2. Transmission Owners must submit a maintenance outage request to the NYISO Scheduling Department. If that request requires a specific generator be committed or remain on line during the outage, that information must be provided when the request is made. The NYISO will record the details of the outage.
3. Transmission Owners must perform the following with respect to outages:
    a. Verify that any required generators are available for commitment during the outage.
    b. Review the Day-Ahead Market generation commitment to determine that the required generation is scheduled. If it is not scheduled, the TO must notify the NYISO Grid Operations Department that a unit commitment for local reliability is required, identifying the generators required and the Start Date/Start Time and End Date/End Time of the local reliability commitment.
    c. Notify the GOs of the commitment after the NYISO has approved the local reliability commitment.
4. If a transmission outage request requires a specific generator remain off line or derated during the outage, that information must be provided when the request is made. Notification of an outage impacting a generator will be made to the affected generator via the NYISO scheduling software.

Transmission Outage Rescheduling

1. Facilities expected to impact system Transfer Capability of the NYISO secured system:
    a. Wherever possible, in the event of a NYISO or TO cancellation of an approved outage request fewer than 30 calendar days before the first day of the operative TCC month, a transmission outage will be rescheduled within the same operative TCC month if both of the following conditions are met:
        i) The outage will be expected to have similar impact to Day-Ahead or Real-Time Market system Transfer Capabilities as in the originally scheduled period.
        ii) The outage will be submitted within the minimum notification time of two calendar days.
    b. In the event that cancelled facility work cannot be rescheduled to meet the above conditions but cannot be prudently delayed based on reliability concerns, then the cancelled facility work may be rescheduled within the same or another

operative TCC month; provided the work is rescheduled in a manner that is close as practical to the above conditions.

2. Facilities under NYISO Operational Control expected to impact system Transfer Capability less than 150 MW
   a. Consider rescheduling outage requests deemed by the NYISO to have a substantial impact on Transfer Capability.
   b. Reschedule unapproved outage requests.
3. Facilities Requiring NYISO Notification: consider rescheduling outage requests deemed by the NYISO to have a substantial impact on Transfer Capability.

Transmission Outage Cancellation

1. Provide reasons for the cancellation of an outage request for review by the NYISO Grid Operations Department and NYISO Market Monitoring and Performance Department.

2.2.4 On Shift Outage Scheduling Procedures

On shift outage scheduling by the NYISO is performed according to the following procedure.

NYISO Actions

1. After being notified by the TO of its intention to proceed with a prescheduled outage:
   a. Check the online Outage Scheduler function to verify that the requested outage has been prescheduled.
   b. Study the system conditions for thermal, voltage, or stability violations including the equipment outage before outage starts.
   c. If required, take the necessary actions to ensure that the outage will not violate reliability criteria and make all the necessary pre-outage Notifications.
2. Notify the TO via telephone, to proceed with the actual switching sequence, when the pre-outage actions have been taken and it has been determined that the outage can proceed.
3. Assess the post-contingency conditions for thermal, voltage, or stability violations, after being notified by the TO that the equipment is out of service. If the NYISO determines that the reliability criteria will be violated as a result of the outage, the NYISO will take appropriate actions to correct the problem.
4. After receiving notification from the TO that the outaged equipment is restored and in normal working condition, take the necessary actions to remove restrictions placed on the NYISO monitored facilities for the outage. Equipment restored to service with a derated capacity or with an operational deficiency will be logged appropriately.

Transmission Owner Actions

1. Before starting the actual switching sequence, notify the NYISO Grid Operations Department via telephone of its intention to proceed with a Scheduled Outage and then wait for NYISO approval to proceed.
2. Upon receiving approval from the NYISO, proceed with the switching sequence to remove the equipment from service.
3. Notify the NYISO Grid Operations Department immediately after the facility has been removed from service.
4. If the NYISO cancels the outage, return the facility to service as soon as possible.
5. Notify the NYISO Grid Operations Department immediately after completing the scheduled work, in preparation for restoring the outaged equipment to service. The TO will notify NYISO Grid Operations Department of the restoration intent, however, for the sake of reliability will begin the process of restoring the facilities promptly.
6. Upon receiving approval from the NYISO, proceed with the actual restoration sequence to return the facility to service.
7. Inform the NYISO Grid Operations Department immediately after the equipment is restored to service and of any derated capacity or operational deficiency with that facility. The TO must take appropriate measures to correct the problem as soon as possible.

2.2.5 Switching Requests

Short duration changes in equipment status for the purpose of removal from and restoring to service other associated equipment is classified as *switching*.

Switching requests may be made on shift provided the request meets each of the following requirements:

1. The request is directly related to an appropriately prescheduled outage or the request is to exercise a disconnect switch.
2. The duration of the switching request does not exceed two hours.
3. The TO notifies the NYISO Grid Operations Department a minimum of two hours prior to the start of the switching.
4. The switching is requested to take place during off peak hours or when significant congestion is not expected to occur in the judgment of the NYISO.
5. The switching request will not violate applicable reliability criteria.

2.2.6 Emergency Outages

Planned outages are normally evaluated prior to the calendar day on which they are scheduled to begin. However, there are situations when special operating conditions, or

Emergency Outage requests by TOs, require additional study cases to be performed. Special operating conditions that require an Emergency Outage of transmission facilities, whether they are identified by the NYISO or by a TO, will be evaluated immediately by the NYISO according to the following procedures.

NYISO Actions

1. The NYISO will perform the following:
   a. Obtain a description of the special condition or emergency.
   b. Identify components involved in the emergency.
   c. Determine any special conditions related to the outage.
   d. Request the Start Date/Start Time and End Date/End Time, if known, of the Emergency Outage.
2. Evaluate the impact of the Emergency Outage, if possible. If the nature of the Emergency Outage is such that it cannot be delayed, approval will be given, but appropriate mitigating measures will be implemented to ensure compliance with reliability criteria.
3. Ask the TO requesting the outage to consider delaying the outage if the following conditions apply to the request: the outage meets reliability criteria but has a substantial impact on Transfer Capability in conjunction with previously scheduled outages.
4. If conditions permit, the NYISO will perform the following after coordinating the Emergency Outage request:
   a. Inform the appropriate TOs of the impending Emergency Outage.
   b. Make all the necessary pre-outage verifications and adjustments to the NYISO monitored facilities as required.
5. Notify the requesting TO via telephone, to proceed with the actual switching sequence.
6. Assess the post-contingency conditions for thermal, voltage, or stability violations, after being notified by the TO that the equipment is out of service. If the NYISO determines that the reliability criteria will be violated as a result of the outage, the NYISO will take appropriate actions to correct the problem.
7. Include Emergency Outage and all changes to the Outage Schedule in the daily reports.
8. After receiving notification from the TO that the outaged equipment is restored to service and in normal working condition, take the necessary actions to remove restrictions placed on the NYISO monitored facilities for the outage. Equipment restored to service with a derated capacity or with an operational deficiency will be logged appropriately.
9. Inform the appropriate TOs of the conclusion of the Emergency Outage.

Transmission Owner Actions

1. Inform the NYISO Grid Operations Department immediately after determining that an Emergency Outage is required.
2. Provide the NYISO Grid Operations Department with the following information:
   a. Description of the special condition or emergency.
   b. List of applicable components to be taken out-of-service.
   c. Any special conditions related to the outage.
   d. Start Date/Start Time and End Date/End Time, if known, of the Emergency Outage.
3. Notify the NYISO Grid Operations Department via telephone of their intention to proceed with an Emergency Outage before starting the actual switching sequence and then wait for NYISO authorization to proceed, if the nature of the emergency allows time to do so.
4. Removal of the equipment from service without first notifying the NYISO Grid Operations Department must only be done for safety purposes and to prevent further damage to equipment. If such action is taken, the TO must immediately notify the NYISO Grid Operations Department of the action after the equipment is safely out of service.
5. Upon receiving approval from the NYISO, proceed with the switching sequence to remove the equipment from service.
6. Notify the NYISO Grid Operations Department immediately after the facility has been removed from service.
7. Notify the NYISO Grid Operations Department immediately after completing the emergency work in preparation for restoring the outaged equipment to service. The TO will notify NYISO Grid Operations Department of the restoration intent, however, for the sake of reliability will begin the process of restoring the facilities promptly.
8. Upon receiving the approval from the NYISO, proceed with the actual restoration sequence to return the facility to service.
9. Inform the NYISO Grid Operations Department immediately when the equipment is restored to service and of any derated capacity or operational deficiency with the facility. The TO must take appropriate measures to correct the problem as soon as possible.

2.2.7 In-Service Relay Testing

In-service maintenance and testing of relays on the NYISO monitored facilities, transmission facilities under NYISO Operational Control and on all inter-company and inter-control area ties is allowed under this procedure:

NYISO Actions

1. The NYISO will perform the following:
   a. Identify facilities involved in the test.
   b. Request the Start Date/Start Time and End Date/End Time of the in-service relay test.
   c. Evaluate the impact of the in-service relay test.
   d. List approved in-service relay testing in daily outages notification for each TO.

Transmission Owner Actions

1. For normally scheduled in-service relay tests, the TO must notify the NYISO Scheduling Department at least one business day before the proposed scheduled Start Date, for which the work is to be scheduled. The TO must provide the NYISO Scheduling Department the following:
   a. List of transmission facilities that could be impacted by the test (e.g., line, breaker, capacitor bank, etc.).
   b. Start Date/Start Time and End Date/End Time of the in-service relay test.
2. For same day work, the TO must notify the NYISO Grid Operations Department as soon as possible of their need to perform such work that day. The TO must provide the NYISO Grid Operations Department the following:
   a. List of transmission facilities that could be impacted by the test (e.g., line, breaker, capacitor bank, etc.).
   b. Start Time and End Time of the same day in-service relay test.
3. The TO must perform testing such that appropriate measures that would mitigate the impact of the test are taken.
4. The TO must inform the NYISO Grid Operations Department when the testing has been completed and of any derated capacity or operational deficiency with that facility. The TO must take appropriate measures to correct the problem as soon as possible.

2.2.8 Hot Line Work

Hot line work, as referred to in this procedure, is defined as work on or near any transmission line which requires automatic re-closing to be removed from the line or manual re-closing to be held off for the protection of personnel working on or near such facilities.

NYISO Actions

1. The NYISO will perform the following:
   a. Identify lines included in the work.
   b. Request the Start Date/Start Time and End Date/End Time of the hot line work.
   c. If required, evaluate the impact of the hot-line work.

Transmission Owner Actions

1. For normally scheduled hot line work, notify the NYISO Scheduling Department of hot line work on any inter-control area ties of 115 kV and above, and internal NYISO monitored lines of 230 kV and above. One day prior notification is required except for emergency situations.
2. For emergency situations the TO must notify the NYISO Grid Operations Department immediately after determining that hot line work will be required.
3. Notify the NYSIO Grid Operations Department when automatic re-closing is disabled or manual closing is being held off on the line where the work is being performed.
4. Notify the NYISO Grid Operations Department immediately of any problems or outages relating to hot line work in progress.
5. Notify NYISO Grid Operations Department when hot line work is completed and the automatic re-closing has been enabled.

2.2.9 Emergency Restoration of Facilities

When the NYISO determines that emergency conditions can be averted or alleviated by the restoration of transmission facilities out of service for scheduled work, and the work is of such nature that the facility can be restored within a reasonable recall time, the following procedure will apply.

NYISO Actions

1. Request the restoration of facilities deemed helpful in alleviating the emergency condition.
2. Evaluate continuously the emergency situation and determine if any further attempt should be made to restore the facility, in the event a transmission facility cannot be returned to service using the pre-established procedure for emergency restoration.

Transmission Owner Actions

1. Have restoration procedures in place as part of the outage request for emergency restoration when so requested by NYISO. These will include estimates of time required to restore the facility to service under these conditions.
2. Evaluate the emergency situation and determine if any further attempt should be made to restore the facility in coordination with the NYISO Grid Operations Department, in the event that the transmission facility cannot be returned to service using the emergency restoration procedure.

2.2.10 Extensions of Outages

Although the planning of scheduled outages should always include a realistic allocation of time to accomplish the expected scope of work, it is inevitable that situations will occur that force the extension of the End Date/End Time of a scheduled outage due to unforeseen circumstances. The following actions will be taken in such cases.

NYISO Actions

1. Modify the existing Outage Schedule as required. This includes performing all the necessary reliability studies described in the previous sections according to the extension time required.
2. Notify affected TOs whose prescheduled outage requests must be rescheduled or canceled due to these extensions.
3. Post the new revised schedule in OASIS and update daily reports.

Transmission Owner Actions

1. If the equipment outage extension does not meet the minimum notification required by section 5.3 of this *Outage Scheduling Manual*, notify the NYISO Grid Operations Department immediately of the delay and the new planned schedule so that a review can be made of the impact of this extension on system reliability.
2. If the equipment outage extension meets the minimum notification required by section 5.3 of this *Outage Scheduling Manual*, notify the NYISO Scheduling Department.

2.3 System Reliability and Transfer Criteria

The NYISO uses the approved Outage Schedules to determine operating transfer limits for the monitored interfaces. The following is the current list:

1. Internal Interfaces:
   a. DYSINGER EAST
   b. WEST CENTRAL
   c. MOSES SOUTH
   d. CENTRAL EAST
   e. TOTAL EAST
   f. UPNY/CONED
   g. SPRAINBROOK/DUNWOODIE SOUTH
2. External Interfaces:
   a. CSC-NPX
   b. NPX-CSC
   c. HQ-NYISO

d. NYISO-HQ
e. IMO-NYISO
f. NYISO-IMO
g. ISONE-NYISO
h. NYISO-ISONE
i. 1385-NPX
j. NPX-1385
k. NYISO-PJM
l. PJM-NYISO
m. PJM-NEPTUNE
n. SCH-HQ IMPORT/EXPORT
o. CEDARS-HQ
p. HQ-CEDARS
q. SCH-PJM_VFT
r. SCH-VFT_PJM

2.3.1 Outage Impact Method

The method described below quantifies an outage's impact on the NYISO monitored interfaces. The interface impact method is used because it includes the effect of the outaged facility power flow distribution in addition to the change on the affected interface's thermal, voltage, and stability limits. It is important to remember that changes in the generation dispatch can affect the interface impact.

The Outage Interface Impact is best described by the following formula:

Where:

$$OII = \frac{\{FIL_{max} - [FOI_L + (FIL_{max} * FT_{SF} * FO_{IDF}) - (FF_{FIL_{max}} * FO_{IDF})]\}}{1 + (FT_{SF} * FO_{IDF})}$$

OII = Outage Interface Impact
FIL_{max} = All Facilities in service Interface limit
FOI_L = Facility Outage Interface limit
FT_{SF} = Facility Transfer shift factor for change at interface flow
FO_{IDF} = Interface distribution factor for the Facility Outage
$FF_{FIL_{max}}$ = Facility Flow at all facilities in service limit interface

To mitigate the impact of specific maintenance outages on system operations, operating measures are coordinated in advance with the affected TOs and included as part of the outage request or proposed Outage Schedule. These measures include but are not limited to:

1. Opening of additional circuit breakers or reconfiguring stations to minimize the impact of normal or stuck-breaker contingencies.

2. Scheduling the outage during off-peak hours, or weekends, when the anticipated NYISO monitored facilities power flows are lower.
3. Scheduling the outage when a specific generator configuration is more suitable.

4. OUTAGE SCHEDULING POLICY

This section of the manual describes the NYISO's outage scheduling policy.

Under the provisions of the NYISO Agreement, NYISO Tariff, and NYISO Transmission Owner (TO) Agreement, the NYISO is responsible for coordination of all types of outages on the following NYISO monitored facilities:

- Transmission Facilities under NYISO Operational Control
- Transmission Facilities Requiring NYISO Notification
- Generators monitored by the NYISO

Outages of transmission and generation facilities affect the reliability of the power system. Consequently, the NYISO is assigned the responsibility to coordinate outages to maintain reliable operation of the NYS Power System in accordance with Good Utility Practice and the Reliability Rules as established by the New York State Reliability Council (NYSRC).

Outages of NYISO monitored facilities refer to outages on all associated equipment including but not limited to:

- Transmission lines and components (conductors, insulators, and structures).
- Generators or DSASP Resources located in the NYCA and/or supplying ICAP to the NYCA.
  (For more details, see the *NYISO Installed Capacity Manual*, available from the NYISO Web site at the following URL: http://www.nyiso.com/public/markets_operations/documents/manuals_guides/index.jsp.)
- Switching equipment (circuit breakers and all types of switches).
- Voltage control equipment (power transformers, generator AVRs, load tap changers, synchronous condensers, static capacitors, static inductors, and static VAR compensators or SVCs).
- Phase angle regulators (PARs) and HVDC converters.
- Power system stabilizers (PSSs).
- Associated monitoring, control and protection equipment.

The specific transmission facilities within the NYCA under the scope of these guidelines and procedures are contained in Attachment A of this manual.

These lists are updated by mutual consent between the NYISO and the TO. Current lists of these facilities are posted and maintained by the NYISO on its OASIS site.