

System Restoration Manual

April 2017

3. RESTORATION-RELATED FACILITIES

The NYISO and the TOs within the NYISO's Reliability Coordinator Area shall secure adequate Black Start Facilities to meet the requirements of the NYISO's System Restoration Procedure. Black Start Resources are individual units that have the capability, following a system-wide blackout, to start up and energize a bus without the availability of an outside electric supply. Black Start Facilities are multi-unit plants, containing at least one Black Start Resource, where the entire plant can be restarted without the availability of an outside electric supply. All Black Start Facilities must incorporate at least one Black Start Resource. It is not required that all units at a Black Start Facility be Black Start Resources.

3.1 Black Start Resources

3.1.1 NYISO Black Start Service Resources

The NYISO determines the need and adequacy of Black Start Facilities for the NYISO's restoration procedure through operating studies and simulation. The NYISO restoration procedure shall include identification of any Black Start Facility and the characteristics of such units, including but not limited to the following: the name of the Black Start Facility, location, megawatt and megavar capacity, and type of unit. Procedures for acquiring the necessary Black Start Resources as identified in NYISO studies are in Section 7, Black Start Capability Service, of the *NYISO Ancillary Services Manual* (posted as an Operations manual on the NYISO Web site at the following URL:

http://www.nyiso.com/public/markets_operations/documents/manuals_guides/index.jsp).

3.1.2 Transmission Owner Black Start Service Resources

Transmission Owners within the NYISO's Reliability Coordinator Area are responsible for determining the need and adequacy of Black Start Facilities to meet the requirements of their local restoration procedure. The TO restoration procedure shall include identification of any Black Start Facilities and the characteristics of such units, including but not limited to the following: the name of the Black Start Facility, location, megawatt and megavar capacity, and type of unit. The identity of TO Black Start Facilities shall be made available to the NYISO and to affected TOs. Transmission Owners are responsible for procuring any required local Black Start Resources.

3.1.3 Black Start Testing Procedures

Black Start Testing procedure requirements shall be designed by the Transmission Operator to ensure Black Start Facilities are able to perform their intended function in the SRP. The number of units to be included in the Black Start Resource test procedures shall be determined by the SRP requirements to control voltage and frequency.

Each Generator Operator with a Black Start Resource shall prepare Black Start Resource specific testing procedures, perform Black Start Resource tests, and maintain records of such testing, in accordance with the testing requirements set by the Transmission Owner to

verify the unit's ability to, following a system-wide blackout, start up and fulfill its requirements in the SRP without the availability of an outside electric supply.

The most current test procedure shall be provided to the NYISO, and in the case of local Black Start Resources, to the appropriate TO, upon request.

3.1.4 Black Start Resource Testing Requirements

The annual test requirements for each Black Start Resource shall include the ability to:

1. Start with no support from the Bulk Electric System.
2. Energize a transmission bus or a generating station switchyard element
3. Operate in a stable condition while isolated from the Bulk Electric System for a minimum of ten minutes.

The Transmission Owner may specify additional testing requirements

3.1.5 Black Start Testing Frequency

At least once each capability year each Black Start Facility in the NYISO's Reliability Coordinator Area must successfully test or demonstrate the ability of their Black Start unit(s) to perform their intended function as required by the NYISO's or local TO's SRP.

The NYISO shall determine the time within the capability year that the testing shall be completed.

Tests must be coordinated with the NYISO and the TO in whose service territory the unit is located.

3.1.6 Documentation of Black Start Testing

Generator Operators of Black Start Resources shall document the date, start-time, and duration of all tests, and indicate if the tests meet the criteria in the unit's Black Start test procedure. Testing will be certified to the NYISO through the form found in the *Services Tariff*, Rate Schedule 5, Appendix I (available from the NYISO Web site at the following URL: http://www.nyiso.com/public/markets_operations/documents/tariffs/index.jsp). This documentation must be provided to the NYISO within 30 calendar days following a request from the NYISO.

Each Generator Operator, for each Black Start unit, shall annually provide a letter to the NYISO confirming that it identifies and maintains a list of critical components in its facilities (i.e., batteries, diesel back-up generators, inverters, etc.) to verify the condition of these critical components in accordance with good industry practice.

6. RESTORATION TRAINING

6.1 NYISO Restoration Training

The NYISO shall provide for training NYISO and Market Participant operating personnel for the effective implementation of the NYCA SRP in the following area:

- Annual coordinated restoration training for NYISO and TO system operators, including:
 - Energization paths and initial switching requirements exiting the Black Start Facilities
 - Identification of acceptable voltage and frequency limits during restoration,
 - Operating Processes to reestablish connections between restored systems,
 - Simulation exercises that include modeling of each transmission owner's SRP, and
 - Annual simulations of full or partial system shutdowns and restoration, including the issuance of critique as input to the annual review of the restoration procedure.

Black Start Providers and other generator owners shall be invited to participate in training sessions and exercises as appropriate.

The NYISO shall maintain training program records showing that operating personnel have been trained in the implementation of the NYCA SRP and participated in restoration exercises.

6.2 Transmission Owner Restoration Training

Each TO shall provide for training of operating personnel for the effective implementation of the NYCA SRP in the following areas:

- Annual restoration training for its operating personnel on the local system restoration procedure
- A minimum of two hours of System restoration training every two calendar years to its field switching personnel identified as performing unique tasks associated with the TO's restoration procedure that are outside of their normal tasks.

Each TO shall participate in NYISO restoration drills, exercises, or simulations as requested by the NYISO.

The TOs shall maintain training program records showing that operating personnel have been trained in the implementation of the local system restoration procedure. These records shall be made available to the NYISO upon request.

6.3 Generator Operator Restoration Training

Each Generator Operator shall participate in NYISO restoration drills, exercises, or simulations as requested by the NYISO.

Each Generator Operator with a Black Start Resource shall provide a minimum of two hours of training every two calendar years to each of its operating personnel responsible for the startup of its Black start Resource generation units and energizing a bus. The training program shall include training on the following:

- System restoration procedure elements requiring coordination with the TO
- Procedures for starting each Black Start Resource and energizing a bus

Each Generator Operator with a Black Start Resource shall maintain training program records showing that operating personnel have been trained in the implementation of Black Start procedures. These records shall be made available to the NYISO upon request.