

**Comparison between NERC, NPCC and NYSRC Reliability Rules regarding Black Start testing**

NERC Reliability Standards evaluated:

*EOP-005-2: System Restoration from Blackstart Resources*

NPCC Directories evaluated:

*NPCC Directory 8 System Restoration*

NYSRC Rules Evaluated:

*F.1: NYCA System Restoration Plan*

NERC EOP-005-2 Requirement	NPCC Directory 8 (Existing)	NYSRC Reliability Rules
<p>R9. Each Transmission Operator shall have Blackstart Resource testing requirements to verify that each Blackstart Resource is capable of meeting the requirements of its restoration plan. These Blackstart Resource testing requirements shall include:</p> <p>R9.1. The frequency of testing such that each Blackstart Resource is tested <b><u>at least once every three calendar years.</u></b></p> <p>R9.2. A list of required tests including:</p> <p>R9.2.1. The ability to start the unit when isolated with no support from the BES or when designed to remain energized without connection to the remainder of the System.</p> <p>R9.2.2. <b><u>The ability to energize a bus.</u></b> If it is not possible to energize a bus during the test, the testing entity must affirm that the unit has the capability to energize a bus such as verifying that the breaker close coil relay can be energized with the voltage and frequency monitor controls disconnected from the synchronizing circuits.</p> <p>R9.3. <b><u>The minimum duration of each of the required tests.</u></b></p>	<p>5.7.2 Blackstart Generating Unit Startup Test (Reference: Table 1; Test BS-1)</p> <p>5.7.2.1 The Generator Owner having generating facilities designated as having blackstart capability shall <b><u>annually verify the facilities' blackstart capability</u></b> without dependencies on power sources unavailable during a partial or complete system blackout. Once the facility has been started, it shall continue to demonstrate its capability to operate in a stable condition while isolated from the power system for a <b><u>minimum of ten minutes</u></b>. The number of units within a generating facility that shall be blackstarted for this test is determined by the Reliability Coordinator and Transmission Operator as needed by their respective system restoration plans.</p> <p>5.7.2.2 Each Reliability Coordinator and Transmission Operator shall ensure that the Generator Owner of a blackstart generation facility included in its restoration plan complete a successful blackstart test consistent with the objectives of its system restoration plan.</p> <p>Table BS-1 Requires:</p> <ul style="list-style-type: none"> <li>- Frequency: Annual</li> <li>- Duration: 10 minutes of stable operation</li> <li>- Criteria for Successful Test: <ul style="list-style-type: none"> <li>- <b><u>Successful startup and 10 minute of stable operation</u></b></li> </ul> </li> </ul>	<p>R1.5. Procedures for black start facility test requirements to verify that each black start unit in the NYISO and Transmission Owner SRPs is capable of meeting the requirements of these SRPs. These black start testing requirements shall include:</p> <p><u>Gas turbine, combined cycle, and hydro black start units:</u></p> <p>Each Black Start Provider shall complete a successful test of the startup and operation of each of those black start facilities included in the NYISO and Transmission Owner SRPs for each Capability Year.</p> <p>The NYISO shall determine the number of units within a black start facility that shall be tested annually.</p> <p><u>Steam black start units:</u></p> <p>Each Black Start Provider shall complete a successful test of the startup and synchronization to the transmission system of each unit included in the NYCA SRP every three Capability Years.</p> <p>In addition, completion of successful tests requiring isolation from the transmission system, but not requiring startup and synchronization with the transmission system, shall be conducted during each intervening Capability Year. This intervening year test shall be conducted as follows: 1) a black start gas turbine isolated from the transmission system shall energize the internal light and power bus of the steam black start unit; and 2) auxiliary loads required to introduce fire</p>

		<p>into the boiler (fans, pumps, etc.) shall be added to the internal light and power bus. The intervening year test does not require fire in the boiler or synchronization to the transmission system.</p> <p>The NYISO shall designate which steam units shall be tested during each Capability Year in accordance with the above testing requirements.</p> <p>The NYISO shall determine the time within the Capability Year that testing shall be completed.</p> <p>The NYISO procedures shall indicate that with due regard for reliability considerations and subject to approval by the Transmission Owner and the NYISO, a test performed by black start facilities in the Transmission Owner's SRP within one month beyond the Capability Year test period, or longer in force majeure cases, shall be considered a valid test for that Capability Year. On request by the NYSRC, the NYISO shall certify that reliability was considered when the NYISO and the Transmission Owner approved black start facility testing beyond the Capability Year.</p>
<p><b>NERC Glossary Term: Blackstart Resource</b></p>	<p><b>NPCC Directory 8 (Revised)</b></p>	
<p>A generating unit(s) and its associated set of equipment which has the ability to be started without support from the System or is designed to remain energized without connection to the remainder of the System, <b><u>with the ability to energize a bus</u></b>, meeting the Transmission Operator's restoration plan needs for real and reactive power capability, frequency and voltage control, and that has been included in the Transmission Operator's restoration plan.</p>	<p><b>Requirement 5.7.2.1 mapped into R11.2</b></p> <p>R11.2. A generation facility with black start capability shall be tested annually for successful equipment startup and <b><u>energize a transmission element</u></b> or a generating station switchyard element and verify stable operation while isolated from the bulk power system for a <b><u>minimum of ten minutes</u></b>.</p>	