
Subject: Generator Performance Audits

Statement: From time to time the NYISO will ask each Generator to demonstrate its ability to achieve and sustain its emergency response rate and its ability to reach and operate at its Normal Upper Operating Limit.

Details:**Introduction**

This Technical Bulletin describes the methods used by the New York Independent System Operator (NYISO) to implement the NYISO's Operating Reserves Audit Procedures. An audit is a special test of an individual Generator's Normal Upper Operating Limit (UOL_N) and/or emergency response rate. Audits are used to verify each Generator's capabilities. Actual performance measured during reserve pickups is also used to verify Generator capabilities. This Technical Bulletin covers three topics:

- The audit of an individual Generator to ascertain its emergency response rate as a test of its ability to provide Operating Reserves.
- The audit of an individual Generator's response to an order for a reserve pickup to ascertain its ability to provide Operating Reserves.
- The audit of an individual Generator to ascertain its ability to reach and operate at its Normal Upper Operating Limit (UOL_N).

The NYISO may conduct a performance audit of an individual Generator at any time and without prior notification. Audits are conducted on a random basis. The NYISO may conduct audits outside of reserve pickups as if an actual emergency existed. When environmental limits on normal operation restrict the ability of a Generator to comply fully with an audit request, the Generator must advise the Transmission Owner (TO) that complying with the audit request will violate its environmental restrictions. The TO will convey that information to the NYISO, the test will be terminated, and the NYISO will classify the unit as failing the audit and will de-rate the unit to the level the unit demonstrated. The unit may request a re-test once the environmental restrictions have been lifted.

Applicable Units

The NYISO may randomly select a Generator with a valid Real-Time energy offer as an ISO Committed Flexible or Self Committed Flexible unit for demonstration of Ten-Minute Reserve or Thirty-Minute Reserve. The NYISO may randomly select a Generator with a valid Real-Time offer for demonstration of claimed UOL_N. However, the NYISO will not call for an audit during the start-up of a unit until the unit has attained its minimum generation level. Simple cycle gas turbines, hydro turbines, and pumped storage

hydro units (units that can be started quickly) may be tested even though they may be off-line or below their minimum generation level.

Test of UOL_N or Emergency Response Rate

Prior to a test the NYISO will notify the appropriate TO of the type of test to be conducted. The NYISO will also verify that instructions are understood by the TO and that there is agreement on the parameters being tested, specifically:

- The change in output (MW) that will be required of the Generator;
- The NYISO will increase the Generator's base point to test its ability to provide 10- Minute Reserve, 30-Minute Reserve, or to test its ability to achieve UOL_N.
- The expected response rate of the Generator will be at emergency response rates;
- The current output of the Generator; and
- The operating limits of the Generator and that the test will not cause the Generator to exceed those limits.

The start of the test will be the current NYISO clock time when the TO has been notified of the start of the audit. The Generator should start responding at the time the TO has provided notification to the Generator of the test.

The test will end when one of the following occurs:

- The unit output reaches its offered UOL_N or the reserve response has been demonstrated, depending on the type of test being conducted.
- The appropriate time period for the test, including tolerance, is exceeded.
- The Generator owner informs the NYISO Operator, through the TO, that the unit is unable to demonstrate the claimed response or capability.

Reserve Pick-Up in Lieu of Test

The NYISO measures and reviews the actual response of each Generator that is asked to respond to a reserve pickup. The review period starts when the TOs are informed of the reserve pickup via the hot-line and new base points are made available to the Generators. The Generator's successful response to a reserve pickup is equivalent to an acceptable test of 10-Minute Reserve.

The unsuccessful response of a Generator to a request for reserve pickup is equivalent to failing a test of 10-Minute Reserve. The Acceptance Criteria Section below outlines the actions that must be taken following an unsuccessful test.

Frequency of Tests

Tests of 10-Minute Reserve, 30-Minute Reserve, and UOL_N may be conducted at least once during each Capability Period. Tests may be conducted more frequently to make sure that units can perform as offered. The NYISO will normally consider several factors when determining the start of a test; however the NYISO may call a test at any time, regardless of these considerations. Among the factors that are considered are:

- Tests of non-synchronized units will normally be conducted at times when the unit is otherwise required so the unit will not incur an unnecessary start.
- The NYISO will conduct tests of 10-Minute Reserve, 30-Minute Reserve, and UOL_N at the same time, whenever possible. In such cases, the Generator will first be asked to demonstrate its ability to provide 10-Minute Reserve. Next the Generator will be asked to continue to demonstrate its ability to provide 30-Minute Reserve. Finally the Generator will be asked to demonstrate that it can attain its UOL_N. The test of a non-synchronous reserve supplier will be conducted when a startup is required for reserve pickup or load.
- Tests of synchronized units will be conducted during on-peak hours and when the unit is at least at half load, whenever possible.

Payments and Penalties

Generators will be paid the LBMP at their bus for energy produced during a test. Bid Production Cost Guarantee (BPCG) and Day-Ahead Margin Assurance Payments (DAMAP) will be paid pursuant to the provisions of the Market Administration and Control Area Services Tariff.

Under-generation penalty assessment during a test will be pursuant to the provisions of the Market Administration and Control Area Services Tariff.

Acceptance Criteria

The Generator's UOL_N and response at the emergency response rate for 10 minutes or 30 minutes must normally be attained or exceeded during a test. The UOL_N will be taken from the Generator's Real-Time offer. As always, the Generator may adjust the UOL_N in its Real-Time offer to reflect the capacity of the Generator at expected ambient conditions. In addition, due to possible metering differences and time-keeping discrepancies, the following tolerances are allowed in the evaluation of an acceptable demonstration:

Delay in Generator Notification

In the event the Generator is notified by basepoints or verbally through the TO more than 1 minute after the start time recorded by the NYISO, the additional notification time greater than 1 minute will be added onto the required demonstration period for each test being conducted to evaluate the unit’s performance.

10 Minute Reserve

For individual unit demonstration of 10 Minute Reserve, a variation of 2% of required pickup or 1 MW (whichever is greater) of required pickup may be used. A one-minute tolerance is allowed.

Example: A 15 MW pickup is required in 10 minutes. Minimum acceptable performance would be 14 MW in 11 minutes.

30 Minute Reserve

For individual unit demonstration of 30 Minute Reserve, a variation of 2% of required pickup or 2 MW (whichever is greater) of required pickup may be used. A three-minute tolerance is allowed.

Example: A 30 MW pickup is required in 30 minutes. Minimum acceptable performance would be 28 MW in 33 minutes.

Normal Upper Operating Limit (UOLN)

For individual unit demonstration of UOL_N (adjusted for actual ambient conditions) a variation of 2% of UOL_N may be used. The maximum time allowed from the start of test shall be the greater of (i) one (1) hour or (ii) the time required to reach UOL_N at the Generator’s emergency response rate plus 10%.

<u>Example:</u>	UOL _N (Real-Time offer)	100 MW
	Emergency response rate	3 MW/MIN
	Unit load at start of test	53 MW
	Minimum acceptable performance	98 MW after one hour

or

<u>Example:</u>	UOL _N (Real-Time offer)	200 MW
	Unit load at start of test	120 MW
	Normal response rate	1 MW/MIN
	Minimum acceptable performance	196 MW after 88 minutes

Actions in the Event Of Unsuccessful Performance

In the event of unsuccessful performance, the NYISO will inform the TO that a generator has failed to demonstrate its emergency ramp rate and/or to achieve its UOL_N. The TO will inform the generator of the

failure. Within two business days, NYISO Market Mitigation and Analysis (MMA) will provide the Generator's Primary Contact a copy of the audit report, which details the tested parameter that the Generator failed.

Generator Owner's Explanation of the Failure

Upon failure of a test of 10-Minute Reserve, 30-Minute Reserve or UOL_N, the Generator's owner or agent must submit a letter of explanation to the NYISO stating why the Generator failed the test, how the problem will be corrected, and the time required to make the correction. The letter must be submitted, within 5 business days after receipt of a copy of the audit report, to the MMA department at the NYISO with a copy to the Generator owner's NYISO Stakeholder Services Representative.

Failure of 10-Minute Reserve Test or Failure of 30-Minute Reserve Test

Upon failure of a reserve test, the parameter that failed to reflect the units true capabilities should be reduced to the level the unit achieved.

Physical parameters that may require modification are:

- The Generator's emergency response rate may need to be reset to no higher than the response rate achieved during the test.
- The Generator's Normal Response Rate may need to be reset to no higher than the response rate achieved during the test.

The NYISO may derate the Generator's response rates in MIS, if necessary, to preserve reliability.

The NYISO may derate the Generator's UOL_N in MIS, if necessary, to preserve reliability.

Request to Re-test

Once Generators are capable of performing at their previously stated response rates or UOLs, following a reduction in such rate or UOL as a result of a performance audit or otherwise, they may request a re-test. The request to re-test shall be made to the NYISO's System Operations' Generator Desk (Gen Desk), with parallel notification to the TO, and the Gen Desk will attempt to schedule the re-test within 48 hours of the request.

Upon successful completion of the re-test for UOL_N, the Gen Desk will immediately restore the generator's UOL_N capability in MIS to the value achieved in the re-test. Following a successful response rate re-test, the Gen Desk will provide all the information to MMA and NYISO Stakeholder Services to have the response

rates updated to the value achieved in the re-test. MMA and NYISO Stakeholder Services, within two business days, will confirm the unit's re-tested performance and update the response rates to the appropriate values.

Documentation

The NYISO records the parameters and results of each test using one of the forms appended to this Technical Bulletin. In order that the Generator may have a copy of the test documentation, the Generator is encouraged to record the parameters and results of a test using the same

This Technical Bulletin is not currently expected to be incorporated into a NYISO Manual/User Guide.

10 Minute Sync

INDIVIDUAL GENERATOR RESERVE RESPONSE TEST

Type of test: 10 Minute response Pass _____ Fail _____

This is a NYISO individual unit audit of _____ 10 minute reserve.

The unit has an Emergency Response Rate of ____ MWs per minute.

NYISO shows the unit loaded at _____ MWs and it has to increase loading to _____ MWs to pass the 10 minute reserve audit.

The audit start time is: _____.

TO confirms Generator Notified at this time: _____

Actual output at 10 minutes: _____ 11 minutes _____

Expected output in 10 minutes: _____ Tolerance: _____

Within tolerance: Yes _____ No _____

Test terminated at: _____ TO notified: _____ TO notified Generator: _____

Date: _____

Comments and or actions taken _____

Shift Supervisor _____

TO Operator _____

10 and 30 MINUTE Sync

INDIVIDUAL GENERATOR RESERVE RESPONSE TEST

Type of test: 10 and 30 Minute response Pass_____ Fail_____

This is a NYISO individual unit audit of _____ 10 and 30 minute reserve.

The unit has an Emergency Response Rate of _____ MWs per minute.

NYISO shows the unit loaded at _____ MWs and it has to increase loading to _____ MWs to pass the 10 minute reserve audit and to _____ MWs to pass the 30 minute reserve audit.

The audit start time is _____.

TO confirms Generator Notified at this time _____

Actual output at 10 minutes _____ 11 minutes _____

Expected output in 10 minutes _____ Tolerance _____
Within tolerance: Yes_____ No_____

Actual output in 30 minutes _____ 33 minutes _____

Expected output at 30 minutes _____ Tolerance _____
Within tolerance: Yes_____ No_____

Test terminated at: _____ TO notified: _____ TO notified Generator: _____

Date: _____

Comments and or actions taken _____

Shift Supervisor _____

TO Operator _____

10 – 30 MINUTE Sync and UOL_N

INDIVIDUAL GENERATOR RESERVE RESPONSE TEST

Type of test: 10, 30 minute response and claimed UOL_N. Pass _____ Fail _____

This is a NYISO individual unit audit of _____ 10 and 30 minute reserve.
This is also an audit of the units claimed Upper Operating Limit Normal.
The unit has an Emergency Response Rate of _____ MWs per minute.

NYISO shows the unit loaded at _____ MWs and it has to increase loading to _____ MWs to pass the 10 minute reserve audit, _____ MWs to pass the 30 minute reserve audit and to _____ MWs to pass the Upper Operating Limit Normal audit.

The audit start time is: _____

TO confirms Generator Notified at this time: _____

Actual output at 10 minutes: _____ 11 minutes _____

Expected output in 10 minutes: _____ Tolerance _____
Within tolerance: Yes _____ No _____

Actual output in 30 minutes _____ 33 minutes _____

Expected output at 30 minutes _____ Tolerance _____
Within tolerance: Yes _____ No _____

Maximum generation reached _____ Tolerance: _____
Expected generation _____ (UOL_N)
Within tolerance: Yes _____ No _____

Test terminated at: _____ TO notified: _____ TO notified Generator: _____

Date: _____

Comments and or actions taken _____

Shift Supervisor _____

TO Operator _____

10 MINUTE GT

INDIVIDUAL UNIT RESERVE RESPONSE TEST

Type of test: 10 Minute GT response Pass_____ Fail_____

This is a NYISO individual unit audit of _____ 10 minute start GT.

The unit has a claimed Upper Operating limit Normal (UOL_N) of _____.
The unit must reach this output within 10 minutes of its start time.

The audit start time is _____

TO confirms Generator Notified at this time _____

Actual output in 10 minutes _____ 11 minutes _____

Expected output at 10 minutes _____ Tolerance _____

Within tolerance: Yes _____ No _____

Test terminated at: _____ TO notified: _____ TO notified Generator: _____

Date _____

Comments and or actions taken _____

Shift Supervisor _____

TO Operator _____