

More Granular Operating Reserves

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Business Issues Committee

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Agenda

- Background/Overview
- Load Pocket Reserves Market Design Proposal
- Review of Reserve Provider Performance
- Next Steps

Background

Background

- **The More Granular Operating Reserves project consists of the following components:**
 - ✓ Establishing a reserve region in Zone J (completed)
 - ✓ Market design approved by stakeholders in March 2019
 - ✓ Zone J reserve requirements implemented on June 26, 2019
 - Evaluating load pocket reserves in New York City (NYC)
 - Reviewing performance of resources scheduled to provide reserves
- **The purpose of today's presentation is to discuss NYISO's market design proposal for load pocket reserves and NYISO's review of reserve provider performance**

Previous Presentations

Date	Working Group	Discussion points and links to materials
01-08-19	ICAPWG/MIWG	Proposed schedule for accelerating implementation of Zone J operating reserves
01-15-19	ICAPWG/MIWG	Establishing a new Zone J reserve region with a 500 MW 10-minute and 1,000 MW 30-minute reserve requirement
01-24-19	ICAPWG/MIWG	Proposed operating reserve demand curve prices for the Zone J reserve products and the proposed tariff revisions for this initiative Operating Reserve Background
03-04-19	ICAPWG/MIWG	Analysis of potential impact
03-13-19	BIC	Stakeholder vote: Establishing Zone J Operating Reserves
03-27-19	MC	Stakeholder vote: Establishing Zone J Operating Reserves
04-30-19	ICAPWG/MIWG	More Granular Operating Reserves
07-10-19	ICAPWG/MIWG	More Granular Operating Reserves
09-24-19	ICAPWG/MIWG	More Granular Operating Reserves
10-28-19	ICAPWG/MIWG	More Granular Operating Reserves



Load Pocket Reserves Market Design Proposal

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State of the Market Recommendation

- In its 2017 and 2018 State of the Market (SOM) reports, the Market Monitoring Unit (MMU) recommended that the NYISO consider implementing local reserve requirements in the New York City load pockets.
 - Further, the MMU recommended that the NYISO model these requirements based on the N-1-1 reliability criteria.

See Recommendation 2017-1 in the 2017 SOM report, located at the following link: <https://www.nyiso.com/documents/20142/2223763/2017-State-Of-The-Market-Report.pdf/cd4ee8a0-1989-dfa0-b53e-2d642c65e46d>, and in the 2018 SOM report, located at the following link: <https://www.nyiso.com/documents/20142/2223763/2018-State-of-the-Market-Report.pdf/b5bd2213-9fe2-b0e7-a422-d4071b3d014b?t=1557344025932>

Load Pockets and Local Reliability Requirements

- **Load pockets are areas in NYC which are constrained by:**
 - Load levels and generation capability within the pocket
 - Transmission-supported import levels into the pocket
 - The structure and boundaries of each load pocket varies based on load, generation, and transmission imports
- **Local Reliability Requirements (LRRs) represent a variety of reliability rules set by NYSRC for load pockets in NYC which correspond to certain operating conditions¹**
 - LRRs can be fulfilled through resource commitments which may be accomplished by out-of-market actions
 - LRRs are evaluated during most passes of SCUC, which determines if additional generation is needed within each load pocket to meet the LRRs

These rules are outlined in the "TO Applications of NYSRC Reliability Rules":

https://www.nyiso.com/documents/20142/1406014/reliability_rules_2_2003.pdf/d2d643c8-18a6-3565-50c7-d8965b62ffd1

Load Pocket Reserve Requirements

- The NYISO has proposed the following 30-minute reserve requirements for identified load pockets within NYC:

Load Pocket	30-Minute Operating Reserve Requirement (MW)
Astoria East/Corona/Jamaica	325
Astoria West/Queensbridge/Vernon	225
Greenwood/Staten Island	250

- The reserve requirements are based on the quantity of generation required to return transmission lines into each pocket to applicable limits following an N-1 contingency on one of the other transmission lines into the pocket, consistent with rules for NYCA reliability
- The load pocket reserve regions would be nested within existing, upstream reserve regions (see Appendix for additional information regarding the nesting of existing reserve requirements)
- All reserves procured in the load pockets will contribute to meeting the Zone J, SENY, East and NYCA reserve requirements
- The NYISO will continue to evaluate the local reliability requirements in the Day-Ahead Market

Load Pocket Reserve Requirements

- **The NYISO is proposing to establish operating reserve demand curves for each load pocket that assign a \$25/MWh value to the proposed reserve requirements**
- **A demand curve value of \$25/MWh is intended to:**
 - Provide a reasonable increment over the otherwise prevailing reserve cost in the broader Zone J reserve region due to the cascading of reserve prices (see Appendix for additional information regarding reserve clearing price calculations)
 - Encourage efficient resource dispatch in response to the proposed load pocket reserve requirements
 - Facilitate distribution of reserves
 - Reasonably account for the typical range of potential foregone revenue margins that may arise from scheduling resources to provide reserves instead of energy and/or regulation service
- **The NYISO has determined that the existing market mitigation rules are sufficient to address the proposed load pocket reserve requirements**

Load Pocket Reserves: Expected Benefits

- **More efficient scheduling and procurement of resources**
 - Generators providing local reliability needs would be scheduled economically through a market-based mechanism
 - Help to offset some of the out-of-market commitment costs required to satisfy LRRs
- **Locationally specific market price signals**
 - Aligning reserve regions with load pockets provides a clear signal as to the additional value that may be attributable to resources located in certain areas
- **Incentive for investment in resources that can supply 30-minute reserve products**
 - In the absence of a market mechanism, economic incentives for investment in resources in load pockets capable of providing the required reserves are muted

Review of Reserve Provider Performance

State of the Market Recommendation

- **The 2017 and 2018 State of the Market (SOM) reports provided an evaluation of gas turbine (GT) performance while responding to real-time start-up instructions.**
 - Performance was measured 10 or 30 minutes after an economic start-up signal was received
 - Based on this analysis, the Market Monitoring Unit (MMU) recommended that the NYISO “consider restructuring reserve payments to align with generator performance” and “consider discounting reserve awards based on past performance”¹

1. See Recommendation 2016-2 in the 2017 State of the Market Report, located at the following link: <https://www.nyiso.com/documents/20142/2223763/2017-State-Of-The-Market-Report.pdf/cd4ee8a0-1989-dfa0-b53e-2d642c65e46d> and pages 85 and 110 the 2018 State of the Market Report, located at the following link: <https://www.nyiso.com/documents/20142/2223763/2018-State-of-the-Market-Report.pdf/b5bd2213-9fe2-b0e7-a422-d4071b3d014b?t=1557344025932>

State of the Market Data Analysis

- **In 2018, the MMU found that 10-minute GTs provided an average of 82 percent of the MW offered, and 30-minute GTs provided an average of 87 percent of the MW offered**
 - In 2017, the MMU found that 10-minute GTs provided an average of 58 percent of the MW offered and 30-minute GTs provided an average of 80 percent of the MW offered ¹
 - In its analysis, the MMU attributes this improvement in overall performance to the fact that certain units that contributed to poor performance in 2016 and 2017 were not economically started by RTC in 2018 (including units that had since transitioned to an ICAP Ineligible Forced Outage status)

1. Refer to pages 85-86 of the 2018 State of the Market Report, located at the following link:
<https://www.nyiso.com/documents/20142/2223763/2018-State-of-the-Market-Report.pdf/b5bd2213-9fe2-b0e7-a422-d4071b3d014b?t=1557344025932>

Reserve Provider Audit Process

- **The NYISO has the ability to audit reserve providers at any time and without prior notification**
- **The NYISO evaluated its reserve performance audit data from approximately 475 reserve audits from the last five years throughout NYCA**
 - 10-minute units have an average 85% pass rate
 - 30-minute units have an average 90% pass rate
- **These results indicate that suppliers are able to provide reliable reserve capability when called upon**

Reserve Provider Audit Process Enhancements

- **In ongoing collaboration with the MMU, the NYISO is comprehensively reviewing its reserve audit process and has identified the following enhancements to pursue:**
 - Increasing the number of audits performed each Capability Period
 - Historically, NYISO has conducted approximately 25-30 audits during each Capability Period
 - Going forward, NYISO will seek to audit each reserve provider at least once per year
 - Reviewing the procedures for actions taken in response to demonstrated performance concerns, including limitations/restrictions on a resource's continued ability to provide reserves
 - Resources that fail an audit are required to submit a written explanation describing the reason(s) for a failure and a corrective action plan
 - NYISO currently has the ability to limit a resource's continued ability to provide reserves, and will be evaluating the process for addressing continued poor performance

Reserve Pickup (RPU) Event Performance

- **The NYISO has been actively working to enhance its ongoing evaluation of reserve pickup performance**
 - Evaluation of reserve pickup performance encompasses resources that:
 - Received a reserve schedule in RTD
 - Received a Reserve Pickup Signal when the RPU was activated
 - Not all resources that have received a reserve schedule are asked to convert to energy during a RPU
 - This evaluation assesses a resource's basepoint 10 minutes after the RPU signal
- **The NYISO is developing a process to enhance transparency of resource performance during reserve audits and pickups, and its reporting of performance analytics**

Reserve Performance Reporting

- **Currently, the NYISO reports instances of reserve pickups/activations to stakeholders as follows:**
 - MC and OC: In the Operations Performance Metrics Monthly Report
 - SOAS: In the NYISO Operations report (provided monthly) (Note: MyNYISO website access required for accessing meeting materials)
 - NYISO website: Under daily Operational Announcements
- **Starting in early 2020, the NYISO proposes to supplement its current reporting to provide the following additional analytics within the Operations report distributed at SOAS, at least once per Capability Period**
 - Reserve Audit Results: total number of reserve units audited and the pass rate
 - Reserve Pickup Performance: evaluation of performance during the recent RPU

Reserve Provider Performance

- **The identified enhancements to NYISO’s reserve audit process will continue to allow the NYISO to successfully evaluate the performance capability of reserve providers**
 - The MMU has indicated its support for auditing units at least once per year and has recommended that NYISO should disqualify consistent poor performers
- **The NYISO will use analysis of RPU performance in conjunction with reserve audits to continuously evaluate the performance of reserve providers and in assessing whether to implement responsive action for addressing performance concerns**
 - The MMU has recommended that NYISO allow use of RPU data in lieu of, or as a supplement to, audits
- **The NYISO does not recommend the development of a performance metric or other reserve payment discounting mechanism at this time**

Next Steps

Next Steps

- **The timing to seek stakeholder approval for implementing load pocket reserves remains under review**
 - The NYISO is currently evaluating when load pocket reserves can be implemented
 - Stakeholder approval will not be pursued until draft tariff revisions have been developed and reviewed, and a consumer impact analysis has been completed

Feedback/Questions?

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Appendix

NYCA Operating Reserves

NYCA (Zone A - K)

A = most severe NYCA Operating Capability Loss (1310 MWs)

10 Min Spinning Reserve	½ A = 655 MWs NYSRC Rule
10 Min Total Reserve	A = 1310 MWs NYSRC Rule
30 Min Reserve	2x A = 2620 MWs NYSRC Rule

East (Zone F - K)

A = most severe NYCA Operating Capability Loss (1310 MWs)

10 Min Spinning Reserve	¼ A = 330 MWs NERC, NPCC Rule
10 Min Total Reserve	1200 MWs NYSRC Rule
30 Min Reserve	1200 MWs NERC, NPCC Rule

SENY (Zone G - K)

10 Min Spinning Reserve	0 MWs
10 Min Total Reserve	0 MWs
30 Min Reserve	1300 MWs NYSRC Rule

Long Island (Zone K)

10 Min Spinning Reserve	0 MWs
10 Min Total Reserve	120 MW NERC, NPCC Rule
30 Min Reserve	270 - 540 MWs Max limits NYSRC Rule

NYC (Zone J)

10 Min Spinning Reserve	0 MWs
10 Min Total Reserve	500 MW
30 Min Reserve	1000 MWs

A	WEST
B	GENESE
C	CENTRL
D	NORTH
E	MHK VL
F	CAPITL
G	HUD VL
H	MILLWD
I	DUNWOD
J	N.Y.C.
K	LONGIL

Reserve Clearing Price Calculation

- Each reserve product and location pair produces a shadow price for procurement of the reserve product
 - This shadow price is the cost to procure one additional MW of the reserve product in question
- The maximum shadow price value is capped based on the pricing values of the operating reserve demand curves
 - These maximum pricing values are shown in the table below
 - The reserve demand curve prices reflect those in effect during periods when the Special Case Resource program and/or the EDRP have not been activated

Reserve Product	NYCA	EAST	SENY	NYC	LI
10 Spinning	S.P.3 = \$775	S.P.6 = \$25	S.P.9 = \$25	S.P.12 = \$25	S.P.13 = \$25
10 Total	S.P.2 = \$750	S.P.5 = \$775	S.P.8 = \$25	S.P.11 = \$25	S.P.14 = \$25
30	S.P.1 = \$25, \$100, \$200, or \$750	S.P.4 = \$25	S.P.7 = \$500	S.P.10 = \$25	S.P.15 = \$25

Reserve Clearing Price Calculation

- Reserve clearing price calculations reflect the cascaded nature of reserve products
 - This cascading is reflected in the formulas in the following table
- Resources receive the total price equal to the summation of the shadow prices for all of the products that they are providing

Reserve Product	NYCA	EAST	SENY	NYC	LI
10 Spinning	S.P.1 + S.P.2 + S.P.3	S.P.1 + S.P.2 + S.P.3 + S.P.4 + S.P.5 + S.P.6	S.P.1 + S.P.2 + S.P.3 + S.P.4 + S.P.5 + S.P.6 + S.P.7 + S.P.8 + S.P.9	S.P.1 + S.P.2 + S.P.3 + S.P.4 + S.P.5 + S.P.6 + S.P.7 + S.P.8 + S.P.9 + S.P.10 + S.P.11 + S.P.12	S.P.1 + S.P.2 + S.P.3 + S.P.4 + S.P.5 + S.P.6 + S.P.7 + S.P.8 + S.P.9 + S.P.13 + S.P.14 + S.P.15
10 Total	S.P.1 + S.P.2	S.P.1 + S.P.2 + S.P.4 + S.P.5	S.P.1 + S.P.2 + S.P.4 + S.P.5 + S.P.7 + S.P.8	S.P.1 + S.P.2 + S.P.4 + S.P.5 + S.P.7 + S.P.8 + S.P.10 + S.P.11	S.P.1 + S.P.2 + S.P.4 + S.P.5 + S.P.7 + S.P.8 + S.P.13 + S.P.14
30	S.P.1	S.P.1 + S.P.4	S.P.1 + S.P.4 + S.P.7	S.P.1 + S.P.4 + S.P.7 + S.P.10	S.P.1 + S.P.4 + S.P.7 + S.P.13

Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system

