

# More Granular Operating Reserves

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February 10, 2020

# Agenda

- **Background**
- **Generator Performance During Reserve Pickups**
- **Proposed Tariff Revisions for Load Pocket Reserves**
- **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)
    - Proposal developed in 2019 and reviewed with stakeholders at the November 6, 2019 BIC meeting
  - Reviewing performance of resources scheduled to provide reserves
    - Proposed enhancements to audit process and performance reporting reviewed with stakeholders at the November 6, 2019 BIC meeting
- **The purpose of today's presentation is to review reserve provider performance during reserve pickup (RPU) events and discuss draft tariff revisions for the load pocket reserves proposal**

Date	Working Group	Discussion Points and Links to Materials
01-08-19	ICAPWG/MIWG	<a href="#">Proposed schedule for accelerating implementation of Zone J operating reserves</a>
01-15-19	ICAPWG/MIWG	<a href="#">Establishing a new Zone J reserve region with a 500 MW 10-minute and 1,000 MW 30-minute reserve requirement</a>
01-24-19	ICAPWG/MIWG	<a href="#">Proposed operating reserve demand curve prices for the Zone J reserve products and the proposed tariff revisions for this initiative</a>  <a href="#">Operating Reserve Background</a>
03-04-19	ICAPWG/MIWG	<a href="#">Analysis of potential impact</a>
03-13-19	BIC	<a href="#">Stakeholder vote: Establishing Zone J Operating Reserves</a>
03-27-19	MC	<a href="#">Stakeholder vote: Establishing Zone J Operating Reserves</a>
04-30-19	ICAPWG/MIWG	<a href="#">More Granular Operating Reserves</a>
07-10-19	ICAPWG/MIWG	<a href="#">More Granular Operating Reserves</a>
09-24-19	ICAPWG/MIWG	<a href="#">More Granular Operating Reserves</a>
10-28-19	ICAPWG/MIWG	<a href="#">More Granular Operating Reserves</a>
11-06-19	BIC	<a href="#">More Granular Operating Reserves: Overall Design</a>
02-06-20	ICAPWG/MIWG	<a href="#">Consumer Impact Methodology</a>

# Reserve Pickup Event Performance

# Background: Reserve Provider Performance

- **Throughout the stakeholder process in 2019, the NYISO presented the following:**
  - Review of reserve provider audit process
  - Historic reserve audit data
  - Enhancements to the reserve audit process
  - Enhancements to NYISO's reporting on reserve provider performance
- **In response to stakeholder requests, the NYISO committed to provide data regarding historic reserve pickup (RPU) event performance**

# Review of RPU Event Performance

- The NYISO evaluated performance of 10-minute reserve qualified units during 87 RPUs between November 2018 and November 2019
- NYISO's evaluation of reserve pickup performance encompasses resources:
  - With a reserve schedule in NYISO's Real-Time Dispatch (RTD) when the RPU was activated
  - That were asked to convert reserves to energy when the RPU was activated
    - Not all resources that receive a reserve schedule are asked to convert to energy during a RPU



# RPU Event Performance Parameters

- **The NYISO defined a set of parameters to evaluate performance during a RPU**
- **During a reserve audit, the NYISO evaluates performance based on the tolerance parameters defined in Technical Bulletin 142**
  - During a reserve audit for a 10-minute reserve provider, a variation of 2% of the required pickup, or 1 MW (whichever is greater), and a one-minute tolerance is allowed
- **To provide consistency in its analysis, NYISO is using the same parameters to evaluate performance during an RPU**
  - For gas turbines (GTs), performance is measured 11 minutes after the start time of the RPU to reflect the operating characteristics of GTs
  - For all other reserve providers, if the duration of the RPU is less than 10 minutes, a one-minute tolerance is added to the end time of the RPU. If the duration of the RPU is greater than 10 minutes, performance was measured after 11 minutes.

# RPU Event Performance Initial Analysis

- **Pass rate for 10-minute reserve providers:**
  - GTs: 87%
  - All resources (including GTs): 85%
- **The quantity of energy provided during RPUs was also assessed**
  - This metric is an important indicator of performance as it evaluates the ability of the reserve providers to provide the expected capability when called upon in real-time
  - The aggregate quantity of energy provided by all 10-minute reserve providers during RPUs exceeded the required response
    - Over performance by certain providers exceeded instances of under performance by other resources

# RPU Event Performance Results

- The below tables show the results of NYISO’s analysis
  - Of the 21 GTs with failed performance during a RPU event, 5 were due to a failed start

Pass and Fail Rates During a RPU				
	Pass	Fail	Total	Pass %
GTs	136	21	157	87%
All Resources	619	113	732	85%

Total Quantity of Energy Expected and Provided During a RPU			
	Total Energy Expected (MW)	Total Energy Provided (MW)	Percent of Energy Provided
GTs	5,122	5,031	98%
All Resources	17,678	21,319	121%

# Reserve Provider Performance Analysis

- **Historic performance evaluations demonstrate the following:**
  - Actual RPU performance pass rate between November 2018 and November 2019:
    - GTs: 87%
    - All units (including GTs): 85%
  - Average reserve performance audit pass rate from last 5 years (all units):
    - 10-minute units: 85%
    - 30-minute units: 90%
  - MMU's analysis in 2018 SOM - Average output after receiving an economic start-up signal in RTC:
    - 10-minute GTs: 82% of the MW offered
    - 30-minute GTs: 87% of the MW offered
- **These results demonstrate the same range of performance across the three methods of evaluation and indicate that suppliers are able to provide reliable reserve capability when called upon**

# Reserve Provider Performance: Next Steps

- **The NYISO will use analysis of RPU performance in conjunction with reserve audits to continuously evaluate the performance of reserve providers and in assessing the need for remedial action for addressing any demonstrated performance concerns**
- **The NYISO does not recommend the development of a performance metric or other reserve payment discounting mechanism at this time**
  - The NYISO will proceed with implementing the reserve provider audit and performance reporting enhancements previously discussed to facilitate its ongoing evaluation of performance
    - The proposed enhancements are further described in the presentation given at the November 6, 2019 BIC meeting

# Load Pocket Reserves Proposal

# Load Pocket Reserve Requirement

- The NYISO has proposed 30-minute reserve requirements for the 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

# Load Pocket Reserve Proposal

- **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**
  - The NYISO does not propose to modify the 30-minute reserve demand curves for load pockets during activations of SCR program/EDRP in real-time
    - SCR/EDRP and the scarcity pricing logic are generally zonal constructs
    - Scarcity pricing considerations for NYC will be accounted for in the 30-minute reserve demand curve for Zone J
- **The load pocket reserve regions would be nested within existing, upstream reserve regions**
- **All reserves procured in the load pockets will contribute to meeting the Zone J, SENY, East and NYCA reserve requirements**



# Proposed Tariff Revisions

- **Changes to the following tariff sections are proposed to address the establishment of the proposed load pocket reserve regions and associated reserve requirements:**
  - MST Rate Schedule 4 (Section 15.4)
- **The proposed tariff revisions are posted with today's meeting materials**

# Rate Schedule 4

- **Proposed changes within Rate Schedule 4 (MST Section 15.4):**
  - Revisions to reserve region descriptions and reserve clearing price calculations to account for the three new reserve regions (Sections 15.4.1.1, 15.4.4.1, 15.4.5.1, 15.4.6.1, and 15.4.7)
  - Revisions to scarcity pricing rules to clarify that the proposed 30-minute reserve demand curves for the load pocket reserve regions are not altered during SCR program/EDRP activations in real-time (Section 15.4.6.1.1)
  - Establishment of Operating Reserve Demand Curves for the three new reserve regions(Section 15.4.7)
  - Ministerial revisions to correct references to the Market Monitoring Unit (Section 15.4.7)

# Next Steps

# Next Steps

- **February 2020: The NYISO currently anticipates presenting the results of its consumer impact analysis for the load pocket reserves proposal by the end of February 2020 (currently targeting the February 25, 2020 ICAPWG/MIWG meeting)**
- **March 2020: Seek stakeholder approval of load pocket reserves proposal at BIC and MC**

# Appendix

# 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

Note: these calculations do not include the proposed load pocket reserve requirements or proposed additional SENY requirements

# 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

Note: these calculations do not include the proposed load pocket reserve requirements or proposed additional SENY requirements

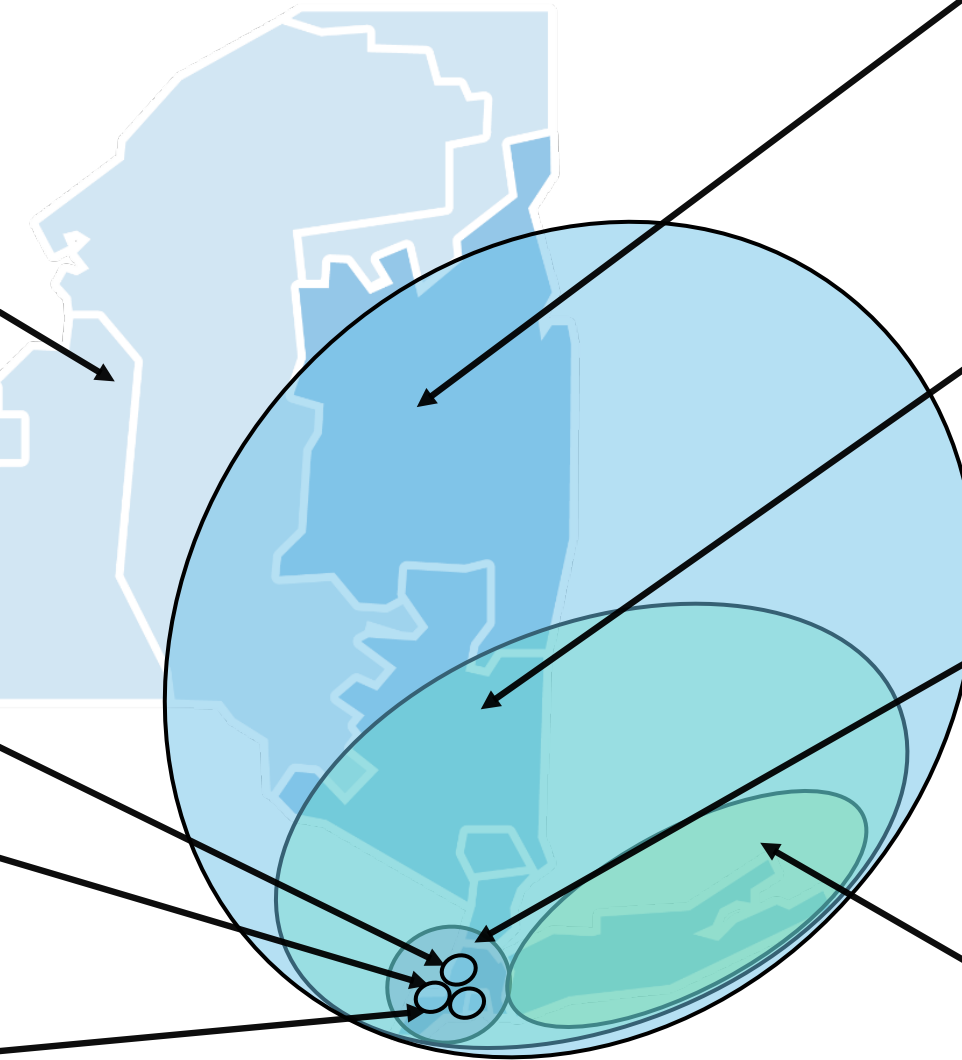
# NYCA Operating Reserves with Ongoing Reserves Efforts

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	2xA=2620 MWs - NYSRC Rule

Greenwood/Staten Island Load Pocket (proposed)	
10 Min Spinning Reserve	0 MWs
10 Min Total Reserve	0 MWs
30 Min Reserve	250 MWs

Astoria East Load Pocket (proposed)	
10 Min Spinning Reserve	0 MWs
10 Min Total Reserve	0 MWs
30 Min Reserve	325 MWs

Astoria West/Queensbridge/Vernon Load Pocket (proposed)	
10 Min Spinning Reserve	0 MWs
10 Min Total Reserve	0 MWs
30 Min Reserve	225 MWs



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
	500 MWs (proposed addition)

NYC (Zone J)	
10 Min Spinning Reserve	0 MWs
10 Min Total Reserve	500 MW
30 Min Reserve	1000 MWs

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



# Questions?

# 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

