More Granular Operating Reserves

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NEW YORK INDEPENDENT SYSTEM OPERATOR

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Agenda

- Background
- Load Pocket Reserves
- Next Steps

Background

Background- A Grid in Transition

- The New York Control Area is transitioning to a grid with increased weather-dependent resources on the system as environmentally focused public policies shape the way energy is supplied and consumed in New York[1].
- The primary future challenge arises from the variability and unpredictability of wind and solar generation resources and the potentially large quantities of each.
  - Energy and ancillary services products must continue to support reliable operations as the system evolves.

For further discussion, please see the report "Reliability and Market Considerations for a Grid in Transition" at the following link:
https://www.nyiso.com/documents/20142/6785167/Grid%20in%20Transition%20DRAFT%20FOR%20POSTING.pdf/74eb0b20-6f4c-bdb2-1a23-7d939789ed8c

Background- A Grid in Transition

- **As the penetration of weather-dependent generation technologies increases, the grid will need responsive and flexible resources that provide Ancillary Services, such as reserves, to address expected and unexpected changes in net load.**
  - Effective pricing of energy and ancillary services products to reflect system conditions and operational needs is crucial.
  - Reserve prices fall when and where this grid reliability service is not needed or when there is ample supply.
    - In this way, and by fostering competition, prices help to maintain grid reliability at the lowest cost.

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Background

- **NYISO staff has agreed to consider the following design elements as part of the More Granular Operating Reserves project:**
  - ✓ Establishing a reserve region in Zone J (completed)
  - Evaluating load pocket reserves in New York City (NYC)
  - Reviewing performance of resources scheduled to provide reserves
  - Two components which were identified in the project scope earlier in 2019 have been moved to be a part of the Ancillary Services Shortage Pricing project:
    - Evaluating the NYCA 30-minute reserve demand curve structure that applies during certain activations of Special Case Resources (SCRs) and Emergency Demand Response Program (EDRP) resources
    - Reviewing the Zone J reserve demand curve pricing and applicable reserve requirements during Thunderstorm Alerts (TSAs)

Background

- **The purpose of today's presentation is to discuss load pocket reserves in NYC**
  - The deliverable for More Granular Operating Reserves is Market Design Complete in 2019
- **More Granular Operating Reserves is one of several current projects evaluating components of the Ancillary Services market such as shortage pricing values and quantity of reserves procured**
  - Due to these dependencies, this project will benefit from being developed in parallel with Ancillary Services Shortage Pricing and Reserves for Resource Flexibility

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

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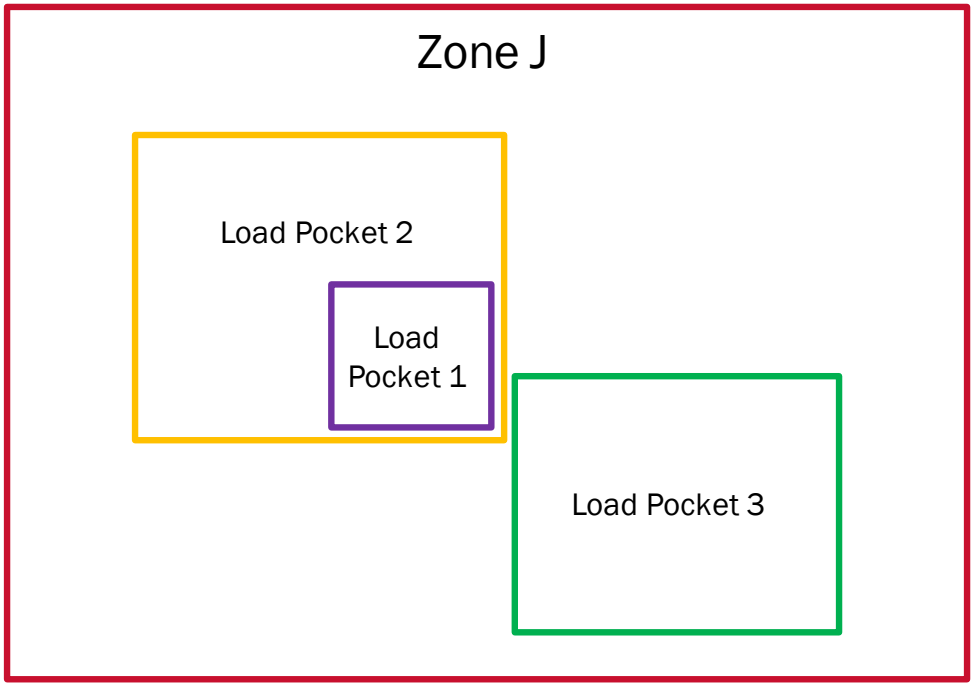
Load Pocket Reserves

What are Load Pockets?

- Load pockets are constrained areas in NYC which are impacted by:
  - Load levels and generation capability within the pocket
  - Transmission-supported import levels into the pocket
- The increasing reliance on weather-dependent renewable resources can potentially lead to more dynamic net load (and increased load variability/uncertainty) within load pockets, which will require that sufficient resources are available to respond to potentially rapid and unanticipated changes in load

Load Pockets



- The load pockets being evaluated as part of this project are all contained within Zone J
- The structure and boundaries of each pocket varies based on load, generation, and transmission imports
  - These load pockets can be nested, as shown in the illustrative example on the left

Local Reliability Requirements

- **Local Reliability Requirements (LRRs) can be fulfilled through resource commitments, dispatch reductions, or adjustments to transfer limitations, which may be accomplished by out-of-market actions**
  - Currently, the LRRs are evaluated during most passes of SCUC
- **The LRR evaluation determines if additional generation is needed within each load pocket**
  - Commonly, units with high start-up and minimum generation costs are committed to satisfy the LRRs
  - Units are often committed at their minimum generation level, even though additional output may be required to resolve a contingency
    - Commitment at minimum generation levels may result in circumstances where such units have not procured fuel in advance to readily accommodate increased output

Local Reliability Requirements

- **The LRR evaluation can result in committing resources that would not otherwise be committed economically**
  - These commitments may result in uplift if the resource does not earn enough revenue to recover their cover its day-ahead bids
  - Any resulting uplift costs associated with satisfying LRRs for NYC load pockets are allocated to the Con Edison Subzone
- **Uplift payments may result in market outcomes where the full cost of the resources required to meet system needs are not transparently reflected in energy prices**

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

Out-of-Market Costs

- **The 2018 SOM report noted that the total value of Day-Ahead Bid Production Cost Guarantee (BPCG) payments incurred to satisfy N-1-1 contingency requirements for NYC load pockets was over $26 million in 2018**
  - This represents an increase from the $20 million cost noted in the 2017 SOM report
  - Further information on local reliability costs and commitments for NYC is reported in NYISO's monthly Operations Report and in uplift reports implemented in response to FERC Order No. 844
    - The monthly Operations Reports are available on the NYISO's website and reviewed at Operating Committee and Management Committee meetings
    - The uplift reports are available within the "Reports & Info" portion of the "Energy Market & Operational Data" section of the NYISO's website

Load Pocket Reserve Requirements

- **The NYISO is exploring the possibility of establishing load pocket reserve requirements to address certain NYC load pocket LRRs**
  - This effort represents an extension of the recently approved Zone J reserve region proposal to explore the potential further specification of the appropriate geographic dispersion of NYC reserves within Zone J
- **The NYISO is proposing to target certain load pockets within NYC where units are commonly committed out-of-merit for local reliability, such as:**
  - Astoria East
  - Astoria West/Queensbridge
  - Astoria West/Queensbridge/Vernon
  - Greenwood/Staten Island
- **The NYISO would procure additional reserves specific to these locations and reserve requirements would be based on needs to meet LRRs**

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
- **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 10-minute and 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
  - Increasing reliance on weather dependent renewables (including distributed solar) can potentially lead to more dynamic and uncertain net load that will require the availability of sufficient resources deliverable to those locations to respond to unexpected load increases

Load Pocket Reserves: Next Steps

- **Continue to discuss aspects of market design:**
  - Reserve regions and associated requirements:
    - Identify load pockets to target for potential reserve regions within NYC
    - Determine appropriate quantity of reserves to be procured in each identified load pocket
    - Determine appropriate reserve demand curve values for load pocket reserve requirements
  - Cost allocation
    - The development of load pocket reserves for local reliability would differ from NYISO's existing reserves regions in which costs are allocated based on NYCA reliability
    - The cost to commit generators for local reliability needs in NYC are currently allocated to the local transmission owner
    - NYISO will evaluate how to structure the cost allocation to account for local reliability
  - Market Mitigation
    - NYISO will evaluate existing market mitigation measures for reliability commitments in NYC and determine if additional measures will be required

Load Pocket Reserves: Next Steps

- **July – August 2019**
  - Continue to discuss aspects of market design
  - Present Consumer Impact Analysis methodology and results
- **September 2019**
  - Present completed market design at BIC and MC

Feedback/Questions?

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- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system

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