

# Securing 100+kV Transmission Facilities in the Market Model

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**Market Issues Working Group**

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# Agenda

- Background
- Challenges
- Comparison to other ISOs/RTOs
- Implementation Timeline
- Procedure to Add/ Remove Lower kV Facilities
- Guarantee Payment (Uplift) Cost Allocation
- Transmission Congestion Contract (TCC) Market Impacts
- Energy Market Mitigation
- Timeline

# Background

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Date	Working Group	Link
06-29-2017	Market Issues Working Group (MIWG)	<a href="#">Presentation</a> on the NYISO's <a href="#">whitepaper</a>
08-18-2017	MIWG	<a href="#">Presentation</a>

# Purpose

- **The NYISO intends to secure select 100+kV transmission facilities within the market model. The proposed change addresses the State of the Market Recommendation from Potomac Economics**
  - The NYISO is currently working with stakeholders on the market design concept proposal

# Overview

- **The NYISO is the NERC Transmission Operator (TOP) for the NYCA 230 kV and higher system, while the Transmission Owners (TOs) are the TOPs for the lower kV system**
  - The TOs are ultimately responsible to NERC for lower kV system security
- **The NYISO helps the TOs to manage lower kV constraints through a number of out of market actions, which can lead to situations where market prices are not reflective of all actions required to maintain system reliability. These actions include:**
  - Transaction curtailments
  - PAR adjustments
  - Out of Merit (OOM) actions
  - Day-Ahead Reliability Unit (DARU) commitments
  - Supplemental Resource Evaluation (SRE)
  - Surrogate interface derates

# State of the Market Recommendation

- Potomac Economics recommends in each of the 2014 through 2016 State of the Market Reports\* that 100+kV transmission facilities be secured in the NYISO's market model, stating that:
  - Incentives to invest in resources on the 115kV system in upstate New York are inadequate
  - Managing lower kV facilities through out-of-market actions has increased power supplier uplift payments and contributed to the need for cost-of-service contracts to keep older resources operating
  - At times, transfer limits on internal and external interfaces are reduced to manage 115 kV security
- Potomac maintains that managing the security of lower kV facilities in the DA and RT markets would be more efficient, and recognizes that this would be a significant effort, requiring additional coordination with the local TO
- Potomac also recommends that mitigation measures be expanded to address the potential exercise of market power if lower kV facilities are to be secured within the market model

\*Link to the 2016 State of the Market Report:

[http://www.nyiso.com/public/webdocs/markets\\_operations/documents/Studies\\_and\\_Reports/Reports/Market\\_Monitoring\\_Unit\\_Reports/2016/NYISO\\_2016\\_SOM\\_Report\\_5-10-2017.pdf](http://www.nyiso.com/public/webdocs/markets_operations/documents/Studies_and_Reports/Reports/Market_Monitoring_Unit_Reports/2016/NYISO_2016_SOM_Report_5-10-2017.pdf)

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# Benefits

- **Optimality** – In many cases, the market software is likely able to provide a lower cost solution when securing these transmission constraints, compared to other means of securing these constraints
- **Price Formation/ Transparency** – the current approach mutes price signals for investment that would improve system reliability and efficiency
  - The absence of transmission constraint costs in LBMPs can lead to inefficient investment; suppliers have no visibility into potential revenue opportunities, and policy makers and the TOs cannot easily quantify the benefits of transmission solutions
    - This lack of transparency could result in the need for reliability contracts that impose significant cost on consumers. Improved transparency may produce a lower cost market solution
  - It will become increasingly important to incorporate the impacts and value of maintaining transmission system reliability into wholesale electricity market prices as Distributed Energy Resources (DERs) are expected to be located at the 100+kV level in the future
- **Securing these facilities may also reduce power supplier guarantee payments (uplift)**



# Challenges

# Challenges

- There are a number of challenges that the NYISO may have to resolve to move forward
- The technical considerations include:
  - Computation size impacting software execution performance
  - Longer software execution time resulting in increased risk of later posting of the DAM
  - Network topology solutions to 100+kV transmission constraints are not currently available to the optimization algorithm, see next slide for additional detail
  - Transmission constraint price volatility due to cycling units at the 100+kV level
  - A lower CRM (relative to 230+kV lines) may be more appropriate for some lower kV facilities; this will require Graduated Transmission Demand Curve modifications
  - The Automated Mitigation Process (AMP) will likely require modification if constrained areas are identified in upstate New York
  - Much of the 100+kV system does not have local generation to resolve 100+kV transmission constraints, possibly resulting in sustained pricing with the Graduated Transmission Demand Curve, which will require software modifications

# Network Topology Solutions

- **If a constraint forms during real time, the local TOs may be able to open a breaker to alleviate the constraint**
  - The NYISO's market model eventually catches up to this topology change; prices and line flows then reflect the new system conditions
- **The NYISO is not proposing to model line sectionalization/ load switching with this project**
  - The NYISO does not have direct control over transmission topology
  - Optimizing transmission topology would require extensive revisions to the NYISO's market software processes

# Comparison to other ISOs/RTOs

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- **NYISO secures 230 kV and higher transmission facilities throughout the NYCA, 138 kV facilities in New York City (Zone J) and on Long Island (Zone K), and a single 115 kV line in northern New York in our market model**
  - Normal ratings are used for base case constraints
  - Applicable limits are used for contingency constraints
- **ISO-NE secures transmission elements 115kV and above, as well as a few selected elements below 115 kV, to Long Term Emergency (LTE) within their market model**
  - Normal ratings are used for base case constraints
  - LTE limits are used for contingency constraints
- **ERCOT secures all transmission elements down to 69 kV in their market model**
  - Normal ratings are used for base case constraints
  - Emergency ratings are used for contingency constraints
    - Normal ratings are used for contingency constraints that are part of an Interconnection Reliability Operating Limit (IROL)
- **PJM secures most facilities 100 kV and above in their market model**
  - Normal ratings are used for modeled base case constraints
  - LTE limits are used for modeled contingency constraints
- **CAISO secures different facilities depending on whether the facility is in the northern or southern region; all transmission elements greater than 200 kV, as well as some 138 kV, 115 kV, and 69 kV elements are secured in the market model in the southern region, while all transmission elements 60 kV and above are secured in the northern region**
  - Normal ratings are used for base case constraints
  - Emergency ratings are used for contingency constraints

# Implementation Timeline

# EMS/BMS Dependency

- **Select 100+kV facilities may be able to be secured within the market model before the EMS/BMS project implementation in 2019**
  - The NYISO will prepare documentation of the procedure to add/ remove 100+kV facilities and provide it for stakeholder review before the tentative Q3 2018 Market Design Complete vote
- **It is anticipated that market design enhancements will be necessary to secure the majority of the facilities identified by the procedure; these enhancements will require extensive revisions to the market software**
  - If approved as part of the Market Design Complete phase in 2018, the majority of identified 100+kV facilities will be able to be secured within the market model following the implementation of the EMS/BMS Upgrade project

# Procedure to Add/ Remove Lower kV Facilities



# Procedural Modifications

- **The method NYISO intends use to evaluate 100+kV transmission facilities for inclusion in the market model will be consistent with legacy constraint modeling efforts**
  - Identify candidate transmission facilities and contingencies
  - Verify expected constraint flows in the Day-Ahead and real time Energy market models
  - Identify generators with adequate shift factors to resolve candidate constraints
  - Determine if additional market power mitigation rules are necessary/ feasible
- **In addition, the NYISO will develop a process for notifying NYISO Stakeholders of DAM/RTM modeling changes to implement transmission facility constraints**

# Procedure to Add/ Remove Lower kV Facilities

- **The NYISO is currently preparing more detailed documentation of the procedures to add and/or remove lower kV facilities**
  - This document will also state the methodology used to identify resources with adequate shift factors to resolve candidate constraints
- **This document will identify:**
  - Facilities to be added prior to the deployment of the EMS/BMS project
  - Facilities to be added after the deployment of the EMS/BMS project

# Procedure to Add/Remove Lower kV Facilities

- The following must be reviewed prior to securing select 100+kV transmission facilities within the market model before the EMS/BMS project deployment:
  - The impact of the current Graduate Transmission Demand Curve on pricing outcomes
    - Applying the price and MW points on the current GTDC, or the \$4,000/MWh cap, to lower kV transmission constraints may, at times, result in an inefficiently high shortage cost for some facilities; Constraint Specific Demand Curves is anticipated to alleviate this concern
      - The NYISO will begin stakeholder discussions regarding Constraint Specific Demand Curves at an MIWG meeting in late September or Early October
  - Whether current market mitigation rules are adequate to protect consumers after securing 100+kV facilities in the market model
    - The NYISO proposes to modify the definition of “Constrained Area” and extend AMP to any newly identified load pockets as part of the implementation after the EMS/BMS project deployment

# Guarantee Payment (Uplift) Cost Allocation

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- Any uplift resulting from securing additional, lower kV facilities in the market model will be allocated statewide
- If a local TO requests an out of market action, such as a DARU or OOM, then any uplift paid to a generator as a result of that action will be allocated to the local TO
- The NYISO will continue to closely monitor uplift once 100+kV facilities are secured in the market model

# Transmission Congestion Contract (TCC) Market Impacts

# TCC Market Impacts

- **Consistent with current practice, the NYISO will continue to initialize the TCC model using the transmission system representation, including transmission limits, within the NYISO model for the Day-Ahead Market (DAM) Security Constrained Unit Commitment (SCUC) software**
  - The 100+kV transmission elements will likely be limiting for TCC Auction constraints
  - All outages of 100+kV transmission facilities will be evaluated for cost impact in either the TCC Auction or the DAM Congestion settlement process

# Energy Market Mitigation



# Energy Market Mitigation

- In areas where there are a limited number of resources capable of resolving transmission constraints, the potential for the exercise of market power exists; in these instances, market mitigation rules are essential for the protection of New York consumers
  - Once certain 100+kV facilities are secured in the market model, the NYISO's current rules and software would need to be improved to permit the NYISO to implement appropriate mitigation rules for constrained load pockets outside of the currently defined "Constrained Area" (NYC)
  - The NYISO proposes to extend AMP to any newly identified load pockets
    - If an interim solution is required, then the NYISO proposes to mitigate conduct that exceeds a specified conduct threshold without an accompanying impact threshold in any identified Constrained Area(s)
- The NYISO is conducting further analysis to identify new Constrained Areas(s), along with an initial Load Pocket Threshold (LPT) to be set for newly created Constrained Areas
  - The NYISO is currently considering an initial LPT of \$10, consistent with the current value for Rest of State reliability mitigation

# Timeline

# Timeline

- **September 2017**
  - Targeted presentation of the Market Design Concept Proposal
- **October 2017**
  - Targeted initial presentation for Constraint Specific Demand Curves
  - Targeted presentation of the Consumer Impact Analysis
- **Q3 2018**
  - Tentative target date for:
    - The documentation of the procedures to add and/or remove lower kV facilities
    - The Market Design Complete Vote of Securing 100+kV Transmission Facilities in the Market Model
- **2019**
  - EMS/BMS Project Deployment
- **After 2019 EMS/BMS Project Deployment**
  - Implementation of Constraint Specific Demand Curves\*
  - Implementation of Securing 100+kV Transmission Facilities in the Market Model\*

\*Subject to Stakeholder, NYISO Board of Directors, and FERC approval

# The Mission of the New York Independent System Operator is to:

- Serve the public interest and
- Provide benefit to stakeholders 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 policy makers, stakeholders and investors in the power system



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