Securing 100+kV Transmission Facilities in the Market Model

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Agenda

- Background
- Comparison to other ISOs/RTOs
- Procedure to Add Lower kV Facilities
- Transmission Shortage Cost/ Constraint Reliability Margin (CRM)
- Uplift Cost Allocation
- Market Power Mitigation
- Timeline

Background

Purpose

- The NYISO intends to secure select 100+kV transmission facilities within the market model
- The NYISO will work with stakeholders to develop a market design concept proposal over the next few stakeholder meetings

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

Challenges

- **There are a number of benefits to securing 100+kV transmission facilities within the market model**
  - There are also 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
  - 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 pricing with the Graduated Transmission Demand Curve, which will require software modifications

Benefits

- **Optimality - 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)**

Comparison to other ISOs/RTOs

Comparison to other ISOs/RTOs

- **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 (continuous) ratings are used for base case constraints
  - Emergency ratings are used for contingency constraints
    - Normal (continuous) 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

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Procedure to Add Lower kV Facilities

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Procedural Modifications

- **The method NYISO would 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
  - Develop process for notifying NYISO Stakeholders of DAM/RTM modeling changes to implement lower kV constraints

Procedural Modifications

- **The NYISO will indicate on the A-1/ A-2 list which facilities have thermal limits secured in the market model**
  - A new column will be included within Attachment A of the Outage Scheduling Manual

Link to Attachment A of the NYISO Outage Scheduling Manual:
http://www.nyiso.com/public/webdocs/markets_operations/documents/Manuals_and_Guides/Manuals/Operations/Child_outage_sched_mnl/M-29_Outage%20Scheduling_Att%20A.pdf

Transmission Shortage Cost/ Constraint Reliability Margin (CRM)

Transmission Shortage Cost

- **The current transmission shortage pricing logic applies either the graduated transmission demand curve, or a $4,000/MWh cap to transmission constraints**
  - Applying the price and MW points on the current GTDC, or the $4,000/MWh cap, to lower kV transmission constraints would, at times, result in an inefficiently high shortage cost for these facilities

Transmission Shortage Cost

- Securing lower kV facilities within the market model depends on the completion of Constraint Specific Demand Curves, a separate project currently being prioritized by stakeholders

Constraint Reliability Margin (CRM)

- **The CRM defines a value below the maximum physical limit on a transmission facility that is used by the NYISO's market software as the effective limit when making economic commitment and dispatch determinations**
  - The CRM value is normally 20 MW or larger, but is zero for a limited number of internal transmission facilities and effectively zero for all external interfaces
- **Given that current CRM values were originally developed for higher kV lines, the NYISO intends to reduce the typical 20 MW CRM value for lower kV lines**
  - Generally, the NYISO intends to use a 20 MW CRM for 138 kV and above facilities, while a 10 MW CRM will be used for 115 kV facilities
  - The NYISO currently posts facilities with a CRM value that is not equal to 20 MW, and intends to maintain similar transparency regarding CRM values moving forward

Guarantee Payment Cost Allocation

Guarantee Payment Cost Allocation

- **The NYISO's preference is to allocate guarantee payments (uplift) locally as is currently done for securing local 115 kV facilities**
  - However, in the absence of new uplift allocation rules, any uplift resulting from securing local 115 kV facilities in the market model will be allocated statewide
- **The NYISO will continue to closely monitor uplift once 100+kV facilities are secured in the market model**

Market Power Mitigation

Market Power Mitigation

- **Securing the underlying 100+kV transmission system in the market software has the potential to introduce new congested areas to the market**
  - Where these areas include a limited number of resources capable of resolving transmission constraints, potential for the exercise of market power exists
- **In areas where there is a strong potential for market power to be exercised, market mitigation rules are essential for the protection of New York consumers**
  - 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)

Market Power Mitigation

- The NYISO's current AMP software does not allow for the creation of mitigated load pockets outside of NYC
  - The NYISO proposes to modify the definition of "Constrained Area" and 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 threshold without an accompanying impact threshold in any identified Constrained Area

Market Power Mitigation

- **Defining new Constrained Areas:**
  - Ensures consumers in typically constrained areas are protected from the exercise of market power
  - Is consistent with AMP in NYC (Zone J)
  - Provides the market with transparency into which areas are subject to automated mitigation

Market Power Mitigation

- The NYISO proposes to initially use a Load Pocket Threshold (LPT) of $10 for newly created Constrained Areas

Timeline

EMS/BMS Dependency

- **Securing 100+kV transmission facilities within the market model will require extensive revisions to the market software**
  - If approved as part of the Market Design Complete phase in 2018, this project will not be able to be implemented until after the implementation of the EMS/BMS Upgrade project

Timeline

- **July MIWG**
  - Discuss the NYISO's proposal
  - Consumer Impact Analysis Methodology
- **August MIWG**
  - Continue discussion of the NYISO's proposal
- **September MIWG**
  - Consumer Impact Analysis
  - Present Market Design Concept Proposal

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