Securing 100+kV Transmission Facilities in the Market Model

Draft Market Design Complete Presentation

Ethan D. Avallone

SENIOR MARKET DESIGN SPECIALIST – ENERGY MARKET DESIGN, NYISO

Market Issues Working Group

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Agenda

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- White Paper
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Background

Previous Presentations

Date	Document Type/ Link
6/29/2017	Presentation
6/29/2017	White Paper
7/31/2017	Consumer Impact Analysis Methodology
7/31/2017	Presentation
8/25/2017	Presentation
9/25/2017	Presentation
11/2/2017	Consumer Impact Analysis
1/10/2018	Presentation
2/6/2018	Market Update
2/21/2018	Presentation
3/26/2018	Timeline Update
3/26/2018	Facilities List
5/9/2018	Presentation
6/13/2018	Presentation
7/24/2018	Presentation
7/24/2018	Timeline Update
7/24/2018	Facilities List
8/7/2018	Presentation

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Purpose

- **This presentation will summarize the Securing 100+kV Transmission Facilities in the Market Model project. This project is expected to provide a number of benefits.**
  - This project will reduce out of market actions by allowing the market software to use more efficient solutions to thermal overloads when such solutions are available.
  - Implementing the identified 115kV facilities* as secured in the market models will also allow for more efficient price formation and price transparency as the cost to secure the system is more accurately represented in LBMPs moving forward.

*Link to the July 24, 2018 Facilities List:
http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2018-07-24/July%2024,%202018%20List%20of%20Facilities%20-%20100+kV%20FINAL.PDF

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, but are not limited to:**
  - 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 recommended in each of the 2014 through 2017 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 observed that some 115kV facilities raise the local market power concern that suppliers may be able to extract inflated guarantee payments.
    - The MMU recommended that, once such constraints are modeled and priced, mitigation measures be expanded to address the potential exercise of market power.

*Link to the 2017 State of the Market Report: https://www.potomaceconomics.com/wp-content/uploads/2018/06/NYISO-2017-SOM-Report-5-07-2018_final.pdf

White Paper

White Paper

- **The NYISO published a white paper in June 2017 discussing Securing 100+kV Transmission Facilities in the Market Model.**
  - This white paper provided an overview of the challenges and benefits of this project.
  - The white paper also provided a study model that analyzed the potential system impacts of including lower kV facilities as secured in the market model.

- Link to the white paper: http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_icapwg/meeting_materials/2017-06-29/Securing%20100+kV%20Transmission%20Facilities%20in%20the%20Market%20Model.pdf

Consumer Impact Analysis

Consumer Impact Results

- **A consumer impact analysis was completed, indicating that securing 100+kV facilities in the market model will lead to a more efficient solution, reducing the number of out of market action taken to secure the system.**
  - Though this project is expected to cause a slight increase in consumer cost initially, over time consumers will benefit from improved market signals that reduce long run consumer cost.

*Link to the Consumer Impact Analysis: http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2017-11-02/CIA%20-%20100+kV%20110217.pdf

Process for Determining Facilities Secured in the Market Models

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Process for Determining Facilities Secured in the Market Models

- **The NYISO and its stakeholders developed a procedure to add or remove facilities as secured in the market models.**
  - This procedure was incorporated into the Transmission and Dispatching Operations Manual,* and includes the following steps (further details are included at Appendix I)
    - Identify candidate transmission facilities to be secured including expected contingencies.
    - Confirm efficient solution options are expected to be available to the BMS market models to secure the thermal constraints in the market model.
    - Identify system changes that could trigger the removal of a facility as secured in the market models.
    - Communicate to stakeholders that the transmission facility thermal constraints are now being secured, or is no longer secured within the BMS market models.

*Link to the August 13, 2018 BIC presentation discussing the relevant Transmission & Dispatching Operations Manual revisions:
http://www.nyiso.com/public/webdocs/markets_operations/committees/bic/meeting_materials/2018-08-13/T_D%20Manual%20Revisions%20August%20BIC%20FINAL.pdf

Market Implementation

Constraint Reliability Margin (CRM)

- As the NYISO continues to consider inclusion of certain 115 kV facilities with lower thermal ratings (relative to 230 kV and higher facilities) into its dispatch, a 20 MW CRM can often represent a significant percentage of the facility limits.
- The NYISO is separately working with market participants on a proposed tariff update that would permit the use of a non-zero constraint reliability margin (CRM) that is less than 20 MW, which was approved at the August 13, 2018 BIC meeting, and will be voted on at the August 29, 2018 MC meeting.*
- The ability to apply a CRM value less than 20 MW will facilitate the continued pricing of smaller 115 kV facility constraints.

*Link to the August 13, 2018 BIC presentation:
http://www.nyiso.com/public/webdocs/markets_operations/committees/bic/meeting_materials/2018-08-13/BIC%2020MW%20CRM_Aug13vFINAL.pdf

TCC Auction Implementation

- **The NYISO will begin securing in all rounds of the Autumn 2018 Centralized TCC Auction the four facilities with the notation "Targeting November 2018" in the 100+kV Facilities List posted with the materials of the July 24, 2018 ICAP/MIWG meeting.***
  - The ratings for these facilities will reflect a 20 MW CRM in all rounds of the Autumn 2018 Centralized TCC Auction.
- **The NYISO will also begin securing in all rounds of the Autumn 2018 Centralized TCC Auction the eighteen facilities with the notation "Targeting December 2018" in the 100+kV Facilities List posted with the materials of the July 24, 2018 ICAP/MIWG meeting.***
  - The ratings for these facilities will reflect a 20 MW CRM in all rounds of the Autumn 2018 Centralized TCC Auction.

*Link to the July 24, 2018 Facilities List:
http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2018-07-24/July%2024,%202018%20List%20of%20Facilities%20-%20100+kV%20FINAL.PDF

TCC Auction Implementation

- The November 2018 Balance-of-Period Auction will allow TCC Market Participants to reconfigure their TCC holdings for the individual months (periods) of November 2018 through April 2019.
- Adjustments to facility ratings which may occur as a result of tariff updates which would permit the use of non-zero CRM values less than 20 MW may be reflected in the November 2018 Balance-of-Period Auction and/or subsequent TCC auctions, depending on the status of this initiative.
- Adjustments to the secured status of 100+kV Facilities may be reflected in the November 2018 Balance-of-Period Auction and/or subsequent TCC auctions based on information available at the time auctions are conducted.
- The NYISO will provide announcements via email to stakeholders describing any changes in modeling assumptions for 100+kV Facilities which differ from those used in the Autumn 2018 Centralized TCC Auction prior to the start of the November 2018 Balance-of-Period Auction or subsequent TCC auction.

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Energy Market Implementation

- **The NYISO posted a revised list of facilities to the July 24, 2018 MIWG meeting materials.***
  - Certain facilities are targeted to be secured in the energy market by the end of November 2018.
    - A modeling update is needed for these facilities (breakers modeled as normally open as a topology change to split the bus).
  - Certain facilities are targeted to be secured in the energy market by the end of December 2018.
    - A modeling update is also needed for these facilities (breakers modeled as normally open as a topology change to split the bus).
    - Additionally, Niagara generation modeling updates are needed for these facilities.

*Link to the July 24, 2018 MIWG meeting materials:
http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2018-07-24/July%2024,%202018%20List%20of%20Facilities%20-%20100+kV%20FINAL.PDF

Market Power Assessment of 115kV Implementation

Market Power Assessment of 115kV Implementation

- The NYISO presented the Market Power Assessment of the 115kV Implementation at the June 13, 2018 MIWG meeting, which discussed:*
  - Reliability Committed Resources,
  - Traditional Load Pockets, and
  - Uneconomic Over-production
- The NYISO's Market Power Assessment of 115 kV facilities indicated that it is not necessary to pursue mitigation rules tied to the 100+kV project at this time.

Link to the June 13, 2018 Market Power Assessment of 115kV Implementation presentation:
http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2018-06-13/115_market_power_vFINAL.pdf

Market Power Assessment of 115kV Implementation – Reliability Committed Resources

- **Reliability committed resources not in a Constrained Area are currently subject to a mitigation threshold of $10 or 10%, which is assessed by the NYISO after the market software determines prices and schedules.**
- **After 115kV lines are secured, certain resources could become pivotal suppliers, and have the ability to set the price of new local 115kV constraints.**
  - The NYISO would need to modify MST Section 23.3.1.2.3.3 and to develop necessary software improvements to ensure that generators committed for reliability outside the NYISO's economic merit order selection process would be mitigated according to reference prices before prices and schedules are established by the market software.
- **Only two lines of the 30 originally identified (Gardenville/ Cloverbank, 141/142), would require the described mitigation rule enhancements in order to be secured.**
  - Because Gardenville/ Cloverbank, 141/142 are secured by line sectionalization by the local TO, which cannot be accurately represented in the NYISO's market model, the NYISO does not plan to secure these facilities in the market model at this time.

Market Power Assessment of 115kV Implementation – Traditional Load Pockets

- **Securing the Gardenville/Cloverbank facilities could also create load pocket concerns.**
  - Given that only these two facilities were identified as potential contributors to load pocket concerns, and given that these facilities are not proposed to be modeled at this time, the NYISO proposes not to pursue mitigation rule changes for load pockets.
- **Instead, the NYISO proposes to monitor load pocket concerns, and pursue related mitigation rule changes if additional facilities in the future are unable to be modeled in the absence of mitigation rule changes.**

Market Power Assessment of 115kV Implementation – Uneconomic Over-Production

- **Uneconomic over-production occurs when a resource's output is increased to levels that would otherwise be uneconomic in order to cause, and obtain benefits from, a transmission constraint.**
  - Instead of pursuing uneconomic over-production rule changes as part of the 100+kV project, the NYISO will begin discussions with stakeholders later in 2018 to address uneconomic over-production more broadly.

Market Design Summary

Summary

- The 100+kV White Paper provided an overview of the challenges and benefits of this project, while the consumer impact analysis noted that short term consumer costs would yield consumer savings over the long run.
- The NYISO and stakeholders developed the Process for Determining Facilities Secured in the Market Models, and included this process as a new section in the Transmission and Dispatching Operations Manual.
- The NYISO has communicated targeted market implementation dates for the TCC auctions and energy market models, and will continue to update stakeholders as necessary regarding these implementation plans.
- The NYISO conducted a Market Power Assessment of 115kV facilities which indicated that it is not necessary to pursue mitigation rules tied to the 100+kV project at this time, given the facilities proposed to be secured in the market model.

Timeline

Timeline

- **September 12, 2018 BIC**
  - Market Design Complete Presentation for Securing 100+kV Transmission Facilities in the Market Model.
- **By November 30, 2018**
  - Targeting to begin securing four facilities identified for November 2018 in the energy market models.
- **By December 31, 2018**
  - Targeting to begin securing eighteen facilities identified for December 2018 in the energy market models.

Appendix I: Process for Determining Facilities Secured in the Market Models

Transmission and Dispatching Operations Manual

- The content on the following slides has been incorporated into the NYISO Transmission and Dispatching Operations manual starting at section 5.0.

5.0 Introduction

- **Consistent with the NYISO's responsibility to ensure reliable operation and efficient market outcomes, the following process is utilized to identify and evaluate facilities that should be secured in the Business Management System (BMS) Day-Ahead and real time market models.**
  - The NYISO is the Transmission Operator (TOP) responsible for operating and securing the transmission system 230kV and above, which is typically done in the market models.
  - The NYISO has worked with Con Ed and LIPA to include their respective 138 kV facilities in the BMS market models to facilitate congestion management improvements in those franchise areas.
- **The NYISO expects there may be additional congestion management opportunities to modeling other 100+ kV facilities throughout the state for those facilities that often require manual action to secure.**

5.1 Identify candidate facilities to be secured, including expected contingencies

- The NYISO shall evaluate all transmission facility thermal constraints that require out of market actions to operate reliably including, but not limited to, DARU/SRE/Out of Merit operation of a NYCA generating resource, Applications of Reliability Rules (ARRs), modification of external TTC limits, Phase Angle Regulator (PAR) adjustments, or interchange transaction contract curtailments.
- The NYISO shall review with the local Transmission Operator (TOP) the facility constraints to be secured in the BMS market models. The NYISO and local TOP will determine whether additional operating actions are used to secure the facility (e.g. load switching, station bus sectionalizing, phase angle regulator action, etc.).
  - If the actions that the local TOP will take to secure the facility cannot be adequately represented in the BMS market models, then the facility under consideration shall not be secured in the BMS market models until such actions can be adequately represented

5.1 Identify candidate facilities to be secured, including expected contingencies

- **Before considering a facility to be modeled as secured in the market models, the NYISO shall verify that facility constraint flow development in the BMS market models is consistent with expected EMS actual constraint power flows. This step shall ensure that the market models accurately reflect expected power flows over the transmission facilities to be secured (e.g. market model flows are expected to be within 5% of EMS flows).**
  - If constraint flow development in the BMS market models is not consistent with EMS actual constraint power flows, then the facility under consideration shall not be secured in the BMS market models until such constraint flows can be adequately represented

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5.2 Confirm Efficient Solution Options are Available

- **The NYISO shall verify that NYCA resources are available with a greater than or equal to 5% generator shift factor on the constraint in either direction *(i.e.*, dispatch generation up or dispatch generation down), and that those resources are capable of establishing an appropriate shadow price in the SCUC/RTC/RTD market models.**
  - A generation shift factor of 5% is consistent with the North American Electric Reliability Corporation (NERC) Transmission Loading Relief (TLR) procedure that is used for interchange transaction contract curtailments and is considered by the NYISO to provide effective relief of a constraint.
- **The NYISO shall evaluate whether any NYCA resources necessary to solve the facility constraint could result in an exercise of market power if the facility is implemented in the BMS market models. If so, the NYISO shall determine if there are existing mitigation rules in place to effectively address the market power issues. If there are no effective mitigation rules in place, the facility will continue to be secured using local TOP operating actions and be subject to the NYISO's existing market power mitigation rules (e.g. Rest-of-State Reliability Mitigation Rules).**
  - If existing mitigation rules are not in place to address such market power issues, then the facility under consideration shall not be secured in the BMS market models until further mitigation rules are developed.

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5.3 Identify System changes that could Trigger the Removal of a Facility Secured in the Market Models

- The NYISO shall consider topology changes that make it no longer necessary to secure a given facility within the market models. No longer securing a facility in the market models in these instances ensures that solve times are kept within acceptable limits while ensuring that the most important facilities are included.
  - For example, the frequent OOM actions that originally triggered securing of the facility in the market models could be resolved by transmission facility or generator upgrades.

5.4 Communicate Facility Status

- The NYISO shall include an additional column within Attachment A of the Outage Scheduling Manual to indicate that a given facility is secured within the market models

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- 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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