New York ISO
Independent System Operator

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May 11, 2023

Submitted Electronically

Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street N.E.
Washington, D.C. 20426

Re: Docket No. ER23-___-000, *New York Independent System Operator, Inc.*; Proposed Transmission Constraint Pricing Enhancements

Dear Secretary Bose:

In accordance with Section 205 of the Federal Power Act[1] and Part 35 of the regulations of the Federal Energy Regulatory Commission ("Commission"), the New York Independent System Operator, Inc. ("NYISO") submits proposed revisions to its Market Administration and Control Area Services Tariff ("Services Tariff") to implement enhancements to its transmission constraint pricing logic.[2]

The NYISO respectfully requests: (1) issuance of an order accepting the proposed tariff revisions on or before July 10, 2023 (*i.e.*, within sixty days after submission of this filing); and (2) approval of a flexible effective date to be established upon at least two weeks' prior notice as further described in Section IV below.[3]

I. List of Documents Submitted

The NYISO submits the following with this filing letter:

1. A clean version of the proposed revisions to the Services Tariff ("Attachment I"); and

2. A blacklined version of the proposed revisions to the Services Tariff ("Attachment II").

[1] 16 U.S.C. § 824d.

[2] Capitalized terms not otherwise defined herein shall have the meaning specified in the Services Tariff.

[3] The NYISO proposes to submit a subsequent filing to establish the effective date for the proposed tariff revisions. The effective date will follow the successful deployment of the software changes necessary to implement the transmission constraint pricing enhancements described herein. The NYISO currently anticipates that the effective date for the proposed tariff revisions will likely be a date within the second week of October 2023 (*i.e.*, potentially as early as October 9, 2023).

II. Background

The pricing and dispatch algorithms within the NYISO's Day-Ahead and real-time market software utilize Transmission Shortage Cost values to establish an upper bound on the Shadow Price of resolving transmission constraints when determining Locational Based Marginal Prices. Transmission Shortage Cost values support the production of efficient and timely dispatch results by allowing the software to conclude its search for solutions to a given transmission constraint when such constraint either cannot be solved or can only be solved at a Shadow Price higher than the applicable upper bound value.

The applicable transmission constraint pricing logic depends on whether a transmission facility or Interface is assigned a non-zero constraint reliability margin ("CRM") value.[4] Transmission facilities and Interfaces assigned a non-zero CRM value utilize a graduated Transmission Shortage Cost mechanism. Transmission facilities and Interfaces assigned a zero CRM value utilize a Shadow Price capping mechanism.

For transmission facilities and Interfaces assigned any non-zero CRM value, the current transmission constraint pricing logic includes a graduated Transmission Shortage Cost mechanism.[5] This mechanism consists of both a transmission demand curve and a Shadow Price cap.[6] The first two steps of the graduated Transmission Shortage Cost mechanism are implemented as a transmission demand curve providing 20 MW of additional resource capability

[4] *See* Docket No. ER17-1453-000, *New York Independent System Operator, Inc.*, Proposed Tariff Revisions to Clarify and Enhance Transmission Constraint Pricing (April 21, 2017) ("2017 Filing"); and Docket No. ER17-1453-000, *supra*, Letter Order (June 14, 2017). The CRM establishes a pre-defined offset (or reduction) to the otherwise applicable physical operating limit of a transmission facility or Interface. For example, if a transmission facility had a physical operating limit of 1,000 MW and was assigned a CRM value of 20 MW, the effective limit utilized by the NYISO's market software for securing such facility would be 980 MW. The CRM assigned to a transmission facility or Interface is determined based on the NYISO's operational experience and consideration of various factors across a broad range of potential system conditions.

[5] The most common non-zero CRM value is 20 MW; however, the NYISO utilizes values lower and higher than 20 MW for certain transmission facilities and Interfaces. A list of all transmission facilities and Interfaces assigned a non-zero CRM value other than 20 MW is available on the NYISO's website at the following location: https://www.nyiso.com/documents/20142/2267995/Constraint_Reliability_Margin_CRM.pdf. This list also identifies transmission facilities and Interfaces assigned a zero CRM value.

[6] *See* 2017 Filing at 5-8.

to help resolve transmission constraints.[7] The final portion of the graduated Transmission Shortage Cost mechanism operates as a Shadow Price cap equal to $4,000/MWh.[8]

Transmission facilities and Interfaces assigned a zero CRM value utilize a single value Shadow Price capping mechanism.[9] The value of the cap is $4,000/MWh. This construct is consistent with the pricing structure of the graduated Transmission Shortage Cost mechanism. Due to absence of a CRM value, any shortage in resource capability to maintain flows at or below the applicable physical limit would result in power flows exceeding such limit.[10] Consistent with the graduated Transmission Shortage Cost mechanism, shortages of this magnitude are subject to the $4,000/MWh Shadow Price cap.

In 2018, the NYISO, in collaboration with its stakeholders, conducted a study to assess the current transmission constraint pricing logic and identify potential enhancements to further consider.[11] This assessment recommended the consideration of several potential enhancements to the current transmission constraint pricing logic, including: (1) adjustments to the transmission demand curve mechanism to better reflect the use of non-zero CRM values other than 20 MW; (2) reducing reliance on "constraint relaxation" when resolving transmission constraints;[12] and (3) application of a transmission demand curve mechanism to internal transmission facilities

[7] The 20 MW total value of additional relief provided by the transmission demand curve is based on the most commonly assigned non-zero CRM value. The transmission demand curve consists of 5 MW of available capability at a cost of $350/MWh and an additional 15 MW of available capability at a cost of $1,175/MWh.

[8] The pricing logic will continue to pursue available physical resource capability to resolve a transmission constraint at costs greater than $1,175/MWh based on bids submitted by supply resources subject to a maximum allowable Shadow Price of $4,000/MWh.

[9] *See* 2017 Filing at 7-8. The NYISO assigns a zero CRM value to external interfaces, as well as certain internal transmission facilities that accommodate power flows out of export constrained areas (commonly referred to as "generation pockets").

[10] In the context of transmission constraints, a "shortage" represents the absence of available resource capability to help relieve a transmission constraint and maintain power flows on such constraint at or below the applicable physical operating limit of the transmission facility or Interface associated with the constraint. The absence of available resource capability can result from the actual unavailability of additional resource capability or the absence of additional resource capability at a cost less than the applicable Transmission Shortage Cost value.

[11] NYISO, *Constraint Specific Transmission Shortage Pricing* (September 2018), available at: https://www.nyiso.com/documents/20142/2549789/Constraint%20Specific%20Transmission%20Shortage%20Pricing%20-%20Paper_Final.pdf ("2018 Study Report").

[12] *See* 2017 Filing at 8. "Constraint relaxation" refers to logic utilized by the NYISO's software to resolve infeasible transmission constraints in the economic dispatch. An infeasible constraint represents a circumstance where insufficient resource capability is available to resolve a given transmission constraint. When faced with these circumstances, the market software resolves the infeasibility by adjusting the otherwise applicable physical operating limit to a value consistent with quantity of resource capability that is available (including, if applicable, the 20 MW of additional resource capability made available by the transmission demand curve mechanism).

assigned a zero CRM value.[13] In response to these recommendations, the NYISO proposes the enhancements described herein.

III. Description of Proposed Tariff Revisions

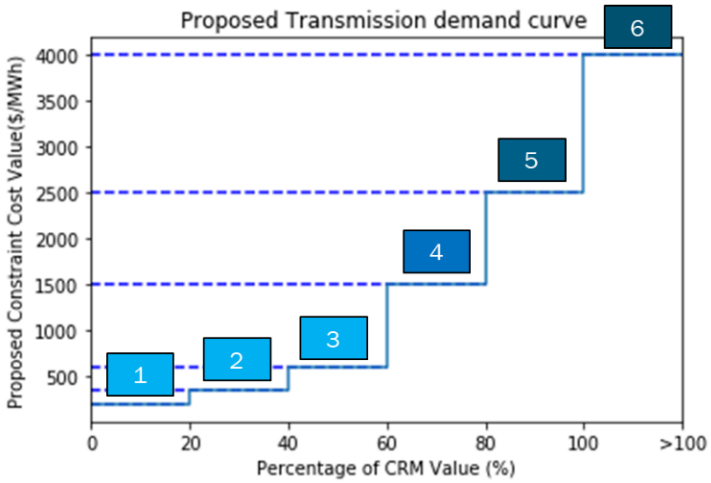
The NYISO proposes revisions to Section 17.1.4 of Attachment B to the Services Tariff to implement enhancements to its current transmission constraint pricing logic. Specifically, the NYISO proposes to: (1) replace the current 20 MW, two-step transmission demand curve that is included as part of the pricing logic for transmission facilities and Interfaces assigned a non-zero CRM value with a six-step transmission demand curve tailored to the CRM value assigned to a particular transmission facility or Interface; (2) assign a non-zero CRM value to internal facilities currently assigned a zero CRM value and implement a new two-step transmission demand curve as part of the pricing logic for such internal facilities; and (3) implement enhancements to the operation of the transmission demand curves when solving redundant transmission constraints on in-series and parallel transmission facilities, as well as multiple active transmission constraints on the same transmission facility or Interface.[14] The NYISO is not proposing any changes to the current $4,000/MWh Shadow Price capping mechanism applicable to transmission facilities and Interfaces assigned a zero CRM value. This pricing logic will continue to apply to transmission constraints associated with external interfaces.

The NYISO proposes to replace the current two-step transmission demand curve applicable to transmission facilities and Interfaces assigned a non-zero CRM value with a six-step transmission demand curve.[15] The depiction below illustrates the proposed six-step transmission demand curve.

[13] 2018 Study Report at 40-41.

[14] The NYISO also proposes to add language within Section 17.1.4 of Attachment B to the Services Tariff to clarify that in circumstances where PJM Interconnection, L.L.C. ("PJM") requests that the NYISO assess its ability to provide relief in real-time for a transmission constraint within PJM's system pursuant to the market-to-market ("M2M") coordination protocols between NYISO and PJM, the transmission constraint pricing logic set forth in Section 17.1.4 does not apply to such PJM transmission constraint. Instead, the NYISO will apply the M2M pricing rules described in Section 35.23 of Attachment CC to the NYISO Open Access Transmission Tariff to such PJM transmission constraint.

[15] *See, e.g.*, NYISO, *Constraint Specific Transmission Shortage Pricing: Market Design Proposal* (presented at the October 27, 2021 NYISO Management Committee meeting) at 8-9 and 24-30, available at: https://www.nyiso.com/documents/20142/25598577/06%20CSTSP.pdf ("October MC Presentation").



The quantity of additional resource capability made available by the revised transmission demand curve is tailored to the specific CRM value assigned to each transmission facility and Interface rather than utilizing a static 20 MW value. Each of the first five steps of the proposed transmission demand curve represent a quantity of additional resource capability equal to 20 percent of the assigned CRM value. The sixth and final step essentially provides an infinite quantity of additional resource capability to assist in resolving any shortage that exceeds the full value of the assigned CRM. For transmission facilities and Interfaces assigned a non-zero CRM value other than 20 MW, tailoring the transmission demand curve to the specific CRM value of each applicable transmission facility and Interface is intended to improve market price efficiency and better align such pricing outcomes with the system conditions presented.

The revised structure of the transmission demand curve also provides for further graduation of rising price levels as the severity of shortages in resolving a transmission constraint increases. The pricing values proposed for the first three steps are based on a review of historical costs to solve transmission constraints associated with transmission facilities and Interfaces assigned a non-zero CRM value.[16] The pricing values assigned to these steps are intended to maximize the utilization of physical resources to efficiently resolve transmission constraints associated with transmission facilities and Interfaces assigned a non-zero CRM value. The proposed $200/MWh price for the first step represents a value informed by the historical cost to resolve greater than 90 percent of the applicable transmission constraints. The NYISO proposes the use of a $350/MWh price value for the second step. This value corresponds to the historical cost of solving 95 percent of the applicable transmission constraints.[17] The NYISO proposes to assign a value of $600/MWh to the third step of the revised transmission demand curve. The NYISO's historical analysis indicates that this pricing level should be sufficient to resolve approximately 98 percent of the applicable transmission constraints.

[16] *Id.* at 9 and 24-27. The NYISO utilized a three-year historical period from March 2018 through March 2021.

[17] The $350/MWh value is the same as the pricing value of the first step of the current two-step transmission demand curve mechanism that applies to transmission facilities and Interfaces assigned a non-zero CRM value.

The NYISO proposes a $1,500/MWh value for the fourth step of the revised transmission demand curve. This value is designed to maintain appropriate trade-offs between securing the transmission system and procuring other market-based reliability products, such as Operating Reserves. This price is derived from the results of a market simulation conducted by the NYISO. This analysis identified the pricing level at which the market software would begin to go short of 30-minute reserves in Southeastern New York, and instead convert such reserves to energy to assist with solving a transmission constraint on key facilities that accommodate power flows from the upstate region to the downstate load centers in New York.[18] The price value proposed for the fifth step of the revised transmission demand curve is $2,500/MWh. This value is intended to help reduce unnecessary price volatility by providing an additional graduated value between the fourth step and the maximum value of $4,000/MWh assigned to the sixth and final step. The proposed value for the sixth step maintains the current maximum allowable value of $4,000/MWh for transmission constraints.[19] However, the NYISO proposes to revise the operation of the pricing logic such that the final step of the transmission demand curve can provide a pricing value for any magnitude of shortage that exceeds the applicable CRM value. As a result, the sixth step eliminates use of the $4,000/MWh Shadow Price capping mechanism previously included as part of the pricing logic for transmission facilities and Interfaces assigned a non-zero CRM value.[20]

The NYISO also proposes to assign a non-zero CRM value to the internal transmission facilities currently assigned a zero CRM value.[21] Rather than continued reliance on the $4,000/MWh Shadow Price capping mechanism currently applicable to these facilities, the NYISO proposes to implement a new two-step transmission demand curve for such facilities.[22]

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[18] *See* October MC Presentation at 28.

[19] *Id.* at 30. This value is intended to facilitate efficient re-dispatch of higher cost physical resources to help resolve transmission constraints. For example, this value would be sufficient to dispatch relief from a resource with a supply cost of $1,000/MWh and a "shift factor" of 25 percent on a transmission constraint. The "shift factor" of a resource represents the MW impact that 1 MW of capability from that resource would have on a transmission constraint. A resource with a 25 percent shift factor on a transmission constraint would need to be dispatched to provide 4 MW of relief to reduce flows on the constraint by 1 MW.

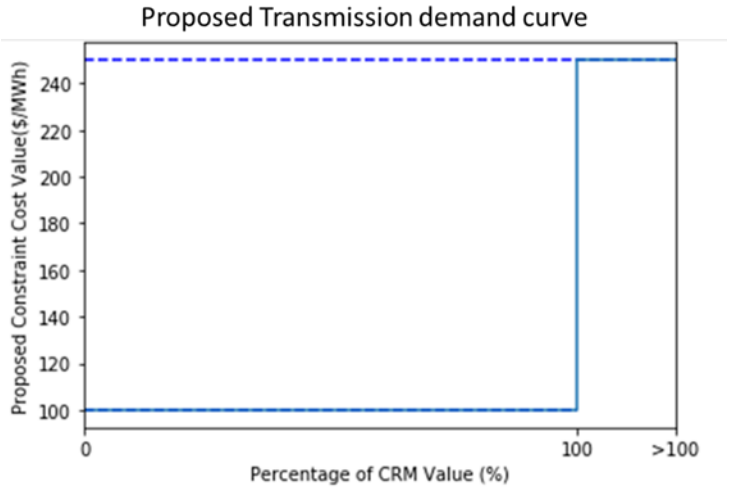
[20] Use of a transmission demand curve that provides a pricing value for any quantity of needed resource capability to resolve shortages greater than the applicable CRM eliminates the need for continued application of the current "constraint relaxation" logic for transmission facilities and Interfaces assigned a non-zero CRM value. The NYISO proposes to revise the current language in Section 17.1.4 of Attachment B to the Services Tariff describing this logic to clarify that, upon implementation of the proposed enhancements, the "constraint relaxation" logic applies only to transmission facilities and Interfaces assigned a zero CRM value.

[21] *See* October MC Presentation at 8, 11 and 32-34. As previously described, the internal transmission facilities currently assigned a zero CRM value represent transmission facilities that accommodate power flows out of generation pockets.

[22] The NYISO currently identifies these internal facilities as having a zero CRM value within the publicly posted list of facilities and Interfaces assigned a CRM value other than 20 MW. The NYISO will continue to specifically identify these internal facilities and the applicable CRM values assigned

The transmission system infrastructure associated with generation pockets was generally designed to provide only the capability necessary to accommodate delivering the generation output within such areas to the system. Careful consideration is required in applying a transmission demand curve mechanism to such facilities to avoid the potential for producing extreme negative price outcomes in circumstances such as when the capability of such transmission facilities is reduced due to maintenance and/or outage conditions. Such outcomes may adversely impact the incentive for the affected generation assets to offer their capability as dispatchable by the NYISO. Accordingly, as further described below, the NYISO established the pricing values for the proposed two-step transmission demand curve applicable to these transmission facilities to reflect the historical costs experienced to resolve transmission constraints associated with such facilities. The proposed enhancements to the transmission constraint pricing logic applicable to internal transmission facilities that accommodate power flows out of generation pockets is intended to improve market price efficiency and better align such pricing outcomes with the system conditions presented and operator actions taken to maintain reliability.

The depiction below illustrates the two-step transmission demand curve the NYISO proposes to use for internal transmission facilities previously assigned a zero CRM value.



The first step of this transmission demand curve mechanism will provide a quantity of additional resource capability equal to the CRM value assigned to each of these internal transmission facilities.[23] The second step will provide available resource capability that can be used to resolve any shortages greater than the applicable CRM value.

Consistent with the pricing values for the first three steps of the proposed six-step transmission demand curve, the NYISO conducted a historical transmission constraint cost

thereto within such posting. This reporting provides transparency regarding the facilities subject to the alternative two-step transmission demand curve.

[23] The NYISO anticipates initially assigning a CRM value of 5 MW to these facilities.

analysis to help inform the pricing values proposed for the new two-step transmission demand curve mechanism.[24] The proposed pricing values are intended to maximize the dispatch capability from physical resources to efficiently resolve transmission constraints on the facilities at issue prior to utilizing capability made available by the transmission demand curve mechanism. The NYISO proposes a $100/MWh value for the first step of this alternative transmission demand curve. The NYISO's historical analysis indicated that this pricing value should be sufficient to resolve more than 95 percent of transmission constraints associated with these facilities. The pricing value proposed for the second step is $250/MWh, which exceeds the historically observed cost of resolving 99 percent of the applicable transmission constraints.

Additionally, the NYISO proposes to enhance the operation of the transmission demand curve mechanisms when used to help resolve redundant transmission constraints on in-series and parallel transmission facilities, as well as multiple active transmission constraints on the same transmission facility or Interface (*e.g.*, a base case constraint and a contingency scenario constraint).[25] The proposed enhancements seek to improve the efficiency of market outcomes and avoid the potential for excessive prices that may not accurately reflect system conditions.

The NYISO's software does not treat relief provided by a transmission demand curve in the same manner as relief provided by a physical resource. When a physical resource provides relief on a transmission constraint, the market software accounts for the relief provided when assessing other transmission constraints on the same transmission facility or Interface, as well as constraints on in-series and parallel transmission elements. In other words, the relief provided by a physical resource can be simultaneously applicable to, and is accounted for in assessing, other active transmission constraints. Relief provided by a transmission demand curve, however, is applied in an isolated manner such that it can only apply to a single transmission constraint. As a result, the relief provided by a transmission demand curve does not apply to other active transmission constraints. The current application of relief provided by a transmission demand curve can result in the potential for excessive prices when such relief is needed to resolve simultaneously active transmission constraints on the same facility or Interface, as well as in-series and parallel facilities.[26]

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[24] *See* October MC Presentation at 8, 11 and 32-34. The NYISO utilized the same historical data period (*i.e.*, March 2018 through March 2021) to assess the cost of resolving transmission constraints associated with these facilities.

[25] NYISO, *Constraint Specific Transmission Shortage Pricing: Pricing Proposal for "Multiple Active Transmission Constraints"* (presented at the June 30, 2022 NYISO Management Committee meeting), available at: https://www.nyiso.com/documents/20142/31859086/02%20CSTSP%20MATC%20Proposal.pdf ("June MC Presentation").

[26] In 2019, the NYISO implemented interim measures to help mitigate the potential for such excessive pricing outcomes for in-series transmission facilities. The interim actions included securing in the market model only the transmission facility anticipated to be the most limiting element among such in-series facilities. *See* NYISO, *Update on Facilities Secured in the Market Model* (presented at the September 10, 2019 NYISO Market Issues Working Group meeting), available at: https://www.nyiso.com/documents/20142/8220793/2%20Facilities%20Status%20Change%20Draft%20vFINAL.pdf. The NYISO, however, has continued to assess the development of more dynamic and

In response to the potential for suboptimal outcomes that can arise from the market software's current application of relief provided by a transmission demand curve, the NYISO proposes to implement enhancements to the operation of the transmission demand curves. If redundant transmission constraints are identified on in-series and parallel transmission facilities, the market software will identify the most limiting of such redundant constraints and utilize it for application of the applicable transmission demand curve and pricing purposes.[27] Similarly, if multiple transmission constraints are active on the same transmission facility or Interface, the market software will, collectively, consider all such active transmission constraints in applying a transmission demand curve rather than applying a distinct transmission demand curve individually to each such constraint.[28] The proposed enhancements are intended to provide greater consistency in the treatment of relief provided from a transmission demand curve and relief provided by a physical resource. Such improved consistency should produce more efficient outcomes while mitigating the potential for unnecessarily excessive pricing outcomes.

IV. Effective Date

The NYISO respectfully requests that the Commission issue an order accepting the proposed tariff revisions on or before July 10, 2023 (*i.e.*, within sixty days after submission of this filing). Such timely action by the Commission will: (a) allow the NYISO to proceed confidently with developing and deploying the software changes necessary to implement the proposed transmission constraint pricing enhancements; and (b) assist with achieving the NYISO's desired effective date for these proposed changes.

The NYISO respectfully requests approval of a flexible effective date for the proposed tariff revisions. The NYISO proposes to submit a subsequent filing to specify, upon at least two weeks' prior notice, the date on which the revisions will take effect. The NYISO currently anticipates that the effective date for the proposed tariff revisions will likely be a date within the second week of October 2023 (*i.e.*, potentially as early as October 9, 2023). The NYISO, however, will be unable to propose a precise effective date until the software changes necessary to implement the proposed changes are ready for deployment and testing thereof is completed.

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efficient means to address the pricing issues that can arise due to the way relief from a transmission demand curve is currently applied by the market software. The proposed enhancements described herein are a result of such efforts.

[27] *See* June MC Presentation at 7-8; and NYISO, *Constraint Specific Transmission Shortage Pricing: Multiple Active Transmission Constraints* (presented at the April 5, 2022 joint meeting of the NYISO Market Issues Working Group and Installed Capacity Working Group) at 8-14, available at: https://www.nyiso.com/documents/20142/29688278/CSTSP%20-%20MATC%20Topology%20Proposal%2004052022%20MIWG_final.pdf.

[28] *See* June MC Presentation at 9-10; and NYISO, *Constraint Specific Transmission Shortage Pricing: Multiple Active Transmission Constraints* (presented at the May 3, 2022 joint meeting of the NYISO Market Issues Working Group and Installed Capacity Working Group) at 8-18, available at: https://www.nyiso.com/documents/20142/30342744/CSTSP%20-%20MATC%20Same%20Facility%20Proposal%2005032022%20MIWG%20Draft%20v5_final%20(002).pdf.

Consistent with Commission precedent, the subsequent filing obligation will provide adequate notice to the Commission and Market Participants of the effective date for the tariff revisions.[29]

The NYISO also requests a waiver of the Commission's regulations to allow the NYISO to make this filing more than 120 days prior to the date on which the proposed enhancements are expected to become effective.[30] No Market Participant will be prejudiced by this request because the NYISO has informed stakeholders of the anticipated implementation timeline for these proposed enhancements. Additionally, submitting the proposed tariff revisions at this time provides greater certainty and awareness of upcoming market rule changes.

V. Stakeholder Approval

The NYISO developed the transmission constraint pricing enhancements in two components: (1) development of the proposed enhancements to the graduated Transmission Shortage Cost mechanism; and (2) development of enhancements to the operation of transmission demand curve mechanisms in resolving redundant and multiple active transmission constraints. The Management Committee unanimously approved the first component on October 27, 2021. Stakeholders unanimously approved the second component at the Management Committee on June 30, 2022. The NYISO Board of Directors approved both components on July 19, 2022.

VI. Correspondence

Please direct all communications and service in this proceeding to:

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[29] *See, e.g., New York Independent System Operator, Inc.*, 106 FERC ¶ 61,111 at P 10 (2004); Docket No. ER11-2544-000, *New York Independent System Operator, Inc.*, Letter Order at 1 (February 10, 2011); Docket No. ER15-485-000, *New York Independent System Operator, Inc.*, Letter Order at 2 (January 15, 2015); *New York Independent System Operator, Inc.*, 151 FERC ¶ 61,057 at P 20 (2015); and *New York Independent System Operator, Inc.*, 154 FERC ¶ 61,152 at P 19 and 25 (2016).

[30] *See* 18 C.F.R. § 35.3(a)(1).

VII. Service

A complete copy of this filing will be posted on the NYISO's website at www.nyiso.com. The NYISO will send an electronic link to this filing to the official representative of each of its customers, and each participant on its stakeholder committees. The NYISO will also send an electronic copy of this filing to the New York State Public Service Commission and the New Jersey Board of Public Utilities.

VIII. Conclusion

The NYISO respectfully requests that the Commission: (1) waive its regulations to permit the NYISO to submit this filing more than 120 days prior to the date on which the proposed tariff revisions are anticipated to take effect; (2) issue an order accepting the proposed transmission constraint pricing enhancements described herein on or before July 10, 2023; and (3) permit the NYISO to submit a subsequent filing to establish the effective for the proposed tariff revisions as further described in Section IV above.

Respectfully submitted,

/s/ Garrett E. Bissell
Garrett E. Bissell, Senior Attorney
New York Independent System Operator, Inc.

cc: Janel Burdick
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