



PJM Interconnection, L.L.C.
2750 Monroe Blvd.
Audubon, PA 19403-2497

Chenchao Lu
Assistant General Counsel
T: (610) 666-2255 | F: (610) 666-8211
Chenchao.Lu@pjm.com

January 31, 2022

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

Re: *PJM Interconnection, L.L.C.*, Docket No. ER22-957000
Proposed Amendment to the Transmission Constraint Penalty Factor Filed
Pursuant to section 205 of the Federal Power Act, Request for Waiver of Notice
Requirement, and Request for a Shortened Comment Period of 7 Days.

Dear Secretary Bose:

PJM Interconnection, L.L.C. (“PJM”), pursuant to section 205 of the Federal Power Act (“FPA”), 16 U.S.C. § 824d, and section 35.13 of the regulations of the Federal Energy Regulatory Commission (“FERC” or the “Commission”), 18 C.F.R. part 35, hereby submits revisions to the PJM Open Access Transmission Tariff (“Tariff”), Attachment K-Appendix, section 5.6.3.¹ The proposed revisions herein modify the provisions related to the application of the Transmission Constraint Penalty Factor² on a prospective basis.³

This filing proposes to remedy a discrete and unique circumstance caused by a planned Lanexa-Dunnsville-Northern Neck 230 KV circuit line outage that has resulted in

¹ The proposed revisions to the Tariff are submitted pursuant to FPA section 205, while PJM is separately submitting the proposed revisions to the Amended and Restated Operating Agreement of PJM Interconnection, L.L.C. (“Operating Agreement”) pursuant to FPA section 206. Since the proposed substantive revisions to the Tariff are identical to the proposed substantive revisions to the Operating Agreement, PJM recognizes that the Commission has found that it is not held to the 60-day notice period in section 205 in cases when the proposed revisions are identical and in both PJM’s Operating Agreement and Tariff. See, e.g., *PJM Interconnection, L.L.C.*, 149 FERC ¶ 61,091 at n.4 (2014). PJM is filing this package separately under sections 205 and 206 consistent with the Commission’s eTariff filing rules. Id.

² Capitalized terms not otherwise defined herein shall have the meaning ascribed to them in the Tariff or Operating Agreement.

³ The *Memphis* clause set forth in Tariff, Part I, section 9, permits PJM to make prospective changes to its Tariff rates, terms, conditions, and charges. *United Gas Pipe Line Co. v. Memphis Light, Gas & Water Div.*, 358 U.S. 103, 110-13 (1958).

the application of the Transmission Constraint Penalty Factor in the Northern Neck peninsula of the Dominion Zone. This, in turn, has produced high LMPs that nonetheless have not attracted generation or demand response to alleviate the constraint, due to (a) the limited resources in the area that are available to control the constraint and (b) the relatively short term nature of the situation. Further, no additional long-term investments for transmission in such localized area is necessary as the congestion currently being observed is due to a transmission outage to enable the construction of a transmission upgrade that will mitigate these issues in the long-term.

To remedy this issue, PJM proposes, for this specific location, to set the transmission line limit in its Security Constrained Economic Dispatch (“SCED”) program to a level that ensures the offers of the resources being used to control the constraint are reflected in the Congestion Price in lieu of applying the Transmission Constraint Penalty Factor when there are insufficient available resources to relieve a transmission constraint caused by this transmission outage.⁴ As noted herein, the requested relief is limited in time as the current high level of congestion is caused by that transmission outage to enable the construction of a transmission upgrade that will mitigate congestion on the Northern Neck peninsula in the long-term. This narrowly tailored deviation to the Transmission Constraint Penalty Factor rules for this location for this limited time is necessary and appropriate given the confluence of unique circumstances described below, namely:

⁴ The proposed revisions to the Operating Agreement are submitted pursuant to FPA section 206, while PJM is separately submitting the proposed revisions to the Tariff pursuant to FPA section 205. Since the proposed substantive revisions to the Tariff are identical to the proposed substantive revisions to the Operating Agreement, PJM recognizes that the Commission has found that it is not held to the 60-day notice period in section 205 in cases when the proposed revisions are identical and in both PJM’s Operating Agreement and Tariff. See, e.g., *PJM Interconnection, L.L.C.*, 149 FERC ¶ 61,091 at n.4 (2014). PJM is separately filing this package under section 205 and 206 consistent with the Commission’s eTariff filing rules. Id.

- extremely high levels of LMP over extended periods of time resulting from the application of the Transmission Constraint Penalty Factor;
- insufficient supply options available in the local area to control the constraint leading to oscillating and inconsistent LMPs;
- inelastic demand in the local area impacted by the constraint; and
- temporary nature of the anomalous congestion levels caused by a transmission outage on a key transmission line serving the Northern Neck peninsula.

While PJM is submitting this filing pursuant to FPA section 205, PJM recognizes that the Commission may not be held to the FPA 60-days' notice period generally applicable to FPA section 205 filings where the proposed substantive Tariff revisions are identical to proposed revisions to the Operating Agreement that PJM is concurrently submitting in a separate companion FPA section 206 filing.⁵ Thus, PJM also requests waiver of the Commission's 60-days' notice requirement⁶ to allow for the proposed revisions to become effective upon Commission action in the separate companion 206 filing containing parallel revisions to the Operating Agreement. Lastly, given that this filing proposes amendments to the Tariff that are identical to the proposed revisions to the Operating Agreement submitted in the separate 206 filing, PJM also requests that the Commission establish the same requested shortened seven day comment period to be applicable to both filings.

Expedited consideration and Commission action is also needed on this issue because the transmission constraints – and the application of the Transmission Constraint Penalty Factor – is expected to persist for the duration of the transmission outage,

⁵ See, e.g., *PJM Interconnection, L.L.C.*, 149 FERC ¶ 61,091 at n.4 (2014). PJM is filing this package separately under sections 205 and 206 consistent with the Commission's eTariff filing rules. *Id.*

⁶ See 18 C.F.R. § 35.3(a).

particularly on high-load days in the winter and summer seasons.⁷ Considering that there are still a couple of months left in this winter season where high loads can trigger the application of the Transmission Constraint Penalty Factor, it is imperative that the Commission acts quickly in accepting PJM's proposed amendment to protect consumers from prolonged periods of significant cost increases.

I. BACKGROUND

A. The Transmission Constraint Penalty Factor is Designed to Provide Efficient Price Signals in Determining Where Additional Transmission And Generation Investments Are Needed.

PJM's generation dispatch is accomplished via an optimization algorithm in PJM's market clearing engine, known as SCED, which PJM uses to determine resource commitments and resource dispatch basepoints. When the physical limit of a transmission facility is reached during normal or contingency system operations, the most economic generation cannot be delivered to the load due to the transmission facility's physical limitations. Instead, more expensive generation that is electrically closer to the load must be dispatched in order to ensure that flows on transmission facilities are maintained within their operating limits.

To internalize the transmission constraints in the market, the optimization algorithm utilizes Transmission Constraint Penalty Factors.⁸ The Transmission Constraint

⁷ PJM notes that it is working with Dominion on various potential actions which may mitigate the transmission constraint so that the Transmission Constraint Penalty Factor would not need to be applied. However, none of those potential remedies are immediate and obviate the need for immediate action to remedy the currently unjust and unreasonable rates in this area. Should the circumstances change as a result of such potential mitigation actions, PJM pledges to inform the Commission and promptly amend this filing to reflect such changed circumstances.

⁸ Affidavit of Frederick S. (Stu) Bresler, III on Behalf of PJM Interconnection, L.L.C. ("Bresler Affidavit") at P 6.

Penalty Factor (set at a default rate of \$2,000/MWh in the Real-time Energy Market)⁹ is one of the parameters used within the SCED application and represents the cost of violating a transmission constraint per megawatt of violation (megawatt flow exceeding the applicable limit). Functionally, it also places an upper bound on the per megawatt hour cost that may be incurred to control a transmission constraint. Ultimately, SCED determines the most efficient means of serving load and meeting reserve requirements at different locations within the PJM Region based on actual system conditions, including transmission constraints. To that end, SCED uses all available controlling actions to economically relieve a transmission constraint up to the relevant Transmission Constraint Penalty Factor.

Under PJM's rules, the Transmission Constraint Penalty Factor is used to determine the Marginal Value¹⁰ of a transmission constraint when sufficient controlling actions do not exist to control the constraint at or below the applicable limit.¹¹ The Marginal Value is one component used in determining Congestion Price. More particularly, the Congestion Price at any location is equal to the sum of the product of the transmission constraint's Marginal Value and the distribution factor¹² of that location on that constraint for all binding constraints in a given dispatch interval.¹³ Since the components of LMP are

⁹ Tariff, Attachment K-Appendix, section 5.6.2

¹⁰ Marginal Value is defined as "the incremental change in system dispatch costs, measured as a \$/MW value incurred by providing one additional MW of relief to the transmission constraint." Tariff, Definitions M-N-O.

¹¹ The Transmission Constraint Penalty Factor is one of the parameters used within the SCED application and represents the maximum cost that may be incurred to control a transmission constraint.

¹² The distribution factor represents the change (or sensitivity) of an active power flow in a reference direction on a transmission line with respect to a change in injection at the generator bus and a corresponding change in withdrawal at the reference bus (calculated with a DC power flow).

¹³ See Tariff, Attachment K – Appendix, section 5.1

System Energy Price, Congestion Price, and Loss Price,¹⁴ the Transmission Constraint Penalty Factor affects LMPs by raising the value of the Congestion Price. In short, when there is a transmission constraint that cannot be controlled below the applicable limit, the congestion is ultimately reflected in PJM's energy market through higher LMPs.

The intended purpose of applying a Transmission Constraint Penalty Factor is to provide transparent price signals to the market that are important in determining where transmission and generation investments are needed.¹⁵ As Frederick S. (Stu) Bresler, III, PJM's Senior Vice President of Market Services explains in his attached affidavit, "[t]he underlying goal and intent of reflecting the Transmission Constraint Penalty Factor in LMPs is to provide market signals that incentivize supply and/or load response to help mitigate the constraint in the short-term, while also incentivizing the development of additional supply, load response and/or transmission through long-term investments."¹⁶

B. As a Result of Unique Circumstances, Application of the Default Transmission Constraint Penalty Factor for the Lanexa-Dunnsville-Northern Neck 230 KV Circuit Line Outage Is Not Sending Proper Price Signals.

1. The Lanexa-Dunnsville-Northern Neck Line is on a planned outage approved as part of PJM's regional transmission expansion planning process.

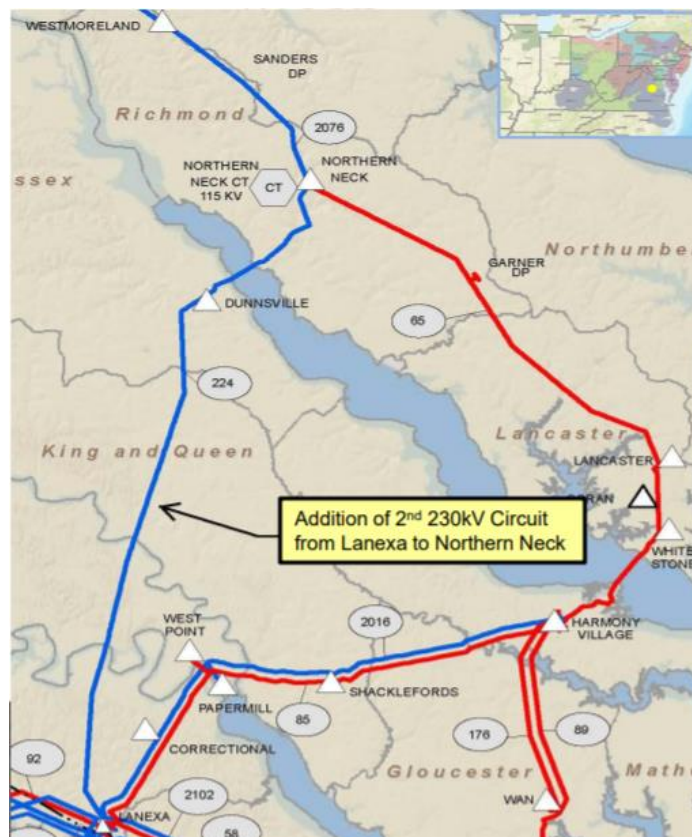
¹⁴ See Tariff, Attachment K – Appendix, sections 2.5 and 2.6 and parallel provisions of Operating Agreement, Schedule 1, sections 2.5 and 2.6.

¹⁵ See *PJM Interconnection, L.L.C.*, Transmittal Letter proposing Transmission Constraint Penalty Factor, Docket No. ER19-323-000 (Nov. 8, 2018); see also Uplift Cost Allocation and Transparency in Markets Operated by Regional Transmission Organizations and Independent System Operators, 163 FERC ¶ 61,041, P 121 (2018).

¹⁶ Bresler Affidavit at P 8; see also *PJM Interconnection, L.L.C.*, Transmittal Letter proposing Transmission Constraint Penalty Factor, Docket No. ER19-323-000 (2018).

As part of PJM’s regional transmission expansion plan (“RTEP”) process,¹⁷ in 2020, the PJM Board voted to approve baseline upgrades associated with the Northern Neck peninsula in the Dominion Zone. The Northern Neck peninsula is normally served by three transmission lines (230kV LN 2083 from Fredericksburg, 230kV LN224 from Lanexa, and 115kV LN65 from Harmony Village) as shown in the map below:

Figure 1: Map of Northern Neck



Historically, Virginia Electric and Power Company (hereinafter referred to as “Dominion”) has employed an operating procedure to open the 115kV LN 65 at the Northern Neck end to accommodate outages on one of the two 230 kV feeds into Northern

¹⁷ See Operating Agreement, Schedule 6 (detailing Region Transmission Expansion Planning Protocol rules and procedures, including the development of annual RTEPs).

Neck to mitigate thermal overloads on Dominion Line 65. Dominion's operating procedure also helps control and mitigate voltage issues that occur when either of the 230kV feeds are out of service.

The winter 2025 RTEP N-1-1 analysis showed that both thermal and voltage violations will occur in 2025 from the loss of both 230 kV feeds (230kV Ln 224 and 230kV Ln 2145) that go into the Northern Neck area. However, continued use of Dominion's operating procedure to mitigate thermal and voltage issues on LN 65 would have resulted in a PJM planning criteria violation of dropping over 300 MW of load in the 2022/2023 timeframe based on the 2020 PJM load forecast. In addition, the Rappahannock-Whitestone and Harmony Village-Greys Point 115 kV circuits are overloaded for an N-1-1 contingency.¹⁸

Because the analyses showed various N-1-1 voltage magnitude and voltage drop violations¹⁹ in the Northern Neck peninsula, a baseline upgrade project for the Northern Neck was included in PJM's RTEP. In addition, the PJM Board approved the installation of a second Lanexa-Northern Neck 230 kV circuit with a minimum summer emergency rating of 1047 MVA between Lanexa and Northern Neck Substations. The second circuit will utilize the vacant arms on the double-circuit structures that are being installed on the Line #224. Further, the Northern Neck terminal will be expanded from a four-breaker ring bus to a six-breaker ring bus, and the Lanexa 230 kV terminal will expand from a six-

¹⁸ See PJM Baseline Reliability Assessment 2020-2035 Period, Baseline Project b3223: Northern Neck area, available at: <https://www.pjm.com/-/media/planning/rtep-dev/baseline-reports/2020-rtep-baseline-assessment.ashx>.

¹⁹ Voltage drop violations occur when, for the loss of one transmission facility, the voltage at certain locations of the system drops instantaneously with the potential to cause cascading outages and/or loss of load.

breaker ring bus to a breaker-and-a-half arrangement.²⁰ Ultimately, the cumulative project will preserve the reliability of PJM's interstate transmission system and ensure that power continues to flow reliably, while facilitating the administration of robust, competitive power markets.

To effectuate this project, on January 5, 2022, the Lanexa-Dunnsville-Northern Neck 230 KV circuit line was placed on an extended outage while this transmission line is in the process of being rebuilt.²¹ This transmission line outage is expected to extend until at least approximately December 2023.²² Figure 3 below shows the Lanexa-Dunnsville-Northern Neck transmission line (in pink) and the map of the local area with the remaining transmission facilities.

2. The planned Lanexa-Dunnsville-Northern Neck line outage has created congestion on the remaining lines.

Since the Lanexa-Dunnsville-Northern Neck line has been placed on the extended outage, transmission constraints on the remaining transmission facilities serving the Northern Neck peninsula have not always been controllable because there is only one set of relatively small combustion turbine ("CTs") units available in this area for PJM to manage transmission constraints on the peninsula.²³ As a result, there have been several instances when all of the available CTs in the area are operating but are insufficient to

²⁰ See Transmission Expansion Advisory Committee Recommendations to the PJM Board, available at: <https://www.pjm.com/-/media/committees-groups/committees/teac/2020/20201201/20201201-pjm-teac-board-whitepaper-december-2020.ashx>

²¹ See PJM Transmission Facilities Outage List (eDART ticket #952188), available at: <https://edart.pjm.com/reports/linesout.txt>

²² Bresler Affidavit at P 12. The Lanexa-Dunnsville-Northern Neck line outage is technically comprised of two separate outages (Lexana – Dunnsvile and Dunnsville – Northern Neck) and represents two pieces of a series path. Therefore the entire path is essentially scheduled to be out through at least December, 2023.

²³ Bresler Affidavit at P 12.

control the constraint and all other controlling actions are exhausted. When this occurs, the Tariff and Operating Agreement require that the transmission constraint bind at the default Transmission Constraint Penalty Factor of \$2,000/MWh in the Real-time Energy Market.²⁴ The end result of this constraint binding at the default Transmission Constraint Penalty Factor is high LMPs in this area and increased costs to load. Moreover, given the lack of sufficient available resources, fluctuating load levels in the area have resulted in LMPs oscillating dramatically between the offers of the CTs and the \$2,000/MWh Transmission Constraint Penalty Factor, leading to an anomalous and inconsistent price signals that further exacerbates differences between Day-ahead and Real-time Energy Market prices.

To illustrate, the graph below shows the severe price fluctuations in the Northern Neck peninsula on a typical winter day caused by the transmission constraint binding and the application of the default Transmission Constraint Penalty Factor.²⁵ As shown below, even when the available CTs were operating, the transmission constraint could not be solved for several intervals in the early morning hours. When this occurs, the price is set at the default Transmission Constraint Penalty Factor of \$2,000/MWh instead of the much lower offers submitted by the CTs. During the daytime hours, however, there are no transmission constraints due partially to lower net load resulting from solar energy production from behind-the-meter resources on the peninsula. The result is extremely high Congestion Prices in the early morning hours and none during most of the daylight hours.²⁶

²⁴ See Tariff, Attachment K – Appendix, sections 5.6.1 and 5.6.2 and parallel provisions of Operating Agreement, Schedule 1, sections 5.6.1 and 5.6.2.

²⁵ While this graph shows price oscillations on January 14, 2022, similar Congestion Prices have been seen on most days since the Lanexa-Dunnsville-Northern Neck line has been placed on the extended outage.

²⁶ Bresler Affidavit at P 13.

response to such prices absent an amendment to the existing Transmission Constraint Penalty Factor rules.

Notably, while there is a load switching option that would alleviate the transmission constraint, implementing the switching solution places the load pocket at risk of uncontrolled load shed. Specifically, when output from the available CTs is insufficient to control the N-1 contingency flow below the facility's emergency rating, the transmission constraint can be managed by post-contingency local load relief warning (which is planned load shed if the contingency occurs to bring flows across the constraint within limit).²⁸ However, if the load-dump rating on the constraint is close to being exceeded, the local transmission system is reconfigured via the switching option referenced above. When this occurs, the constraint stops binding altogether, because the 115 kV path, including the constrained facility, is severed. This reduces actual line flow to a portion of the area load, which eliminates the impact of the contingent facility loss. However, implementing the switching solution will also lead to increased risk of lost load on the peninsula.²⁹

3. Given the topology of the peninsula and the confluence of other unique circumstances, the price signals resulting from the application of the Transmission Constraint Penalty Factor in the Northern Neck peninsula have not produced load response or alternative solutions to date and are not expected to be effective in mitigating the transmission constraint during the pendency of the outage.

Locational price signals such as those provided through the PJM markets are critical to incentivizing both short-term response and long-term investment. In the short-term, such signals, in this case high energy prices, signal the need for additional supply or

²⁸ PJM *Manual 13: Emergency Operations*, section 5.4, available at: <https://www.pjm.com/~media/documents/manuals/m13.ashx>.

²⁹ Bresler Affidavit at P 14.

reduced demand in a given area. In fact, PJM strongly believes that allowing prices to increase to high levels when needed for *short* periods of time improves pricing signals and generally improves investment signals for flexible resources that are best able to capitalize on those more volatile prices.³⁰ Additionally, high prices can also signal the need for investment in additional supply or transmission capability into an area in the long-term.³¹

In the limited and unique instance present here, however, PJM has observed that no additional supply exists and there is currently no load response available in the Northern Neck area significant enough to help resolve the congestion (and none have responded in this area since the high price signals began in early January).³² In other words, there is no known additional supply capable of responding, and similarly no demand capable of curtailing in response to the prolonged high prices caused by the application of the Transmission Constraint Penalty Factor. In addition, PJM has not been notified by any Market Participant of any forthcoming response to those prices that would improve reliability in the area and, in the long-term, a transmission upgrade currently under construction will mitigate these issues.

Furthermore, it would be unrealistic for new resources to come online and alleviate the congestion on the Northern Neck peninsula during the Lanexa-Dunnsville-Northern Neck line outage given that it generally takes years for any resource to be sited and built.

³⁰ Bresler Affidavit at P 15.

³¹ See, e.g., *Midwest Indep. Transmission Sys. Operator, Inc.*, 140 FERC ¶ 61,067, at P 39 (2012) (“In the long term, [the Extended LMP algorithm, MISO’s version of fast-start pricing] should also send more effective signals about the need for additional resources in the region. By producing a clearing price that better reflects the most expensive action taken to satisfy demand in the region, the Extended LMP algorithm should promote more efficient development of supply and demand resources in the future.”).

³² Bresler Affidavit at P 14.

Even if one could be developed within the next two years, it is unlikely that investors would attempt such a feat because alleviating the transmission constraint would also eliminate the need to apply the Transmission Constraint Penalty Factor, undercutting their potential revenues. By the same token, although demand response solutions could theoretically be implemented sooner, to alleviate the imposition of the penalty factor on the peninsula during cold winter or hot summer days, there would need to be more than 1,000 times as much demand response registered on the peninsula from the current 0.1MW level.³³ As a result, it is difficult to hypothesize how it would be a prudent investment decision to develop a new resource to address a short term transmission constraint because such a resource would likely not be able to recover its costs once the congestion is resolved. Accordingly, the Northern Neck peninsula has an inelastic short-run supply because there are insufficient supply resources that can respond to the increased prices that result from the application of the Transmission Constraint Penalty Factor in this unique circumstance.³⁴

4. The Application of the Penalty Factor in this Instance Is Not Accomplishing its Long Term Design Objectives.

In addition to the lack of short term options to control the constraint, continued application of the Transmission Constrained Penalty Factor in this location would not accomplish its intended goal in the long term. That is, the very purpose of applying the Transmission Constraint Penalty Factor is to incent solutions (or resolutions) of the

³³ Bresler Affidavit at P 16.

³⁴ In the highly unlikely event that a local solution is implemented that substantially mitigates the application of the Transmission Constraint Penalty Factor due to the anomalies explained in this transmittal, PJM pledges to inform the Commission and promptly amend this filing to reflect such changed circumstance.

transmission constraint, and the transmission upgrade project causing the Lanexa-Dunnsville-Northern Neck 230 KV circuit line would be such a solution as it will reinforce the transmission into this area. Thus, approximately \$23 million dollars of investments³⁵ are already being made to strengthen the transmission capabilities in the Northern Neck peninsula and the transmission line outage is occurring to accommodate the construction of this project. Once the rebuild of the Lanexa-Dunnsville-Northern Neck line is complete, no additional transmission would be needed in this area and any potential additional transmission enhancements would be duplicative and unnecessary.³⁶ While high price signals are valuable even in cases where long-term investment is not necessary if they incentivize short-term response that enhances reliability, this is not occurring in this unique situation as explained *supra*.

Therefore, in this limited and unique circumstance, application of the default Transmission Constraint Penalty Factor raises costs to consumers across the Dominion Zone while providing little measurable benefit in the short term because of the limited resources in the area available to help mitigate this constraint.³⁷ In sum, the application of the default Transmission Constraint Penalty Factor while the Lanexa-Dunnsville-Northern Neck line is on an outage will result in higher costs over an extended period of time that may be harmful to consumers with no apparent response that could provide the desired near-term operational benefits.³⁸

³⁵ PJM Reliability Analysis Update, slide 28, available at: <https://www.pjm.com/-/media/committees-groups/committees/teac/2020/20201006/20201006-item-10-reliability-analysis-update.ashx>

³⁶ Bresler Affidavit at P17.

³⁷ *Id.* at P18.

³⁸ *Id.*

II. THE CURRENT PROVISIONS OF THE TRANSMISSION CONSTRAINT PENALTY FACTOR CAN PRODUCE AN UNJUST AND UNREASONABLE RATE AND MUST BE AMENDED.

A. The Existing Tariff and Operating Agreement Rules Do Not Allow Adjustment of The Default Transmission Constraint Penalty Factor Here, Even When There is Insufficient Supply Available to Alleviate the Constraint.

The existing Tariff and Operating Agreement rules governing the application of the Transmission Constraint Penalty Factor provide little discretion for PJM to reduce or remove the Transmission Constraint Penalty Factor.³⁹ Specifically, the existing rules allow PJM to adjust the default Transmission Constraint Penalty Factor only “when sufficient congestion relief on the constraint can be provided by available resources at a cost below the default Transmission Constraint Penalty Factor in order to prevent a high cost resource that cannot provide material congestion relief on the constraint from inappropriately setting price for the constraint.”⁴⁰ However, this provision is limited and intended to allow PJM to avoid dispatching small resources that would have little impact on a transmission constraint but could impact the Congestion Price.

³⁹ *PJM Interconnection, L.L.C.*, Transmittal Letter proposing Transmission Constraint Penalty Factor, Docket No. ER19-323-000 (2018).

⁴⁰ Tariff, Attachment K – Appendix, section 5.6.3 and parallel provisions of Operating Agreement, Schedule 1, section 5.6.3.

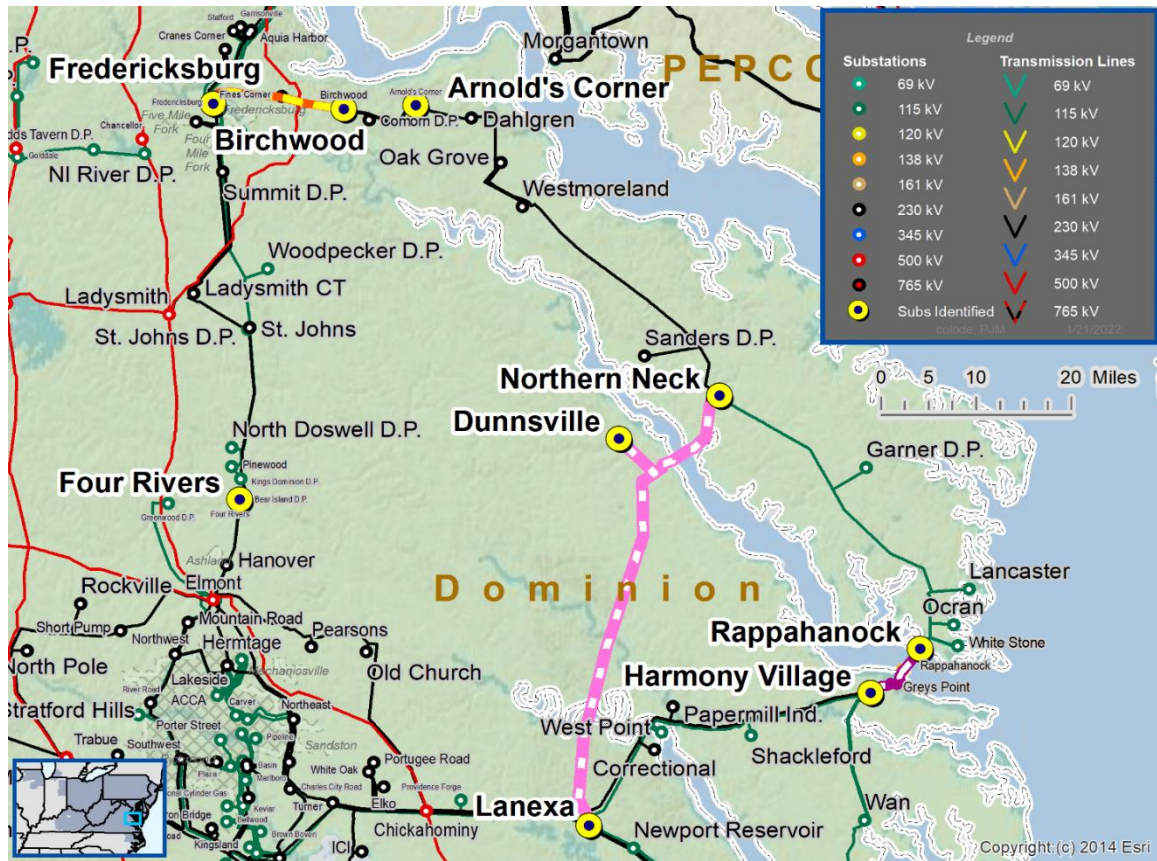
In short, rules for adjusting the Transmission Constraint Penalty Factor do not provide sufficient latitude for PJM to lower the default Transmission Constraint Penalty Factor where no other available resources can relieve the constraint. Therefore, for the Lanexa-Dunnsville-Northern Neck line outage, PJM does not currently have authority to lower the default \$2,000/MWh Transmission Constraint Penalty Factor. For the reasons stated above, however, it is unjust and unreasonable to continue applying the Transmission Constraint Penalty Factor for the remainder of this extended transmission outage because PJM has applied it for the previous three weeks with no discernable response.

B. The Lanexa-Dunnsville-Northern Neck Line Outage is Unique and Discrete.

The existing Transmission Constraint Penalty Factor rules are not having the designed effect or intended impact for the Lanexa-Dunnsville-Northern Neck line outage. As Mr. Bresler explains, the unique geography, available supply, and the duration of the line outage precludes the Transmission Constraint Penalty Factor from producing the intended results.⁴¹ As shown in the map below, the Northern Neck peninsula is supplied energy by only three lines. Thus, the Lanexa-Dunnsville-Northern Neck line outage leaves the load to be served with only the single lines from Fredericksburg and Harmony Village. This outage will therefore result in frequent transmission constraints on the two remaining lines serving the Northern Neck peninsula. To make matters worse, there are insufficient resources (only one set of small CTs) in the Northern Neck peninsula that are available to PJM to respond to the constraint.

⁴¹ See Bresler Affidavit at P 19.

Figure 3: Map of Lanexa to Northern Neck



Given that the Lanexa-Dunnsville-Northern Neck line outage is expected to last approximately two years, the application of a \$2,000/MWh penalty factor for transmission constraints caused by this line outage is excessive in both magnitude and duration. Further, as explained above, the increased prices occurring over a substantial period of time are unlikely to incent useful, economic responses, particularly given the long-term solution already underway. Consumers, and the market, are harmed by the long-duration and application of a high penalty factor when no supply responds to high prices for extended period of time. To remedy this unintended outcome, PJM proposes a discrete and prospective rate modification, described below, so that the Transmission Constraint

Penalty Factor does not need to continue to be applied for the duration of the Lanexa-Dunnsville-Northern Neck line outage.

III. PROPOSED AMENDMENT TO THE EXISTING TRANSMISSION CONSTRAINT PENALTY FACTOR RULES SO THAT THE DEFAULT PENALTY FACTOR IS NOT APPLIED TO TRANSMISSION CONSTRAINTS CAUSED BY THE LANEXA-DUNNSVILLE-NORTHERN NECK LINE OUTAGE.

A. PJM Proposes a Targeted and Time-Limited Solution to Address the Unjust and Unreasonable Application of the Penalty Factor in This Instance.

To alleviate the existing and continued harm to consumers caused by the application of the default Transmission Constraint Penalty Factor due to the Lanexa-Dunnsville-Northern Neck line outage, PJM proposes a discrete solution that will limit the market impact of applying the Transmission Constraint Penalty Factor. To be clear, PJM's proposal is applicable in this unique circumstance where there is no additional supply available or is anticipated to become available to resolve the constraint. PJM's targeted proposal retains all actions currently available to operators for maintaining reliability in the region.⁴² Specifically, to remedy this unique circumstance, PJM proposes to set the transmission line limit in its SCED program at a level that ensures the offers of the resources being used to control the constraint are reflected in the Congestion Price in lieu of applying a Transmission Constraint Penalty Factor when there are insufficient available resources to relieve a transmission constraint on the remaining transmission facilities serving the Northern Neck peninsula caused by the Lanexa-Dunnsville-Northern Neck line outage.

⁴² Bresler Affidavit at P 22.

This approach would allow PJM to relax the transmission constraint in SCED so that if the transmission constraint binds, those CTs that are on-line to control the constraint will set the LMP, and the Transmission Constraint Penalty Factor will not be applied for congestion that cannot be solved in the Northern Neck peninsula.⁴³ In other words, PJM's proposal would have the effect of not applying a Transmission Constraint Penalty Factor for congestion caused by the Lanexa-Dunnsville-Northern Neck line outage and simply let the resources that are operating in the area set the Congestion Price.

To be clear, this approach is limited only to the application of the Transmission Constraint Penalty Factor used in SCED and will have no impact on the existing daily operations the grid, which is informed by PJM's Energy Management System model. In addition, this limited rule is narrowly tailored to apply only to transmission constraints in the Northern Neck peninsula caused by the Lanexa-Dunnsville-Northern Neck line outage. Finally, this rule would also be time-limited and would automatically expire upon the completion of the transmission upgrade for the Lanexa-Dunnsville-Northern Neck line.

B. PJM's Proposed Remedy Is Not Unduly Discriminatory.

PJM's proposed remedy is not unduly discriminatory. To be deemed unduly discriminatory, there must be two classes of entities that are treated differently and those two classes must be similarly situated.⁴⁴ Accordingly, applying a rule specific to the unique circumstances here would not be unduly discriminatory given that PJM is not aware of any

⁴³ *Id.* at P21.

⁴⁴ See *TranSource v. PJM Interconnection, L.L.C.*, 168 FERC ¶ 61,119, at P 240 (“a finding of undue discrimination requires a showing that (1) two classes of customers are treated differently; and (2) the two classes of customers are similarly situated.”); see also *Transmission Agency of N. Cal. v. FERC*, 628 F.3d 538, 549, (D.C. Cir. 2010) (“A rate is not unduly preferential or unreasonably discriminatory if the utility can justify the disparate effect.” (internal quotations and citations omitted)).

other areas within the PJM Region that have the same short-term supply constraints in a geographically isolated area caused by a planned transmission upgrade. Accordingly, applying a rule specific to the issues presented by the Lanexa-Dunnsville-Northern Neck line outage is not unduly discriminatory, and is appropriate for this specific situation because:

- the application of the penalty factor is not resulting in, and not likely to result in, short-term responses that could mitigate the transmission constraints caused by the extended line outage;
- applying Transmission Constraint Penalty Factor for extended periods of time is unlikely to incent useful and economic responses given the long-term solution already underway; and
- consumers, and the market, are harmed by the long-duration and application of a high penalty factor when no supply or demand responds to high prices for extended period of time.⁴⁵

These unique circumstances, when compared with the purposes and intent behind application of the Transmission Constraint Penalty Factor, make clear that PJM's remedy does not violate the provisions of the Federal Power Act that require that rates not be unduly discriminatory. In fact, in PJM's view, the continued application of the Transmission Constraint Penalty Factor in these unique circumstances violates the related provision of the Federal Power Act against the imposition of rates that are unjust and unreasonable and therefore itself would violate the FPA in the absence of targeted Commission action pursuant to Section 206 as PJM proposes herein.

C. PJM's Tariff Provisions are Targeted and Time Limited.

Based on the foregoing, PJM proposes to add the following language to Operating Agreement, Schedule 1, section 5.6.3, as shown in blackline below:

⁴⁵ Bresler Affidavit at P 19.

(c) Notwithstanding the provisions of this Section 5.6, and until such time the rebuild of the Lanexa-Dunnsville-Northern Neck line in the Dominion Transmission Zone is complete (as confirmed with the Transmission Owner and subsequently reported on the transmission facilities outage list posted on the Office of the Interconnection’s website), the Office of the Interconnection shall set the transmission line limit in its Security Constrained Economic Dispatch program at a level that ensures the offers of the resources being used to control the constraint are reflected in the Congestion Price in lieu of applying a Transmission Constraint Penalty Factor when there are insufficient available resources to relieve a transmission constraint on the remaining transmission facilities serving the Northern Neck peninsula caused by the Lanexa-Dunnsville-Northern Neck line outage.

IV. STAKEHOLDER PROCESS

Given the significant impact to consumers of continuing to applying the Transmission Constraint Penalty Factor, PJM did not seek stakeholder endorsement prior to submitting this proposed revision and is submitting this filing under Tariff, sections 9.2 and the Consolidated Transmission Owners Agreement (“CTOA”), section 7.5.1. Notwithstanding, PJM provided notice of the proposed revisions to the Transmission Owners and the Members Committee of the proposed revisions on the January 26, 2022.⁴⁶ Accordingly, PJM fulfilled its obligation under the Tariff and CTOA for consultation requirements prior to the submission of this section 205 filing. The feedback from the PJM stakeholder body on this proposed revision was generally positive and stakeholders overwhelmingly encouraged PJM to submit this revision. Based on its review, the PJM Board of Managers directed PJM to submit the Operating Agreement modifications pursuant to Section 206 of the FPA and this companion filing proposing Tariff revisions pursuant to Section 205 of the FPA.

⁴⁶ See Members Committee Agenda for January 26, 2022, item 2; see also PJM TOA-AC Open Session Agenda for January 27, 2022, available at <https://pjm.com/-/media/committees-groups/committees/toa-ac/2022/20220127/20220127-agenda.ashx>

V. FUTURE REVISIONS GOVERNING APPLICATION OF THE TRANSMISSION CONSTRAINT PENALTY FACTOR MORE GENERICALLY.

PJM acknowledges that while this is a unique circumstance, the existing Transmission Constraint Penalty Factor ties PJM's hands in addressing this unique circumstance. As a result, PJM is currently left with no ability to address this unique situation in a manner that ensures that the Transmission Constraint Penalty Factor is addressing its intended goal (*i.e.* incenting the development of new resources through either demand response or generation). Although PJM is not aware of a similar situation elsewhere within the PJM Region, PJM recognizes that a more generic revision to the rules addressing the application of the Transmission Constraint Penalty Factor in the form of a circuit breaker may be appropriate.

To that end, PJM expects to employ the stakeholder process in considering alternative modifications to the Transmission Constraint Penalty Factor rules. PJM notes that the rules governing the application of the Transmission Constraint Penalty Factor are already specifically identified as within the scope of PJM's Energy Price Formation Senior Task Force.⁴⁷ Thus, PJM may submit a future filing that will more generally address potentially similar circumstances that may arise in other Zones. In addressing any such potential situations, it will be critical to ensure that the price signals resulting from the operation of the PJM markets that are so crucial to driving efficient investment are allowed to continue to do so to the fullest extent possible consistent with maintaining just and reasonable rates.

⁴⁷ See PJM Energy Price Formation Senior Task Force: Issue Charge for Operating Reserve Demand Curve & Transmission Constraint Penalty Factors, available at: <https://www.pjm.com/-/media/committees-groups/task-forces/epfstf/postings/or dc-transmission-constraint-penalty-factors-issue-charge.ashx>

VI. REPORTING

Should the Commission desire, PJM is willing to provide regular informational reports to the Commission as to the congestion patterns in the Northern Neck peninsula as well as its work with stakeholders to potentially reform the application of the penalty factor provisions of the tariff should this situation arise in the future.

VII. WAIVER

PJM requests that the Commission act expeditiously in accepting the proposed revisions. PJM recognizes that the Commission has found that it is not held to the FPA 60-days' notice period in section 205 in cases when the proposed revisions are identical and in both PJM's Operating Agreement and Tariff that PJM is submitting as part of a separate 206 filing.⁴⁸ Therefore, PJM requests a waiver of the FPA's and the Commission's 60-days' notice requirement to allow for the proposed revisions to become effective based on the refund effective date that the Commission sets in the companion 206 filing containing parallel revisions to the Operating Agreement.⁴⁹ Lastly, given that this filing proposes amendments to the Tariff are identical to the proposed revisions to the Operating Agreement submitted in the separate 206 filing, PJM also requests that the Commission establish the same 7 day comment period to be applicable to both filings.

⁴⁸ See, e.g., *PJM Interconnection, L.L.C.*, 149 FERC ¶ 61,091 at n.4. PJM is filing this package separately under sections 205 and 206 consistent with the Commission's eTariff filing rules. *Id.*

⁴⁹ See 16 U.S.C. § 824d(d); 18 C.F.R. § 35.3(a).

VIII. CORRESPONDENCE

The following individuals are designated for inclusion on the official service list in this proceeding and for receipt of any communications regarding this filing:

Craig Glazer
Vice President–Federal Government Policy
PJM Interconnection, L.L.C.
1200 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 423-4743 (phone)
craig.glazer@pjm.com

Chenchao Lu
Assistant General Counsel
PJM Interconnection, L.L.C.
2750 Monroe Blvd.
Audubon, PA 19403
(610) 666-2255 (phone)
(610) 666-8211 (fax)
Chenchao.Lu@pjm.com

IX. DOCUMENTS ENCLOSED

This filing consists of the following:

1. This transmittal letter;
2. Revisions to the Tariff (in redlined and clean format (as Attachments A and B, respectively) and in electronic tariff filing format as required by Order No. 714);⁵⁰ and
3. Affidavit of Stu Bresler in support of this filing as Attachment C.

X. SERVICE

PJM has served a copy of this filing on all PJM members and on all state utility regulatory commissions in the PJM Region by posting this filing electronically. In accordance with the Commission's regulations,⁵¹ PJM will post a copy of this filing to the FERC filings section of its internet site, located at the following link: <http://www.pjm.com/documents/ferc-manuals/ferc-filings.aspx> with a specific link to the newly filed document, and will send an email on the same date as this filing to all PJM

⁵⁰ *Electronic Tariff Filings*, Order No. 714, 2008–2013 FERC Stats. & Regs., Regs. Preambles ¶ 31,276 (2008), *final rule*, Order No. 714-A, III FERC Stats. & Regs., Regs. Preambles ¶ 31,356 (2014).

⁵¹ See 18 C.F.R. §§ 35.2(e), 385.2010(f)(3).

members and all state utility regulatory commissions in the PJM Region⁵² alerting them that this filing has been made by PJM and is available by following such link. PJM also serves the parties listed on the Commission's official service list for this docket. If the document is not immediately available by using the referenced link, the document will be available through the referenced link within 24 hours of the filing. Also, a copy of this filing will be available on FERC's eLibrary website located at the following link: <http://www.ferc.gov/docs-filing/elibrary.asp> in accordance with the Commission's regulations and Order No. 714.

⁵² PJM already maintains, updates, and regularly uses email lists for all PJM members and affected state commissions.

XI. CONCLUSION

For the reasons set forth herein, PJM requests that the Commission grant the requested waiver of the notice requirements, shorten the comment period to seven days, and accept the proposed Tariff revisions described in this filing effective the same day as the parallel Operating Agreement revisions proposed in PJM's companion FPA section 206 filing.

Respectfully submitted,



Craig Glazer
Vice President–Federal Government Policy
PJM Interconnection, L.L.C.
1200 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 423-4743 (phone)
craig.glazer@pjm.com

Chenchao Lu
Assistant General Counsel
PJM Interconnection, L.L.C.
2750 Monroe Blvd.
Audubon, PA 19403
(610) 666-2255 (phone)
(610) 666-8211 (fax)
Chenchao.Lu@pjm.com

**Attorney for
PJM Interconnection, L.L.C.**

January 31, 2022

ATTACHMENT A

MARKED TARIFF

5.6 Transmission Constraint Penalty Factors

5.6.1 Application of Transmission Constraint Penalty Factors in the Day-ahead and Real-time Energy Markets

In the Day-ahead Energy Market, the Transmission Constraint Penalty Factors shall be used to ensure a feasible market clearing solution but not used to determine the Marginal Value of a transmission constraint. In the Real-time Energy Market, the Office of the Interconnection shall use Transmission Constraint Penalty Factors to determine the Marginal Value for a transmission constraint when that transmission constraint cannot be managed within the binding transmission limit in a dispatch interval. The Marginal Value of the transmission constraint shall be used in the determination of the Congestion Price component of Locational Marginal Price as referenced in Tariff, Attachment K-Appendix, section 2.5 through Tariff, Attachment K-Appendix, section 2.6, and the parallel provisions of Operating Agreement, Schedule 1, section 2.5 through Operating Agreement, Schedule 1, section 2.6. The Transmission Constraint Penalty Factor may set the Marginal Value of the transmission constraint during any dispatch interval in the Real-time Energy Market depending on the following:

(a) If the market clearing software that clears the Real-time Energy Market cannot produce a solution that manages the flow on a constraint within the binding limit in a dispatch interval at a cost less than or equal to the Transmission Constraint Penalty Factor, the Transmission Constraint Penalty Factor shall set the Marginal Value of the transmission constraint. In such instances, to manage the flow over the constraint, the Office of the Interconnection may adjust the Transmission Constraint Penalty Factor as set forth in Tariff, Attachment K-Appendix, section 5.6.3 and the parallel provisions of Operating Agreement, Schedule 1, section 5.6.3.

(b) If the Real-time Energy Market constraints are subject to market-to-market congestion management protocols with an adjacent Regional Transmission Organization and the market clearing software cannot produce a solution that manages the flow on a constraint within the binding limit in a dispatch interval, the Office of the Interconnection may coordinate with such Regional Transmission Organization to either allow the Transmission Constraint Penalty Factor to set the Marginal Value of the transmission constraint or to apply the Constraint Relaxation Logic upon mutual agreement in accordance with applicable Joint Operating Agreements.

5.6.2 Default Transmission Constraint Penalty Factor Values

Transmission constraints located within the metered boundaries of the PJM Region, including market-to-market coordinated constraints, regardless of voltage level, are defaulted to a \$30,000/MWh Transmission Constraint Penalty Factor in the Day-ahead Energy Market when determining the day-ahead security constrained economic dispatch, known as the dispatch run, and \$2,000/MWh in the determination of Day-ahead Prices in the pricing run. Constraints located within the metered boundaries of the PJM Region, excluding market-to-market coordinated constraints, regardless of voltage level, are defaulted to a \$2,000/MWh Transmission Constraint Penalty Factor in the Real-time Energy Market. Market-to-market coordinated

constraints in the Real-time Energy Market, located within the metered boundaries of the PJM Region, will use a default Transmission Constraint Penalty Factor of \$1,000/MWh or a value agreed upon by PJM and the relevant Regional Transmission Organization in accordance with applicable Joint Operating Agreements.

5.6.3 Modifications to Transmission Constraint Penalty Factor Values

(a) The Office of the Interconnection may modify the default Transmission Constraint Penalty Factor values used in the Real-time Energy Market or Day-ahead Energy Market for individual transmission constraints to: (1) ensure the market clearing solution is feasible, (2) reflect changes to the operating practices which are mutually agreed upon with the neighboring RTO for managing such constraints for market-to-market coordinated constraints, or (3) reflect persistent system operational or reliability needs and the cost of the resources available to effectively relieve congestion on the constraint. When such conditions occur, the Office of the Interconnection may raise the Transmission Constraint Penalty Factor when sufficient congestion relief on the constraint cannot be provided by available resources at a cost below the default Transmission Constraint Penalty Factor. The Office of the Interconnection may lower the Transmission Constraint Penalty Factor when sufficient congestion relief on the constraint can be provided by available resources at a cost below the default Transmission Constraint Penalty Factor in order to prevent a high cost resource that cannot provide material congestion relief on the constraint from inappropriately setting price for the constraint. In either instance, to effectively relieve congestion on the constraint, the revised Transmission Constraint Penalty Factor value may be determined using the following formula, while accounting for the ability for such inputs to vary as system conditions change throughout the operating day:

$$\text{Revised Transmission Constraint Penalty Factor (\$/MW)} = \frac{\text{System Energy Price} + \text{Loss Price} + \text{Congestion Price}}{\text{D}_{\text{fax}} - \text{Incremental Energy Offer}^*}$$

Where D_{fax} equals the distribution factor of the resource for the transmission constraint

*For purposes of this equation only, Incremental Energy Offer includes start up and no load costs where appropriate.

(b) The Office of the Interconnection shall post, as soon as practicable, on its website any changes to the default Transmission Constraint Penalty Factor values used in the Real-time Energy Market and/or the Day-ahead Energy Market.

(c) Notwithstanding the provisions of this section 5.6, and until such time the rebuild of the Lanexa-Dunnsville-Northern Neck line in the Dominion Transmission Zone is complete (as confirmed with the Transmission Owner and subsequently reported on the transmission facilities outage list posted on the Office of the Interconnection’s website), the Office of the Interconnection shall set the transmission line limit in its Security Constrained Economic Dispatch program at a level that ensures the offers of the resources being used to control the constraint are reflected in the Congestion Price in lieu of applying a Transmission Constraint Penalty Factor when there are insufficient available resources to relieve a transmission constraint

on the remaining transmission facilities serving the Northern Neck peninsula caused by the Lanexa-Dunnsville-Northern Neck line outage.

ATTACHMENT B

CLEAN TARIFF

5.6 Transmission Constraint Penalty Factors

5.6.1 Application of Transmission Constraint Penalty Factors in the Day-ahead and Real-time Energy Markets

In the Day-ahead Energy Market, the Transmission Constraint Penalty Factors shall be used to ensure a feasible market clearing solution but not used to determine the Marginal Value of a transmission constraint. In the Real-time Energy Market, the Office of the Interconnection shall use Transmission Constraint Penalty Factors to determine the Marginal Value for a transmission constraint when that transmission constraint cannot be managed within the binding transmission limit in a dispatch interval. The Marginal Value of the transmission constraint shall be used in the determination of the Congestion Price component of Locational Marginal Price as referenced in Tariff, Attachment K-Appendix, section 2.5 through Tariff, Attachment K-Appendix, section 2.6, and the parallel provisions of Operating Agreement, Schedule 1, section 2.5 through Operating Agreement, Schedule 1, section 2.6. The Transmission Constraint Penalty Factor may set the Marginal Value of the transmission constraint during any dispatch interval in the Real-time Energy Market depending on the following:

(a) If the market clearing software that clears the Real-time Energy Market cannot produce a solution that manages the flow on a constraint within the binding limit in a dispatch interval at a cost less than or equal to the Transmission Constraint Penalty Factor, the Transmission Constraint Penalty Factor shall set the Marginal Value of the transmission constraint. In such instances, to manage the flow over the constraint, the Office of the Interconnection may adjust the Transmission Constraint Penalty Factor as set forth in Tariff, Attachment K-Appendix, section 5.6.3 and the parallel provisions of Operating Agreement, Schedule 1, section 5.6.3.

(b) If the Real-time Energy Market constraints are subject to market-to-market congestion management protocols with an adjacent Regional Transmission Organization and the market clearing software cannot produce a solution that manages the flow on a constraint within the binding limit in a dispatch interval, the Office of the Interconnection may coordinate with such Regional Transmission Organization to either allow the Transmission Constraint Penalty Factor to set the Marginal Value of the transmission constraint or to apply the Constraint Relaxation Logic upon mutual agreement in accordance with applicable Joint Operating Agreements.

5.6.2 Default Transmission Constraint Penalty Factor Values

Transmission constraints located within the metered boundaries of the PJM Region, including market-to-market coordinated constraints, regardless of voltage level, are defaulted to a \$30,000/MWh Transmission Constraint Penalty Factor in the Day-ahead Energy Market when determining the day-ahead security constrained economic dispatch, known as the dispatch run, and \$2,000/MWh in the determination of Day-ahead Prices in the pricing run. Constraints located within the metered boundaries of the PJM Region, excluding market-to-market coordinated constraints, regardless of voltage level, are defaulted to a \$2,000/MWh Transmission Constraint Penalty Factor in the Real-time Energy Market. Market-to-market coordinated

constraints in the Real-time Energy Market, located within the metered boundaries of the PJM Region, will use a default Transmission Constraint Penalty Factor of \$1,000/MWh or a value agreed upon by PJM and the relevant Regional Transmission Organization in accordance with applicable Joint Operating Agreements.

5.6.3 Modifications to Transmission Constraint Penalty Factor Values

(a) The Office of the Interconnection may modify the default Transmission Constraint Penalty Factor values used in the Real-time Energy Market or Day-ahead Energy Market for individual transmission constraints to: (1) ensure the market clearing solution is feasible, (2) reflect changes to the operating practices which are mutually agreed upon with the neighboring RTO for managing such constraints for market-to-market coordinated constraints, or (3) reflect persistent system operational or reliability needs and the cost of the resources available to effectively relieve congestion on the constraint. When such conditions occur, the Office of the Interconnection may raise the Transmission Constraint Penalty Factor when sufficient congestion relief on the constraint cannot be provided by available resources at a cost below the default Transmission Constraint Penalty Factor. The Office of the Interconnection may lower the Transmission Constraint Penalty Factor when sufficient congestion relief on the constraint can be provided by available resources at a cost below the default Transmission Constraint Penalty Factor in order to prevent a high cost resource that cannot provide material congestion relief on the constraint from inappropriately setting price for the constraint. In either instance, to effectively relieve congestion on the constraint, the revised Transmission Constraint Penalty Factor value may be determined using the following formula, while accounting for the ability for such inputs to vary as system conditions change throughout the operating day:

$$\text{Revised Transmission Constraint Penalty Factor (\$/MW)} = \frac{\text{System Energy Price} + \text{Loss Price} + \text{Congestion Price}}{\text{D}_{\text{fax}} - \text{Incremental Energy Offer}^*}$$

Where D_{fax} equals the distribution factor of the resource for the transmission constraint

*For purposes of this equation only, Incremental Energy Offer includes start up and no load costs where appropriate.

(b) The Office of the Interconnection shall post, as soon as practicable, on its website any changes to the default Transmission Constraint Penalty Factor values used in the Real-time Energy Market and/or the Day-ahead Energy Market.

(c) Notwithstanding the provisions of this section 5.6, and until such time the rebuild of the Lanexa-Dunnsville-Northern Neck line in the Dominion Transmission Zone is complete (as confirmed with the Transmission Owner and subsequently reported on the transmission facilities outage list posted on the Office of the Interconnection's website), the Office of the Interconnection shall set the transmission line limit in its Security Constrained Economic Dispatch program at a level that ensures the offers of the resources being used to control the constraint are reflected in the Congestion Price in lieu of applying a Transmission Constraint Penalty Factor when there are insufficient available resources to relieve a transmission constraint

on the remaining transmission facilities serving the Northern Neck peninsula caused by the Lanexa-Dunnsville-Northern Neck line outage.

ATTACHMENT C
Affidavit of Stu Bresler

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL REGULATORY COMMISSION**

PJM Interconnection, L.L.C.,))))))	Docket Nos. EL22-__-000 ER22-__-000
-------------------------------------	----------------------------	--

**AFFIDAVIT OF FREDERICK S. BRESLER, III
ON BEHALF OF PJM INTERCONNECTION, L.L.C.**

I. QUALIFICATIONS

1. My name is Frederick S. (Stu) Bresler, III. I am the Senior Vice President of Market Services, for PJM Interconnection, L.L.C. (“PJM”). My business address is 2750 Monroe Blvd, Audubon, PA 19403.

2. My duties include responsibility for the conduct of day-to-day operations of the various PJM electricity markets including the Capacity Market, the Financial Transmission Right Markets, the Day-Ahead and Real Time Energy Markets, and Ancillary Service Markets. I am responsible for evolution of the PJM markets and rule changes to existing markets, as well as implementing the required technical software changes to ensure complete, accurate and timely execution of the PJM markets.

3. I hold a B.S. degree in Electrical Engineering and a Master of Management degree, both from Penn State University. I am a licensed professional engineer in Pennsylvania.

II. PURPOSE AND OVERVIEW OF AFFIDAVIT

4. The purpose of my affidavit is to support PJM’s filing to address an unforeseen and unintended consequence by amending the rules associated with the application of the Transmission Constraint Penalty Factor. In particular, PJM proposes a

discrete and limited provision that would allow PJM to set the transmission line limit in its Security Constrained Economic Dispatch (“SCED”) program at a level that ensures the offers of the resources being used to control the constraint are reflected in the Congestion Price in lieu of applying a Transmission Constraint Penalty Factor when there are insufficient available resources to relieve a transmission constraint on the remaining transmission facilities serving the Northern Neck peninsula.

III. DISCUSSION

A. The Transmission Constraint Penalty Factor is Designed to Provide Efficient Price Signals in Determining Where Additional Transmission, Generation, and/or Demand Response Investments Are Needed.

5. A transmission constraint occurs when a physical limitation of a transmission facility is reached during normal or contingency system operations. When this occurs, the most economic generation cannot be delivered to the load due to physical limitations on transmission facilities. As a result, when there is a transmission constraint, more expensive generation that is electrically closer to the load must be dispatched in order to ensure that flows on transmission facilities are maintained within their operating limits.

6. To internalize the transmission constraints in the market, the optimization algorithm utilizes Transmission Constraint Penalty Factors. The Transmission Constraint Penalty Factor (set at a default rate of \$2,000/MWh in the Real-time Energy Market) is one of the parameters used within the SCED application and represents the cost of violating a transmission constraint per megawatt of violation (megawatt flow exceeding the applicable limit). Functionally, it also places an upper bound on the per megawatt hour cost that may be incurred to control a transmission constraint.

7. Under the existing market rules, the Transmission Constraint Penalty Factor is used to determine the Marginal Value of a transmission constraint when sufficient controlling actions do not exist to control the constraint at or below the applicable limit. The Marginal Value is a factor used in determining Congestion Price. Since the components of LMP are System Energy Price, Congestion Price, and Loss Price, the Transmission Constraint Penalty Factor ultimately affects LMP by impacting the value of the Congestion Price.

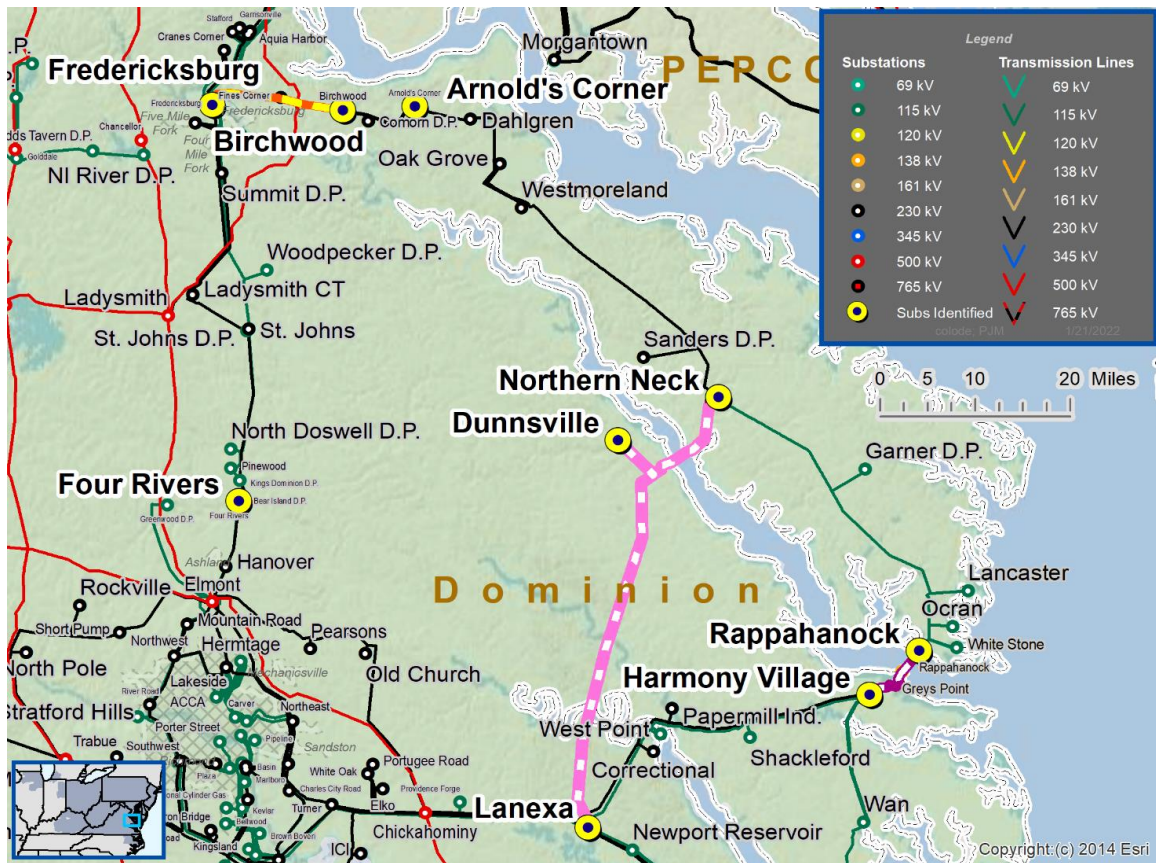
8. The underlying goal and intent of reflecting the Transmission Constraint Penalty Factor in LMPs is to provide market signals that incentivize supply and/or load response to help mitigate the constraint in the short-term, while also incentivizing the development of additional supply, load response and/or transmission through long-term investments. Use of the Transmission Constraint Penalty Factor, therefore, generally results in prices that signal short-term responses and longer-term investment that would be beneficial to the reliability of the transmission system and therefore have the intended impact.

B. The Application of the Default Transmission Constraint Penalty Factor is Inappropriate for the Lanexa-Dunnsville-Northern Neck 230 KV Circuit Line Outage.

9. As part of PJM's regional transmission expansion planning ("RTEP") process set forth in Operating Agreement, Schedule 6, the PJM Board voted to approve a baseline upgrade associated with the Northern neck peninsula in the Dominion Zone. This project was included in PJM's RTEP because there are various N-1-1 voltage magnitude and drop violations in the Northern Neck peninsula. In addition, the Rappahannock-Whitestone and Harmony Village-Greys Point 115 kV circuits are overloaded for an N-1-1 contingency

10. To address these issues, in 2020, the PJM Board approved the installation of a second Lanexa-Northern Neck 230 kV circuit, expansion of the Northern Neck 230 kV terminal from a four-breaker ring bus to a six-breaker ring bus, and expansion of the Lanexa 230 kV terminal from a six-breaker ring bus to a breaker-and-a-half arrangement.¹ The map below shows the Lanexa-Dunnsville-Northern Neck 230 KV circuit line in pink.

Figure 1: Map of Lanexa to Northern Neck



11. To effectuate these upgrades, the Lanexa-Dunnsville-Northern Neck 230 KV line has been placed on an extended outage to allow for the construction and

¹ See Transmission Expansion Advisory Committee Recommendations to the PJM Board, available at: <https://www.pjm.com/-/media/committees-groups/committees/teac/2020/20201201/20201201-pjm-teac-board-whitepaper-december-2020.ashx>.

reinforcement of the transmission capabilities in Northern Neck peninsula. This outage is expected to be in place until at least approximately December 2023.²

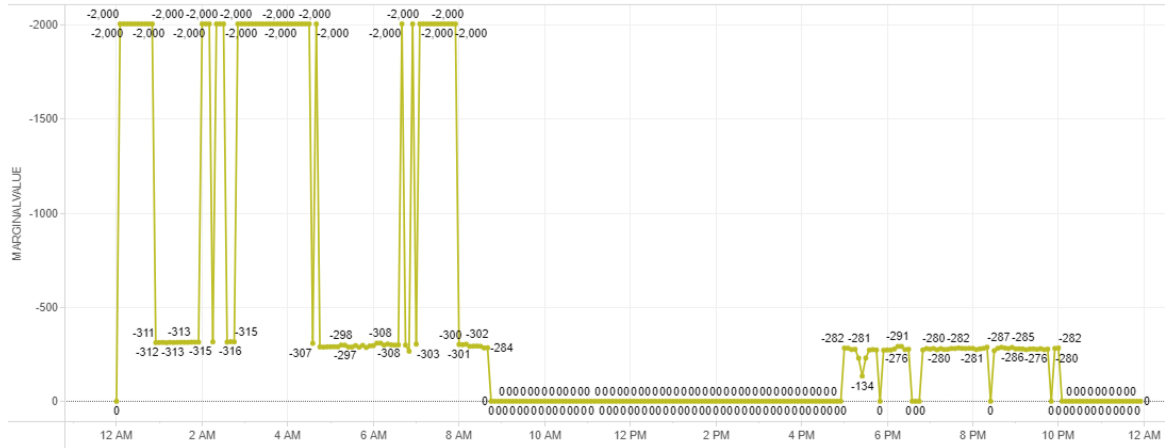
12. Since the Lanexa-Dunnsville-Northern Neck line has been placed on the extended outage to allow for the construction to reinforce the transmission capabilities in the area, transmission constraints on the remaining transmission facilities serving the Northern Neck peninsula have not always been controllable because there is only one set of relatively small combustion turbine (“CTs”) units available in this area for PJM to manage transmission constraints on the peninsula. As a result, there have been several instances when all of the available CTs were operating yet still insufficient to control the constraint and no other controlling actions are available. When this occurs, the transmission constraint binds at the default Transmission Constraint Penalty Factor of \$2,000/MWh.

13. To illustrate this issue, the graph below shows the severe price fluctuations that occurred on January 14, 2022 in the Northern Neck peninsula caused by the transmission constraint binding and the application of the default Transmission Constraint Penalty Factor. As shown in this graph, even when the available CTs are operating, the transmission constraint could not be solved for several intervals in the early morning hours. When this occurs, the price is set at the default Transmission Constraint Penalty Factor of \$2,000/MWh instead of the offers submitted by the CTs. During the daytime hours, however, there are no transmission constraints due partially to lower net

² The Lanexa-Dunnsville-Northern Neck line outage is technically comprised of two separate outages (Lanexa – Dunnsville and Dunnsville – Northern Neck) and represents two pieces of a series path. Therefore the entire path is essentially scheduled to be out through at least December, 2023.

load resulting from solar energy production from behind-the-meter resources on the peninsula.

Figure 2: Graph of Price Fluctuations in Northern Neck on January 14, 2022.



14. While there is a load switching option that would alleviate the transmission constraint, implementing the switching solution places the load pocket at risk of uncontrolled load shed. Specifically, when output from the available CTs is insufficient to control the N-1 contingency flow below the facility’s emergency rating, the transmission constraint can be managed by post-contingency local load relief warning (which is planned load shed if the contingency occurs to bring flows across the constraint within limit). However, if the load-dump rating on the constraint is close to being exceeded, the local transmission system is reconfigured via the switching option referenced above. When this occurs, the constraint stops binding altogether, because the 115 kV path, including the constrained facility, is severed. This reduces actual line flow to a portion of the area load, which eliminates the impact of the contingent facility loss. However, implementing the switching solution will also lead to increased risk of lost load on the peninsula.

15. Locational price signals such as those provided through the PJM markets are critical to incentivizing both short-term response and long-term investment. In the short-term, such signals, in this case high energy prices, signal the need for additional supply or reduced demand in a given area. In fact, allowing prices to increase to high levels when needed for *short* periods of time improves pricing signals and generally improves investment signals for flexible resources that are best able to capitalize on those more volatile prices. In this limited and unique circumstance, however, there has been no additional supply observed and there is currently no load response available in the Northern Neck area significant enough to help resolve the congestion (and none have responded in this area since the high price signals began in early January). In addition, PJM has not been notified by any Market Participant of any forthcoming response to those prices that would improve reliability in the area and, in the long-term, a transmission upgrade currently under construction will mitigate these issues.

16. Even if one could be developed within the next two years, it is unlikely that investors would attempt such a feat because alleviating the transmission constraint would also eliminate the need to apply the Transmission Constraint Penalty Factor, undercutting their potential revenues. By the same token, although demand response solutions could theoretically be implemented sooner, to alleviate the imposition of the penalty factor on the peninsula during cold winter or hot summer days, there would need to be more than 1,000 times as much demand response registered on the peninsula from the current 0.1MW level. As a result, it is difficult to hypothesize how it would be a prudent investment decision to develop a new resource to address a short-term transmission constraint because such a resource would likely not be able to recover its costs once the congestion is resolved.

17. In the long-term, such high prices signal the need for investment in additional supply or transmission capability into an area. In this instance, however, investment in additional supply or transmission investment in the long-term is not necessary because investments are already being made to strengthen the transmission capabilities in the Northern Neck peninsula and the current transmission line outage is occurring only to accommodate the construction of this rebuild project. Once the rebuild of the Lanexa-Dunnsville-Northern Neck line is complete, no additional transmission would be needed in this area and any potential additional transmission enhancements would be duplicative and unnecessary.

18. As a result, in this limited and unique circumstance, application of the default Transmission Constraint Penalty Factor raises costs to consumers while providing little measurable benefit in the short term because of the limited resources in the area available to help mitigate this constraint, and will result in higher costs over an extended period of time with no apparent response that could provide the desired near-term operational benefits.

C. It is Appropriate to Not Apply the Transmission Constraint Penalty Factor in this Limited and Unique Circumstance.

19. The transmission constraints that are occurring on the Northern Neck peninsula is a unique circumstance that the market rules were not designed to address because:

- the application of the penalty factor is not resulting in, and not likely to result in, short-term responses that could mitigate the transmission constraints caused by the extended line outage;
- applying Transmission Constraint Penalty Factor for extended periods of time is unlikely to incent useful and economic responses given the long-term solution already underway;

- consumers, and the market, are harmed by the long-duration and application of a high penalty factor when no supply or demand responds to high prices for extended period of time; and
- increased prices occurring over a substantial period of time are unlikely to incent useful, economic responses, particularly given the long-term solution already underway.

20. To alleviate the harm to consumers caused by the unnecessary application of the Transmission Constraint Penalty Factor due to the Lanexa-Dunnsville-Northern Neck line outage, it is appropriate to allow PJM to set the transmission line limit in its Security Constrained Economic Dispatch program at a level that ensures the offers of the resources being used to control the constraint are reflected in the Congestion Price in lieu of applying a Transmission Constraint Penalty Factor when there are insufficient available resources to relieve a transmission constraint on the remaining transmission facilities serving the Northern Neck peninsula caused by the Lanexa-Dunnsville-Northern Neck line outage.

21. This approach would allow PJM to relax the transmission constraint in SCED so that if the transmission constraint binds, those CTs that are on-line to control the constraint will set the LMP, and the Transmission Constraint Penalty Factor will not be applied for congestion that cannot be solved in the Northern Neck peninsula.

22. This approach provides a discrete solution that will limit the harmful market impact of continuing to apply the Transmission Constraint Penalty Factor in this specific situation when no additional investments are needed while retaining the existing approach used for operational purposes. In other words, this targeted proposal retains all actions currently available to operators for maintaining reliability in the region.

IV. SUMMARY AND CONCLUSION

23. The continuing application of the existing Transmission Constraint Penalty Factor rules is not having the designed or intended impact when applied during the Lanexa-Dunnsville-Northern Neck line outage because of the unique geography, load characteristics, and available resources of the Northern Neck peninsula. The proposed amendment to the application of the Transmission Constraint Penalty Factor described above will ensure that consumers will not continue to be harmed by high costs with little, if any, commensurate benefit.

24. This concludes my Affidavit.

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

PJM Interconnection, L.L.C.,)	
)	
)	Docket Nos. EL22-__-000
)	ER22-__-000
)	

VERIFICATION

Frederick S. Bresler, III, being first duly sworn, deposes and says that he has read the foregoing “Affidavit of Frederick S. Bresler, III on behalf of PJM Interconnection, L.L.C.,” that he is familiar with the contents thereof, and that the matters and things set forth therein are true and correct to the best of his knowledge, information, and belief.

In light of the steps that PJM Interconnection, L.L.C. has taken to address the ongoing emergency relating to COVID-19, including making arrangements for employees to work remotely, I respectfully request waiver of the Commission’s regulations with respect to any expectation or requirement that this verification be notarized.³

/s/ Frederick S. Bresler, III
Frederick S. Bresler, III
Senior Vice President, Market
Services
PJM Interconnection, L.L.C.

Dated: January 31, 2022

³ See *Extension of Non-Statutory Deadlines*, Supplemental Notice Waiving Regulations, Docket No. AD20-11-000 (Dec. 8, 2021).