UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Offer Caps in Markets Operated by	**)**	**Docket No. RM16-5-000**
Regional Transmission Organizations	**)**	
and Independent System Operators	**)**	

JOINT COMMENTS OF PJM INTERCONNECTION, L.L.C. AND SOUTHWEST POWER POOL, INC.

In response to the Federal Energy Regulatory Commission's (the "Commission") Notice of Proposed Rulemaking, issued on January 21, 2016 ("NOPR"),[1] PJM Interconnection, L.L.C. ("PJM") and Southwest Power Pool, Inc. ("SPP") (collectively, "PJM/SPP") hereby respectfully submit these comments in response to the NOPR.

I. INTRODUCTION AND BACKGROUND

A. PJM/SPP Support the Commission's Goals Outlined in the NOPR

At the highest level, the NOPR sets forth a balanced and consistent approach to resolving the long-standing issue of offer caps applied in Regional Transmission Organization and Independent System Operator (collectively, "RTO/ISO") energy markets. PJM/SPP generally support the proposed rule, and appreciate the Commission's leadership on this important issue. Limiting market-based cost recovery to the $1,000/MWh competitive energy offer cap potentially undermines market efficiency by precluding the clearing of energy offers that are legitimately based on incremental energy costs that exceed $1,000/MWh.

In recent years, there have been operational conditions in some parts of the country that have resulted in fuel prices rising to a level that raises a generation resource's incremental energy

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[1] *Offer Caps in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 154 FERC ¶ 61,038 (2016).

costs above the $1,000/MWh energy offer cap.[2] Under such conditions, and absent any changes to the $1,000/MWh offer cap rules, the system operator would dispatch the grid based on competitive offers up to $1,000/MWh, which would set the market clearing price. However, resources' costs greater than $1,000/MWh would be recovered via out-of-market uplift charges, if at all, and would not be reflected in market prices. This result is inefficient because the costs associated with such resources reflect the cost of meeting system demand, and ideally should be reflected in market prices. PJM made a series of filings over the past three winters making adjustments to the $1,000/MWh energy offer cap in order to address these circumstances, which were all accepted by the Commission.[3]

Moreover, today there is a patchwork of different approaches to the level of the offer cap across the nation's RTOs/ISOs, as well as whether costs above $1,000/MWh can set price or are merely placed into uplift. Particularly in the contiguous eastern RTO/ISO markets, this lack of uniformity with respect to offer caps raises a significant set of seams issues, which the ISO/RTO Council has urged the Commission to address in its comments responding to the NOPR.[4]

With respect to the overarching framework for addressing the issues outlined in the NOPR, PJM/SPP agree with the NOPR's principles that: 1) a uniform energy offer cap rule that is applicable to all RTOs/ISOs will ensure better price formation in wholesale electric markets

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[2] *See e.g.* Analysis of Operational Events and Market Impacts During the January 2014 Cold Weather Events, (May 8, 2014) http://www.pjm.com/~/media/committeesgroups/task-forces/cstf/20140509/20140509-item-02-cold-weather-report.ashx (providing background and analysis on the cold weather events of January 2014).

[3] *See PJM Interconnection, L.L.C.*, 146 FERC ¶ 61,041(2014); *PJM Interconnection, L.L.C.*, 146 FERC ¶ 61,078 (2014); *PJM Interconnection, L.L.C.*, 150 FERC ¶ 61,020 (2015); *PJM Interconnection, L.L.C*, 153 FERC ¶ 61,289 (2015).

[4] *See Offer Caps in Markets Operated by Regional Transmission Organizations and Independent System Operators*, Comments of the ISO/RTO Council, Docket No. RM16-5-000 (April 4, 2016).

and also decrease the impact of seams issues between RTOs/ISOs;[5] 2) a market seller's incremental energy offer for its resource should be capped at the higher of $1,000/MWh or that market seller's verified cost-based offer;[6] and 3) an appropriate method of verification of cost-based offers can be implemented,[7] provided that the final rule only establishes guiding principles regarding verification, and allows the RTOs/ISOs adequate flexibility to design verification rules that are consistent with their market rules and designs. PJM/SPP believe these are sound principles that should be the basis for the framework of any final rule in this proceeding.

B. PJM/SPP Do Not Believe The NOPR Should Apply to Emergency Situations or Load Reductions From Demand Resources

Before answering the specific questions posed by the Commission in the NOPR, it is important for PJM/SPP to note that their comments herein, and the proposed rule in general, do not and should not pertain to energy procured during emergency situations, or load reductions from resources providing demand response.

With respect to emergency conditions, the value of energy or load reductions is related to the preservation of system reliability, and prices should reflect the value of the resources being procured during emergency conditions. Notably, the value of energy provided during emergency conditions is greater than the value of energy provided during non-emergency conditions. Given

[5] *See e.g.* NOPR at PP 4, 70-71.

[6] *See e.g. id.* at 1. Generally in PJM, market sellers of generation resources submit two types of energy offers -- a market-based offer and a cost-based offer. Cost-based offers are based on the short-run marginal cost of the applicable generation resource as explained in Schedule 2 of the Operating Agreement and PJM Manual 15 ("Cost Development Guidelines"). *See e.g.* PJM Manual 15: Cost Development Guidelines (rev. 26, Nov. 5, 2014), http://www.pjm.com/~/media/documents/manuals/m15.ashx ("PJM Manual 15"). Market sellers of generation resources in SPP submit a market-based offer and a cost-based offer (mitigated offer). Cost-based offers are based on the short-run marginal cost of the generation resource, which are developed in accordance with SPP Tariff Sections 3.2, 3.3, 3.4 and Market Protocols, SPP Integrated Marketplace, Revision 36, Appendix G, Mitigated Offer Development Guidelines.
http://www.spp.org/documents/36461/integrated%20marketplace%20protocols%2036%201.pdf.

[7] *See e.g.* NOPR at P 56.

the drivers associated with pricing energy in the day-ahead and real-time energy markets under normal conditions, it is not appropriate to apply the NOPR, and any related final rule, to the purchase of emergency energy or emergency load reductions. Rather, the respective RTOs/ISOs should have discretion to develop independent compensation structures for the procurement of emergency energy or emergency load reductions that facilitates the ability of the RTOs/ISOs to obtain energy or load reductions under those conditions in a timely manner to support system reliability.

For example, currently in PJM, the $1,000/MWh competitive energy offer cap does not apply to energy that PJM procures during emergency situations. Instead, energy procured during emergency conditions is capped at $2,700/MWh for purposes of setting Locational Marginal Price ("LMP") only.[8] The reason for having this higher cap is that during emergency situations, PJM is willing to pay a higher price for such energy in order to mitigate the need to shed load. If the offer level of emergency energy were subject to the rules at issue in the NOPR, it could result in unwillingness for entities to sell emergency power to PJM, and could consequently result in PJM needing to enact more severe emergency procedures, such as a voltage reduction or load shedding. Simply put, the different circumstances between normal and emergency conditions justify different compensation methodologies.

Accordingly, for these reasons, the Commission should not apply its proposed rule, or any final rule, to energy or load reductions procured during emergencies. It is during emergency situations when response is needed without restrictions and prices need to reflect the actions taken by operators to maintain reliability. PJM is concerned that an energy offer cap on emergency energy or emergency load reductions would limit its ability to procure sufficient

[8] This level is equal to the current $1,000/MWh offer cap plus two reserve penalty factors. *See e.g.* PJM Open Access Transmission Tariff ("PJM Tariff"), Attachment K-Appendix, section 3.2.3A.

resources during emergency situations, and thus could threaten the reliability of the bulk electric system, as well as undermine compensation methodologies that reflect the enhanced value of energy and load reductions provided during emergencies.[9]

Similarly, PJM/SPP strongly believe that the NOPR and any final rule resulting from the NOPR should not apply to resources providing demand response (*i.e.* load reductions) generally. For example, in PJM, offers from such resources were never intended to capture the short-run marginal cost of reducing output, but rather the foregone commercial revenues incurred by curtailing consumption. Therefore, capping the offers of these resources in the same manner as generation resources would undermine PJM's construct for how resources providing demand response are able to offer into PJM's markets. Moreover, as a general matter, it is unclear what "costs" for resources providing demand response could be validated to justify an offer above the offer cap, as the cost structures and drivers for offers from generation resources and demand response resources are completely different.

II. COMMENTS

In the NOPR, the Commission seeks comment regarding several issues related to its proposed rule. PJM/SPP provide responsive information through their comments below.

A. It Is Not Reasonable To Place a Hard Cap On Verified Cost-Based Offers

The Commission first seeks comment on "whether a hard cap on cost-based incremental energy offers used for purposes of calculating LMPs should be included in any final rule in this proceeding and, if so, whether the hard cap should equal $2,000/MWh or another value."[10]

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[9] SPP does not have a similar compensation methodology for emergency energy purchases, but supports this position in principle.

[10] NOPR at P 73.

PJM/SPP do not believe that there should be a hard cap on cost-based offers used for the purposes of calculating LMP. So long as there is an appropriate verification process for cost-based offers, there is no reason to assign an arbitrary cap to such offers. In fact, doing so is contrary to the Commission's goals because a hard cap could preclude legitimate offers from setting the market price, thereby resulting in inefficient market outcomes. If a cost-based offer is verified prior to the clearing of the day-ahead or real-time market, then it should be eligible to set LMP. As long as there are appropriate checks and reviews in place, there is no reason to relegate recovery for cost-based offers above any arbitrary hard cap to unhedgeable uplift, while cost-based offers at or below $1,000/MWh are allowed to set LMP. Importantly, including cost-based offers above $1,000/MWh in the calculation of LMP will help improve price transparency, reduce unnecessary uplift, and help fulfill the Commission's goal of improving price formation across RTOs/ISOs.[11] Accordingly, the final rule in this proceeding should not include an arbitrary hard cap for cost based offers above $1000/MWh.

B. Verification of Cost-Based Offers

The Commission next seeks comment on "the ability to timely verify the costs within incremental energy offers above $1,000/MWh prior to the day-ahead or real-time market

[11] While it is true that PJM recently filed governing document revisions that instituted a hard cap on cost-based offers for the purpose of calculating LMPs at $2,000/MWh, which was accepted by the Commission, that filing, and the $2,000/MWh hard cap contained therein, was the result of a stakeholder compromise aimed at addressing short term consequences of not having effective governing document provisions that would permit Market Sellers to recover costs greater than $1,000/MWh. *See PJM Interconnection, L.L.C.,* Filing to Increase Energy Offer Cap, Docket No. ER16-76-000, at 5-6 (Oct. 14, 2015) ("2015 Offer Cap Filing"); *PJM Interconnection, L.L.C.*, 153 FERC ¶ 61,289 (2015) ("2015 Offer Cap Order"). In agreeing to the 2015 Offer Cap Filing, PJM's stakeholders expected the Commission to issue a proposed rule on energy offer caps that would apply on a national level (*i.e.* the NOPR). Knowing that this rule was forthcoming, PJM clarified that the revisions proposed in the 2015 Offer Cap Filing did "not necessarily represent PJM's, or any stakeholder's, view of offer cap or price formation issues within the context of a future Commission rulemaking." *See* 2015 Offer Cap Filing at 6, n. 20.

clearing process, including whether the verification of physical offer components is also necessary."[12]

1. Background

a. Cost-Based Offers Today in PJM and SPP

Before commenting directly on this question, it is important to understand how cost-based offers are calculated today in PJM and SPP, as PJM's and SPP's methods differ from how similar offers are calculated in other RTOs/ISOs. These nuances are important to understand because they impact how PJM and SPP, as well as RTOs/ISOs generally, may be able or unable to verify cost-based offers above $1,000/MWh, particularly before the close of the day-ahead or real-time market (i.e. on an *ex-ante* basis).

Notably, in both PJM and SPP, market participants are responsible for developing their cost-based offers in accordance with prescribed guidelines, and submitting such offers into the market. PJM and SPP do not utilize "reference prices" like other RTOs such as ISO New England ("ISO-NE"), the Midcontinent Independent System Operator ("MISO") and the New York Independent System Operator ("NYISO"). Importantly, in these other RTOs/ISOs, reference prices are not calculated and submitted by the market participant like cost-based offers in PJM and SPP, but instead are calculated in conjunction with (or entirely by) the RTO/ISO and/or the RTO's/ISO's market monitor.[13] In short, PJM and SPP depend on the market

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[12] *See* NOPR at P 73.

[13] *See e.g.* ISO-NE, Energy Market Offer Flexibility Training Presentation, http://www.pjm.com/~/media/committees-groups/task-forces/gofstf/20150629/20150629-iso-ne-hourly-marketoffer-presentation.ashx; NYISO, Generation Offers Within the New York Energy Market Presentation, http://www.pjm.com/~/media/committees-groups/task-forces/gofstf/20150629/20150629-item-05-generation-offerswithin-the-ny-energy-market.ashx (both presentations were presented to PJM Stakeholders at the June 29, 2015 meeting of PJM's Generator Offer Flexibility Senior Task Force).

participant to justify their costs rather than establishing an upfront "reference level" up to which costs can be recovered.

In PJM, market sellers of generation resources develop cost-based offers for each resource that are based on the resource's short-run marginal cost in accordance with PJM's Cost Development Guidelines.[14] Moreover, market sellers' individual fuel cost polices contain the methodologies used by market sellers to calculate cost-based offers in accordance with the Cost Development Guidelines that account for, *inter alia*, changes in fuel costs. Thus, market sellers in PJM bear the burden of ensuring that their cost-based offers are submitted in accordance with the Cost Development Guidelines generally. While PJM and the Independent Market Monitor for PJM ("PJM IMM") have the right to request information from market sellers about their cost-based offers at any time, and refer market sellers to the Commission if they believe that a market seller has submitted cost-based offers in violation of their fuel cost policy and/or the Cost Development Guidelines, such actions are taken only after the cost-based offers have been submitted into PJM's energy markets.

In SPP, like PJM, market participants submit cost based offers that are developed in accordance with specific guidelines. SPP's Market Monitoring Unit ("SPP MMU") reviews these offers. If the SPP MMU agrees with the cost-based offers submitted by the market participant, that value stands. If the SPP MMU disagrees with the value submitted by the market participant, that value is replaced with an SPP MMU calculated value.[15]

b. Background on the Gas Market

Next, it is important to understand how the natural gas market generally functions in order to fully answer the Commission's question related to verification. This is because the gas

[14] *See* note 6, *supra*.

[15] *See* SPP Tariff, Attachment AF, Section 3.5.

market is much more fluid compared to markets for other fuel types that are used to power generation resources. The dynamic nature of the gas markets, combined with a lower level of transparency than what exists in wholesale electricity markets, leads to greater challenges related to real time verification of market sellers' natural gas related costs compared to market sellers with other types of generation resources, particularly on an *ex-ante* basis.

Natural gas is purchased from suppliers and marketers on a daily and monthly basis across North America. Natural gas buyers generally consist of Natural Gas Distribution Companies ("NGDCs"), large industrial customers and marketing companies. The buying and selling of natural gas is accomplished in a variety of ways. In general, buyers with relatively stable, known requirements (such as NGDCs) purchase consistent levels of supply on a monthly basis. The last five business days of the month are known as the "bid week," and consists of buyers procuring their needed baseload supplies for the following month. During the bid week, these buyers will lock in gas purchases with one or more suppliers, typically basing the purchase price on a published index for the location at which the gas will be procured. These same buyers will then buy incremental supplies of gas in the daily natural gas spot market as needed throughout the delivery month as demand on the system deviates from forecasted needs due to factors including, but not limited to, changes in temperature and customer usage. Natural gas buyers with less uniform requirements, such as many market sellers of natural gas generation resources, typically buy their supply in the daily spot market based on their required electric demand schedule from their RTO/ISO. These purchases are either directly from the market or through a third party, such as a natural gas marketing company.

The daily spot market, by its very nature, is more volatile relative to the month-ahead index, as prices in the daily natural gas spot market can vary widely throughout the month and throughout a given day due to large temperature swings as well as interstate gas pipeline capacity curtailments and/or maintenance activities. Market sellers that rely on the natural gas spot market to procure their supply of natural gas may not know the actual cost of procuring such gas at the time they submit an offer into the day-ahead or real-time markets. This is due not only to the volatility of commodity prices in the natural gas spot market, but also the availability of firm transportation capacity, as well as the terms of the particular contractual arrangements that market sellers may have entered into with third parties that assist in asset management.

While the exact cost of fuel may not be known when bids are submitted to the day-ahead or real-time markets, on most days of a given year market sellers can still *reasonably approximate* what their cost to procure natural gas will be at the time they submit cost-based offers based on the daily spot market. This is because natural gas trading hubs, such as Texas Eastern M3 or Transco Zone 6 NNY, are liquid, supply is readily available on the spot market, and prices are transparent. Importantly, when gas is readily available and not in short supply, gas that is procured on a bilateral basis (*i.e*. not on a natural gas trading hub) is purchased at prices that are close to the prices in the spot market for natural gas trading hubs. Accordingly, entities can reasonably estimate their fuel costs on most days.

However, when there is an insufficient supply of natural gas available at trading hubs due to high demand, constrained supply, and/or limited transportation available, the prices for bilateral sales of natural gas can be much higher than the prices being posted on the trading hubs (*i.e.* the index prices) due to supply scarcity and greater demand. Thus, the days when natural gas markets are "tight," which also typically correlate to the days on which cost-based offers are most likely to approach or exceed $1,000/MWh, are precisely the days when the price of natural gas is less transparent to market sellers (and RTOs/ISOs) because the actual price paid by a market seller for gas on the bilateral market is farthest away from index prices or what a market seller typically pays for natural gas under normal conditions.

Recent data collected by PJM highlights this issue. Over the past three years, PJM has observed that higher gas prices have led to higher cost-based offers from market participants. However, there is no strong correlation between changes in gas prices (*i.e.* gas index prices) and the *magnitude* of changes in cost-based offers, particularly when cost-based offers are high. Attachment A presents a summary of data related to cost-based offers that were submitted in PJM during the past three winters. Importantly, Attachment A shows the mean and median gas prices that correspond with particular ranges of cost-based offer prices that were observed in PJM over the past three winters. If there were a strong correlation between gas prices and observed cost-based offers, one would expect roughly the same average and median gas prices to be present for each range of cost-based offers across the past three winters. However, as shown, for cost-based offers between $500/MWh and $750/MWh, the median gas price corresponding to this range of offers was $10.44 for the 2013-2014 winter, $15.62 for the 2014-2015 winter, and $3.75 for the 2015-2016 winter. While further analysis is needed to draw definitive conclusions for why this may be the case, PJM/SPP highlight this data to illustrate the fact that in the PJM region, there is not a straightforward line to be drawn between observed gas prices and the value of submitted cost-based offers.

Furthermore, an example of price deviation in the SPP region occurred during the "polar vortex" conditions of the winter of 2014. During those conditions, the price at the Panhandle Gas Hub separated from the Henry Hub price, and was approximately $70/MMbtu. These examples of how natural gas prices fluctuate during periods of high volatility in turn adds to the complexity inherent in designing a viable *ex-ante* verification regime.

2. The Difficulty with Ex-Ante Verification

There are practical implementation issues with respect to performing exact, cost-based *ex-ante* verifications that should be recognized and accommodated by the Commission's resulting final rule. Central to the Commission's proposed rule is the ability to verify the costs of offers above $1,000/MWh on an *ex-ante* basis. However, due to the timing of the submission of bids and subsequent clearing of the energy markets, the aforementioned issues associated with the natural gas market, and the size and complexity of the gas markets generally, it would be practically impossible to verify the actual costs incurred by a natural gas resource (*e.g.* verifying against invoices) on an *ex-ante* basis.[16] Accordingly, if the Commission intends on moving forward with its proposed rule, it must be willing to consider alternatives to verification based on the review of the actual costs incurred by a resource *(i.e*. invoiced expenses).

Importantly, there are several ways to approximate the reasonableness of a cost-based offer, and thus there is no need to mandate any one particular approach. This is reflected by the fact that RTOs/ISOs have different rules related to the establishment of cost-based offers. PJM/SPP believe that the same flexibility should be afforded in this rule with respect to the *ex-ante* verification in order to effectively implement the proposed rule because there is no single "correct way" of designing an *ex-ante* verification process.

Accordingly, each RTO/ISO may come up with, or already have, different designs of *ex-ante* verification processes that would ensure just and reasonable rates. As will be described in further detail below, PJM and SPP are each investigating potential means to develop their own *ex-ante* verification processes that will include, *inter alia*, a "screening review" to ensure that

[16] Importantly, these concerns are not present for generation resources with other fuel types, such as coal, oil, hydro, and nuclear because all of these types of resources have fuel that is on site and easily stored. This means that market sellers for these types of generation resources are more easily able to know what their fuel costs are.

cost-based offers submitted above $1,000/MWh that are eligible to set LMP are accurate, related to actual costs, and fall within a zone of reasonableness so that their use in setting market prices is justified. Notably, an *ex-ante* screen would not be a substitute for an *ex-post* review of the costs. Rather, the screen, along with other measures (such as an approved fuel cost policy) would provide an appropriate *ex-ante* verification process that will make it reasonable to allow cost-based offers to set price, rather than simply being included in uplift.

While PJM/SPP believe it is possible to develop *ex-ante* verification procedures to facilitate the goals of the NOPR, because of the practical realities associated with verifying actual costs on an *ex-ante* basis, the Commission must realize that with any *ex-ante* verification process there will necessarily be a tradeoff between the *level of precision* that the process (including the screen) requires before allowing cost-based offers greater than $1,000/MWh to be eligible to set LMP, and *the number* of offers above $1,000/MWh that legitimately reflect resources' incremental energy costs and are eligible to set LMP. In all but a very few cases, an *ex-ante* process that includes a screen will likely not be able to confirm the actual costs of a market seller prior to clearing the energy markets, but instead would permit offers within a certain price defined range to "pass" the screen and be permitted to set LMP.[17]

Given the foregoing, it is crucial for the Commission to clarify and allow flexibility in any final rule as to what constitutes acceptable *ex-ante* verification of offers that are permitted to set price. In essence, the Commission should consider the tradeoffs between the level of precision required for the *ex-ante* verification and the level of uplift that will result if there are a significant number of offers that can only be verified on an *ex-post* basis. If the Commission

[17] The application of a screen could prevent the inclusion of some legitimate cost-based offers from setting the market price, but it would prevent significant potentially unjustified market price impacts that could result from inappropriate cost-based offers setting the price if they somehow pass other applicable verification procedures. The precise impact of a screen would depend on its actual structure and functionality.

requires absolute precision relative to actual costs incured, such a position will severely limit the number of offers that will be able to be verified on an *ex-ante* basis, which will relegate the recovery of those costs to uplift rather than the market in contravention to the Commission's stated goals in this proceeding.

Moreover, PJM/SPP do not believe there is a reason to require a uniform verification process, and the final rule in this matter should not impose a single means of accomplishing verification. The existing RTO/ISO procedures for reflecting market sellers' costs in their offers have been developed over time and reflect approaches that work for their particular regions. Therefore, PJM/SPP request that in any final rule the Commission issue guidelines that may be applicable in designing an *ex-ante* verification process, but also allow each RTO/ISO flexibility in the specific design of its *ex-ante* verification process, or alternatively, to demonstrate why a novel *ex-ante* verification process is not necessary to ensure just and reasonable rates given the RTO's/ISO's existing cost verification rules and market design.

3. PJM and SPP Cost Verification Proposals

As an initial matter it is important to note that neither PJM nor SPP have specific, definitive positions or proposals for particular *ex-ante* verification procedures (including the potential use of a screen). Rather, these comments are merely identifying, at a conceptual level, potential means to develop *ex-ante* verification procedures that could facilitate achievement of the NOPR goals in a manner that would be consistent with each entity's respective rules and market designs. Ultimately, both PJM and SPP would develop specific proposals in response to the Commission's final rule in concert with their stakeholders in their respective committee processes.

That being said, PJM and SPP have each begun to think through mechanisms that they believe would provide sufficient verification for offers greater than $1,000/MWh to set LMP, which are discussed in more detail below. In setting forth these concepts, as noted previously, PJM and SPP are not seeking that the Commission "hard wire" these proposals into the final rule itself. Rather, these preliminary thoughts are presented to demonstrate that there are different ways to accomplish *ex-ante* verification to support the goals of the NOPR. The conceptual proposals, along with the fact that requiring exact precision for *ex-ante* verification is likely not feasible, support the request that the Commission provide latitude as to the degree of "verification" to which a market participant's cost-based offer will be subjected. The different proposals also support the request to provide flexibility with respect to how each RTO/ISO implements *ex-ante* verification for the purposes of any final rule in this proceeding. Again, although final rules would need to be developed by each RTO/ISO, the proposals demonstrate that there are different means to accomplish *ex-ante* verification in different regions.

a. PJM Proposal

i. Automated Screen

PJM believes it is possible to develop an automated screen for all cost-based offers greater than $1,000/MWh. PJM envisions that this screen will act as a final check to ensure that cost-based offers that appear to be unreasonably high (even if ultimately they are determined to be legitimate after an *ex-post* review) are not allowed to set LMP. This screen is not a substitute for either the market participant following its approved fuel cost policy and/or the PJM Cost Development Guidelines, nor is it a substitute for a potential *ex-post* review where additional documentation may be required.

As previously described, the process of market sellers calculating cost-based offers for natural gas powered generation resources can be extremely complex. Given this complexity and the multitude of options that market sellers have in procuring natural gas, PJM does not believe that it is feasible to precisely calculate what each market seller's cost-based offer for a resource should be prior to it submitting a cost-based offer during periods of high natural gas price volatility, which is precisely when cost-based offers are most likely to rise above $1,000/MWh. However, PJM is investigating whether it is possible to construct an automated test that can approximate *a reasonable range* of what a Market Seller's cost-based offer for a resource should be based on several inputs, including but not limited to natural gas index prices, the bid/ask spread,[18] and individual generating unit heat rates.

Moreover, there are several forms that an automated screen could take. For example, the test could automatically compute an "anchor price" that PJM expects to be submitted from an average resource with a given fuel type within a certain geographic area in PJM. Once the "anchor price" is calculated, PJM could also establish a bandwidth around the anchor price (for example, +/- 10% of the anchor price or +/- $100/MWh) that would be considered to account for "reasonable" cost-based offers (in other words, cost-based offers that are not abnormally high given current market conditions). Using this type of screen, when a market seller submits a cost-based offer greater than $1,000/MWh, before such offer is accepted, the Market Seller would be automatically notified if its cost-based offer is within the bandwidth that has been computed by PJM. If the cost-based offer is within the bandwidth, it will be eligible to set LMP. However if the cost-based offer is above the upper limit set by the bandwidth, the cost-based offer would still be accepted, but would be limited to that upper limit of the bandwidth for the purposes of setting LMP, and any additional costs that the market seller seeks to recover beyond the

[18] The bid/ask spread is the price difference between what sellers are willing to sell gas for and what others are willing to purchase gas for.

threshold would be through make-whole payments based on an after-the-fact review of additional documentation.

In a different implementation, the automated check could compute a unit specific "anchor price" based on multiplying the average natural gas price in an area by a generating unit's heat rate. Moreover, instead of preventing cost-based offers above the top end of the bandwidth from setting price, PJM could allow such cost-based offers to set price, but subject the market seller to heightened after the fact scrutiny, and if the cost-based offer turned out to be inconsistent with PJM's Cost Development Guidelines or the market seller's fuel cost policy, PJM and/or the PJM IMM could refer the matter to the Commission's Office of Enforcement.

Given the complexity involved with calculating market sellers' cost-based offers for natural gas powered resources, the lack of a strong correlation between changes in gas prices and the magnitude of changes in cost-based offers in PJM, and the size and complexity of the natural gas market in the PJM region compared to other RTOs/ISOs, PJM is still in the process of determining how to best design an *ex-ante* screen, whether such screen will ensure just and reasonable rates, and whether the costs of instituting an *ex-ante* screen are commensurate with the benefits it would provide to the market as a whole. Determining how to best design an automated screen will require additional analysis and consultation with the PJM IMM and PJM's stakeholders. Accordingly, PJM requests that the Commission allow PJM (and all other RTOs/ISOs as applicable) appropriate time to develop an automated screen as part of any compliance filing associated with the final rule in this proceeding, as well as flexibility in how to design such a test.

ii. Increased Oversight of Cost Development Guidelines

Additionally, in order to ensure that *all* cost-based offers in PJM appropriately reflect the short run marginal costs to produce energy for a given generation resource (whether they are above or below $1,000/MWh), PJM intends to conduct a review of its Cost Development Guidelines and the rules regarding market sellers' fuel cost policies in the near future to ensure that prior to cost-based offers being submitted, appropriate and transparent rules and processes are in place around the content, review and approval of submitted fuel cost policies. As previously noted, PJM currently relies on market sellers to submit cost-based offers that are compliant with the PJM Cost Development Guidelines, and importantly, allows market sellers some latitude in developing their own fuel cost policies. The latitude afforded to market sellers is appropriate and necessary because market sellers, particularly those offering energy from natural gas powered generation resources, may procure fuel for their resources in a variety of ways depending on the circumstances.

PJM intends to undertake a comprehensive review of its Cost Development Guidelines regardless of what results from this proceeding, as this review will apply to all cost-based offers submitted in PJM, and not just those greater than $1,000/MWh. PJM mentions this review herein because the goal of the process will be to ensure that cost-based offers better reflect market sellers' short run marginal costs when they are submitted to PJM, including those submitted over $1,000/MWh. PJM believes that improved guidelines surrounding cost-based offers are required, and thus lay the foundation to ensure cost-based offers are reasonable. PJM views the proposed *ex-ante* screen as complementary to the enhanced guidelines PJM is currently contemplating.

b. SPP Proposal

In considering this issue, while SPP would develop its final proposal in response to the final rule in conjunction with its stakeholders, SPP believes that a process similar to its current cost based verification methodology combined with the use of an appropriate screen could be an effective means of establishing reasonable cost-based prices that can be used to clear the day-ahead and real-time markets and set LMP. To accomplish this, SPP could use the short run marginal costs provided by resources. Under such a process, entities would be required to submit costs pursuant to rules that are similar to and consistent with the rules that apply to establishing cost-based offers under the existing tariff. In addition, if SPP ultimately pursues this type of process, in recognition of the difficulties of determining fuel costs on an *ex-ante* basis with exact precision, SPP would consider developing rules to facilitate the submission of the fuel cost component in a manner that ensures those costs either 1) reflect a resource's actual costs (where possible), or 2) are otherwise a reasonably accurate representation of the actual costs.

Collectively, these rules would be designed to facilitate *ex-ante* cost based verifications that produce values that provide reasonable assurance that the cost-based offers reflect actual costs incurred by units and, therefore, are justified in setting market prices where such units are cleared in the day-ahead and/or real-time energy markets. As discussed, the *ex-ante* verification process would, in most cases, likely be subject to a reasonable margin of error due to the need for the process to approximate fuel costs due to the difficulty of knowing these costs with precision on an *ex-ante* basis. This is especially true during system conditions where cost-based offers above $1,000/MWh would likely be implicated in setting market prices.

To mitigate the potential for unjustified anomalous cost-based offers to set market prices, similar to PJM, SPP would consider the use of an objective price screen to mitigate the potential for unreasonable cost-based offers to clear the market (the parameters of what is unreasonable, if any level, would need to be developed by SPP in concert with its stakeholders and submitted to the Commission for approval). Finally, another option to mitigate the introduction of inappropriate cost based offers into the market would be to consider potential penalty mechanisms that may be effective in deterring the submission of inappropriate or inaccurate bids. These additional components could further facilitate an effective *ex-ante* verification process in a manner consistent with the Commission's goals in this matter. Although detailed rules will need to be developed, SPP believes this approach could support the development of an effective *ex-ante* verification process that ensures cost-based offers are reasonable relative to actual cost and, therefore, are justified to set LMP.

Moreover, PJM and SPP believe that their current rules are adequate for establishing physical offer components and, therefore those components do not need further verification under the final rule in this proceeding.

C. Additional Information Required and Applicability of 10% Adder

The Commission seeks guidance on "whether the Market Monitoring Unit or RTO/ISO may need additional information to ensure that all short-run marginal cost components that are difficult to quantify, such as certain opportunity costs, are accurately reflected in a resource's cost-based incremental energy offer and to the extent that RTOs/ISOs currently include an adder above cost in cost-based incremental energy offers, whether such an adder is appropriate for incremental energy offers above $1,000/MWh."[19] PJM and SPP each address the Commission's question separately below:

1. PJM Position

a. Additional Information Needed to Verify Costs

The PJM IMM currently collects the majority of the data that would be required to calculate a reasonable range for each resource's cost-based offer as a means of conducting an *ex-ante* verification. The PJM IMM collects this information from some, but not all, resources within the PJM footprint via its Member Information Reporting Application ("MIRA"). This data generally includes:

- Heat rate curves
- Performance factors
- Variable operations and maintenance costs
- Emissions allowances and rates
- Fuel prices indices
- Startup and No Load cost components

The cost-based offers submitted by market sellers into PJM's energy markets currently include a component for opportunity costs that are difficult to quantify, such as those related to (i) environmentally limited run time restrictions, (ii) physical equipment limitations due to original equipment manufacturer recommendations or insurance carrier restrictions and (iii) a fuel supply limitation resulting from an event of force majeure.[20] These costs, where they exist,

[19] *See* NOPR at P 73.

[20] *See e.g.* PJM Manual 15, section 12.

must be included in the market seller's cost-based offer. Further, PJM's Markets Gateway[21] application contains an Opportunity Cost Calculator module, which aids market sellers in the calculation of such opportunity costs.[22] To the extent that this calculator is used to derive these opportunity costs, PJM collects and retains all of the input information used in forming the opportunity costs.

b. Applicability of the 10% Adder

PJM currently allows market sellers to include in cost-based offers both the incremental cost of the resource and adder of up to ten percent to account for the uncertainty inherent in computing those cost-based offers before all costs are known. PJM Tariff, Attachment K-Appendix, section 6.4.2(a) details the eligibility of this cost-based offer adder:

> (a) The offer price cap shall be one of the amounts specified below, as specified in advance by the Market Seller for the affected unit:
>
> . . .
>
> (ii) For offers of $2,000/MWh or less, the incremental operating cost of the generation resource as determined in accordance with Schedule 2 of the Operating Agreement and the PJM Manuals ("incremental cost"), plus up to 10% of such costs, the sum of which shall not exceed $2,000/MWh; and, for offers greater than $2,000/MWh, the incremental cost of the generation resource.

The Commission recently clarified when the inclusion of the 10% adder was appropriate for cost-based offers in PJM. Specifically, in its order approving PJM's 2015 Offer Cap Filing, the Commission agreed with PJM that it was appropriate to include the 10% adder in cost-based offers where a market seller did not yet know the precise value of all costs that it would incur (i.e. *ex-ante* offers), even if such offers were above $1,000/MWh.[23] However, when a market

[21] Markets Gateway is the PJM application used by market participants to submit offers into the energy market.

[22] *See* PJM, Markets Gateway User Guide, Appendix, http://www.pjm.com/~/media/etools/emkt/20151223-user-guide.ashx.

[23] *See* 2015 Offer Cap Order P 30.

seller was to be compensated through uplift based on an after-the-fact review, the uncertainty would no longer be present, and the inclusion of the 10% adder would no longer be just and reasonable.[24]

PJM believes that it is appropriate to carry forward this construct. Specifically, if a market seller submits a cost-based offer above $1,000/MWh and the offer is eligible to set LMP (*i.e.* it is verified), the market seller should be allowed to include the 10% adder. However, if the market seller submits a cost-based offer above $1,000/MWh and it is not eligible to set LMP (presumably because it was not verified), then while the market seller would be eligible to receive uplift payments based on an after-the-fact review, it should not be allowed to include the 10% adder in the recovery of such costs because there no longer would be any uncertainty regarding the level of costs the market seller incurred.

2. *SPP Position*

SPP believes its current rules are likely adequate for establishing the cost-based offer components for the purpose of *ex-ante* verification under the NOPR proposal (and presumably any final rule). As discussed previously, the one potential exception is fuel. In order to implement *ex-ante* verification procedures in accordance with any final rule in this proceeding, SPP may need to develop new rules to verify the fuel component of cost based offers. SPP intends on reviewing this issue relative to the need for *ex-ante* verification to achieve the goals of the NOPR. Based on that review, SPP will revise its rules as necessary to facilitate *ex-ante* verifications. As discussed, SPP intends on incorporating those rules into any new process related to complying with a final rule in this proceeding (assuming the final rule reflects and does not change significantly from the Commission's proposal in the NOPR).

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[24] *See id.* at P 31.

SPP does not presently use a structural adder to capture costs that may be difficult to quantify. As noted, SPP believes its current rules adequately support the development of cost-based offers. Because SPP intends on utilizing its existing rules to the maximum extent possible when developing its procedures to comply with any final rule in this proceeding, at this point, SPP does not intend on utilizing an adder of any amount. However, SPP understands that different regions have different rules with respect to adders. Accordingly, SPP takes no position on the issue of whether such an adder is appropriate for cost based offers above $1,000/MWh, and believes that the different RTOs/ISOs should be allowed to develop verification rules that are consistent with their rules (including adders), provided their proposals are consistent with achieving the goals of the NOPR and any subsequent final rule.

D. Additional Authority Required

The Commission also seeks comments on "whether the Market Monitoring Unit or RTO/ISO may need additional information or new authority to require revisions or corrections to a cost-based incremental energy offer to ensure that a resource's cost-based incremental energy offer is an accurate reflection of that resource's short-run marginal cost."[25]

PJM's answer in section II.C above addresses the Commission's question related to what new information PJM may need. With regard to what new authority PJM may require, as noted previously, market sellers in PJM currently submit cost-based offers, as well as market-based offers in most cases, for each of their resources.[26] As such, all offers PJM currently uses to schedule, dispatch and compensate resources are submitted directly by the market seller. PJM would require additional authority to implement an *ex-ante* verification paradigm that would

[25] *See* NOPR at P 73.

[26] *See* note 6, *supra*.

limit the cost-based offer used for scheduling, dispatch, pricing and settlement for a given resource.

As discussed, with respect to the verification piece of the proposed rule (and any final rule) SPP intends on utilizing its existing cost-based offer rules to the maximum extent possible, but may need to revise those rules to effectively implement an *ex-ante* cost-based verification process to effectuate the purposes of, and comply with, any final rule in this proceeding. SPP may also have to make other revisions depending on the final rule to ensure any procedures developed in response to the final rule in this proceeding are consistent with other aspects of the SPP tariff. However, SPP will not be able to determine whether it will need additional authority, or what the extent of that authority is, until it develops its procedures (including *ex-ante* verification procedures) in response to the final rule in this proceeding.

E. Application to Imports

The Commission next seeks comment on "whether the proposal should apply to imports and whether a cost verification process for import transactions is feasible."[27]

1. PJM Position

PJM believes it is necessary to allow import transactions to submit offers in excess of $1,000/MWh to ensure that economic (*i.e.* non-emergency) purchases and sales of energy continue to occur even when prices exceed $1,000/MWh. Such purchases and sales benefit the market and the power system as a whole by allowing the lowest cost energy to be provided to consumers and can also result in deferring operational emergency procedures in extreme situations.

[27] *See* NOPR at P 73.

Under PJM's current rules, economic transactions are offer capped at the maximum energy price (absent congestion and losses) of $2,700/MWh.[28] This is contrasted by emergency import transactions, which under today's rules are not offer capped but are capped for the purposes of price-setting at $2,700/MWh. PJM utilizes emergency import transactions during extreme operating conditions when PJM has already initiated its emergency procedures. Emergency import transactions are not offer capped because they are used to avoid the most severe emergency procedures such as voltage reductions and manual load shedding. While there is no defined number in PJM for the value of lost load,[29] PJM believes it to be in excess of $2,700/MWh, and therefore is willing to pay more than that to procure emergency energy to avoid load shedding.

PJM believes that the Commission's proposed rule should generally apply to economic import transactions but not emergency import transactions for the reasons previously stated. The cost verification process for economic import transactions will need to be slightly different than that of generation resources located within PJM because the sourcing generator of a transaction is typically not known, unless the transaction is from a resource that is dynamically scheduled or pseudo-tied into PJM.

If economic import transaction offers exceed the pre-defined cap, similar to generation resources within PJM, those offers would be accepted but limited to the cap level for the purpose of real-time dispatch and the initial make-whole payment. If further evidence is provided that justifies the offer at a level above the cap, an additional make-whole payment would be credited to the transaction for the difference.

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[28] $2,700/MWh is the maximum level of the energy component of LMP in PJM. *See* note 8, supra.

[29] Value of lost load is the estimated amount of money in $/MWh that firm load entities are willing to pay to avoid having their consumption curtailed.

2. SPP Position

SPP believes the application of the proposal to imports could be problematic to administer due to the difficulty of obtaining cost data from resources outside of the SPP footprint. However, SPP believes that the Commission should allow regional flexibility for this issue, and if regional flexibility is allowed, SPP would investigate this issue further in developing its procedures/rules related to this matter in response to the final rule issued in this proceeding.

F. Virtual Transactions

The Commission next seeks comment on "whether excluding virtual transactions above $1,000/MWh could limit hedging opportunities, present opportunities for manipulation or gaming, create market inefficiencies, or have other undesirable consequences, and whether alternatives exist which would allow virtual increment offers."[30]

PJM does not believe virtual transactions should be capped at $1,000/MWh or be subject to a "reasonableness" screen. Virtual transactions are purely financial and were implemented primarily for their ability to mitigate market power by allowing market participants without physical assets to compete with those that do. This increases competition in the day-ahead market, reduces market share and therefore reduces market power. If virtual transactions are capped at $1,000/MWh, then they will be unable to compete with physical asset owners when prices increase above $1,000/MWh. This will reduce competition in the day-ahead market when prices are at their highest and would likely be an unintended consequence of capping them at $1,000/MWh.

Additionally, virtual transactions also have the ability to converge the prices in the day-ahead and real-time markets. If these transactions were limited to a bid or offer level of

[30] *See* NOPR at P 73.

$1,000/MWh, then it would severely limit their ability to provide any type of market convergence when market clearing prices are high.

SPP takes no position on the application of the NOPR proposal to virtual transactions.

G. Additional Issues

1. PJM's Position on Changes to Shortage Pricing Rules

Additionally, in response to the Commission's charge to comment on any suggested additional market rule changes that may be related to the energy offer cap,[31] PJM believes that it needs to adjust its shortage pricing rules to account for a change in the offer cap. This is because PJM's current shortage pricing penalty prices (referred to as "reserve penalty factors") of $850/MWh are based on the $1,000/MWh energy offer cap. The existing $850/MWh reserve penalty factor was derived by looking at the average out-of-market lost opportunity costs that PJM paid to market sellers providing reserves during reserve shortage events prior to PJM's implementation of its shortage pricing construct in 2012.[32] Because the basis for lost opportunity costs is the difference between the LMP at the generator's location and the market seller's offer price for that generator, and because LMPs are based on such offers, the penalty price is directly linked to offers and the offer cap itself.

It is imperative that reserve penalty factors are set at a level that allows for reasonable assurance that all resources are utilized in meeting reserve and energy needs on the system prior to invoking shortage pricing. PJM believes that under the $1,000/MWh offer cap, the current $850/MWh reserve penalty factor achieves that goal. However, if cost-based offers greater than $1,000/MWh are allowed to set LMP, the reserve penalty factor will also need to be raised to

[31] *See id.* at P 72.

[32] *See e.g. PJM Interconnection, L.L.C.*, 139 FERC ¶ 61,057, at P 62 (2012).

ensure full asset utilization prior to initiating shortage pricing. Should the offer cap be a "floating" offer cap based on the greater of $1,000/MWh or the cost-based offer of the resource as the Commission proposes, PJM would propose that the reserve penalty factor used for shortage pricing follow that same methodology.

Specifically, PJM proposes that the reserve penalty factor for shortage pricing be set dynamically based on the highest offer submitted for each day. For example, on a normal day where offer prices do not exceed the $1,000/MWh level, PJM proposes that the reserve penalty factor could either be set at $1,000/MWh or remain at the current level of $850/MWh. However, when cost-based offers eligible to set market clearing prices are greater than $1,000/MWh, the reserve penalty factors must match the highest cost-based offer eligible to set the market price. For example, assume on a peak load day the highest cost-based offer eligible to set the market price is $1,500/MWh. On such a day, PJM proposes that the reserve penalty factor should also be raised to $1,500/MWh. Raising it to this level reasonably ensures that if the $1,500/MWh resource is marginal for energy, all resources with an offer greater than $0/MWh are utilized to meet energy and reserve needs prior to PJM entering a reserve shortage and invoking shortage pricing.

2. Additional Issues Related to SPP

SPP notes that any final rule in this proceeding could indirectly impact other market rules. For example, in SPP if the final rule ultimately allows cost based offers above $1,000/MWh to set market prices, then SPP would likely need to adjust its rules related to scarcity (*i.e.* shortage) pricing and Violation Relaxation Limits to ensure they are appropriately aligned and compatible with the energy market prices during times when the offers are greater than the values used for scarcity and model solving. Accordingly, SPP requests that the

Commission recognize the potential need for entities to make corresponding adjustments to other market rules that are related to and/or impacted by the final rule in this proceeding. Consistent with its comments above in the section related to additional authority needs, SPP will not be able to determine what additional authority and/or tariff revisions are needed until it develops its rules in response to the final rule in this proceeding.

III. CONCLUSION

PJM/SPP respectfully request that the Commission consider the information provided herein.

Respectfully submitted,

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Enclosures: Attachment A

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Audubon, PA, this 4th day of April, 2016.

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Attachment A
Tables Summarizing Natural Gas and Cost-Based Offer Prices in PJM During the Winters of 2013/2014, 2014/2015 and 2015/2016.

Winter 2013/2014			
LEAST COST OFFER BUCKET[1]	% COUNT OF LEAST COST OFFERS	MEAN GAS PRICE[2] ASSOCIATED WITH OFFER	MEDIAN GAS PRICE ASSOCIATED WITH OFFER
0 to 50	19%	5.7	4.52
50 to 100	32%	6.51	4.85
100 to 150	13%	8.61	6.5
150 to 200	9%	12.12	6.67
200 to 250	6%	11.81	6.34
250 to 300	5%	16.08	8.27
300 to 400	8%	12.68	6.34
400 to 500	3%	16.3	8.9
500 to 750	3%	17.71	10.44
750 to 900	1%	30.44	23.68
900 AND GREATER	2%	35.72	28.62

[1] In PJM's Day-ahead Energy Market, Market Sellers can submit more than one cost-based offer. When this occurs, PJM chooses the offer that represents the Market Seller's lowest-cost generation that is made available to schedule resources.

[2] In order to compute the price associated with a generation resource's offer shown in these tables, PJM utilized the index price associated with the liquid gas trading hub located closest to the resource.

Winter 2014/2015			
LEAST COST OFFER BUCKET	% COUNT OF LEAST COST OFFERS	MEAN GAS PRICE ASSOCIATED WITH OFFER	MEDIAN GAS PRICE ASSOCIATED WITH OFFER
0 to 50	44%	3.39	3.06
50 to 100	27%	4.39	3.48
100 to 150	9%	7.09	4.13
150 to 200	7%	7.93	4.11
200 to 250	5%	9.66	5.59
250 to 300	3%	8.16	3.65
300 to 400	3%	10.31	5.47
400 to 500	1%	16.21	16.02
500 to 750	1%	21.08	15.62
750 to 900	0%	14.63	15.34
900 AND GREATER	0%	16.38	15.34

Winter 2015/2016			
LEAST COST OFFER BUCKET	% COUNT OF LEAST COST OFFERS	MEAN GAS PRICE ASSOCIATED WITH OFFER	MEDIAN GAS PRICE ASSOCIATED WITH OFFER
0 to 50	74%	2.07	2.01
50 to 100	17%	2.64	2.2
100 to 150	5%	2.78	2.1
150 to 200	2%	1.98	1.68
200 to 250	1%	1.51	1.35
250 to 300	0%	2.73	2.68
300 to 400	0%	2.41	1.82
400 to 500	0%	2.9	3
500 to 750	0%	4.15	3.75
750 to 900	-	-	-
900 AND GREATER	-	-	-