

(“IMM”),⁴ the Joint Consumer Advocates,⁵ and the Indicated State Commissions⁶ each filed comments or protests taking issue with a handful of fairly detailed aspects of the revisions included in the August 30 Filing. The Organization for PJM States, Inc. (“OPSI”) also filed comments out of time concerning the scope of PJM’s compliance filing.⁷ No party alleges that the August 30 Filing failed to meet the broad directive of the April 18 Order: to implement fast-start pricing.⁸ As demonstrated in the August 30 Filing and in this answer, PJM’s compliance changes to the PJM Open Access Transmission Tariff (“Tariff”) and the Amended and Restated Operating Agreement of PJM Interconnection, L.L.C. (“Operating Agreement”)⁹ properly implement fast-start pricing in accordance with the April 18 Order’s directives.

January 2020); Limited Comments of Indicated Parties, Docket No. ER19-2722-000, at 2, 3 (Sept. 20, 2019) (urging implementation by March 2020); *see also* Comments of Vistra Energy Corp. and Dynegy Marketing and Trade, LLC in Response to PJM Interconnection L.L.C.’s Compliance Filing, Docket No. ER19-2722-000, at 8 (Sept. 20, 2019) (“Vistra Comments”) (stating that “the Commission should expeditiously” approve the August 30 Filing).

⁴ Comments of the Independent Market Monitor for PJM, Docket No. ER19-2722-000 (Sept. 17, 2019) (“IMM Comments”).

⁵ Protest of the Joint Customer Advocates, Docket No. ER19-2722-000 (Sept. 20, 2019) (“JCA Protest”).

⁶ Comments of the Indicated State Commissions, Docket No. ER19-2722-000 (Sept. 20, 2019) (“Indicated State Commissions Comments”).

⁷ Motion for Leave to File Comments Out of Time and Comments of the Organization of PJM States, Inc., Docket No. ER19-2722-000, at 3 (Oct. 2, 2019) (“OPSI Comments”).

⁸ *See PJM Interconnection, L.L.C.*, 167 FERC ¶ 61,058, at PP 17-18 (2019) (“April 18 Order”).

⁹ For ease of understanding this answer, PJM will refer only to the Operating Agreement when describing revisions that are incorporated into both the Tariff, Attachment K-Appendix and the parallel provisions of the Operating Agreement, Schedule 1. Capitalized terms not defined herein shall have the meaning as

I. ANSWER

A. The Market Revisions in the August 30 Filing Comply with the April 18 Order.

The IMM, Joint Consumer Advocates, and OPSI contend that a few of the energy market revisions included are “neither required by the [April 18] Order nor necessitated by the change in market design,”¹⁰ and therefore the Commission should reject these changes and the entire August 30 Filing.¹¹ These claims are without merit.

PJM’s proposed market rule changes each fulfill the April 18 Order’s directives to change PJM’s market design to implement fast-start pricing. The Commission did not provide specific tariff language to implement such fundamental changes to market design. Rather, the Commission listed eight concepts and directed PJM to submit a compliance filing “reflecting” them.¹²

In developing the revisions to implement fast-start pricing, PJM responsibly and reasonably performed a detailed review and examination of how such changes would interact with other market rules and determined which rules would need to be modified.¹³ The results of PJM’s efforts are evident in the August 30 Filing, where each revision is consistent with the Commission’s directives.

contained in the Tariff, the Operating Agreement, or the Reliability Assurance Agreement Among Load Serving Entities in the PJM Region.

¹⁰ IMM Comments at 1.

¹¹ IMM Comments at 1-2; JCA Protest at 1-2; *see also* OPSI Comments at 3.

¹² April 18 Order at PP 17-18.

¹³ The complexity of the design changes led PJM to request, and the Commission to grant, a 30-day extension of the compliance deadline. Motion of PJM Interconnection, L.L.C. for Extension of Time and Request for Shortened Answer Period, Docket No. EL18-34-000 (July 5, 2019); *PJM Interconnection, L.L.C.*, Notice of Extension of Time, Docket No. EL18-34-000 (July 19, 2019).

The items the IMM and others claim to be “beyond the requirements” of the April 18 Order are in fact revisions necessitated by the implementation of fast-start pricing. For example, as discussed in sections I.B and I.C below, the August 30 Filing included make whole payments to Virtual Transactions and supply resources in certain circumstances. Yet, these circumstances arise only and directly from the imposition of separate and distinct dispatch and pricing runs which allows for resources to be dispatched at offer prices that can differ from the price set in the pricing run. Employing distinct runs is a fundamental market design change required to “[i]nclude its fast-start pricing practices in [PJM’s] Tariff,” and “[i]nclude commitment costs in energy prices for fast-start resources in both the day-ahead and real-time markets.”¹⁴ Just because the April 18 Order did not specifically mention these payments does not mean they are out of the scope of the Order’s directives.¹⁵ The Commission directed broad changes to PJM’s market design, and then directed PJM to submit changes “reflecting” this new market design. The Commission’s approach is reasonable, given that the record before the Commission did not include revised tariff language detailing how fast-start pricing may be implemented in PJM’s markets.¹⁶ These make whole payments are two of the

¹⁴ April 18 Order at P 17.

¹⁵ *See, e.g., Cal. Indep. Sys. Operator Corp.*, 127 FERC ¶ 61,156, at P 9 (2009) (“Because the compliance obligations in our prior order are broad, we cannot agree with [the commenter] that the CAISO’s proposal is beyond the scope of the Commission’s compliance directive.”).

¹⁶ OPSI contends that PJM’s plan to implement the August 30 Filing after Commission acceptance somehow evidences that the filing includes matters beyond the scope of the April 18 Order. OPSI Comments at 3. That is not the case, however. PJM has responsibly allowed the Commission the opportunity to review PJM’s compliance filing and implementation approach before actually implementing such approach.

revisions necessary to implement, among other things, “fast-start pricing practices in [PJM’s] Tariff” and to ensure resources follow PJM’s dispatch instruction when prices do not match system dispatch.¹⁷

In any event, should the Commission find any of the revisions included in the August 30 Filing to be beyond the scope of this proceeding, the Commission should not reject the filing as a whole, as the IMM, Joint Consumer Advocates, and OPSI request. Rather, the Commission should reject only the suspect revision and allow the other fast-start pricing provisions to become effective. Rejection of the entire filing would only serve to delay implementation of fast-start pricing, and allow energy market rules the Commission found unjust and unreasonable to remain in place with no corresponding benefit.

B. Distinct Dispatch and Pricing Runs in the Day-ahead Market Create the Need for Make Whole Payments to Virtual Transactions, Price Sensitive Demand, Dispatchable Exports, and Day-ahead Scheduling Reserve Resources.

The IMM, Joint Consumer Advocates, and the Indicated State Commissions argue that PJM’s inclusion of make whole payments to Virtual Transactions, price-sensitive demand, dispatchable exports, and Day-ahead Scheduling Reserve Resources to cover any differences between the offer price on which they were committed in the dispatch run and the price determined in the pricing run is outside the scope of this proceeding.¹⁸ The IMM contends that the make whole payments “would shield a subset of market

¹⁷ April 18 Order at P 17.

¹⁸ IMM Comments at 2-5; JCA Protest at 2-5; Indicated State Commissions Comments at 2-5.

participants from fast start prices”¹⁹ and that because such Virtual Transactions do not “directly affect prices they do not provide price convergence.”²⁰ The IMM also contends that make whole payments to Virtual Transactions raises market manipulation concerns.²¹

To the contrary, such changes are a necessary resultant of the Commission’s directives to implement fast-start pricing. The Commission recognized that by establishing two distinct runs, the circumstance can arise in which the price at which resources are committed in the dispatch run and the clearing price determined in the pricing run are different.²² For Virtual Transactions, price-sensitive demand, and dispatchable exports, this can be problematic where the clearing price in the pricing run does not support the accepted bid or offer price in the dispatch run thus making the accepted offer uneconomic to the buyer or seller and thus creating unwarranted financial exposure. The issue regarding market clearing price (i.e., Locational Marginal Price, or “LMP”) not supporting cleared offer prices is one that exists today for generation resources. To ensure PJM-committed generators are kept whole to their offer prices, uplift payments are required.²³ For Virtual Transactions, price-sensitive demand, and dispatchable exports, however, this is a new problem introduced by fast-start pricing, and therefore, there are no existing provisions that will ensure that such cleared transactions are kept whole to their bid or offer price. Thus, the August 30 Filing appropriately

¹⁹ IMM Comments at 3.

²⁰ IMM Comments at 4.

²¹ IMM Comments at 4.

²² See April 18 Order at P 138.

²³ See Operating Agreement, Schedule 1, section 3.2.3(b).

addresses a matter within the scope of the directed fast-start changes, and rather than “shielding” certain resources, seeks to treat all resources comparably for when the bid or offer on which they are committed is not supported by the LMP. Failure to provide such make whole payments could be unduly discriminatory.

In addition, the difference between commitment price and clearing price creates a financial disincentive for Virtual Transactions to participate in PJM’s energy market. The issue is that market participants are presented with the additional risk of clearing uneconomically and not being made whole to their offer. This risk may drive a set of Virtual Transactions out of the market, including those that are economic and which would have price convergence benefits.

With respect to the IMM’s general concern that make whole payments to Virtual Transactions presents opportunities for market manipulation, PJM notes that the IMM did not provide any specific evidence or examples supporting such concern, but rather simply cited Commission investigations into other virtual traders.²⁴ Nonetheless, PJM recognizes that providing such make whole payments will change the incentives around virtual trading; but, so will implementing fast-start pricing without such make whole payments. The Commission has already approved similar make whole payments in the context of implementing Midcontinent Independent System Operator’s (“MISO”) Extended Locational Marginal Pricing, and no documented concerns have arisen there.²⁵

²⁴ See IMM Comments at 5.

²⁵ See MISO Open Access Transmission, Energy, and Operating Reserve Markets Tariff, Module C, § 39.3.2B (Day-Ahead Revenue Sufficiency Guarantee Payments); *Midwest Indep. Transmission Sys. Operator, Inc.*, 140 FERC ¶ 61,067, at PP 11, 24 (2012).

Given that fast-starting pricing will change the incentives for Virtual Transactions, price-sensitive demand, and dispatchable exports, regardless of whether a make-whole payment is provided or not, PJM will closely monitor the activity of these transactions following implementation.

Finally, the IMM criticizes providing payments to Day-ahead Scheduling Reserve Resources when the offer price on which they were committed is greater than the clearing price in the pricing run, because they have “no incentive to deviate from real-time dispatch instructions due to their day-ahead financial position.”²⁶ This critique misses the point. PJM included a Day-ahead Scheduling Reserve Lost Opportunity Cost (“LOC”) credit to ensure sellers do not have an incentive *not* to offer to supply Day-ahead Scheduling Reserve. Without the LOC payment, sellers would have an incentive to economically withhold their resources’ Day-ahead Scheduling Reserve capability if they do not remain financially indifferent to providing energy or reserves.²⁷ Accordingly, such an LOC payment ensures that fast-start pricing may be implemented without impairing PJM’s ability to secure Day-ahead Scheduling Reserve.

C. The Make Whole Payment to Ensure Resources Follow Dispatch when Uneconomic Is Consistent with the April 18 Order’s Directives.

The IMM and the Joint Consumer Advocates assert that PJM’s proposal to provide a make whole payment to supply resources when the clearing price is lower than the offer price on which the resource was committed and when the resource is being

²⁶ IMM Comments at 5.

²⁷ Such withholding would be permissible under the current rules, as there is no offer price cap for Day-ahead Scheduling Reserve nor does PJM apply the three pivotal supplier test when committing resources to provide Day-ahead Scheduling Reserve.

instructed to provide energy in real-time in excess of its day-ahead assignment is outside the scope of the compliance directive and would provide the resource “additional revenue.”²⁸ However, such a payment is consistent with the Commission’s findings and directives in the April 18 Order.

In the April 18 Order, to ensure resources do not have an incentive to deviate from PJM’s dispatch instructions, the Commission directed PJM to include an LOC payment to resources dispatched down to accommodate fast-start resources when the pricing run yields a price higher than the dispatch run.²⁹ PJM complied with this directive by including the Dispatch Differential LOC payment in the August 30 Filing. While it is generally understood that fast-start pricing will, on average, produce LMPs that are above the offer at which resources are dispatched, it is possible, particularly on the sending side of a transmission constraint, that the LMP could actually be lower than the offer at which a resource is dispatched. Resources dispatched on an offer above the LMP will similarly require a payment to ensure that they do not have the incentive to deviate from dispatch.³⁰ This is akin to an LOC payment but in the reverse. To address this issue, PJM proposed a make whole payment to ensure that a resource facing this circumstance simply due to the difference in prices created by fast-start pricing would not have the incentive to deviate from PJM’s dispatch instruction. Without such payment, the resource would not be fully compensated for providing energy in excess of its day-

²⁸ IMM Comments at 6; JCA Protest at 5.

²⁹ April 18 Order at P 138.

³⁰ See August 30 Filing at 17-19; proposed Operating Agreement, Schedule 1, section 3.2.3(e-1) (proposed revisions to the Operating Agreement are shown in redline and clean in Attachments C and D to the August 30 Filing).

ahead assignment and thus would have a financial incentive to *not* follow dispatch. Thus, such a make whole payment is better considered as an LOC payment in purpose and is consistent with the Commission’s recognition that fast-start pricing may create an incentive to deviate from dispatch instructions and such incentive should be addressed through LOC payments.³¹ Further, this payment is similar to the one the Commission approved as part of ISO New England Inc.’s (“ISO-NE”) fast -start implementation.³²

The IMM’s other criticism of this provision—that it would “provide additional revenue”—is correct, but only to a degree and not as a general matter. PJM minimized the ability for resources to gain additional revenue by providing that “any make whole payments received pursuant to this new provision will be subtracted from the resource’s general balancing operating reserve credit under section 3.2.3(e).”³³ Thus, a resource would have an opportunity for additional revenue only in the event that (1) it actually receives such make whole payments, which can arise only in the limited circumstances described above, and (2) it does not earn balancing operating reserve credits equal to or greater than any such make whole payments. This tradeoff of a limited opportunity to obtain additional revenue in exchange for generally ensuring resources follow dispatch when it would otherwise be uneconomic for them to do so (i.e., operate *at a loss*) is reasonable.

³¹ April 18 Order at P 138.

³² See ISO New England Inc. Transmission, Markets and Services Tariff, Appendix F, section III.F.2.3.10; Revisions to Fast-Start Resource Pricing and Dispatch of ISO New England Inc. and New England Power Pool, Docket No. ER15-2716-000 (Sept. 24, 2015); *ISO New England Inc.*, Letter Order, Docket No. ER15-2716-000 (Oct. 19, 2015).

³³ August 30 Filing at 19; proposed Operating Agreement, Schedule 1, section 3.2.3(e).

D. PJM Correctly Designed the Dispatch Differential LOC Payment to Remove Incentive to Chase Prices.

The IMM and the Joint Consumer Advocates each criticize PJM's Dispatch Differential LOC credit for being provided "on a five minute basis without regard for the overall profitability of the resource commitment."³⁴ The IMM asserts that the Dispatch Differential LOC should be included "only consistent with the existing uplift structure" in which uplift is paid only to the extent a resource's revenues do not cover its cost across an Operating Day.³⁵

However, these arguments fail to recognize the purpose of the Dispatch Differential LOC: to ensure resources follow dispatch instructions and do not deviate for financial gain.³⁶ In this vein, the Dispatch Differential LOC is not intended to ensure that a resource does not operate at a loss over an Operating Day, but rather it is intended to remove the incentive to deviate from dispatch—an incentive that can arise every five minutes. The Commission explicitly directed PJM to address this incentive.³⁷ To net the Dispatch Differential LOC against losses in other intervals would undermine the LOC payment's effectiveness at muting the incentive to chase higher prices on an interval-by-interval basis. Moreover, PJM's approach is consistent with other LOC payment methodologies in PJM³⁸ and with that the Commission approved for ISO-NE.³⁹

³⁴ IMM Comments at 6; JCA Protest at 5.

³⁵ IMM Comments at 7.

³⁶ See April 18 Order at P 138.

³⁷ See April 18 Order at P 138.

³⁸ See, e.g., Operating Agreement, Schedule 1, section 3.2.3(f) (providing for make whole payments when a resource is manually dispatched down by PJM).

³⁹ See *supra* note 32.

E. The August 30 Filing Contained Sufficient Description of the Dispatch and Pricing Runs.

The IMM, Joint Consumer Advocates, and the Indicated State Commissions contend that the tariff revisions in the August 30 Filing do not “include sufficient detail to ensure that fast start pricing is correctly implemented.”⁴⁰ To the contrary, the revised tariff provides:

The Office of the Interconnection calculates Locational Marginal Prices separately from and subsequent to the security-constrained unit commitment and security-constrained economic dispatch of the system, the latter of which is referred to as the dispatch run. The calculation of Locational Marginal Prices, which occurs in a process referred to as the pricing run, is based on the same optimization problem as the security-constrained economic dispatch. The objective of both the dispatch run and the pricing run is to serve load and meet reserve requirements at the least cost while respecting transmission constraints. However, Integer Relaxation is applied only to Eligible Fast-Start Resources committed in the pricing run to provide energy.⁴¹

In other words, this provision clearly establishes: (1) the sequence of events; (2) that the dispatch and pricing runs use the same optimization problem; and (3) that both runs solve for the same objective, but only the pricing run employs Integer Relaxation. And this provision simply lays out the general rule for PJM’s markets. PJM also included market-specific language for the Real-time Energy Market⁴² and the Day-ahead Energy Market.⁴³

⁴⁰ IMM Comments at 7; JCA Protest at 5; *see also* Indicated State Commissions Comments at 8.

⁴¹ August 30 Filing at 9-11; proposed Operating Agreement, Schedule 1, section 2.2.

⁴² *See* August 30 Filing at 10-11; proposed Operating Agreement, Schedule 1, section 2.5.

⁴³ *See* August 30 Filing at 10; proposed Operating Agreement, Schedule 1, section 2.6.

The IMM and the Joint Consumer Advocates point to the language that, in the Real-time Energy Market, PJM will use “input data from a reference real-time security constrained economic dispatch case,” and then they pose questions about the origin of such data.⁴⁴ But, their truncated presentation of the provision omits that the input data will be “as described in the PJM Manuals.”⁴⁵ Thus, the market generally will know the origin of such data, and including such implementation detail about the minutia or running the markets is appropriately left to the PJM Manuals.

With regard to the commenting parties’ claim that PJM “currently uses mismatched inputs,”⁴⁶ this claim is not specific to implementing fast-start pricing. As the parties note, this issue is pending in the stakeholder process, where PJM, the IMM, and stakeholders are currently discussing the transparency of the inputs used in different phases of running the market models, along with the alignment of the intervals for which each phase solves.⁴⁷ Accordingly, because this complaint encompasses more than implementation of fast-start pricing, the Commission should leave it to the stakeholder process wherein any changes to the tariff or PJM Manuals will be fully vetted.

⁴⁴ IMM Comments at 8 (quoting August 30 Filing at 10 (quoting proposed Operating Agreement, Schedule 1, section 2.5(a))); JCA Protest at 6 (same).

⁴⁵ August 30 Filing at 10 (quoting proposed Operating Agreement, Schedule 1, section 2.5).

⁴⁶ IMM Comments at 8; JCA Protest at 6; Indicated State Commissions Comments at 8.

⁴⁷ See IMM Comments at 8; JCA Protest at 6; Indicated State Commissions Comments at 8; see also *Five Minute Dispatch and Pricing*, PJM Interconnection, L.L.C., <https://www.pjm.com/committees-and-groups/issue-tracking/issue-tracking-details.aspx?Issue={6DECC213-EC91-4CCF-B75C-3BE72FE0D347}> (last visited Oct. 3, 2019).

F. The April 18 Order Did Not Direct Any Changes to Address the IMM's Market Power Allegations.

The IMM contends that PJM “ignored” “structural market power [that] may exist in the pricing run,” and faults PJM for revising the market power rules to specify that PJM will not check for market power in the pricing run.⁴⁸ However, in the April 18 Order, the Commission found “a lack of sufficient evidence at this time” to require any modifications to the market power mitigation rules, as the IMM requested.⁴⁹ Instead of directing any changes based on insufficient evidence, the Commission directed PJM to submit an informational report addressing market power issues.⁵⁰ PJM submitted such report on September 27, 2019 in Docket No. EL18-34-000.⁵¹ In any event, the tariff revision to which the IMM and the Indicated State Commissions specifically object merely memorializes PJM’s existing process of performing the three pivotal supplier test at the time of commitment and not when determining prices.⁵²

G. PJM Appropriately Did Not Address False Positive and False Negative Shortage Pricing in the August 30 Filing.

The IMM criticizes the August 30 Filing for failing to address false positive and false negative shortage pricing.⁵³ The IMM’s claims with regard to false negative shortages appear based on an inaccurate understanding of how Integer Relaxation will

⁴⁸ IMM Comments at 9; *see also* JCA Protest at 6-7, Indicated State Commissions Comments at 6-7.

⁴⁹ April 18 Order at P 127.

⁵⁰ *See* April 18 Order at PP 128-29.

⁵¹ Informational Report of PJM Interconnection, L.L.C., Docket No. EL18-34-000 (Sept. 27, 2019) (“PJM Informational Report”).

⁵² *See generally* PJM Informational Report.

⁵³ IMM Comments at 9.

work. The IMM appears to believe that, under Integer Relaxation, PJM will relax an Eligible Fast-Start Resource's Economic Minimum, which would result in the resource being dispatched to a value in between Economic Minimum and zero in the pricing run, and therefore the capability between zero and the resource's Economic Minimum can be used to satisfy reserve requirements in addition to the capability that exists above Economic Minimum.⁵⁴ The IMM asserts that counting such reserve capability in the pricing run could lead to a scenario in which an actual shortage in the dispatch run does not convey to the pricing run, i.e., a false negative shortage.

The IMM's explanation is incorrect. While PJM's Integer Relaxation does relax a resource's Economic Minimum in the pricing run, it does so by scaling in unison the resource's Economic Minimum and Economic Maximum by the relaxed energy commitment variable (between zero and one). As a result, no additional reserve capability is created through Integer Relaxation, as the IMM posits, because the difference between a resource's Economic Minimum and Economic Maximum in the pricing run is always less than or equal what it was in the dispatch run. This is because in the dispatch run the energy commitment variable is one, and in the pricing run it is less than or equal to one. Uniformly scaling both parameters is necessary to ensure that resources that are not capable of providing reserves in the dispatch run are not able to

⁵⁴ IMM Comments at 10. The Indicated State Commissions echo the IMM's concerns with regard to how reserves may be calculated under PJM's fast-start pricing approach and requested that PJM's method for calculating reserves be codified in the tariff. Indicated State Commissions Comments at 7-8. However, the rules for calculating reserves is beyond the scope of this proceeding to implement fast-start pricing.

provide them in the pricing run either.⁵⁵ For example, assume an Eligible Fast-Start Resource has an Economic Minimum value of 50 megawatts (“MW”) and an Economic Maximum value of 50 MW. If the resource’s commitment variable is reduced to 0.8 in the pricing run, the resource still cannot provide reserves because both parameters are now 40 MW. Similarly, assume an Eligible Fast-Start Resource has an Economic Minimum value of 50 MW and an Economic Maximum value of 100 MW, and thus 50 MW of reserve capability. If the resource’s commitment variable is reduced to 0.8 in the pricing run, the resource can now only provide 40 MW of reserve capability, as there is now a 40 MW difference between its Economic Minimum of 40 MW and Economic Maximum of 80 MW. This reflects the fact that only 80 percent of the unit was actually needed.

With regard to a false positive shortage, i.e., where the pricing run indicates a shortage even though sufficient resources are available, the IMM contends that, to the extent Eligible Fast-Start Resources’ Composite Energy Offers exceed the applicable Reserve Penalty Factor, the pricing run will not dispatch such fast-start resources to resolve a shortage, resulting in shortage pricing.⁵⁶ The IMM is correct in indicating that the interaction between the Reserve Penalty Factor and the Composite Energy Offer are important in determining whether reserves are adequate, or short, under fast-start pricing. However, the mechanics explained by the IMM are not correct and PJM does not support their suggested remedy to the problem.

⁵⁵ PJM will develop business rules describing how to determine an Eligible Fast-Start Resource’s reserve capability and place such rules in the PJM Manuals.

⁵⁶ IMM Comments at 10.

Under fast-start pricing, the Composite Energy Offer of an Eligible Fast-Start Resource will be used to determine how much of that fast-start resource is needed (i.e., the level of the energy commitment variable) to reach the cheapest solution to the dispatch problem in the pricing run. The use of the Composite Energy Offer and the relaxation of the energy commitment variable are what effectuates the fast-start pricing objectives set forth in the April 18 Order.

When assigning resources to provide reserves, the cost of a resource is measured by its lost opportunity cost to provide those reserves, which can be generically defined as the LMP minus the offer of the resource at the MW output where it would need to be dispatched to provide reserves. If the lost opportunity cost for a resource is above the Reserve Penalty Factor, it is cheaper for the system to go short reserves than to assign reserves to that resource. If the lost opportunity cost is below the Reserve Penalty Factor, the resource can be assigned reserves if it is part of the most economic set available to meet the requirement. In the fast-start pricing context, the only relevant thing here that changes is that the LMP can now be set by the Composite Energy Offer of an Eligible Fast-Start Resource, which could result in higher reserve lost opportunity costs, even from resources which are not eligible for fast-start pricing, than are experienced currently. PJM believes that this is the actual issue the IMM is attempting to highlight.

Under the current reserve market design, with no fast-start pricing and where the Reserve Penalty Factor is set at \$850/MWh, there is the potential for reserve shortages to be reflected in prices when they physically do not exist. This can occur when the system operator takes a manual action to maintain reserves that is more costly than the \$850/MWh Reserve Penalty Factor. The phenomenon that changes under fast-start

pricing is that this can potentially now occur only in the pricing run as a result of the introduction of the Composite Energy Offer of an Eligible Fast-Start Resource. In order for this to occur, the Composite Energy Offer of an Eligible Fast-Start Resource would have to be marginal in the pricing run at a level that does not result in sufficient reserves available to meet the reserve requirement even though there were adequate reserves available in the dispatch run. When this occurs, there will be a shortage in the pricing run that does not occur in the dispatch run.

To “remedy” this, the IMM proposes an early concept that PJM shared with stakeholders regarding only allowing the dispatch run to determine the existence of a reserve shortage.⁵⁷ While this would align the existence of shortages between the dispatch and pricing runs, it would also effectively disable fast-start pricing by not permitting fast-start resources to set price under false positive shortage conditions which would be completely unknown to the market. PJM also views this proposal as deficient because it does not actually resolve the problem stated by the IMM which is that, “[c]onsumers should not bear the cost of false positive shortages and should not avoid shortage costs due to false negative shortages.”⁵⁸ The IMM’s solution fails to recognize that reserve shortages that are not consistent with real-time operating conditions also occur in the dispatch run today, due to the Reserve Penalty Factor level.

⁵⁷ IMM Comments at 10-11 (citing *FERC Docket EL18-34-000: Fast-Start Pricing*, PJM Interconnection, L.L.C., 7 (January 29, 2018) (<https://www.pjm.com/-/media/committees-groups/task-forces/epfstf/20180129/20180129-item-08-fast-start-206-response.ashx>) (PJM Presentation to the Energy Price Formation Senior Task Force).

⁵⁸ IMM Comments at 11.

To the extent, the Commission determines that shortages in the pricing run that do not arise in the dispatch run and which are caused by the introduction of Eligible Fast-Start Resources' Composite Energy Offers are an issue to be addressed, PJM believes that setting the Reserve Penalty Factor at a level that exceeds the reserve lost opportunity costs likely to be experienced under fast-start pricing is the only way to eliminate this issue, while also ensuring the actions system operators have already taken to maintain reliability can be transparently conveyed through prices.

H. PJM's Approach for Defining a Fast-Start Resource Eligible for Integer Relaxation Protects the Market.

The IMM, Joint Consumer Advocates, and Indicated State Commissions criticize the August 30 Filing for providing PJM discretion in determining "fast start resource status."⁵⁹ However, PJM intentionally established a two-step process for when a resource would be eligible for fast-start pricing, with the goals of (1) ensuring the determination of fast-start eligibility cannot be unwittingly influenced by erroneous data submitted by a market participant and (2) facilitating the verification of a Fast-Start Resource's Composite Energy Offer (to the extent it is greater than \$1,000/MWh) prior to the market clearing process as required by Order No. 831.⁶⁰

Under the proposed two-step authentication process, PJM first will determine whether a resource is "capable of operating with a notification time plus startup time of

⁵⁹ IMM Comments at 11; JCA Protest at 7; Indicated State Commissions Comments at 5-6; *see also* Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM, Docket No. ER19-2722-000, at 3 (Sept. 27, 2019).

⁶⁰ *Offer Caps in Markets Operated by Regional Transmission Organizations and Independent System Operators*, Order No. 831, 157 FERC ¶ 61,115, at PP 139-147 (2016), *order on reh'g & clarification*, Order No. 831-A, 161 FERC ¶ 61,156 (2017).

one hour or less and a Minimum Run Time of one hour or less or minimum down time of one hour or less based on its operating characteristics.”⁶¹ If so, then the resource will be a Fast-Start Resource. Second, as explained in the August 30 Filing, to be eligible for fast-start pricing treatment, a Fast-Start Resource must meet the criteria set forth in revised section 2.2. Those criteria are (1) actually submitting an offer with parameters allowing it to provide energy within an hour and have a Minimum Run Time of an hour or less;⁶² and (2) not being a member of specific categories of resources because, as fully explained in the August 30 Filing, such resources face specific circumstances preventing them from being treated as Eligible Fast-Start Resources.⁶³ Resources that meet such criteria will be Eligible Fast-Start Resources and shall have Integer Relaxation applied to them in the pricing run.

The only discretion comes in the first step of the process, and is intended only to prevent sellers of resources which are unable to meet the basic fast-start operating characteristics from accidentally or intentionally triggering fast-start pricing for such resource by submitting offer parameters that erroneously indicate the resource could provide energy within an hour and have a Minimum Run Time of an hour or less. This process is similar to that used pursuant to Operating Agreement, Schedule 1, section 1.7.19A for PJM determining which resources are capable of providing Tier 1

⁶¹ Proposed Operating Agreement, Article I, Definitions E-F (definition of Fast-Start Resource); August 30 Filing at 4.

⁶² See Proposed Operating Agreement, Schedule 1, sections 2.2(i) and (ii).

⁶³ See August 30 Filing at 5-7. Proposed Operating Agreement, Schedule 1, section 2.2(iii) excludes the following resource types from being Eligible Fast-Start Resources: self-scheduled for energy; pumped storage hydropower scheduled day-ahead using PJM’s hydro optimization tool; only partially pseudo-tied into PJM; and dynamically scheduled.

Synchronized Reserves.⁶⁴ In fact, just like for Synchronized Reserves, PJM will base its determination on the resource's technology type and/or the Market Seller attesting to upgrades allowing the resource to meet the basic operating characteristics of fast-start resources.⁶⁵ For example, resource types categorically unable to be fast-start resources include nuclear and coal-fired units.

In addition, by allowing PJM to designate in the first instance the universe of resources capable of meeting the fast-start performance standards (i.e., provide energy within an hour and have a Minimum Run Time of an hour or less), PJM is able to review and verify such resources' Composite Energy Offers (to the extent they are greater than \$1,000/MWh) *before* the market clearing process begins, as required by Order No. 831.⁶⁶ PJM defined this set of resources as "Fast-Start Resources."⁶⁷ PJM will perform the offer verification screens on Fast-Start Resources' Composite Energy Offers upon submission of the resource's Incremental Energy Offer and/or Start-Up Costs and No-load Costs. Thus, in the event one or more of these resources submits an offer with the ability to

⁶⁴ See Operating Agreement, Schedule 1, section 1.7.19A(a) ("All on-line non-emergency generation resources providing energy are deemed to be available to provide Tier 1 Synchronized Reserve and Tier 2 Synchronized Reserve to the Office of the Interconnection, as applicable to the capacity resource's capability to provide these services.").

⁶⁵ Compare August 30 Filing at 4-5 ("PJM's determination of whether a resource qualifies as a Fast-Start Resource will be based on the operational characteristics of the resource's technology type and/or attestation from the Market Seller that investments have been made to allow the resource to meet the criteria of a Fast-Start Resource."), with *Big Sandy Peaker Plant, LLC v. PJM Interconnection, L.L.C.*, 154 FERC ¶ 61,216, at PP 42-54 (2016) (finding section 1.7.19A gives PJM "broad authority to determine which units are physically capable of providing Tier 1 reserves").

⁶⁶ See Order No. 831 at PP 139-147.

⁶⁷ See August 30 Filing at 4-5.

provide energy within an hour and with a Minimum Run Time of an hour or less, which qualifies it as an Eligible Fast-Start Resource subject to Integer Relaxation and for which the Composite Energy Offer will be considered when setting LMP, PJM will have already verified the Composite Energy Offer. This simplification is important because PJM's market rules provide hourly flexibility for the notification time and Minimum Run Time offer parameters.⁶⁸ A resource's classification as an Eligible Fast-Start Resource could therefore change on an hourly basis.

Absent such pre-designation as a Fast-Start Resource, PJM would need to check each resource's offer parameters for each individual hour to determine if the resource may qualify as an Eligible Fast-Start Resource if later committed based on such offer parameters, so that offer verification could be appropriately triggered. Given that these parameters can change on an hourly basis in real-time, and after the initial Incremental Energy Offer and/or Start-Up Costs and No-load Costs are submitted, PJM would need to dynamically monitor its entire resource pool and upon each change (1) determine whether a resource is subject to fast-start pricing; if so, then (2) determine whether the resource's Composite Energy Offer has segments that exceed \$1,000/MWh; and if so, then (3) perform the offer verification screens to verify Composite Energy Offer for price determination purposes. This process would be administratively burdensome. By contrast, PJM's approach of using of an upfront designation that indicates that the

⁶⁸ See Operating Agreement, Schedule 1, section 1.10.9B(b) ("For generation resource offers, Market Sellers may vary for each clock hour during the entire Operating Day the following offer parameters: . . . and (6) for Real-time Offers only, (i) notification time and (ii) for uncommitted hours only, Minimum Run Time.").

resource *may* become an Eligible Fast-Start Resource given its technology type would facilitate efficient offer verification prior to the market clearing process.

Moreover, if PJM has designated a resource as a Fast-Start Resource, but that resource does not submit an offer with the fast-start parameters (i.e., does not qualify as an Eligible Fast-Start Resource), then there is no harm in PJM reviewing and screening the resource's Composite Energy Offer since the Composite Energy Offer will not be used in the pricing run in such instance. PJM's process facilitates offer validation and market efficiency, as well as helping to prevent adverse market impacts of applying fast-start pricing based on erroneously submitted startup and Minimum Run Times.

Finally, the discretion afforded by the August 30 Filing is only a one-way street: PJM cannot deem a resource to be subject to fast-start pricing without the resource also submitting an offer with the fast-start performance criteria. Rather, PJM can only prevent resources categorically unable to meet such criteria, like coal or nuclear resources, from being Fast-Start Resources.⁶⁹

While PJM acknowledges that this process includes some discretion for PJM, it is not PJM's intent to freely exercise such discretion. PJM sees its role as merely protecting the market from erroneous offer parameters that may inappropriately trigger application of Integer Relaxation and inclusion of commitment costs in prices.⁷⁰

⁶⁹ Contrary to the IMM, the August 30 Filing would not bestow PJM with "the authority to alter the offered parameters" of a resource. IMM Comments at 12. Rather, PJM's discretion is only whether a resource will be eligible for fast-start pricing.

⁷⁰ While such market participants could be subject to a referral to the Commission's Office of Enforcement for submitting erroneous information, PJM's approach better guards against the adverse impacts of such erroneous information on clearing prices in the first instance.

I. PJM’s Offer Verification Approach Is Consistent with Order No. 831.

Vistra Energy Corporation (“Vistra”) objects to PJM’s approach to determining Eligible Fast-Start Resource’s Composite Energy Offers for price determination purposes when the \$1,000/MWh or \$2,000/MWh offer price thresholds are met, claiming that it would “inappropriately circumvent” the requirements of Order No. 831.⁷¹ Specifically, Vistra argues that PJM should allow Composite Energy Offers greater than \$1,000/MWh with cost components that fail the reasonableness screens to be administratively set at \$1,000/MWh, and Composite Energy Offers greater than \$2,000/MWh to be set at \$2,000/MWh for price setting purposes.⁷²

However, PJM’s approach is consistent with Order No. 831. Under Order No. 831, offers greater than \$1,000/MWh must be cost-based and verified in order to prevent the exercise of market power and offers up to \$1,000/MWh may be market-based and not subject to offer verification.⁷³ The August 30 Filing set forth an offer verification approach that is only triggered when Composite Energy Offers exceed \$1,000/MWh.⁷⁴ It

⁷¹ Vistra Comments at 3-4.

⁷² Vistra Comments at 7.

⁷³ *See* Order No. 831 at P 83 (“The requirement that incremental energy offers above \$1,000/MWh be cost-based retains the backstop mitigation function that current offer caps play in existing RTO/ISO market power mitigation because incremental energy offers that are not cost-based may not exceed \$1,000/MWh. A cost-based incremental energy offer is based on the associated resource’s short-run marginal cost, which constitutes a competitive offer free from the exercise of market-power.”).

⁷⁴ August 30 Filing at 31-36, 37-39. Order No. 831 also required that offers considered in setting price cannot exceed \$2,000/MWh. Order No. 831 at P 77. PJM’s approach also meets this requirement by excluding commitment costs until a Composite Energy Offer falls below that threshold and maintain the current cap of \$2,000/MWh on Incremental Energy Offers. August 30 Filing at 39.

is only when the Composite Energy Offer exceeds \$1,000/MWh and a component fails the reasonableness screen that an offer may be mitigated below \$1,000/MWh.

For example, assume an Eligible Fast-Start Resource's \$1,200/MWh Composite Energy Offer is comprised of: \$750/MWh Incremental Energy Offer; \$300/MWh amortized Start-up Cost; and \$150/MWh amortized No-load Cost. Next assume that the Start-Up Cost fails the screen but the other components pass. Under PJM's approach, the resource's verified cost-based Composite Energy Offer would be \$900/MWh, because the start-up costs have been excluded from the offer.⁷⁵ This is a reasonable outcome. The market is protected from paying a price determined based on a commitment cost that could not be verified at the time of submission.

Vistra would prefer that the resource's offer be set at \$1,000/MWh.⁷⁶ But, to do this PJM would need to assume \$100/MWh should be added to the resource's offer with no justification for doing so or administratively set the amortized Start-Up Costs at the dollar difference between the resource's verified costs and \$1,000. This would mean that a cost component that failed the reasonableness screen could factor into prices.

Vistra points to MISO and ISO-NE's fast-start offer verification practices for support.⁷⁷ However, PJM's market mitigation, offer verification, and fast-start pricing approaches are different from those employed in MISO or ISO-NE. When mitigating

⁷⁵ The resource would be able to recover its amortized Start-Up Cost through an out-of-market make whole payment. *See, e.g.*, Operating Agreement, Schedule 1, section 3.2.3(b) (providing for make whole payments when the day-ahead clearing price does not cover the resource's costs) and section 3.2.3(e) (providing for make whole payments when the real-time clearing price does not cover the resource's costs).

⁷⁶ Vistra Comments at 6.

⁷⁷ Vistra Comments at 4-7.

fast-start offers for failing to pass verification tests, MISO and ISO-NE rely on pre-determined reference levels for start-up and no-load costs. By contrast, PJM does not have any such values to substitute in when a component fails the verification test. Rather, PJM would have to administratively assign an arbitrary value.

In addition, as PJM explained in the August 30 Filing, PJM will only determine whether a resource is being dispatched on its Composite Energy Offer in the pricing run. In other words, “[t]he cleared megawatts and the resulting Composite Energy Offer value at that cleared megawatt amount are determined simultaneously as part of the pricing run solution.”⁷⁸ This is because, in PJM’s market process, the Composite Energy Offer will be an output of the pricing run and not an input into the commitment, dispatch, or pricing processes. Thus, it is not as simple as applying a cap to the Composite Energy Offer after the fact. Such ex post action would result in a possibly interminable iterative process as PJM would need to re-run the pricing solution with the capped offer, which in turn could result in a different solution where another resource could require capping. Such an iterative process introduces significant inefficiency in the market as pricing solutions would be delayed.

Nonetheless, should the Commission determine that PJM needs to modify its offer verification rules, PJM agrees with Vistra⁷⁹ that the Commission should not defer implementation of fast-start pricing while such new rules are developed by PJM and considered by the Commission. Rather, the Commission should allow PJM to implement fast-start pricing with PJM’s proposed rules temporarily in place to protect the market.

⁷⁸ August 30 Filing at 30.

⁷⁹ Vistra Comments at 8.

The offer verification rules only apply during limited circumstances and are not fundamental to the price formation purposes of fast-start pricing.

II. CONCLUSION

PJM respectfully requests that the Commission accept the August 30 Filing as in compliance with the Commission's directive in the April 18 Order.

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
craig.glazer@pjm.com

/s/ Ryan J. Collins
Paul M. Flynn
Ryan J. Collins
Wright & Talisman, P.C.
1200 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 393-1200
flynn@wrightlaw.com
collins@wrightlaw.com

Jennifer Tribulski
Associate General Counsel
PJM Interconnection, LLC
2750 Monroe Boulevard
Audubon, PA 19403
(610) 666-4363
jennifer.tribulski@pjm.com

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

October 9, 2019

CERTIFICATE OF SERVICE

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

Dated at Washington, D.C., this 9th day of October 2019.

/s/ Ryan J. Collins

Ryan J. Collins
Wright & Talisman, P.C.
1200 G Street, N.W., Suite 600
Washington, DC 20005
202-393-1200

Attorney for PJM Interconnection, L.L.C.