UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

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PJM Interconnection, L.L.C.	)	Docket No. EL08-47-006
	)	

COMMENTS OF THE INDEPENDENT MARKET MONITOR FOR PJM

Pursuant to Rule 211 of the Commission's Rules and Regulations, 18 CFR § 385.211 (2010), and the Commission's order of March 23, 2010,[1] in this proceeding, Monitoring Analytics, LLC, acting in its capacity as the Independent Market Monitor for PJM ("Market Monitor"),[2] submits these comments on the compliance filing submitted by PJM Interconnection, L.L.C. ("PJM") in the above captioned proceeding on July 1, 2010 ("July 1st Filing"). This proceeding concerns the calculation of the cost-based offers used to implement local market power mitigation, and specifically, the development of an appropriately detailed and accurate method for the calculation of an opportunity cost adder to such cost-based offers.

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[1] *PJM Interconnection, L.L.C.*, 130 FERC ¶61,23 ("March 23rd Order"); *see also*, 126 FERC ¶61,145 (February 19, 2009) ("February 19th Order"), *order on clarification*, 127 FERC. ¶61,188 (May 28, 2009).

[2] PJM Interconnection, L.L.C. is a FERC approved Regional Transmission Organization. Capitalized terms used herein and not otherwise defined have the meaning used in the PJM Open Access Transmission Tariff ("OATT") or the PJM Operating Agreement ("OA").

The objective in developing opportunity cost adders is to ensure the competitive pricing of energy for the benefit of all market participants.[3] The determination of opportunity cost is part of defining cost-based offers. The only purpose of cost-based offers and of the opportunity cost component of cost-based offers is to implement the local market power mitigation rules in the PJM tariff.

The goal of incorporating opportunity costs in competitive, cost-based offers is to recognize legitimate opportunity costs. This goal must be achieved without creating incentives to economically withhold by pricing above the competitive level, without creating advantages for old, inefficient units and without creating incentives to let units in load pockets deteriorate.

Capacity Resources are obligated to make offers every day and should be available every day. The incentives in the market rules for the capacity market and the energy market should continue to be consistent with these obligations.

This proceeding should not be allowed to become a vehicle for the transfer of investment and operational risks appropriately born by suppliers in markets regulated

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3 *See PJM Interconnection, L.L.C.*, 126 FERC ¶61,145 at P 42 (February 19, 2009) ("February 19th Order") ("[W]e find that because opportunity cost are not specifically provided for or clearly defined, the current provisions for including this component of costs are limited to a case-by-case process. Default bids that do not account for opportunity costs can lead to inefficient use of scarce resources and increase costs to customers.")

through competition to consumers. The goal of competitive pricing cannot be achieved if the rules do not include safeguards that prevent the exercise of market power.

Consistent with the process established by the Commission,[4] PJM submitted an earlier compliance filing on April 22, 2010, to address environmental opportunity costs ("April 22nd Filing").[5] The July 1st Filing addresses, in addition to operational limitations that result from environmental regulation, physical equipment and fuel supply limitations. Together, these filings, even though flawed and incomplete, constitute PJM's proposal for compliance under the established procedures.[6]

The July 1st Filing reflects some of the significant achievements by the Cost Development Task Force (CDTF) in addressing the opportunity cost issue. Provided that certain defective aspects are corrected and certain missing components are added, the approach included in the April 22nd and July 1st Filings could enhance PJM's mitigation rules by facilitating the optimal allocation of resources with limited run times that result from external causes over the course of the year. Corrective action, however, requires addressing the lack of appropriate protection from market power, ensuring the use of clear and objective standards, reiterating the role of the Market Monitor in the process, and approving revisions to remedy language and standards that

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4 March 23rd Order, Ordering Para. (A).

5 PJM compliance filing regarding environmental opportunity costs in Docket No. EL08-47-005.

6 March 23rd Order, Ordering Paras. (A) & (B).

are unnecessarily vague and could easily result in future confusion and misapplication of the rules.

In order to preserve what the CDTF has achieved and to address these flaws, the Market Monitor has developed and provides as an Attachment to this proceeding revised and supplemental tariff language. With these modifications, the Commission can have confidence that it has fully addressed the concerns raised in its order of February 19, 2009,[7] that the rules defining competitive, cost-based offers account for opportunity costs consistent with the objectives of the market power mitigation rules. Accordingly, the Market Monitor respectfully requests that the Commission approve the April 22nd and July 1st Filings, subject to the condition that PJM incorporate the modifications proposed here.

I. BACKGROUND

A. Successful Application of an Objective Method for Calculating Opportunity Costs Requires Accurate Identification of an Operational Limitation and a Defined Period of Limitation That Can Be Compared Against a Defined Period of Future Opportunity.

The April 22nd Filing proposed tariff revisions that set forth a method to account for opportunity costs associated with environmental regulation. The April 22nd Filing provides a method for calculating an adder to a cost-based offer submitted by a unit

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7 February 19th Order at P 42, *order on clarification*, 127 FERC. ¶61,188 (May 28, 2009).

operating under environmental limitations imposed by regulators. The calculation of opportunity cost is based on the difference between the forecast LMP less units' forecast cost for a future period, which depends on the exact limitation.[8] The forecast differentials must be assigned to hours and buses using historical data because the forecast data is not sufficiently granular. Whenever running at PJM's direction in the present means that a unit has to give up its opportunity to run in a future hour with higher net revenues, the unit may add the differential between the forecast LMP and its forecast cost to its current cost-based offer. The existence of a genuine opportunity assumes that the unit would have been eligible for dispatch based on its operational characteristics (e.g. minimum run time).

The July 1st Filing does not propose a new method to calculate opportunity costs, it instead proposes to extend the method introduced in the April 22nd Filing to address additional operational limitations, categorized as physical equipment and fuel supply limitations. This method of calculation can only be applied to an operational limitation for which the limits on MW and hours of operation are clearly defined and for which

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8 The proposed tariff language forecast future LMP on the basis of "future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the relevant compliance period." The proposed tariff language provides for forecasting costs at the same bus over the same period using rules included in PJM Manual 15. See April 22nd Filing Attachment A.

there is a clearly defined future period that incorporates foregone opportunities. For example, environmental limitations mean that a unit can run for a defined number of hours during a calendar year or during a rolling twelve month period. In the case of environmental limitations, the limits on operation are clearly defined and matched to a specific future time period.

Operational limitations based on physical equipment issues pose greater challenges than limitations based on imposed environmental limits. Regulators can impose precisely defined parameters; operational disruptions typically have uncertain parameters. It is difficult to determine for how many hours and at what output level a unit will be able to operate with a physical limitation and how long it will be before the unit can be repaired. It is essential to know all these elements in order to accurately calculate an opportunity cost.

B. Correctly Designed Opportunity Cost Adders Will Promote Efficient and Reliable Markets.

Generation resource owners know that they are expected to make their resource available to dispatchers at all times. This is a fundamental requirement and a key feature of reliability planning. PJM carefully plans for both planned and unplanned outages to ensure reliability after accounting for the need to maintain units and after accounting for the probability of forced outages. The design of the energy and capacity markets reduces the value of units as their forced outage rate increases. The market rules do not and should not provide incentives for unreliable plants to remain in service, especially at the expense of incentives for new and more reliable entry. Poorly defined opportunity costs could lead to raising the cost-based offer to limit the possibility of operation rather than taking an appropriate outage.

Keeping a unit available for dispatch is a basic business risk that owners are expected to manage. Consistent with a fundamental purpose of regulation through competition, the market rules must assign the cost of risk management to asset owners instead of customers. Participants in a competitive market should have fair opportunity to include opportunity costs in their offers to account, for example, for environmental run hour limitations imposed by regulators, but the rules for opportunity cost should not become a mechanism for resource owners to inappropriately reassign risks that participants are well suited to address and reassign them to their customers, who are ill-suited to prepare for and address those risks. For example, if a resource owner wants to cut costs by assuming risks regarding fuel availability, the resource owner should bear the consequences of that decision. It would distort the appropriate incentives if a resource owner's fuel delivery choice resulted in windfall profits to that resource owner's fleet, as a result of market rules that permit an opportunity cost adder when that choice results in fuel unavailability.

Improperly designed rules for opportunity cost adders also distort the incentives for resource owners to maintain each of their units in good condition. Unless limited to apply in extraordinary and objectively identifiable circumstances and subject to procedures for independent ex ante review and verification, the rules provide incentives to an owner of multiple units for the continued operation of an unreliable unit on the system. Unless the rules appropriately limit the use of opportunity cost adders in the first instance, it will be difficult to prevent unit owners from continuing to operate an unreliable unit that would otherwise be retired or overhauled.

C. Accurate Calculation of Opportunity Cost Is Essential to Avoid Exercise of Market Power at Those Times When System Constraints Create Structural Market Power.

Opportunity cost adders are intended to allow market participants to account for appropriate opportunity costs in their cost-based offers. Cost-based offers are significant to the market only when a supplier has local market power. When a market participant has local market power, the offers of the participant's units are set to the competitive level, the cost-based offer. If the offer of such a market participant were not set to the competitive level in these circumstances, it would have the ability to exercise market power and raise market prices to inefficient and unlawful levels. In markets regulated in accordance with competitive principles, prices established on the basis of market power cannot be just and reasonable.

Because a market participant's cost-based offer will set the prevailing LMP during precisely those times when its ability to exercise market power has been identified, it knows that a cost-based offer higher than its true costs will set the LMP or be compensated via balancing operating reserve credits. The market participant does not have to intend to exercise market power, the exercise of market power will occur if the inflated offer results from an incorrect calculation of the cost-based offer, including opportunity cost..

For this reason, it is essential that cost-based offers are subject to the scrutiny necessary to ensure competitive behavior during times when structural market power exists. It is essential to protect the accuracy and integrity of the process chosen to determine such cost-based offers. To the extent that such protections can be accurate, objective, and defined in the rules, that approach is preferable. To the extent that those objectives cannot be met, it is essential that the Commission provide for the most careful and objective review of the particular circumstances. This objective is best achieved when the Market Monitor, backed by the authority of the Commission when necessary, conducts the initial review and verification in this process.

In the first stage of compliance with Order No. 719, the Market Monitor argued that this process should be limited to the market participant, the Market Monitor and, in the case of a disagreement, the Commission.[9] This had been the historical approach in PJM,

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[9] *See, e.g.*, Protest and Compliance Proposal of the Independent Market Monitor for PJM in ER09-1036-000, -001 (May 27, 2009).

and it operated successfully for many years.[10] The Commission instead accepted PJM's filing, which asserted for PJM a role in all tariff-defined processes as the final authority responsible for administering the tariff.[11] One basis for this determination was PJM's affirmation that it did not intend to usurp the Market Monitor's role in determinations of market power.[12] PJM proposed a formula, which the Commission accepted, that provided for an initial review by the Market Monitor of the inputs to prospective mitigation, subject to a final decision by PJM under the applicable provisions of the tariff and the manuals, whether or not to accept or reject an offer without regard to any determination made by the Market Monitor. In PJM's Commission-approved framework the Market Monitor has recourse to the Commission if it disagrees with PJM's decision.

The rules for developing opportunity cost adders should carry forward the role assigned to the Market Monitor in this earlier stage of compliance with Order No. 719. There is no reason to reduce the Market Monitor's role to an undefined ex post audit or

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10 *See Id*. at 12–32.

11 *See PJM Interconnection, L.L.C.*, 129 FERC ¶61,250 at P 143–159 (2009).

12 *See* Motion for Leave to Answer and Answer of PJM Interconnection, L.L.C. to Protests and Comments in Docket No. ER09-1063-000 at 7–8 (July 28, 2009) ("PJM reiterates that it is not seeking to substitute its market power decisions for those of the IMM or exercise control over the IMM's determinations. Any decision PJM may make to reject an input proposed by the IMM will not be based on PJM rendering opinions on questions of market power. Rather, and as previously noted, such decisions will rest on whether PJM believes it and the relevant market participants are acting in a manner consistent with PJM's Tariff and related business rules.")

to fail to set forth the Market Monitor's role explicitly. On the contrary, the potential for abuse and the significant impacts on pricing of opportunity cost adders all support ensuring that the Market Monitor has a defined role and adequate opportunity for review and verification consistent with the approach recently proposed by PJM and approved by the Commission.

Wherever possible, it is preferable to provide objective standards in the tariff that reduce or even eliminate the need to exercise discretion.[13] Creating such rules was an explicit goal of PJM and of the CDTF up until the day before the April 22nd Filing, which, without any stakeholder discussion, proposed to include in the rules a provision that would allow PJM to ignore the tariff and develop a market participant-specific approach to calculate an opportunity cost adder and then to clear the market without review or input from any other party. The Market Monitor objected to this provision in its comments on the April 22nd Filing.[14]

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[13] Even objective rules require ex ante review of the data input for accuracy and verification of the documentation or other information relied upon to establish eligibility.

[14] Comments of the Independent Market Monitor for PJM filed in Docket No. EL08-47-005 at 4–8 (May 13, 2010) ("May 13th Comments").

II. COMMENTS

D. The Compliance Proposal Fails to Include Safeguards Sufficient to Prevent the Exercise of Market Power in PJM's Energy Markets.

1. The Commission Should Require PJM to Remove a Provision That Would Allow It to Ignore the Objective Method Set Forth in Its Filing and Substitute Its Subjective Case-by-Case Judgment to Determine Opportunity Cost-Based Offers, and Otherwise Ensure that PJM's Filing Conforms to the March 23rd Order.

Just prior to the April 22nd Filing, PJM decided to include a provision in Schedule 2 that introduces a parallel subjective process to develop opportunity cost-based offers that undermines what was achieved after months of effort in the PJM stakeholder process to develop an accurate and objective method to calculate opportunity cost adders. The provision included in the April 22nd Filing reads:

> Notwithstanding the foregoing, a Market Participant may submit a request to PJM for consideration and approval of an alternative method of calculating its Energy Market Opportunity Cost if the standard methodology described herein does not accurately represent the Market Participant's Energy Market Opportunity Cost.

This provision allows PJM discretion to ignore the process and definitions included in the April 22nd Filing and substitute its judgment concerning appropriate costs. PJM's last-minute reversal of the position it held for months on the need for strictly objective rules was unexpected and is unexplained in the April 22nd Filing. Also unexplained is PJM's proposal to remove the Market Monitor from this process entirely rather than reserve to PJM an ability to make final determinations consistent with its role in tariff administration. This approach remains unexplained in the July 1st Filling.

However, the July 1st Filing indicates that PJM has had second thoughts on this issue. In the July 1st Filing, PJM specifically declines to adopt a similar measure for subjective case-by-case consideration of Non-Regulatory Opportunity Costs adders. PJM declined stakeholders' suggestion that "generators requesting approval [for categories of costs] would submit documentation[] to the IMM for review and to PJM for approval, evidencing the operating limitation, a mitigation plan and the proposed methodology to be used determine the amount of opportunity costs that should be applied."[15] PJM explains that it did not comply with this request because "the requested revisions do not meet with the Commission's requirement that PJM 'provide a mechanism by which opportunity costs can be included in mitigated bids in order to eliminate the need to evaluate the opportunity costs of resources on a case-by-case basis.'"[16] PJM does not explain why, consistent with this explanation, PJM did not withdraw its proposal in the April 22nd Filing to address Energy Market Opportunity

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15 July 1st Filing at 9–11, citing a proposal from the CDTF that can be accessed at <*http://www.pjm.com/~/media/committees-groups/committees/mrc/20100623/20100623-item-04-pjm-icc-alternate-proposal-as-amended.ashx*>.

16 PJM at 11, citing March 23rd Order at P 22.

Cost adders on a case-by-case basis. The same Commission "requirement" should apply with equal force to Energy Market Opportunity Cost adders.[17]

The Commission should require PJM to incorporate the objective process approved in this proceeding for all types of opportunity costs, regardless of whether they are Non-Regulatory Opportunity Costs or Energy Market Opportunity Costs. In either case, the inclusion of an approach that substitutes PJM's (or the Market Monitor's) case-by-case judgment for the defined rules contravenes the provision cited by PJM as well as the Commission's requirement that the tariff "clearly and explicitly provide for the inclusion of opportunity costs, especially for energy and environmentally-limited resources."[18]

If the Commission nonetheless approves a provision for case-by-case review, of either or both Non-Regulatory or Energy Market Opportunity Costs, such ex ante review should continue to be performed by the MMU. The current market rules assign this determination to the Market Monitor.[19] Continuation of this role would be consistent with the Market Monitor's role in making determinations that relate to the

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17 *See* May 13th Comments at 3–7.

18 February 19th Order at P 42.

19 The revisions to Section 8.1.1 of the Cost Development Guidelines filed by PJM delete the following provision: "Requests for recovery of Opportunity Costs not defined in the Operating Agreement … should be submitted to the PJM MMU for approval."

potential exercise of market power, a role that is acknowledged by PJM.[20] Continuation of the Market Monitor's current role is also consistent with the desire expressed by stakeholders that the requests for case-by-case reviews of opportunity costs be subject to "oversight by the MMU in advance," as PJM relates (at 10–11).

PJM argues that the Commission's order on PJM's filing to comply with Order No. 719 decided that PJM and not the Market Monitor "has the authority to make the final determinations regarding the appropriate value of offers and rates, including default bids for mitigated generators."[21] The Market Monitor does not contest this point. PJM's proposal does not concern a "final determination;" rather, it concerns a determination made in the first instance. Indeed, this effort to displace the Market Monitor from its current role and to limit the Market Monitor's ability to monitor the potential exercise of market power illustrates precisely the concerns raised by the Market Monitor about PJM's approach to compliance with Order No. 719.[22] PJM does not appear content to

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20 *See infra* footnote no. 11.

21 April 22nd Filing at 11 citing *PJM Interconnection, L.L.C.*, 129 FERC ¶61,250 at PP 150–54 (2009).

22 *See* Protest and Compliance Proposal of the Independent Market Monitor for PJM filed in Docket No. ER09-1063-000 at 5–6 (May 27, 2009) ("Based on a misreading of Order No. 719's requirements and an apparent dissatisfaction with the structure and tools for market monitoring resulting from the 2007 PJM/MMU Settlement, PJM has proposed changes that would compromise the ability of the Market Monitor to continue to employ this successful approach for developing the inputs to prospective mitigation in PJM. The April 28th Filing would add a new step in most provisions where the Market Monitor's responsibilities to make certain determinations are established. This new step would create the opportunity for PJM to substitute its own market power determinations for those of the Market Monitor. This approach would establish a duplicative "shadow" market

reserve to itself final authority on administering the tariff, nor does it follow through on its pledge to refrain from rendering any judgment on questions of market power, questions concerning which it claimed to have neither an interest nor the required expertise.[23] The determination of opportunity cost is part of defining cost-based offers. The only purpose of cost-based offers and of the opportunity cost component of cost-based offers is to implement the local market power mitigation rules in the PJM tariff.

The Market Monitor urges the Commission to simply delete the provision added by PJM. This would be consistent with the Commission's policy favoring objective market rules over the exercise of discretion[24] and, as PJM now acknowledges (at 11), the

monitoring function that vitiates the incentives for Market Participants to continue to fully participate in the existing arrangement. The result will be that the Market Monitor will be less able to deter misconduct ex ante and will have to rely more on post hoc adversarial processes. This will subordinate market monitoring, weaken the effectiveness of market monitoring, will create uncertainty for market participants and could prove damaging to public confidence in organized wholesale electricity markets. PJM's vague concerns about its institutional prerogatives do not warrant this overstepping of the requirements of Order 719.").

23 *See* Motion for Leave to Answer and Answer of PJM Interconnection, L.L.C. to Protests and Comments in Docket No. ER09-1063-000 at 7 (July 28, 2009) ("PJM reiterates that it is not seeking to substitute its market power decisions for those of the IMM or exercise control over the IMM's determinations. Any decision PJM may make to reject an input proposed by the IMM will not be based on PJM rendering opinions on questions of market power. Rather, and as previously noted, such decisions will rest on whether PJM believes it and the relevant market participants are acting in a manner consistent with PJM's Tariff and related business rules.").

24 *See, e.g.*, *PJM Interconnection, L.L.C.*, 126 FERC ¶61,275 at P 190 (2009) ("PJM must provide objective tariff provisions that will determine when mitigation measures will be applied."); *PJM Interconnection, L.L.C.*, 117 FERC ¶61,331 at P 115 (2006) ("we will require PJM to file … objective factual criteria to be used by the Market Monitor in reviewing bids"), 122 FERC ¶61,264 (2008).

requirements in the March 23rd Order. To the extent that the objective rules do not meet individual parties' concerns, as seems unlikely, they continue to have recourse to the Commission. If, however, the Commission permits this provision, it should condition its approval on PJM's retention of the Market Monitor's current role and confirm PJM's role regarding final responsibility for tariff administration and deference to the Market Monitor on determinations related to the potential exercise of market power.[25] The Market Monitor includes as an Attachment revisions to Schedule 2 that address each of these issues.

2. The Tariff Should Recognize Explicitly the Market Monitor's Role in Advance Review and Verification of Opportunity Cost Adders.

The Market Monitor must play an important role in the advance review and verification of opportunity costs even where the rules are objective. This role may be more limited than what would be required for case-by-case subjective determinations about whether recovery or opportunity costs are justified, but this role is still critical for deterring and protecting the market from misconduct. The Market Monitor has

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25 *See Id.* at 7–8 ("PJM does not intend to arbitrarily 'pick and choose which inputs it allows,'[footnote omitted] nor reconsider every, most or even more than a *de minimis* number of calculations or determinations made by the IMM. Instead, PJM will rely on a market participant to notify PJM of any concerns with an IMM determination or input. Based on past experience and recent history, PJM does not expect to disagree with the IMM's determinations on other than rare occasions. Moreover, should any such disagreement occur, the IMM has all resources at its disposal as market monitor to air its concerns further. Finally, any position PJM may take contrary to the IMM is not to suggest PJM is rendering any judgment on questions of market power; opinions of this sort are the province of the IMM and judgments of this sort ultimately rest with the Commission.").

developed a calculator that will allow it to independently verify the accuracy of the opportunity cost adders and evaluate their consistency with the Cost Development Guidelines (Manual 15). It is also important that Market Participants adequately document the information relied upon to establish their eligibility to submit opportunity cost adders, such as a fuel supplier's confirmation of the period of disruption of fuel deliveries or an insurance carrier's findings concerning a physical operating limitation. Because opportunity costs could have a significant impact on market prices and are expected to apply only in extraordinary circumstances, it is reasonable to require Market Participants to notify the Market Market of their use in advance and to provide in advance supporting documentation and information to allow the Market Monitor to apply its calculator and to evaluate the Market Participants' claim for eligibility. The Market Monitor would raise any issues identified with the Market Participant, PJM or, if necessary, the Commission.

Accordingly, the Market Monitor has developed language that, consistent with the formula developed on compliance with Order No. 719, would capture the Market Monitor's role in advance review and verification and included it in the revisions to Schedule 2 provided in the Attachment to this pleading. Approval of these provisions would recognize and confirm the Market Monitor's important role in screening opportunity costs for accuracy and legitimacy.

3. The Commission Should Resolve this Proceeding without Prejudice to Its Future Consideration of Additional Changes That May Be Proposed in Future Proceedings.

The July 1st Filing states (at 11) that "additional types of opportunity costs should be addressed by the CDTF and PJM's typical stakeholder process." The July 1st Filing also points out (*Id*.) that stakeholders "have the option of seeking Commission approval, on a case-by-case basis, of any additional opportunity costs that are not specifically defined in the Operating Agreement." The Market Monitor agrees that both the stakeholder and regulatory process continue to afford these procedural avenues to address these issues and any other issues that may be identified in the future. However, there are significant problems with all of the items not incorporated in the July 1st Filing, and there is no basis for any presumption that any further action on these items will be necessary or desirable. The July 1st Filing, together with the changes proposed by the Market Monitor here, fully address each issue that has been substantiated to date.

For example, the MRC has directed the CDTF to continue discussion of short-term opportunity costs and the use of engineering analysis in defining Non-Regulatory Opportunity Cost. The CDTF will consider whether to allow engineering analysis as a basis for determining physical equipment limitations, as well as consider permitting the recovery of short-term opportunity costs, which are typically of a length shorter than 30 days. Both of the proposals raise serious issues.

Any engineering analysis, for example, must be completely objective and independent, as the results of that study, if the basis for an opportunity cost adder, could have a significant impact on wholesale electricity prices in PJM. No need for the use of engineering analysis to define opportunity costs has been established in light of the criteria proposed. Nothing prevents a market participant from requesting review and approval of such opportunity costs directly from the Commission.

The July 1st Filing states (at 4):

> With respect to fuel limitations, the proposal would allow recovery of opportunity costs for units that experience an Out of Management Control ("OMC") fuel limitation that is recognized by PJM's eGADS system. Such fuel limitations would immediately qualify to recover opportunity costs, either for the *short* term or long term depending on the duration of the event [emphasis added].

This could be read to imply that PJM has included in the July 1st Filing a provision for the short term fuel limitations or that such provisions could be implemented through the manuals based on the proposed tariff revisions. Such a reading, however, would contradict PJM's statement (at 9–11) that it plans to continue discussion in the CDTF about rules that would "permit the recovery of short term 'non-regulatory opportunity costs' (typically of limited duration lasting 30 days or less)," and may or may not file a proposal to permit a short-term based adder on or by January 1, 2011.

The Market Monitor welcomes further discussion of these and other issues in future CDTF meetings, but observes that they are not included in this filing because the need for these provisions has not been established and no acceptable approach for implementation has been proposed. There is no reason to presume either will occur as a result of continued deliberation. It would remove possible future confusion if the Commission specifically recognized that the compliance filing in this proceeding has not addressed the issue of short-term opportunity costs adders or even whether such adders are necessary or appropriate, that it would be inappropriate to add such a substantive change to Manual 15 without Commission approval, and that the Commission would consider any proposals for such adders that emerge from the stakeholder process without prejudice to its conclusion to the compliance phase of this proceeding.

It is sufficient for the successful conclusion of the present matter that the Commission approve the April 22nd and July 1st Filings, including the revisions proposed by the Market Monitor in the Attachment. The proposed rules are more than sufficient to ensure that application of market power mitigation in PJM appropriately includes recognition of opportunity costs based on run-time limitations. Any additional modifications should receive full deliberation in the stakeholder process, and not be subject to the articifical haste and consequent opportunity for error that can result in the more pressured context of developing compliance filings. Proposals that additional operational limitations or short term limitations should serve as the basis for calculating opportunity cost adders can proceed through the stakeholder and regulatory process in the ordinary course.

4. The July 1st Filing Lacks Necessary Provisions to Ensure Oversight to Protect the Market from Market Power Abuses in Calculating Opportunity Cost Adders.

The addition of a provision for calculating opportunity cost adders for use in PJM's mitigation program is an important issue because, if it is improperly designed or administered, it could undermine the protection from the exercise of local market power that buyers in PJM markets have enjoyed for the past decade. If corrected as proposed by the Market Monitor, the compliance proposal would state with specificity the objective standards to apply. Even with the implementation of objective rules and standards, there will remain an element of discretion in interpretation of the rules and the degree and diligence of verification of eligible costs. It is critical, therefore, that the Commission require additional provision for effective oversight and a clear specification in the tariff of the Market Monitor's role in providing that oversight.

As the July 1st Filing now stands, a market participant could calculate and apply opportunity cost adders without approval from the Market Monitor or PJM, just as it could with respect to any cost input to a cost-based offer in the PJM energy markets. Because the introduction of opportunity cost adders should reflect extraordinary circumstances and could have unusually significant impacts on market prices, it is critical that PJM apply the review and verification procedure recently adopted on compliance with Order No. 719 and ensure that the Market Monitor has the opportunity to perform ex ante review and verification of opportunity cost adder inputs. Consistent with the approved approach for the inputs to prospective mitigation, PJM can reserve to itself the final authority to determine whether to accept an offer in accordance with its rules.

However, rather than apply the review and verification approach needed, on an ex ante basis or otherwise, PJM has instead, without any discussion with the Market Monitor, systematically removed entirely the existing and explicit statement of the Market Monitor's role in the applicable manuals. The Market Monitor agrees that these provisions should not provide for a subjective review of case-by-case proposals, but the tariff should affirmatively and explicitly set forth the Market Monitor's role, rather than omit any discussion of that role as PJM has proposed.

The July 1st Filing states (at 9), "The IMM can audit the data submitted to support the request to recover Non-Regulatory Opportunity Cost if the IMM questions whether the recovery of these costs is warranted." This statement does not, however, appear in the proposed revisions to the tariff or in the manuals, and it is itself substantially inadequate. The reference to an MMU "audit" could be read to limit the Market Monitor's role to an audit of PJM's eMKT Opportunity Cost Calculator and not Market Participant conduct. In order to facilitate the Market Monitor's independent review and verification of cost-based offers, the Market Monitor intends to evaluate data and documentation received from Market Participants, and to check the data submitted using its own cost calculator, which has already been updated to analyze all of the standards specified in the July 1st Filing.[26] Moreover, the Market Monitor seeks clarification that the Market Monitor should have the opportunity to apply this process, and that PJM should have the opportunity to consider the outcome of this process, before the opportunity cost adder is included in an offer and accepted.

In order to provide for effective oversight of the development of opportunity cost-based inputs to prospective mitigation consistent with the approach approved under Order No. 719 that is lacking from the April 22nd and July 1st Filings, the Market Monitor provides in the Attachment to this pleading revisions to the Schedule 2 of the Operating Agreement that serve this purpose. The Market Monitor respectfully requests that in order to ensure that opportunity cost calculations do not undermine PJM's mitigation program and permit the exercise of market power in PJM energy markets that the Commission condition approval of the April 22nd and July 1st Filings on the incorporation of these revisions in full into the tariff.

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[26] Information about the IMM's opportunity cost calculator can be found on Monitoring Analytics website at the following link: <*http://website/tools/docs/Opportunity_Cost_Screen_User_Guide.pdf*>. Use of the calculator is available to those registered for use of the eFuel tool (which will soon be renamed "CODA").

E. The Standards for Applying Non-Regulatory Opportunity Cost Adders Require Precision Sufficient to Ensure Objectivity.

1. Introduction

The calculation of opportunity cost is based on the difference between the forecast LMP less units' forecast cost for a future period, which depends on the exact operational limitation.[27] The forecast differentials must be assigned to hours and buses using historical data because the forecast data is not sufficiently granular. Whenever running at PJM's direction in the present means that a unit has to give up its opportunity to run in a future hour with higher net revenues, the unit may add the differential between the forecast LMP and its forecast cost to its current cost-based offer. The existence of a genuine opportunity assumes that the unit would have been eligible for dispatch based on its operational characteristics (e.g. minimum run time).

The July 1st Filing does not propose a new method to calculate opportunity costs, it instead proposes to extend the method introduced in the April 22nd Filing to address additional operational limitations, categorized as physical equipment and fuel supply limitations. The July 1st filing does not address any of the complex issues associated

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27 The proposed tariff language forecast future LMP on the basis of "future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the relevant compliance period." The proposed tariff language provides for forecasting costs at the same bus over the same period using rules included in PJM Manual 15. See April 22nd Filing Attachment A.

with simply applying the prior method to new operational limits. This method of calculation can only be applied to an operational limitation for which the limits on MW and hours of operation are clearly defined and for which there is a clearly defined future period that incorporates foregone opportunities. For example, environmental limitations mean that a unit can run for a defined number of hours during a calendar year or during a rolling twelve month period. In the case of environmental limitations, the limits on operation are clearly defined and matched to a specific future time period.

Operational limitations based on physical equipment issues pose greater challenges than limitations based on imposed environmental limits. Regulators can impose precisely defined parameters; operational disruptions typically have uncertain parameters. It is difficult to determine for how many hours and at what output level a unit will be able to operate with a physical limitation and how long it will be before the unit can be repaired. It is essential to know all these elements in order to accurately calculate an opportunity cost. The definition of opportunity cost must address these issues in a clear and objective manner.

5. Reference to "Start Times" in the Proposed Definition of Non-Regulatory Opportunity Cost Is Vague and Must Be Deleted Because the July 1st Filing Fails to Establish Either a Need for or a Capability to Measure Limitations on "Start Times" Separately from Limitations on Run Hours.

The definition of Non-Regulatory Opportunity Cost included in the July 1st Filing would apply "when the unit only has a limited number of starts or available run hours."[28] There is currently no established method to calculate opportunity costs for units that have a limited number of starts during a particular time period. Currently, both the calculator and calculation method require defined run-hour limitations. Start times have no logical relationship to opportunity costs except as they result in limits on the hours for which a unit may run. A limitation on starts can and should be taken into account only to the extent that it can be translated into a limitation on run hours. However, no method for doing so has been developed. Consequently, based on the proposed method, provision for "run hour limitations" is appropriate but inclusion of a self-standing provision for start limitations is not.

Accordingly, approval of the July 1st Filing should be conditioned on deletion of "start time" as a separately stated component of the definition of Non-Regulatory Opportunity Cost. If and when the CDTF, PJM and the Market Monitor are able to develop an objective approach to translate limited start times into run times limitations, the existing compliance proposal should serve as sufficient basis to apply them as run time limitations.

Accordingly, the Market Monitor proposes in an Attachment to delete the inclusion of a separate definition for Non-Regulatory Opportunity Cost, which separately specifies "start times," and to retain Energy Market Opportunity Cost as the defined

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28 PJM Attachment A (Tenth Revise Sheet No. 67, Proposed OA Schedule 1 § 1.3.17A).

term allowing for consistent treatment of all opportunity costs. The consideration of start times as a source of opportunity costs should be specifically prohibited until an objective and mutually satisfactory approach to expressing such limitations in terms of limited run hours has been developed.

6. The Standards for Physical Equipment Limitations Proposed in the July 1st Filing Are Acceptable.

The July 1st Filing provides two objective standards for a unit to develop a Non-Regulatory Opportunity Cost adder, including operational restrictions supported by an "original equipment manufacturer ("OEM") recommendation or bulletin" or "a documented restriction imposed on the generating unit by the insurance carrier." These are clear and reasonable standards, provided that (i) they reflect the independent judgment of the manufacturer or insurance carrier, (ii) that the sole motivation reflected in this judgment are safety and economic concerns, (iii) the resource owners consistently complies with such recommendations or restrictions, and (iv) PJM reasonably accounts for such restrictions in determining the capacity rating of the unit.[29] The Market Monitor believes that the tariff language is adequate, but requests that the Commission explicitly identify and affirm in its order on compliance these understandings about the basis for these standards.

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29 *See* OATT Attachment DD § 5.6.6.

7. The Standard for an Out of Management Control Fuel Supply Limitation Is Vague and Subjective.

The July 1st Filing defines one of the two acceptable fuel limitation criteria as "an Out of Management Control fuel supply limitation as defined in the PJM eGADS User Manual." The eGADS User Manual does not actually define the criteria for an OMC outage, but only references the NERC definitions. PJM eGADS administrators currently evaluate outages and determine whether they are considered Out of Management Control (OMC). The standards used by GADS administrators to evaluate outages for lack of fuel are not designed to evaluate the validity of outages for purposes of opportunity cost eligibility. While the PJM OMC outage review process has improved significantly, PJM continues to apply subjective and non-transparent criteria in accepting and rejecting the requests for OMC outage classifications.

OMC cause codes include "high ash content", "low grindability", and "other fuel quality problems." These and other OMC outage cause codes are too vague to serve as useful criteria for the purpose of defining eligibility for opportunity costs.

The majority of OMC outages in PJM are fuel related. It is questionable whether any fuel related outages should be considered as appropriate screens for eligibility for opportunity cost adders. In fact, the NYISO explicitly rejects fuel related outages from OMC treatment for outages.

In addition, OMC outages include outage types that do not and cannot result in opportunity costs. For example, if a transmission system outage prevents a unit from selling power for a period, there is no opportunity cost. The unit cannot produce power and there is no associated foregone opportunity. This is another illustration that the use of the OMC designation has not been carefully considered and should not be incorporated as a screen for opportunity cost eligilibility.

PJM has not explained why OMC outages are an appropriate screen for opportunity cost determinations and have not addressed the issues raised here.

The application of these standards as a screen for opportunity cost eligibility is also necessarily subjective. A subjective evaluation does not become objective merely because it is used in a new and unintended context. Subjective case-by-case basis determinations by eGADs administrators raise the same issues addressed by the Commission in directing that objective rules be used to determine eligibility for opportunity costs. Consequently, the tariff should not designate reliance on such determinations as a standard for approval of a Non-Regulatory Opportunity Cost adder.

The Market Monitor believes that the standard for a fuel supply limitation can be reasonably defined as any such limitation occurring due to an event caused by *Force Majeure* as defined in Section 18.9 of the PJM Operating Agreement.[30] *Force Majeure*

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[30] Section 18.9 (*Force Majeure*) provides:

provisions are an established legal mechanism for the identification of precisely those types of events that are beyond parties' control. It is consistent, just and reasonable to apply this same standard to identify those events that are truly "outside of management control." Examples of fuel limitations discussed at CDTF meetings met the Operating Agreement's definition of *Force Majeure. C*onsequently, this standard should apply instead of the vague, inapposite and subjective standards of OMC outage and NERC EOP-004 Disturbance Reporting, which unlike the concept of Force Majeure, serve distinctly different purposes. With these changes, resource owners would be permitted to develop opportunity cost adders in appropriate contexts in accordance with objective

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> No Member shall be liable to any other Member for damages or otherwise be in breach of this Agreement to the extent and during the period such Member's performance is prevented by any cause or causes beyond such Member's control and without such Member's fault or negligence, including but not limited to any act, omission, or circumstance occasioned by or in consequence of any act of God, labor disturbance, act of the public enemy, war, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment, or curtailment, order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities; provided, however, that any such foregoing event shall not excuse any payment obligation. Upon the occurrence of an event considered by a Member to constitute a force majeure event, such Member shall use due diligence to endeavor to continue to perform its obligations as far as reasonably practicable and to remedy the event, provided that no Member shall be required by this provision to settle any strike or labor dispute.

criteria. Accordingly, the Market Monitor requests that the Commission approve the definition of a fuel supply limitation as provided in the Attachment to this pleading.

8. The Commission Should Reject the Use of NERC Disturbance Reports as a Standard for Identifying a Fuel Supply Limitation.

The July 1st Filing inappropriately uses the NERC EOP-004 Disturbance Reporting as a standard for fuel limitation. Neither the CDTF nor the MRC approved use of a disturbance report as a separate standard. The MRC proposal provided only that "[u]nit(s) experiencing an Out Of Management Control fuel limitation as recognized by PJM eGADS shall immediately qualify for opportunity cost adders." The July 1st Filing does not explain how the purpose of this NERC standard has any relevance to determining whether a fuel disruption is significant enough to warrant an opportunity cost or is one for which the resource owner is responsible and appropriately assumes the risk.

The NERC EOP-004 standard is met if "[f]uel inventory or hydro storage levels ≤ 50% of normal."[31] While this is adequate basis for a disturbance report, it has no implications for whether an opportunity cost is justified. Mere consideration of fuel inventories considered out of context, such as the prospect for imminent resupply, does not constitute a self-standing basis to apply a an opportunity cost adder. Application of

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[31] NERC EOP-004 at 12. This standard can be accessed at: <*http://www.nerc.com/files/EOP-004-1.pdf*>.

this standard could easily result in routine and unnecessary usage of opportunity cost adders even thought the CDFT has conceived of an adder that would apply only in extraordinary circumstances. Accordingly, the Market Monitor requests that the Commission reject this criterion, and include in the Attachment revisions necessary to eliminate it.

PJM has not explained why or how a NERC Disturbance Report should or could serve as an appropriate screen for opportunity cost determinations and has not addressed any of the implementation details of the type raised here.

9. Appropriate Limitation on the Use of Non-Regulatory Opportunity Cost Adders Could Protect the Markets without Preventing Legitimate Recovery of Opportunity Costs

Resource owners stated, throughout the stakeholder process in which non-regulatory opportunity costs were discussed, that provision for non-regulatory opportunity cost adders for operational events was needed, but that such events likely would be rare.[32] This means that non-regulatory opportunity costs can be addressed without significant compromise to the limits on market power simply by requiring a

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[32] This understanding is reflected in the stakeholder discussion of a limitation on including opportunity adders to three time in a rolling five-year period. For example, see the CDTF proposal at the following link: *<http://www.pjm.com/~/media/committees-groups/task-forces/cdtf/20100514/20100514-item-05a-nrocc-proposal.ashx>*.

clear and objective criterion for the frequency of application of non-regulatory opportunity costs adders for the same or related issues.

The July 1st Filing describes (at 9) stakeholders' discussion of the issue of frequency to date, but includes no restriction in the interim. Rather than leave this matter unaddressed, and risk a significant attenuation of the limits on market power created by cost-based offers, the Market Monitor recommends that each resource be limited to no more than three non-regulatory opportunity cost adders in five years for the same or related issues without the express approval of the Commission. If it is true that such issues are unusual for a unit, then this definition is quite expansive. If it is not true that such issues are unusual, then the risks associated with such outages should be borne by the unit owner. At one point in the discussion, the CDTF deemed acceptable a three in five-year limitation.[33]

Commission approval of this protective standard would facilitate rather than impede continued stakeholder deliberation of this issue. As PJM gains experience with opportunity cost adders in place, it will have more information to guide any warranted refinement of this measure. In the meantime, resource owners would have the option to request that the Commission lift the limitation where they can demonstrate necessity. Presumably, such requests would be very rare. Accordingly, the Market Monitor

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[33] *Id.*

includes in an Attachment its proposed revised language for Schedule 2 of the OATT language that would include this measure, and requests that the Commission condition its approval of the July 1st Filing on the inclusion of this language.

F. Reasonable and Specific Run-Hour Limitations Are Needed to Properly Assess Opportunity Cost

The July 1st Filing explains (e.g. at 4) that the purpose of its proposal is "recovery of opportunity costs incurred to operate a specific generating unit when the unit has only a limited number of starts or available run hours due to physical equipment limitations or fuel limitations." The Market Monitor agrees that recovery of opportunity costs for units with extraordinary physical equipment and fuel supply limitations may be reasonable. However, the number of "available run hours" is an important element that CDTF has not yet discussed.

The opportunity cost calculation method requires a specific run hour limitation.[34] Many factors will determine how quickly an equipment failure or low fuel supplies can be addressed. The length of time relates directly to the potential for lost future opportunities. No objective rule can directly define the appropriate length of time that such a limitation would be in place. However, an objective rule can define a process for

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34 April 22nd Filing Attachment C (Approved Changes to Section 8 of the Cost Development Guidelines (Manual 15)).

defining a limit and provide that that contingencies will be addressed with best efforts. In the case of physical equipment limitations, it is expected that resource owners will make repairs within a reasonable time period. Similarly, management decisions such as whether to invest in dual fuel use, firm contracts, additional fuel storage and emergency procurement alternatives will determine a resource's vulnerability to fuel supply disruptions. As explained above, the expectation is that resource owners will strive to make their resources available and eliminate chronically unreliable ones, and the market incentive and resource valuation structure will reflect this. Reasonable limits on time periods covered by objective opportunity cost parameters can indicated to resource owners the level of reasonable diligence the market expects to keep their facilities available.

An approach that would apply objective standards for determining the period of limitation would remove that determination from the control of the Market Participant applying the opportunity cost adder. The appropriate point of reference is the party most aware of the nature of the limitation and the time required to rectify. For example, the original equipment manufacturer or insurance carrier who defines the restriction and the parties who would make the necessary repairs, to the extent that they are independent of the Market Participant, could document and verify an appropriate period of limitation. This period could change based on new information, as this independent third party updates its schedule for repair or delivery of parts or fuel, and, if it does, the Market Participant must immediately update its opportunity cost calculation. The Market Monitor provides tariff language that captures this approach in the Attachment below. On the basis of this language the CDTF could develop more detailed provisions to ensure that a professional, disinterested opinion from an independent third party would serve as the basis to establish a period of limited operation, and this period would be subject to revision as new information develops. Accordingly, the Market Monitor requests that the Commission condition approval of the July 1st Filing on the incorporation of its proposed revision to the tariff included in the Attachment to this pleading and subsequent development of implementing provision in the manuals consistent with the tariff-defined standards.

G. Self Scheduling Should Not Result in Opportunity Costs or in OMC Outages

The MRC proposal states (at 2), "To remain eligible for Opportunity Cost Adders the generator cannot self-schedule the affected unit(s) and must run solely at the direction of PJM."[35] This is consistent with the nature of an opportunity cost, a situation where a resource owner is required by PJM to operate in the present and, as a consequence, lose a future superior opportunity. If a unit owner chooses to use some of the limited run

[35] The MRC proposal can be accessed at the following link: < *http://www.pjm.com/~/media/committees-groups/committees/mrc/20100623/20100623-item-04-pjm-icc-alternate-proposal-as-amended.ashx*>.

hours available by self scheduling, the unit owner is voluntarily increasing the opportunity costs of the unit and should no longer be eligible for an opportunity cost adder.

The July 1st Filing provides that if "any resource subject to a non-regulatory fuel supply or physical equipment limitation that makes use of the calculation procedure prescribed in PJM Manual 15 and runs out of hours during the Delivery Year, with the resource being self-scheduled 50% of the available run hours or greater, then PJM will consider this outage a Forced Outage (as defined by NERC)." In other words, if a resource self-schedules up to 50% of the available run hours and, as consequence, the resource in the future runs out of available hours, PJM would consider the resulting outages to be Outside Management Control.

It is inappropriate for PJM to attempt to modify the definition of outages in this filing. This topic was not discussed and would not have been an appropriate topic for discussion in the CDTF as part of the opportunity cost discussion.

PJM's approach is illogical in that it ignores that these outages are the direct result of management's determination to self-schedule the unit. Excusing forced outages for a unit that self-schedules less than 50 percent of its run hours is unsupported and arbitrary. Neither this 50 percent level or the need for any threshold was vetted or even discussed by stakeholders in any CDTF or MRC meeting.

If a resource self-schedules at any point during a compliance period application of an opportunity cost adder, and so chooses to run out of available hours at any point during the compliance period, that resource should be subject to a Forced Outage. Resources running at their own discretion are not eligible for opportunity cost, and accordingly should not reap the benefits of an opportunity cost adder if said units may be unavailable for reliability in the future, which is the goal of the adder.

PJM's new proposal to excuse units that self schedule below an arbitrary level from forced outages is inconsistent with the theory of opportunity cost, lacks any support as just and reasonable, and should be rejected. Because the July 1st Filing does not propose to codify this approach in the tariff or the manuals, but merely advises the Commission that the approach will applied, the Market Monitor requests that the Commission include a specific rejection of this approach in its order on compliance.

III. CONCLUSION

The Market Monitor respectfully requests that the Commission consider this protest and the alternative and supplemental revisions to Schedule 2 and related provisions of the OA and the Cost Development Guidelines as it resolves the issues raised in this proceeding.

Respectfully submitted,

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Dated: August 2, 2010

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 Eagleville, Pennsylvania,
This 2nd day of August, 2010.

Jeffrey W. Mayes
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Attachment

EXPLANATORY NOTE:

Due to the multiple stages of compliance in this proceeding, presentation of the changes proposed by PJM and the proposed revisions to those changes proposed by the Market Monitor is complicated. Consequently, the Market Monitor presents its proposed revision in the following sequence:

Item 1: PJM's proposed revisions in blackline to the current version of Schedule 2 of the Operating Agreement, included in PJM's April 22nd Filing.

Item 2: The IMM's proposed revisions to the PJM's proposed revisions of Schedule 2 in the April 22nd Filing, that was attached in the IMM's comments filed on May 13th, 2010. The IMM explains the need for the changes in its May 13th comments and does not repeat them in this pleading.

Item 3: PJM's proposed clean sheet for Schedule 2 of the Operating Agreement, included in the July 1st Filing.

Item 4: PJM's proposed clean sheet for Schedule 2 of the Operating Agreement, included in the July 1st Filing, with the IMM's revisions proposed in comments of May 13, 2010 transposed. The IMM's comments appear in boldface.

Item 5: PJM's proposed clean sheet for Schedule 2 of the Operating Agreement, included in the July 1st Filing, with all of the IMM's proposed revisions in boldface.

Item 6: Item 4 above in clean form, showing in boldface only those additional changes proposed by the IMM in this pleading.

This item also includes changes to the definition of the "Energy Market Opportunity Cost" that PJM included in its April 22nd Filing and proposes to delete the new term, "Non-Regulatory Opportunity Cost," that PJM introduces in the July 1st Filing.

Item 1

SCHEDULE 2

COMPONENTS OF COST

(a) Each Market Participant obligated to sell energy ~~from operating capacity~~ on the PJM Interchange Energy Market at cost-based rates ~~shall~~ may include the following components or their equivalent in the determination of costs for ~~operating capacity~~energy supplied to or from the PJM Region:

~~(1)~~ For generating units powered by ~~B~~boilers
Firing-up cost~~;~~
~~No-load cost during period of operation;~~

Peak-prepared-for maintenance cost~~;~~

~~Incremental labor cost; and~~
~~Other incremental operating costs.~~
~~(2)~~ For generating units powered by ~~M~~machines

Starting cost from cold to synchronized operation~~;~~

For all generating units
Incremental fuel cost
Incremental maintenance cost

No-load cost during period of operation~~;~~
Incremental labor cost~~; and~~
Other incremental operating costs~~.~~

For a generating unit that is subject to operational limitations due to energy or environmental limitations imposed on the generating unit by Applicable Laws and Regulations (as defined in the PJM Tariff), the Market Participant may include in the calculation of its "other incremental operating costs" an amount reflecting the unit-specific Energy Market Opportunity Costs expected to be incurred. Such unit-specific Energy Market Opportunity Costs are calculated by forecasting Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the relevant compliance period, and subtract therefrom the forecasted costs to generate energy at the bus at which the generating unit is located, as specified in more detail in PJM Manual 15, Section 8: Cost Development Guidelines. If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative, the resulting Energy Market Opportunity Cost shall be zero. Notwithstanding the foregoing, a Market Participant may submit a request to PJM for consideration and approval of an alternative method of calculating its Energy Market Opportunity Cost if the standard methodology described herein does not accurately represent the Market Participant's Energy Market Opportunity Cost.

~~(b) Each Member obligated to sell energy on the PJM Interchange Energy Market at cost-based rates shall include the following components or their equivalent in the determination of costs for energy supplied to the PJM Region:~~

~~Incremental fuel cost;~~

~~Incremental maintenance cost;~~

~~Incremental labor cost; and~~

~~Other incremental operating costs.~~(~~c~~b) All fuel costs shall employ the marginal fuel price experienced by the Member.

(~~d~~c) The PJM Board, upon consideration of the advice and recommendations of the Members Committee, shall from time to time define in detail the method of determining the costs entering into the said components, and the Members shall adhere to such definitions in the preparation of incremental costs used on the Interconnection.

Item 2

SCHEDULE 2

COMPONENTS OF COST

(a) Each Market Participant obligated to sell energy on the PJM Interchange Energy Market at cost-based rates may include the following components or their equivalent in the determination of costs for energy supplied to or from the PJM Region:

For generating units powered by boilers
Firing-up cost
Peak-prepared-for maintenance cost

For generating units powered by machines
Starting cost from cold to synchronized operation

For all generating units
Incremental fuel cost
Incremental maintenance cost
No-load cost during period of operation
Incremental labor cost
Other incremental operating costs

For a generating unit that is subject to operational limitations due to energy ~~or~~**and** environmental limitations imposed on the generating unit by Applicable Laws and Regulations (as defined in the PJM Tariff), the Market Participant may include in the calculation of its "other incremental operating costs" an amount reflecting the unit-specific Energy Market Opportunity Costs expected to be incurred **on an hourly basis**. Such unit-specific Energy Market Opportunity Costs are calculated by forecasting **hourly** Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the relevant compliance period, and subtract therefrom the forecasted **hourly** costs to generate energy at the bus at which the generating unit is located **taking into account historical variability and basis differentials**. **If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative for any of the years, the average shall include the negative result and if the average difference over three years is negative, the resulting Energy Market Opportunity Cost shall be zero.** ~~**, as specified in more detail in**~~ PJM Manual 15, Section 8: Cost Development Guidelines **shall set forth the foregoing method in greater detail, and shall, in order to ensure as accurate a calculation as possible, include, at a minimum, provisions accounting for (i) limitations imposed on the basis of rolling time periods; (ii) whether a resource has capability to use multiple fuels, and, for each fuel, the flexibility for procurement on a spot or monthly contract basis and associated delivery charges; and (iii) the resource's minimum run time and startup costs**. ~~**If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative, the resulting Energy Market Opportunity Cost shall be zero. Notwithstanding the foregoing, a Market Participant may submit a request to PJM for consideration and approval of an alternative method of calculating its Energy Market**~~

~~**Opportunity Cost if the standard methodology described herein does not accurately represent the Market Participant's Energy Market Opportunity Cost.**~~

(b) All fuel costs shall employ the marginal fuel price experienced by the Member.

(c) The PJM Board, upon consideration of the advice and recommendations of the Members Committee, shall from time to time define in detail the method of determining the costs entering into the said components, and the Members shall adhere to such definitions in the preparation of incremental costs used on the Interconnection.

Issued By: Craig Glazer Effective: June 21, 2010
Vice President, Federal Government Policy
Issued On: April 22, 2010
Filed to comply with order of the Federal Energy Regulatory Commission, Docket No. EL08-47-004, issued March 23, 2010, 130 FERC ¶ 61,230 (2010).

Item 3

SCHEDULE 2

COMPONENTS OF COST

(a) Each Market Participant obligated to sell energy on the PJM Interchange Energy Market at cost-based rates *may* include the following components or their equivalent in the determination of costs for *energy* supplied to or from the PJM Region:

For generating units powered by boilers
Firing-up cost
Peak-prepared-for maintenance cost

*For generating units powered by m*achines
Starting cost from cold to synchronized operation

For all generating units
Incremental fuel cost
Incremental maintenance cost
No-load cost during period of operation
Incremental labor cost
Other incremental operating costs

For a generating unit that is subject to operational limitations due to energy or environmental constraints imposed on the generating unit by Applicable Laws and Regulations (as defined in the PJM Tariff), the Market Participant may include in the calculation of its "other incremental operating costs" an amount reflecting the unit-specific Energy Market Opportunity Costs expected to be incurred. Such unit-specific Energy Market Opportunity Costs are calculated by forecasting Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the relevant compliance period, and subtract therefrom the forecasted costs to generate energy at the bus at which the generating unit is located, as specified in more detail in PJM Manual 15~~, Section 8: Cost Development Guidelines~~. If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative, the resulting Energy Market Opportunity Cost shall be zero. Notwithstanding the foregoing, a Market Participant may submit a request to PJM for consideration and approval of an alternative method of calculating its Energy Market Opportunity Cost if the standard methodology described herein does not accurately represent the Market Participant's Energy Market Opportunity Cost.

For a generating unit that is subject to operational limitations resulting from (i) the physical equipment limitations of the unit due to original equipment manufacturer recommendations or insurance carrier restrictions, (ii) an Out of Management Control fuel supply limitation as defined in the PJM eGADS User Manual, or (iii) a fuel supply limitation for which a disturbance report was filed pursuant to the requirements of NERC EOP-004 Disturbance Reporting, the Market Participant may include in the calculation of its "other incremental operating costs" an amount reflecting the unit-specific Non-Regulatory Opportunity Costs expected to be incurred. Such unit-specific Non-Regulatory Opportunity Costs are calculated by forecasting Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the period of time in which the unit is bound by the referenced restrictions, and subtract therefrom the forecasted costs to generate energy at the bus at which the generating unit is located, as specified in more detail in PJM Manual 15. If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative, the resulting Non-Regulatory Opportunity Cost shall be zero.

(*b*) All fuel costs shall employ the marginal fuel price experienced by the Member.

(*c*) The PJM Board, upon consideration of the advice and recommendations of the Members Committee, shall from time to time define in detail the method of determining the costs entering into the said components, and the Members shall adhere to such definitions in the preparation of incremental costs used on the Interconnection.

Item 4

SCHEDULE 2

COMPONENTS OF COST

(a) Each Market Participant obligated to sell energy on the PJM Interchange Energy Market at cost-based rates *may* include the following components or their equivalent in the determination of costs for *energy* supplied to or from the PJM Region:

For generating units powered by boilers
Firing-up cost
Peak-prepared-for maintenance cost

*For generating units powered by m*achines
Starting cost from cold to synchronized operation

For all generating units
Incremental fuel cost
Incremental maintenance cost
No-load cost during period of operation
Incremental labor cost
Other incremental operating costs

For a generating unit that is subject to operational limitations due to energy ***and****~~or~~ environmental constraints imposed on the generating unit by Applicable Laws and Regulations (as defined in the PJM Tariff),the Market Participant may include in the calculation of its "other incremental operating costs" an amount reflecting the unit-specific Energy Market Opportunity Costs expected to be incurred* ***on an hourly basis****. Such unit-specific Energy Market Opportunity Costs are calculated by forecasting* ***hourly*** *Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the relevant compliance period, and subtract therefrom the forecasted* ***hourly*** *costs to generate energy at the bus at which the generating unit is located* ***taking into account historical variability and basis differentials. If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative for any of the years, the average shall include the negative result and if the average difference over three years is negative, the resulting Energy Market Opportunity Cost shall be zero.****~~, as specified in more detail in~~ PJM Manual 15~~.~~* ***shall set forth the foregoing method in greater detail, and shall, in order to ensure as accurate a calculation as possible, include, at a minimum, provisions accounting for (i) limitations imposed on the basis of rolling time periods; (ii) whether a resource has capability to use multiple fuels, and, for each fuel, the flexibility for procurement on a spot or monthly contract basis and associated delivery charges; and (iii) the resource's minimum run time and startup costs****~~If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative, the resulting Energy Market Opportunity Cost shall be zero. Notwithstanding the foregoing, a Market Participant may submit a request to PJM for consideration and approval of an alternative method of calculating its Energy Market Opportunity Cost if the standard methodology described herein does not accurately represent the Market Participant's Energy Market Opportunity Cost~~.*

For a generating unit that is subject to operational limitations resulting from (i) the physical equipment limitations of the unit due to original equipment manufacturer recommendations or insurance carrier restrictions, (ii) an Out of Management Control fuel supply limitation as defined in the PJM eGADS User Manual, or (iii) a fuel supply limitation for which a disturbance report was filed pursuant to the requirements of NERC EOP-004 Disturbance Reporting, the Market Participant may include in the calculation of its “other incremental operating costs” an amount reflecting the unit-specific Non-Regulatory Opportunity Costs expected to be incurred. Such unit-specific Non-Regulatory Opportunity Costs are calculated by forecasting Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the period of time in which the unit is bound by the referenced restrictions, and subtract therefrom the forecasted costs to generate energy at the bus at which the generating unit is located, as specified in more detail in PJM Manual 15. If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative, the resulting Non-Regulatory Opportunity Cost shall be zero.

(*b*) All fuel costs shall employ the marginal fuel price experienced by the Member.

(*c*) The PJM Board, upon consideration of the advice and recommendations of the Members Committee, shall from time to time define in detail the method of determining the costs entering into the said components, and the Members shall adhere to such definitions in the preparation of incremental costs used on the Interconnection.

Item 5

SCHEDULE 2

COMPONENTS OF COST

(a) Each Market Participant obligated to sell energy on the PJM Interchange Energy Market at cost-based rates *may* include the following components or their equivalent in the determination of costs for *energy* supplied to or from the PJM Region:

For generating units powered by boilers
Firing-up cost
Peak-prepared-for maintenance cost

*For generating units powered by m*achines
Starting cost from cold to synchronized operation

For all generating units
Incremental fuel cost
Incremental maintenance cost
No-load cost during period of operation
Incremental labor cost
Other incremental operating costs

For a generating unit that is subject to operational limitations due to **(i)** *energy* ***and***~~*or*~~ *environmental constraints imposed on the generating unit by Applicable Laws and Regulations (as defined in the PJM Tariff*), **(ii) the physical equipment limitations of the unit due to original equipment manufacturer recommendations or insurance carrier restrictions lasting for a period independently confirmed and as updated by such manufacturer or insurance carrier, or (iii) a fuel supply limitation resulting from an event substantially equivalent to Force Majeure and lasting for a period independently confirmed and as updated by the fuel supplier,** *the Market Participant may include in the calculation of its "other incremental operating costs" an amount reflecting the* ***highest applicable*** *unit-specific Energy Market Opportunity Cost*~~*s*~~ *expected to be incurred* ***on an hourly basis*** **occurring within the period subject to a limited number of available run hours**. *Such unit-specific Energy Market Opportunity Cost*~~*s*~~ ~~*are*~~***is*** *calculated by forecasting* **hourly** *Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the relevant compliance period, and subtract therefrom the forecasted* **hourly** *costs to generate energy at the bus at which the generating unit is located* ***taking into account historical variability and basis differentials. If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative for any of the years, the average shall include the negative result and if the average difference over three years is negative, the resulting Energy Market Opportunity Cost shall be zero.*** ~~*, as specified in more detail in*~~ *PJM Manual 15*~~*.*~~ ***shall set forth the foregoing method for calculating operational limitations in greater detail, and shall, in order to ensure as accurate a calculation as possible, include, at a minimum, provisions accounting for (i) limitations imposed on the basis of rolling time periods; (ii) whether a resource has capability to use multiple fuels, and, for each fuel, the flexibility for procurement on a spot or monthly contract basis and associated delivery charges; and (iii) the resource's minimum run time and startup costs***~~***If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative, the resulting Energy Market Opportunity Cost shall be zero. Notwithstanding the foregoing, a Market Participant may submit a request to PJM***~~

~~*for consideration and approval of an alternative method of calculating its Energy Market Opportunity Cost if the standard methodology described herein does not accurately represent the Market Participant's Energy Market Opportunity Cost*~~.

A Market Participant shall not include in its determination of costs an Energy Market Opportunity Cost without affording reasonable advance notice and opportunity for the Market Monitoring Unit to review and verify the supporting documentation and information in accordance with Section II.A of the Attachment M–Appendix, and, further, shall not submit Energy Market Opportunity Costs for physical equipment and fuel supply limitations more than three times over a rolling five-year period without the prior approval of the Federal Energy Regulatory Commission. The Office of the Interconnection shall determine whether to accept or reject an offer including Energy Market Opportunity Cost subject to the criteria set forth in the Tariff and the PJM Manuals.

~~**For a generating unit that is subject to operational limitations resulting from (i) the physical equipment limitations of the unit due to original equipment manufacturer recommendations or insurance carrier restrictions, (ii) an Out of Management Control fuel supply limitation as defined in the PJM eGADS User Manual, or (iii) a fuel supply limitation for which a disturbance report was filed pursuant to the requirements of NERC EOP-004 Disturbance Reporting, the Market Participant may include in the calculation of its "other incremental operating costs" an amount reflecting the unit-specific Non-Regulatory Opportunity Costs expected to be incurred. Such unit-specific Non-Regulatory Opportunity Costs are calculated by forecasting Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the period of time in which the unit is bound by the referenced restrictions, and subtract therefrom the forecasted costs to generate energy at the bus at which the generating unit is located, as specified in more detail in PJM Manual 15. If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative, the resulting Non-Regulatory Opportunity Cost shall be zero.**~~

(*b*) All fuel costs shall employ the marginal fuel price experienced by the Member.

(*c*) The PJM Board, upon consideration of the advice and recommendations of the Members Committee, shall from time to time define in detail the method of determining the costs entering into the said components, and the Members shall adhere to such definitions in the preparation of incremental costs used on the Interconnection.

Item 6

1.3.2B Energy Market Opportunity Cost.

"Energy Market Opportunity Cost" shall mean the difference between (a) the forecasted cost to operate a specific generating unit when the unit only has a limited number of available run hours due to **operational** limitations ~~**imposed on the unit by Applicable Laws and Regulations (as defined in PJM Tariff)**~~**set forth in Schedule 2 of the Operating Agreement**, and (b) the forecasted future hourly Locational Marginal Price at which the generating unit could run while not violating such limitations. Energy Market Opportunity Cost therefore is the value associated with a specific generating unit's lost opportunity to produce energy during a higher valued period of time occurring within the ~~**same compliance**~~ period **subject to a limited number of available run hours**~~**, which compliance period is determined by the applicable regulatory authority and is reflected in the rules set forth in PJM Manual 15. Energy Market Opportunity Costs shall be limited to those resources which are specifically delineated in Schedule 2 of the Operating Agreement**~~.

~~**1.3.17A Non-Regulatory Opportunity Cost.**~~

~~**"Non-Regulatory Opportunity Cost" shall mean the difference between (a) the forecasted cost to operate a specific generating unit when the unit only has a limited number of starts or available run hours resulting from (i) the physical equipment limitations of the unit due to original equipment manufacturer recommendations or insurance carrier restrictions, (ii) an Out of Management Control fuel supply limitation as defined in the PJM eGADS User Manual, or (iii) a fuel supply limitation for which a disturbance report was filed pursuant to the requirements of NERC EOP-004 Disturbance Reporting; and, (b) the forecasted future hourly Locational Marginal Price at which the generating unit could run while not violating such limitations. Non-Regulatory Opportunity Cost therefore is the value associated with a specific generating unit's lost opportunity to produce energy during a higher valued period of time occurring within the same period of time in which the unit is bound by the referenced restrictions, and is reflected in the rules set forth in PJM Manual 15. Non-Regulatory Opportunity Costs shall be limited to those resources which are specifically delineated in Schedule 2 of the Operating Agreement.**~~

SCHEDULE 2

COMPONENTS OF COST

(a) Each Market Participant obligated to sell energy on the PJM Interchange Energy Market at cost-based rates *may* include the following components or their equivalent in the determination of costs for *energy* supplied to or from the PJM Region:

For generating units powered by boilers
Firing-up cost
Peak-prepared-for maintenance cost

*For generating units powered by m*achines
Starting cost from cold to synchronized operation

For all generating units
Incremental fuel cost
Incremental maintenance cost
No-load cost during period of operation
Incremental labor cost
Other incremental operating costs

For a generating unit that is subject to operational limitations due to **(i)** *energy and environmental constraints imposed on the generating unit by Applicable Laws and Regulations (as defined in the PJM Tariff),* **(ii) the physical equipment limitations of the unit due to original equipment manufacturer recommendations or insurance carrier restrictions lasting for a period independently confirmed and as updated by such manufacturer or insurance carrier, or (iii) a fuel supply limitation resulting from an event substantially equivalent to Force Majeure and lasting for a period independently confirmed and as updated by the fuel supplier,** *the Market Participant may include in the calculation of its "other incremental operating costs" an amount reflecting the* ***highest applicable*** *unit-specific Energy Market Opportunity Cost~~s~~ expected to be incurred on an hourly basis* **occurring within the period subject to a limited number of available run hours**. *Such unit-specific Energy Market Opportunity Cost~~s are~~* ***is*** *calculated by forecasting hourly Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the relevant compliance period, and subtract therefrom the forecasted hourly costs to generate energy at the bus at which the generating unit is located taking into account historical variability and basis differentials. If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative for any of the years, the average shall include the negative result and if the average difference over three years is negative, the resulting Energy Market Opportunity Cost shall be zero. PJM Manual 15 shall set forth the foregoing method* ***for calculating operational limitations*** *in greater detail, and shall, in order to ensure as accurate a calculation as possible, include, at a minimum, provisions accounting for (i) limitations imposed on the basis of rolling time periods; (ii) whether a resource has capability to use multiple fuels, and, for each fuel, the flexibility for procurement on a spot or monthly contract basis and associated delivery charges; and (iii) the resource's minimum run time and startup costs.*

A Market Participant shall not include in its determination of costs an Energy Market Opportunity Cost without affording reasonable advance notice and opportunity for the Market

Monitoring Unit to review and verify the supporting documentation and information in accordance with Section II.A of the Attachment M–Appendix, and, further, shall not submit Energy Market Opportunity Costs for physical equipment and fuel supply limitations more than three times over a rolling five-year period without the prior approval of the Federal Energy Regulatory Commission. The Office of the Interconnection shall determine whether to accept or reject an offer including Energy Market Opportunity Cost subject to the criteria set forth in the Tariff and the PJM Manuals.

~~For a generating unit that is subject to operational limitations resulting from (i) the physical equipment limitations of the unit due to original equipment manufacturer recommendations or insurance carrier restrictions, (ii) an Out of Management Control fuel supply limitation as defined in the PJM eGADS User Manual, or (iii) a fuel supply limitation for which a disturbance report was filed pursuant to the requirements of NERC EOP-004 Disturbance Reporting, the Market Participant may include in the calculation of its "other incremental operating costs" an amount reflecting the unit-specific Non-Regulatory Opportunity Costs expected to be incurred. Such unit-specific Non-Regulatory Opportunity Costs are calculated by forecasting Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the period of time in which the unit is bound by the referenced restrictions, and subtract therefrom the forecasted costs to generate energy at the bus at which the generating unit is located, as specified in more detail in PJM Manual 15. If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative, the resulting Non-Regulatory Opportunity Cost shall be zero.~~

(*b*) All fuel costs shall employ the marginal fuel price experienced by the Member.

(*c*) The PJM Board, upon consideration of the advice and recommendations of the Members Committee, shall from time to time define in detail the method of determining the costs entering into the said components, and the Members shall adhere to such definitions in the preparation of incremental costs used on the Interconnection.