

134 FERC ¶ 61,246
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Jon Wellinghoff, Chairman;
Marc Spitzer, Philip D. Moeller,
John R. Norris, and Cheryl A. LaFleur.

PJM Interconnection, L.L.C.

Docket No. ER11-12-000

ORDER ON PROPOSED TARIFF PROVISIONS

(Issued March 30, 2011)

1. On October 1, 2010, PJM Interconnection, L.L.C. (PJM) submitted revisions to Section 1.2A.2 of Schedule 1 of the Amended and Restated Operating Agreement (Operating Agreement) and the parallel provision of the Attachment K – Appendix of the PJM Open Access Transmission Tariff (Tariff), Part I, Section 3F.2 of the Tariff and Section 14A.2 of the Operating Agreement, to incorporate the definitions of PJM Markets Facilities, PJM Reliability Facilities and Reliability Monitored Facilities into the Tariff and Operating Agreement. The purpose of the proposed revisions is to eliminate from the PJM marginal loss calculation model all lower voltage facilities that PJM does not control or operate for congestion or reliability, as well as generator step-up transformers (GSU) that are metered on the “high side” that the market seller has requested be removed from the loss calculation.¹ In this order, the Commission accepts the proposed revisions, subject to a compliance filing, to be effective June 1, 2012.

I. Background

2. The Commission required PJM to implement a marginal loss methodology on May 1, 2006,² and approved PJM’s methodology on November 6, 2006.³ The methodology provides, among other things, that PJM must calculate and assess

¹ GSU transformers increase the voltage level from the generator to the transmission network, the “high side” being the network side.

² *Atlantic City Electric Company, et al. v. PJM Interconnection, L.L.C.*, 115 FERC ¶ 61,132 (2006) (*Atlantic City*).

³ *Atlantic City Electric Company, et al. v. PJM Interconnection, L.L.C.*, 117 FERC ¶ 61,169 (2006).

Transmission Loss Charges for every Network Service User, the PJM Interchange Energy Market, and each Transmission Customer.⁴ The basis for these charges is the differences in the Locational Marginal Prices (LMP), defined as the loss price at a bus, between points of delivery and points of receipt.⁵ PJM and its stakeholders have been in discussions regarding making improvements to the calculation of marginal losses since the method was first implemented.

3. PJM stakeholders formed a Marginal Losses Working Group (MLWG) to review the history of marginal losses implementation and evaluate and recommend potential enhancements. The MLWG reported that it was satisfied with the PJM marginal loss implementation process, but that the price difference between two points was no longer hedgeable under the marginal loss construct. The Marginal Losses User Group (MLUG) was formed to further examine whether a marginal loss hedging product should be developed to enhance and improve the ability to hedge marginal losses within the PJM Energy Market. Although the MLUG reported that it was unable to develop a hedging mechanism for the marginal loss component of LMP, its analysis revealed a significant disparity in the impacts of marginal loss calculations across the various transmission zones; and it concluded that the cause of this disparity was the fact that varying levels of lower voltage level transmission and distribution facilities are included in the PJM network model in different zones.

4. The MLUG discussed the impact of underlying facilities on loss prices, the fact that the different voltage levels modeled across the PJM transmission zones result in a lack of common requirements for inclusion in the system model, and the potential inequity in marginal loss price results for generators due to PJM calculating the applicable LMP at generator terminals on the “low side” of GSUs while many of the generators measure their output on the “high side” of GSUs for purposes of revenue metering. The MLUG recommended that PJM remove underlying facilities from the PJM network model for the purposes of marginal loss calculations in order to achieve consistency in the marginal loss calculations across the PJM region.

⁴ Section 5.4.1 of Schedule 1 of the Operating Agreement, and the parallel provisions of Attachment K-Appendix of the Tariff. Transmission losses refer to the loss of energy in the transmission of electricity from generation resources to load, which is dissipated as heat through transformers, transmission lines, and other transmission facilities. *See* Section 3F.1 of the Tariff; Section 14A.1 of the Operating Agreement.

⁵ Section 5.4.1 of Schedule 1 of the Operating Agreement, and the parallel provisions of Attachment K-Appendix of the Tariff.

II. PJM's Proposal

5. As a result of the stakeholder discussions, PJM proposes to modify the calculation of marginal losses by eliminating from the loss model all lower voltage facilities that PJM does not control or operate for congestion or reliability, as well as GSUs that are measured on the "high side" which the Market Seller owning or controlling that GSU has requested be removed from the loss calculation. Specifically, PJM proposes to modify Section 3F.2 of Part I of the Tariff, Section 14A.4 of the Operating Agreement and Section 1.2A.2 of Schedule 1 of the Operating Agreement to provide:

Whenever in this Tariff transmission losses are included in the determination of a charge, credit, load (including deviations), or demand reduction, it is explicitly so stated and such included losses shall be those losses incurred on (a) Reliability Monitored Facilities and (b) any generator step-up transformers that the Market Seller has not elected to remove from the loss calculation, which are included in the PJM network model and determined by, and reflected in, the PJM State Estimator. Absent such explicit statement, such losses are not included in the determination.

6. To implement the proposed revisions, PJM proposes to define Reliability Monitored Facilities in Section 1.38B of Part I of the Tariff as the combined set of "PJM Markets Facilities" and "PJM Reliability Facilities" that are under PJM's control for coordinating regional and interregional operations. Specifically, PJM Markets Facilities will be defined as:

Those facilities which are both monitored in the PJM Energy Management System and included in the Locational Marginal Price calculations for congestion management.⁶

⁶ The term "PJM Markets Facilities" is currently defined in PJM Manual 35 as: "[t]hose facilities *above 100kV* which are both monitored in the PJM EMS and included in the LMP calculations for congestion management." (emphasis added) *See also* PJM Manual 3, Revision 37 (PJM Transmission Facilities are those facilities used in the transmission of electrical energy that: are included in the PJM tariff, have demonstrated to the satisfaction of PJM to be integrated with the PJM RTO Transmission System, and integrated into the planning and operation of the PJM RTO to serve all of the power and transmission customers within the PJM RTO ...).

Further, PJM Reliability Facilities will be defined as:

Those facilities which are monitored as part of the NERC bulk electric system set of facilities but are not included in the Locational Marginal Price calculations for congestion management.⁷

7. PJM states that the proposed revisions will require changes to its modeling software before the new marginal loss methodology can be implemented,⁸ and that the delay in the implementation of other software systems caused all other major system changes in PJM to be delayed due to the prioritization of these other system changes. As a result, PJM has requested an effective date of June 1, 2012 for the proposed revisions. Pursuant to section 35.11 of the Commission's rules and regulations,⁹ therefore, PJM requests a waiver of the Commission's 120-day maximum prior notice requirement set forth in section 35.3(a).¹⁰

III. Notice of Filing and Interventions

8. Notice of this proceeding was published in the *Federal Register*, 75 Fed. Reg. 63,459, with interventions, comments, or protests due on October 22, 2010. Notice of intervention was filed by the New Jersey Board of Public Utilities. Motions to intervene were filed by American Municipal Power, Inc., PSEG Companies, American Electric Power Services Corporation, Long Island Power Authority and LIPA (LIPA), Dayton Power and Light Company (Dayton), Constellation Energy Commodities Group, Inc. and Constellation Power Source Generation, Inc. (Constellation), DC Energy, LLC and Public Power Association of New Jersey (together with DC Energy, Joint Protesters), Duke Energy Corporation (Duke), FirstEnergy Service Company, Old Dominion Electric Cooperative, Allegheny Energy Companies, Exelon Corporation (Exelon), Shell Energy North America (US) L.P., and Dominion Resources Services, Inc. Comments were filed by LIPA, Dayton, Duke, Constellation, and Exelon. A protest was filed by Joint

⁷ The term "PJM Reliability Facilities" is currently defined in PJM Manual 35 as: "Those facilities *above 100kV* which are monitored as part of the NERC BES set of facilities but are not included in the LMP calculations for congestion management." (emphasis added).

⁸ PJM also states that it seeks to give stakeholders as much advance notice as possible of the modeling change so as not to adversely impact the pricing of supply contracts negotiated in reliance on the loss pricing structure.

⁹ 18 C.F.R. § 35.11 (2010).

¹⁰ 18 C.F.R. § 35.3(a) (2010).

Protesters and limited protests were filed by Allegheny, Duke, and Dayton. PJM filed a motion and answer to the Joint Protesters.

IV. Comments, Protests, and Answer

9. Joint Protesters asks the Commission to accept PJM's proposal regarding GSUs. Joint Protesters protest the proposed change to eliminate from the PJM loss calculation model all facilities that PJM does not consider Reliability Monitored Facilities, and state that the proposed change is not just and reasonable. In particular, Joint Protesters contend that the proposed revision leads to a substantial increased cost to consumers,¹¹ introduces an inconsistency in how PJM models various components of the LMP, harms dispatch efficiency, contradicts the Commission's initial ruling on marginal losses in PJM, subverts the agreed-to over-collection allocation methodology, impedes competition with generation resources in the market, and relies on speculative reliability arguments. LIPA filed comments opposing the proposed revisions, contending that they significantly increase costs to load, produce inconsistencies in how PJM models components of its LMP calculation, and result in market inefficiencies. LIPA also opposes the proposed modifications to the treatment of GSUs in the marginal loss calculation.¹²

10. Constellation and Exelon support the proposed revisions and PJM's requested waiver of the Commission's 120 day maximum prior notice requirement. Allegheny, Duke and Dayton protest the proposed implementation date of June 1, 2012. Allegheny and Duke support an implementation date of June 1, 2011; Dayton supports an implementation date of October 2, 2010, one day after PJM filed the proposed revisions.¹³ While Duke agrees with the intent to limit the number of facilities included in the calculation of marginal losses, Duke disagrees with the proposed revision to the definition of PJM Markets Facilities. Duke suggests that PJM should revise its proposed

¹¹ Joint Protesters state that under the proposed revisions, load would pay on average between \$650,000 and \$1 million more per day.

¹² Joint Protesters and LIPA support a technical conference on the proposed revisions.

¹³ Dayton contends that, under the circumstances, the Commission has good cause within the meaning of Federal Power Act (FPA) section 205(d), 16 U.S.C. § 824d(d) (2006), to order the changes to be effective on less than 30 days notice. As an alternative, Dayton suggests that the Commission could exercise its powers under FPA section 205(e), 16 U.S.C. § 824d(e) (2006), to initiate, sua sponte, an investigation of PJM's practices and its effects on marginal loss charges, and establish a refund effective date as of the date notice of such action is published in the *Federal Register*.

definition to include the 100 kV threshold, and contends that removal of the 100 kV threshold from the definition will permit facilities below 100 kV to be included in the model, which will in turn result in an over-collection of marginal losses.

11. Dayton supports PJM's proposal stating that PJM's current marginal loss model is inconsistent with the model used by PJM to identify and price congestion because the current marginal loss model includes losses associated with facilities operating at distribution voltage levels, including in many instances facilities operating at voltages as low as 1 kV. Dayton believes that one effect of including these distribution level facilities in the current model is computation of larger losses within transmission zones than would be computed if only transmission facilities were included. Dayton states that a second effect of including these lower voltage facilities in the current marginal loss model is the creation of undue preferences and undue discrimination in pricing. Dayton states that PJM's proposal largely corrects both problems by making its marginal loss model consistent with its LMP and congestion pricing model.

12. Dayton states that all generating plants in PJM are modeled for marginal loss purposes as if their output was being measured at the generator terminals (low side of the GSU); however, many units have their output metered at the high side of the GSU. Dayton continues that if the metering point at which PJM measures output is on the high-voltage side of the GSU, then the losses through the GSU are already reflected in the meter data. As a result, Dayton states that, without the changes proposed by PJM, the losses from generation units that are metered at the high side after the GSU improperly are taken into account twice: once physically through their net meter reading and, again, financially through a lower LMP (calculated to net-out the GSU marginal losses) at the generator terminals.

13. In its answer, PJM addresses the effect of both the GSU and the removal of low voltage facilities revisions on load. PJM states that no additional cost will be allocated to load due to LMP changes caused by implementation of the proposed revisions. PJM states that the effect of eliminating facilities from the allocation of the marginal loss revenue surplus will be a higher net cost to load. However, PJM emphasizes that this results from the reduction in surplus funds allocated to load for facilities that should not have contributed to the surplus in the first place.¹⁴ Further, PJM states that the net cost to

¹⁴ PJM estimates that the marginal loss surplus would decrease by \$259 million per year, on an annual basis. This includes both the low voltage facilities and GSUs. PJM states that the removal of low voltage facilities, which are largely radial to the transmission system, from the marginal loss calculation will result in an approximate savings of twenty percent to PJM Members on the amount of Transmission Loss Charges that they are assessed, which translates to approximately \$200 million per year.

load will still be lower after the proposed change than it was prior to June 1, 2007 when PJM originally implemented marginal losses.

V. Discussion

A. Procedural Matters

14. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure,¹⁵ the timely, unopposed notice of intervention and motions to intervene serve to make the entities that filed them parties to this proceeding. Rule 213(a)(2) of the Commission's Rules of Practice and Procedure prohibits an answer to a protest unless otherwise ordered by the decisional authority.¹⁶ We will accept PJM's answer because it has provided information that assisted us in our decision making process.

B. Commission Determination

Proposed Revisions

15. We accept the proposed revisions for both the low voltage facilities and GSUs, subject to a compliance filing, as discussed below.

16. The changes with respect to the GSU facilities address an incorrect assumption by PJM in the treatment of GSU marginal losses under which marginal losses for GSUs with "high side" metering are taken into account twice. PJM's proposal provides for a modification to the calculation of marginal losses, allowing the Market Seller to remove its GSU marginal losses from the marginal loss calculation. We find that revising the modeling to reflect the actual metering of the GSUs to accurately account for marginal losses at the GSUs is just and reasonable since computer models should reflect the actual operating conditions of the transmission network and generators should not receive a lower LMP (calculated to net-out the GSU marginal losses) than is appropriate.

17. With respect to the revisions for modeling low voltage facilities, we agree that PJM should discontinue calculating and charging for losses that occur on facilities that it does not operate and control. Losses on these facilities are properly within the purview of the entities that operate and control these facilities. However, it is not clear that PJM would calculate and charge for losses that occur on all transmission facilities that it operates and controls. Therefore, as discussed below, we will require PJM to submit a compliance filing within 30 days of the date of this order to either (i) confirm that under

¹⁵ 18 C.F.R. § 385.214 (2010).

¹⁶ 18 C.F.R. § 385.213(a)(2) (2010).

its proposed tariff revisions, PJM would calculate and charge for losses that occur on all transmission facilities that it operates and controls, (ii) verify that PJM will model its marginal losses consistent with Manual 3A, or (iii) explain why it is not feasible or otherwise reasonable to do so.

18. Joint Protesters contend that,¹⁷ while the proposed change lowers LMPs for load, it also reduces the marginal loss over-collection, which is presently allocated back to load, more than the decrease in LMPs, thus increasing the total cost to load. We do not find that the decrease in the amount credited to load due to the elimination of low voltage facilities for which marginal line losses should not have been calculated, renders this proposal unjust and unreasonable. As PJM points out, no additional costs will be allocated to load due to LMP changes by virtue of the implementation of the proposed revision. Rather the increase in the net cost for some load is the result of the reduction in surplus funds allocated to load that stems from eliminating from the equation the low voltage facilities that should never have contributed to the surplus in the first place.¹⁸

19. In *Atlantic City*, we required PJM to implement a marginal loss methodology. Although Joint Protesters contend that the proposed revision amounts to a re-litigation of the over-collected loss allocation methodology,¹⁹ we did not, in *Atlantic City*, connect the two issues. In fact, we stated that the implementation of marginal loss provisions should not be dependent on resolution of the accounting procedures (for the allocation of surplus revenues).²⁰ As we stated in *Atlantic City*:

Customers, however, are not entitled to receive any particular amounts through disbursement of the over collections, since the price they are paying (based on marginal losses) is the correct marginal cost for the energy they are purchasing.²¹

¹⁷ With respect to the treatment of the facilities that PJM does not consider Reliability Monitored Facilities, Joint Protesters are supported by comments from LIPA.

¹⁸ PJM Answer at 5. The increase in net cost to some load results from, and is equivalent to, the decrease in net cost to the load that was paying for marginal line losses on the low voltage facilities which should not have been included.

¹⁹ LIPA also contends that the modification to the treatment of GSUs in the marginal loss calculation indirectly amounts to a re-litigation of the over-collection of the loss allocation methodology.

²⁰ *Atlantic City*, 115 FERC ¶ 61,132 at P 21.

²¹ *Id.* at P 24.

In this case, while some customers may receive less of a credit than they did previously, we do not believe that this renders PJM's proposal unjust or unreasonable, as these customers are not entitled to any particular amount of credit.

20. Joint Protesters contend that the level of marginal loss surplus is proportional to the degree of marginal loss modeling and market efficiency. Joint Protesters maintain that PJM's proposed revisions will lead to less efficient dispatch, which they contend is evident in the incremental generation required to supply load in the PJM analysis.

21. As Joint Protesters recognize, the goal of implementing a locational marginal loss methodology is to produce a more efficient allocation of resources.²² The marginal loss method changed the way PJM dispatches generators by considering the effects of marginal losses and as a result, the total cost of meeting load is reduced. PJM explains that eliminating facilities that it does not operate or control will not affect the efficiency of the dispatch:

... analysis has indicated that the removal of low voltage facilities, which are largely radial to the transmission system and therefore not networked with the higher voltage transmission facilities, from the calculation of marginal losses would have a negligible effect on optimal generation dispatch because the vast majority of generation in PJM is connected to the higher voltage transmission system.²³

PJM's analyses show that the maximum hourly average additional megawatts (MW) dispatched in any of the executed study cases is 17 MW, a negligible amount on a system the size of PJM.²⁴ Accordingly, the proposed revisions are not inconsistent with the requirements of *Atlantic City* to provide efficient dispatch.

22. Joint Protesters also contend that the proposed revisions will result in poor siting decisions in a non-monitored area of the network. However, the physical losses on these non-monitored facilities are not eliminated through this filing. These losses will be included in and paid for as physical losses by the load serving entities rather than

²² Joint Protesters Protest at 9-10 (citing *Atlantic City*, 115 FERC ¶ 61,132 at P 23).

²³ PJM October 1, 2010 Filing at 15.

²⁴ *Id.* at 16. For example, the summer 2009 weather normalized coincident peak load for PJM was 133,780 MW.

financially through the loss component of the LMP.²⁵ Moreover, since calculating marginal line losses on these facilities are not necessary to ensure efficient dispatch of the PJM system, including such losses should not affect generator siting decisions.

23. Joint Protesters contend that PJM recognizes when a congestion event occurs, it is important to accurately price the congestion relief that each generator can provide, and that this can only be properly done by considering the entire set of lines that connects that generator to the constrained area. Joint Protesters state that PJM is not proposing any change to its current practice of considering all lines in computing the congestion component of each node's LMP; however, they contend PJM fails to recognize that it is similarly important to price the marginal loss relief that a generator can provide at its actual location in the network, irrespective of whether the lines connecting it happen to be Reliability Monitored Facilities. As a result, Joint Protesters state that the proposed revisions would introduce an inconsistency between the methodologies for calculating the congestion and marginal loss components of LMP.

24. We find that rather than creating inconsistency in treatment, the PJM proposal will provide for more consistent treatment. PJM's Energy Management System (EMS) models all elements of the Bulk Electric System as defined by Reliability First Corporation and SERC Reliability Corporation and lower voltage elements of the power system which can be shown to serve as parallel underlying circuitry.²⁶ Although developed initially for reliability purposes, the EMS model serves as the basis for updates to the commercial models used in PJM Market programs; therefore the Operations and Markets models are essentially identical.²⁷ Joint Protesters have not supported their argument that PJM's current practice is to consider all lines in computing the congestion component of each node's LMP. Other commenters recognize that the proposal will provide greater rather than less consistency. As the MLUG stated, one of its reasons to adopt its recommendations is to "cure the inconsistency in calculation of the congestion and marginal loss components of LMP".²⁸

25. Although the proposal appears to create greater consistency in modeling, we cannot determine whether PJM will be modeling all transmission facilities within its

²⁵ *Id.* at 19.

²⁶ PJM Manual 3A at 7.

²⁷ *Id.* at 18.

²⁸ *See* MLUG Letter to PJM Board dated April 23, 2010 at 3, a copy of which may be found on PJM's Web site at <http://www.pjm.com/~media/about-pjm/who-we-are/public-disclosures/20100423-mlug-letter-to-pjm-board-of-managers.ashx>

control.²⁹ Therefore our acceptance is conditioned on PJM submitting a filing within 30 days of the date of this order to either (i) confirm that under its proposed tariff revisions, PJM would calculate and charge for losses that occur on all transmission facilities that it operates and controls, (ii) verify that PJM will model its marginal losses consistent with Manual 3A, or (iii) explain why it is not feasible or otherwise reasonable to do so.

26. Joint Protesters also contend that PJM's proposed revisions are based, in part, on speculative reliability concerns.³⁰ Even if such concerns are speculative, they were not the basis of the filing. Instead, PJM justifies its proposal, in part, on a showing that marginal line losses do not have to be calculated on lines outside of PJM's control to ensure efficient dispatch. In any event, PJM expresses a reasonable concern that the addition of more facilities in future years could impact the reliability of the transmission system, because it will increase the time to find a dispatch solution to reliability constraints.

27. As previously noted, Duke disagrees with the proposed revision to the definition of PJM Markets Facilities, and contends that removal of the 100 kV threshold from the definition will permit facilities below 100 kV to be included in the model, which will in turn result in an over-collection of marginal losses. Further, Duke contends that this will decrease certainty for market participants as to which facilities will be considered PJM Market Facilities. PJM states that an arbitrary voltage cut off of 100kV was considered, and that it concluded that an arbitrary voltage cut off of 100kV would be inappropriate due to the variation in voltage levels of the facilities controlled and operated by PJM on behalf of its Members.³¹ PJM concluded, and we agree, that the better alternative is to limit the number of facilities that are incorporated into the calculation of marginal losses to the subset of facilities in the State Estimator that are controlled or operated by PJM, at whatever voltage levels they may be. This will ensure that PJM has the relevant marginal loss information to allow it to optimize the dispatch of its system.

²⁹ PJM proposes to calculate and charge for losses on PJM Markets Facilities and PJM Reliability Facilities. These are facilities that are monitored, either in the PJM Energy Management System (in the case of Markets Facilities) or as part of the NERC bulk electric system set of facilities (in the case of Reliability Facilities). It is not clear from PJM's filing whether there are any facilities that PJM operates and controls that are not monitored.

³⁰ Joint Protesters contention goes to PJM's assertion that addition of more facilities over future years could impact the reliability of the transmission system if its dispatch software gets overwhelmed trying to determine the optimal dispatch from a much larger number of facilities. PJM October 1, 2010 Filing at 16.

³¹ *Id.* at 13.

Implementation Date

28. Because the proposed revisions will require changes to its modeling software and may affect underlying bilateral contracts, PJM has requested an effective date of June 1, 2012 for the proposed revisions. In order to allow for the requested effective date, PJM has requested a waiver of the Commission's 120-day maximum prior notice requirement. PJM states that a waiver is necessary to give sufficient time to make changes to its software. Allegheny, Duke and Dayton protest the proposed implementation date of June 1, 2012. Allegheny and Duke request that the Commission establish an earlier implementation date of June 1, 2011; Dayton supports an implementation date of October 2, 2010. We find reasonable PJM's explanation for the effective date it requests. Because the proposed revisions will require additional time to implement changes to PJM's modeling software, good cause exists to grant the requested waiver.

The Commission orders:

(A) The Commission conditionally accepts PJM's proposed revisions, to be effective June 1, 2012, as discussed in the body of this order.

(B) PJM is required to submit a compliance filing within 30 day of the date of this order, as discussed in the body of this order.

By the Commission.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.