122 FERC ¶ 61,208
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Joseph T. Kelliher, Chairman;
Suedeen G. Kelly, Marc Spitzer,
Philip D. Moeller, and Jon Wellinghoff.

Black Oak Energy, LLC
EPIC Merchant Energy, LP and
SESCO Enterprises, LLC

Docket No. EL08-14-000

v.

PJM Interconnection, L.L.C.

ORDER DENYING COMPLAINT

(Issued March 6, 2008)

1. This order addresses a complaint filed on December 3, 2007, by Black Oak Energy, LLC, EPIC Merchant Energy, LP, and SESCO Enterprises, LLC (collectively Complainants), in which they contend that the PJM Interconnection, L.L.C. (PJM) tariff unduly discriminates against them by allocating transmission line losses via a marginal methodology to their financial arbitrage transactions, even though such transactions involve no actual physical flows of energy over transmission lines. Likewise, Complainants maintain that arbitrageurs receive none of the inevitably over-collected surplus that PJM distributes to load-serving entities (LSE), even though arbitrageurs pay marginal transmission line losses (marginal line losses) on the same basis as the LSEs. As discussed below, the Commission will deny the complaint.

I. Background

2. On March 3, 2006, Atlantic City Electric Company and others filed a compliant alleging that PJM's practice of recovering transmission line losses through an average cost method violated PJM's tariff. The Complainants asserted that PJM's tariff required that the transmission line losses should be recovered through a marginal transmission line loss collection methodology (marginal cost method) when this became technically feasible, which it had become. They argued that PJM was unreasonably delaying implementation of the marginal loss method because of stakeholder disputes on how to

allocate the over-collected surplus that necessarily would result. The Complainants further argued that continued delay would result in misallocation of transmission line losses among load by as much as $100 million per year and concluded that the average cost method was inconsistent with the efficiency principles underpinning the locational marginal cost method that determines PJM wholesale prices. By contrast, most other parties urged that PJM retain the average cost method of recovering transmission losses, or that implementation of the marginal cost method be delayed until June 1, 2007.

3. The Commission's May 1, 2006 Order concluded that PJM's tariff required use of the marginal loss method when it was technically feasible and that this was now the case.[1] The Commission also affirmed that the marginal loss method was appropriate because it would allow PJM to change its dispatch of generators (by considering the effects of losses) in a way that would reduce the total cost of meeting load.[2] The Commission found that the marginal loss method effectively imposes different loss charges to customers at different locations, as the loss component of the energy price varies for customers at different locations. That is, each spot market energy customer pays an energy price that reflects the full marginal cost—including the marginal cost of transmission losses—of delivering an increment of energy to the purchaser's location. Since losses vary in delivering energy to different locations, marginal losses increase as the number of megawatts of power moved increases.[3] As a result, charging for marginal losses will result in collecting more revenues than needed to cover total loss costs.[4] The Commission further found that PJM would need to develop a method to allocate any over-collections.

4. Subsequently, various parties requested rehearing of the May 1, 2006 Order, asking the Commission to delay the effective date until June 1, 2007. PJM's August 3, 2006 filing modified its tariff to provide the necessary mechanics for utilizing the

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[1] *Atlantic City Elec. Co. v. PJM Interconnection, L.L.C.*, 115 FERC ¶ 61,132, at P 19 (2006) (May 1, 2006 Order).

[2] *See* May 1, 2006 Order, 115 FERC ¶ 61,132 at P 22.

[3] It is a principle of mathematics that whenever any variable is continuously increasing, the marginal value of the last unit exceeds the average of all the units. Thus, where an average method considers all the units and produces an "average" transmission line loss (e.g., 2 percent is the average of an initial line loss of 1 percent that escalates as units increase to 3 percent), a marginal method would consider the losses incurred by the last unit(s) (e.g., 3 percent) and produces a "marginal" transmission line loss figure to be incorporated into the price of delivered energy. The marginal loss method, therefore, will always result in a higher figure than the average loss method.

[4] *See* May 1, 2006 Order, 115 FERC ¶ 61,132 at P 4-5.

marginal loss method to recover transmission line losses. The Commission's November 1, 2006 Order addressed and resolved the allocation issue and affirmed that the marginal loss method will be implemented on June 1, 2007.[5]

II. The Complaint

5. Complainants challenge the maginal loss method and the related allocation methodology in PJM's tariff. They complain that arbitraguers' financial transactions do not create the flow of physical energy and concomitant transmission losses and, therefore, they should not be assigned marginal line losses. Complainants alternatively argue that if arbitrageurs' financial transactions are assigned marginal line losses they should receive, as do the LSEs, a share of the over-collection surplus.

6. Complainants state that arbitrageurs' financial transactions are "virtual," and as such, do not cause transmission line losses because they "do not involve any actual transmission of power."[6] Complainants contend that "it is improper to charge transmission line losses to virtual Market Participants since they do not transmit energy over the physical transmission system."[7] Complainants aver, "Marginal costs are intended to pay for transmission line losses, and these costs are properly borne by physical users of the transmission system, not financial transactions."[8] They maintain that PJM's tariff, therefore, is unjust and unreasonable insofar as it assigns marginal line losses to their financial transactions.

7. Complainants also state that the Commission is obligated to follow cost-causation principles, and these principles preclude the assignment of marginal line losses to "virtual" transactions because such transactions play no role in creating these losses.[9] Complainants cite to *Electricity Consumers Resource Council v. FERC*,[10] where the court rejected a marginal line loss "rate that does not accurately reflect the cost of serving" various classes of market participants.

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[5] *Atlantic City Elec. Co. v. PJM Interconnection, L.L.C.*, 117 FERC ¶ 61,169 (2006) (November 1, 2006 Order).

[6] Complaint at 9; *see also id.* at 6, 11.

[7] *Id.* at 9.

[8] *Id.*

[9] *Id.* at 9-10.

[10] 747 F.2d 1511, 1516 (D.C. Cir. 1984) (*Electricity Consumers*).

8. According to Complainants, arbitrage transactions are less economical under the marginal loss method. Complainants first explain that "[i]t is axiomatic that virtual transactions will only occur if the spread between the Day-Ahead and Real-Time energy price is sufficient to cover the transactional costs of placing the virtual bid offer."[11] Complainants reason that imposing marginal line losses on financial transactions reduces opportunities for market arbitrage, decreases market liquidity, and, as a consequence, increases energy costs for all PJM consumers. Such financial transactions, Complainants maintain, were not assigned these costs prior to the implementation of the marginal loss method and should not be assigned them today. Further, Complainants point out that "the magnitude of these new charges" on financial transactions exceeds other proposed financial transaction "fees" that have been rejected by the Commission.[12]

9. In the event that the Commission does not exempt arbitrageurs from being assigned marginal line losses, Complainants alternatively argue that arbitrageurs should receive a share of the over-collection surplus, since their financial transactions are assigned marginal line losses in the same manner as LSEs but are not credited any of the over-collection as are the LSEs. Complainants contend that there is "no rational basis for refunding transmission line loss over-collections to physical load transactions, but not to virtual load transactions."[13] According to Complainants, virtual demand bids are the financial equivalent of an LSE purchasing power in the Day-Ahead Market.[14] Moreover, failure to include financial transactions in the allocation of over-collected marginal line losses results in financial transactions paying for physical transmission losses that they do not cause. In effect, "[arbitrageurs] are denied a share of the refunds that are made to Market Participants making comparable physical transactions."[15] Thus Complainants conclude that such an unduly discriminatory allocation methodology amounts to financial transactions paying a higher share of marginal line losses than is paid by physical load

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[11] Complaint at 18.

[12] *Id.* at 19.

[13] *Id.* at 15.

[14] *Id.* at 8 (citing *ISO New England, Inc.*, 91 FERC ¶ 61,311, at 62,063 (2000)).

[15] *Id.* at 9; *see also id.* at 12 (referencing *Midwest Indep. Transmission Sys. Operator, Inc.*, 109 FERC ¶ 61,157, at P 93 (2004) (*Midwest ISO*): "the transitional marginal loss refund method that the Midwest ISO adopts … should not disadvantage virtual bidders.").

purchases made by LSEs.[16] Consequently, insofar they are not allocated over-collected marginal line losses, Complainants contend that arbitrageurs are effectively subsidizing LSEs. In Complainants' view, the allocation methodology represents a "dollar-for-dollar transfer" of revenues from arbitrageurs to LSEs.[17]

10. Complainants further contend that assigning transmission line losses to financial or "virtual" transactions harms the market by limiting arbitrageurs' price convergence activities. Complainants explain that the variability in marginal loss costs per megawatt "increases the risk on each virtual transaction and the need to account for this 'risk premium' further reduces the number of economic transactions."[18] By requiring financial transactions to pay for the marginal line losses that Complainants maintain is caused by load, Complainants contend that the PJM tariff fails to send the appropriate price signal to those sectors that cause these costs to be incurred. Further, "[t]here is no market benefit to sending transmission line loss price signals to virtual transactions; doing so masks the true costs of transmission by requiring virtual transactions to subsidize the costs created by actual transmission flows."[19]

11. Complainants state that they are they are not requesting a change in the marginal loss method or in the calculation of locational marginal price (LMP). Rather, they request direct reimbursement. Further, Complainants maintain that there is a need for immediate Commission action due to their estimate that arbitrageurs may contribute as much as $1 million per day due to marginal line losses. Complainants contend that the total collection of marginal line losses is higher than anticipated.[20]

III. Notice and Responsive Pleadings

12. Notice of the complaint filed by Complainants was published in the *Federal Register*, 72 Fed. Reg. 70,579 (2007), with interventions and protests due on or before December 26, 2007. The following parties filed timely motions to intervene: Midwest

[16] *Id.* at 10, 15; *see also id. at* 13 (citing *Sithe/Independence Power Partners, L.P. v. FERC*, 285 F.3d 1, 4 (D.C. Cir. 2002), for the proposition that over-collecting from a market participant but not including that market participant in the refund of the over-collection violates the Federal Power Act sec. 205).

[17] *Id.* at 16.

[18] *Id.* at 20.

[19] *Id.* at 21.

[20] *Id.* at 17 & n.38.

Independent Transmission System Operator, Inc.; DC Energy, LLC; PSEG Companies;[21] Electric Power Supply Association; the Designated FirstEnergy Affiliates;[22] Strategic Energy, LLC; and Integrys Energy Services, Inc.

13. The following parties filed timely motions to intervene and comments: Dominion Resources Services, Inc. (Dominion); Coral Power, L.L.C. (Coral); Old Dominion Electric Cooperative (Old Dominion); Constellation Energy Commodities Group, Inc. and Constellation NewEnergy, Inc. (Constellation); Ameren Services Company (Ameren); the PPL Parties;[23] Allegheny Energy Companies (Allegheny);[24] Consolidated Edison Energy, Inc. and Consolidated Edison Solutions, Inc. (ConEd); Reliant Energy, Inc. (Reliant); PJM Power Providers Group (PJM Power Providers); PJM Industrial Customer Coalition (PJMICC); the Dayton Power and Light Company (DP&L); Duke Energy Ohio, Inc. (Duke); Exelon Corporation (Exelon); and American Electric Power Service Corporation (AEP). On January 4, 2008, Dynergy Power Marketing, Inc. (Dynergy) filed an out-of-time motion to intervene and comments. On December 26, 2007, PJM Interconnection, L.L.C. (PJM) filed an answer. On January 10, 2008, Complainants filed an answer to PJM's answer.

14. With respect to whether arbitrageurs cause transmission line losses, Complainants' position is not supported by any party; rather, the majority states that financial transactions do cause such losses in that they are cleared together with all transactions to generate the LMP in the Day-Ahead market. In its answer, PJM explains, "Although there are different ways to participate in PJM energy markets, some not involving physical transactions, ultimately there is a single integrated PJM energy market, and that market must be rooted in the economic and physical reality of the system."[25] PJM states that financial transactions have the same effect as physical transactions in PJM's Day-

[21] The PSEG Parties are: Public Service Electric and Gas Company, PSEG Power LLC, and PSEG Energy Resources & Trade LLC.

[22] The Designated FirstEnergy Affiliates are: Jersey Central Power & Light Company, Metropolitan Edison Company, Pennsylvania Electric Company, and FirstEnergy Solutions Corp.

[23] The PPL Parties are: PPL EnergyPlus, LLC; PPL Brunner Island, LLC; PPL Holtwood, LLC; PPL Martins Creek, LLC; PPL Montour, LLC; PPL Susquehanna, LLC; PPL University Park, LLC; and lower Mount Bethel Energy, LLC.

[24] Allegheny Energy Companies are: Allegheny Power (as the trade name for Monongahela power Company, the Potomac Edison Company, and West Penn Power Company) and Allegheny Energy Supply Company.

[25] PJM Answer at 6-7.

Ahead market. PJM also states that financial transactions cause transmission losses in the Day-Ahead market because PJM models the actual bids from physical as well as financial transactions in clearing the Day-Ahead market.[26] Financial or "virtual" bids are indistinguishable from physical bids within PJM's optimization software.[27] The true price of delivered energy, PJM explains, results from combination of all the considerations that dictate the optimal dispatch, namely, energy, congestion, and marginal loss components.[28] Allegheny points out that Complainants apparently acknowledge that "the inclusion of marginal transmission loss costs into the LMP is designed to ensure that Market Participants pay the actual locational price of the energy they purchase."[29] PPL Parties remark that the Day-Ahead market is financial not physical,[30] and that neither virtual bids nor physical bids cause physical marginal losses or physical congestion to occur in the Day-Ahead market, which is a financially-settled rather than a physically-settled market.[31] Ameren states that all transactions in the Day-Ahead market are "financial transactions that involve no actual physical flows of energy over transmission lines;" all these transactions have the same effects, are modeled in the same manner, and have the same impact on the determination of the LMP, regardless of whether financial or physical.[32]

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[26] *Id.* at 5; *see also* AEP Comments at 5; Allegheny at 10; Exelon at 3.

[27] *Id.* at 8 n.19; Exelon Comments at 4.

[28] *Id.* at 7.

[29] Allegheny Comments at 4 (quoting Complaint, at 6, which cites to the May 1, 2006 Order).

[30] PPL Parties Comments at 6 (quoting Joe Bowring, PJM Market Monitor, "The objective of the [day-ahead market] has been described as 'to delevelop [a] set of financial schedules that are physically feasible.'" *Convergence Bidding Tutorial and Panel Discussion*, at 2 (June 13, 2006), *available at* http://www.pjm.com/markets/market-monitor/downloads/mmu-presentations/20060613-bowring-presentation.pdf).

[31] *Id.* at 7, 11.

[32] Ameren Comments at 4 (quoting Complaint at 1-2). DP&L further explains that "PJM's algorithms take into consideration the incremental supply available, the transmission system constraints that might exist, and line losses from the supply to the pricing node." Therefore, "[i]f virtual transactions were not assigned line losses, but physical transactions were, the result would be a sub-optimal solution." DP&L Comments at 6; *see also* PJM Answer at 7; PJM Power Providers Comments at 10.

15. Duke posits that if, in fact, Complainants are correct and arbitrageurs' trades do not have any effect on physical flows of power, they would not be contributing to the efficiency of the power markets and there would be no reason to permit their participation.[33] Further, PJM queries whether, by arguing that virtual trading has no material connection to physical deliveries in real time, Complainants inadvertently question the Commission's jurisdiction over Day-Ahead energy markets. PJM explains that "the inclusion of the loss price as a component of LMP improves efficiency by assigning the costs to all parties that contribute to the price of losses, including those on a virtual basis."[34] PJM concludes that "this does not equate to paying for physical losses; rather, it "reflects the more accurate price impact of the virtual transaction on the physical transmission system that forms the basis for both the Day-ahead and Real-time Energy Markets."[35] PJM therefore reasons that financial transactions must be considered within the context of the Real-Time energy market.[36]

16. With respect to Complainants' alternative argument—that because financial transactions include the same marginal line losses as LSEs' transactions, arbitrageurs' financial transactions should be included in the allocation of the over-collection surplus—PJM responds that the allocation of the surplus is not about refunding payment to anyone, because the LMP has cleared at the lawful filed rate both for buyers and sellers. The LMP charged is the lawful filed rate.[37] Likewise, PJM Power Providers maintain that all buyers and sellers in the PJM markets, including those engaging in virtual transactions, are paying the correct marginal cost for the energy they purchase.[38]

17. PJM Power Providers state that refunds of the marginal loss over-collections are disconnected from the correct LMP payments for energy purchases.[39] PJM Power Providers remark that the Commission has recognized that no market participant "is entitled to receive any particular amounts through disbursement of the over collections,

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[33] Duke Comments at 6.

[34] PJM Answer at 7.

[35] *Id.* at 9.

[36] *Id.* at 14. "There is no meaning to virtual transactions outside of the context of real world transactions." *Id.* at 10.

[37] *Id.* at 17.

[38] PJM Power Providers Comments at 8 (quoting May 1, 2006 Order, 115 FERC ¶ 61,132 at P 24).

[39] *Id.* at 8.

since the price they are paying (based on marginal losses) is the correct marginal cost for the energy they are purchasing."[40] Commenters maintain that direct reimbursement was "the only allocation method explicitly prohibited by the Commission [because it] is the one most closely associated with cost causation,"[41] and thus the PJM allocation method is "expressly *not* based on directly reimbursing market participants for their marginal loss payments."[42]

18. In its answer, PJM supports the current allocation methodology, which allocates the over-collected surplus to LSEs on a *pro rata* basis, because "[l]oad ultimately pays for the whole infrastructure that provides the capability to deliver energy and serves as the foundation of the market."[43] Duke notes that Complainants cite *Midwest Independent Transmission System Operator, Inc.* for the uncontroversial statement that "virtual" market participants should not be discriminated against;[44] Complainants fail to point out, however, that shortly thereafter the Commission approved a tariff that allocated marginal line loss over-collections exclusively to LSEs, as here.[45] Quoting the November 1, 2006 Order, PJMICC reaffirms the current allocation, stating that "it is fair to distribute surpluses back to load customers since they pay for the fixed costs of the grid."[46] PJMICC contends that such surpluses properly belong to those entities that pay the embedded costs of the PJM transmission system. Ameren explains that "while virtual transactions, and other deviations between the amount cleared in the Day-Ahead Market and the actual Real-Time power flows, are assessed only the small difference in marginal losses between the Day-Ahead and Real-Time markets that is representative of the

[40] *Id.* at 13 (quoting May 1, 2006 Order, 115 FERC ¶ 61,132 at P 24).

[41] PJM Answer at 18 (citing May 1, 2006 Order, 115 FERC ¶ 61,132 at P 28); PJMICC Comments at 8 (citing November 1, 2006 Order, 117 FERC ¶ 61,169 at P 25; May 1, 2006 Order, 115 FERC ¶ 61,132 at P 24).

[42] PJM Power Providers Comments at 8.

[43] PJM Answer at 20.

[44] 109 FERC ¶ 61,157, at P 93 (2004).

[45] Duke Comments at 5 n.8 (referring to the subsequent Commission decision in *Midwest Indep. Transmission Sys. Operator, Inc.*, 109 FERC ¶ 61,285, at P 160 (2004)).

[46] PJMICC Comments at 6 (quoting November 1, 2006 Order, 117 FERC ¶ 61,169 at P 28); *see also* Ameren Comments at 19 (concluding, "it is fair to distribute surpluses back to load customers since they pay for the fixed costs of the grid." November 1, 2006 Order, 117 FERC ¶ 61,169 at P 28).

differences in power flows and system topology, load pays the total marginal losses associated with either the Day-Ahead or Real-Time power flows."[47]

19. A couple of commenters agree with Complainants that the amount of over-collection surplus is larger than anticipated.[48] Old Dominion, however, states that Complainants "put forth no support or explanation whatsoever for their calculation of losses at $1 million per day," and reminds Complainants that a complaint must "include all documents that support the facts in the complaint in possession of, or otherwise attainable by, the complainant."[49] ConEd contends that Complainants misrepresented the costs they actually incur by not addressing the offsetting of their increased purchase price with their increased sales revenue.[50] The fact that virtual traders may be losing money or simply making less money on a "transaction under the marginal loss model," PJM asserts in its answer, "reflects the increased efficiency and accuracy of marginal loss pricing as a reflection of the impact on the transmission system of all activity in the Day-ahead and Real-time Energy Markets."[51] In PJM's view, "The inclusion of marginal losses was a costly fine-tuning of the market in an effort to make pricing signals more precise."[52] PJM points out that "in the months since marginal losses have been implemented, PJM has observed that virtual trading has increased overall."[53]

20. Complainants express concern that the marginal loss method and allocation methodology may be harming the market. In its answer, PJM suggests that a decrease in the profitability of a financial transaction after the imposition of the marginal loss method

[47] Ameren Comments at 5-6.

[48] DP&L Comments at 2-4; Duke Comments at 8-9.

[49] Old Dominion Comments at 4, 5 (quoting Rule 206, 18 C.F.R. § 385.206(b)(8) (2007)).

[50] ConEd Comments at 3.

[51] PJM Answer at 9.

[52] *Id.* at 11; *see also* Allegheny Comments at 7 (markets working more efficiently), 11 (transactions now reflect physical realities of system and proper price for power).

[53] PJM Answer at 25 & n.44 (providing http://www.pjm.com/committees/members/downloads/20071115-item-13a-markets-operation-report.pdf); *see also* PJMICC Comments at 9 & n.19, 10.

may be a sign that market inefficiency has been rectified.[54] PJM Power Providers contend that Complainants' request will "upset the PJM pricing system, resulting in inefficient dispatch signals for PJM, imperfect economic motivations and outcomes for market participants, and improper forward pricing."[55] Such an upset will cause production cost savings to be sacrificed and price convergence to disappear, according to PJM Power Providers. Further, they warn that market participants could be motivated to engage in virtual transactions with offsetting marginal losses and congestion costs, merely to create a claim on the marginal line loss over-collection surplus.

21. Several commenters contend that Complainants' request to be exempted from transmission line losses would be unduly discriminatory. PJMICC states that transmission line losses are not severable (from the energy and congestion components in the LMP) for other Day-Ahead market participants. DP&L states that excluding transmission line losses for "virtual" financial transactions therefore would be discriminatory against all market participants who are engaged in physical trades. ConEd remarks that it is not obvious how PJM could exempt one class of market participants from paying marginal line losses without adversely impacting others. According to Exelon, "[r]emoving marginal losses from LMP for virtual transactions would completely undermine the LMP by excusing some market participants from the responsibility of paying for the marginal losses they create."[56] Reliant contends that differentiating "virtual" financial transactions from physical ones would result in an uneconomic dispatch of supply and load based upon a discriminatory preference for "virtual" transactions. If the Commission proposes to re-open this issue, however, Exelon advises that the Commission consider the interests of all stakeholders, since the revenues and costs to all will be affected. Reliant and Ameren advise that the Commission reconsider the other allocation mechanisms previously submitted.

22. About half of the commenters contend that Complainants' request and alternative request are collateral attacks on the Commission's decisions with respect to the marginal loss method in the May 1, 2006 Order and the allocation methodology adopted in the

[54] PJM Answer at 12 ("If a potential virtual transaction that is profitable without marginal losses becomes less so after the implementation of marginal losses, then that is an indication that adopting the marginal loss pricing has rectified inefficiency in the previous market where the impact of the virtual trade on system losses was not appropriately recognized."). PJMICC points out that arbitrageurs "do not appear to argue for the exclusion of marginal losses from the products that they resell in the virtual market as they do for exclusion of this element from virtual purchases." PJMICC Comments at 5.

[55] PJM Power Providers Comments at 5; Reliant Comments at 3.

[56] Exelon Comments at 5.

November 1, 2006 Order. One commenter characterizes the complaint as an impermissible request for rehearing of those orders. In its answer, PJM contends that the complaint is untimely, not ripe, and that nothing material has changed with regard to these issues. PJM notes that this proceeding included participation from financial traders, including EPIC, which is a party to this complaint. PJM states that the other two parties that join EPIC in this complaint, Black Oak and SESCO, were members of PJM at the time, "but chose to refrain from meaningful participation … even though the rules applicable to virtual transactions were clear."[57] Accordingly, another commenter states that this complaint is an attempt to retry this matter more than a year after the Commission has ruled squarely on the question presented.

Discussion

A. Procedural Matters

23. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2007), timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding. We will grant the unopposed motion to intervene out-of-time and comments filed by Dynergy given its interest, the early stage of this proceeding, and the absence of undue prejudice or delay.

24. Rule 213(a)(2) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.213(a)(2) (2007), prohibits an answer to an answer unless otherwise ordered by the decisional authority. We are not persuaded to accept Complainants' answer and will, therefore, reject it.

B. Commission Determination

25. The Commission dismisses the complaint.

1. *Res Judicata* and Collateral Estoppel

26. Several parties maintain that the Commission should dismiss the complaint summarily, arguing the complaint is a collateral attack on the Commission's May 1, 2006 Order requiring PJM to implement marginal loss pricing. Complainants maintain that the complaint should not be summarily dismissed because the facts have changed dramatically since PJM first began collecting marginal rather than average revenue on June 1, 2007. They maintain that the actual amount of marginal losses is two to three times PJM's predicted amount. They further maintain that without actual market experience, they could not anticipate how marginal losses would affect their business or the size and volatility of marginal loss calculations. They also argue that the issue of the

[57] PJM Answer at 2-3.

applicability of marginal losses to arbitrageurs has not been considered by the Commission.

27. Section 206 of the Federal Power Act recognizes that a rate previously found just and reasonable may be found unjust and unreasonable in a later proceeding.[58] In this case, even if we were to agree that the complaint could be construed as a collateral attack on prior Commission orders, given the Complainants' particular allegations of changed circumstances, we will not summarily dismiss the complaint, and instead we will consider the complaint on the merits.

2. Requirement That Arbitrageurs Pay Marginal Losses

28. In the May 1, 2006 Order, the Commission required PJM to implement marginal loss calculations as required by its tariff. The Commission determined that charging on the basis of marginal losses is consistent with efficiency because it ensures that each customer pays the proper marginal cost price for the power it is purchasing. As the Commission explained in the May 1, 2006 Order, megawatts are lost when power has to be transmitted over transmission lines, i.e., the total megawatt-hours received by customers at the end of a transmission line are less than the total megawatt-hours energy produced. The marginal line loss associated with transmission between any two points refers to the extra energy lost in moving one more MWh of energy between those points.[59] Other things being equal, customers near generation centers pay prices that reflect smaller marginal loss costs while customers far from generation centers pay prices that reflect higher marginal loss costs. Under the marginal loss method of compensating for line losses, PJM factors the marginal line loss into the energy price (i.e., the locational marginal price or LMP) at each location for both the Day Ahead and Real Time markets.[60] The calculation of LMPs under the PJM tariff requires the summation of three costs, the system-wide cost of energy, congestion price, and the line loss price.[61] In

[58] *Oxy USA v. FERC*, 64 F.3d 679, 690 (D.C. Cir. 1995) ("The fact that a rate was once found reasonable does not preclude a finding of unreasonableness in a subsequent proceeding.").

[59] Suppose that a party schedules one more MWh of energy to be injected at Point A for consumption at Point B, but only .9 MWh can be delivered to B because 0.1 MWh of energy is lost during transmission. The marginal loss in this example would be 0.1 MWh, or about 10 percent. If the marginal cost of energy at A is $10/MWh, the cost of the marginal loss in moving the extra energy to B would be $1 (i.e., 0.1 MWh times $10/MWh).

[60] PJM, Open Access Transmission Tariff, App. K, §§ 2.5, 2.6.

[61] *Id*.

addition, under the marginal loss method (and unlike under the average loss system previously in use), PJM would consider the effects of losses in determining which generators to dispatch in order to serve load at least cost. As a result, the actual cost of meeting load would be reduced by using the marginal loss method.[62]

29. Although, as the Complainants point out, the costs of paying the marginal loss provision have increased over PJM's initial estimates, we find that Complainants have failed to show that the Commission's basis for adopting marginal losses has become unjust and unreasonable. LMPs including marginal losses continue to reflect the proper price of buying and selling power, because generation must be dispatched to account for marginal losses and keep the system in balance. The higher prices now being charged for transmission line losses provide no basis for changing the proper determination of price that we made in the May 1, 2006 Order.

30. Nor do we find any basis to calculate different LMP prices for arbitrageurs than for other participants in the market, as the Complainants seem to suggest. Complainants, in fact, maintain that they are "not requesting in this Complaint that PJM … alter the calculation it uses to compute LMP prices."[63] Yet, then reversing field, they maintain that LMP be calculated differently for arbitrageurs than for everyone else. As discussed

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[62] For example, suppose that there are two alternative generators that could serve an incremental load. One generator is located far from the load and can produce energy at a marginal cost of $50 per megawatt-hour. However, because of its distance from the load, the marginal line losses of delivering its energy to the load is roughly 10 percent. That is, in moving energy from the generator to the load, 0.1 megawatt-hour is lost for every 1 megawatt-hour delivered. Thus, in order to deliver 1 megawatt-hour to the load, the generator must produce 1.1 megawatt-hours. Thus, the marginal cost of delivering 1 megawatt-hour to the load would be the cost of producing 1.1 megawatt-hours, i.e., $55. The second potential generator is located at the same location as the load, and thus, no losses would be incurred in delivering its energy to the load. The second generator can produce energy at a marginal cost of $52 per megawatt-hour, and the marginal cost of delivering its energy to the load is also $52 per megawatt-hour , since delivery would involve no losses. Under the marginal loss method, PJM would select the second generator, since the actual marginal cost of delivering energy to load is $3 lower with the second generator ($52) than with the first generator ($55). However, under the average loss method then in use, PJM would ignore the effect of losses. Thus, PJM would select the first generator because its production cost ($50) is lower than the second generator's production cost ($52). The result is that the actual cost of serving the load would be $3 per megawatt-hour lower (i.e., $52 compared with $55) under the marginal loss method than under the average loss method.

[63] Complaint at 10.

below, we cannot find unjust and unreasonable the application of the same price to all market participants.

31. Arbitrageurs participate in PJM's energy markets by submitting bids in the Day-Ahead market either to buy or sell power and then unwinding that transaction in the Real-Time market. In other words, arbitrageurs seek to make a profit by discovering price differences between the Day-Ahead and Real-Time markets.[64] For example, they will try to buy power in the Day-Ahead market when they believe the price (LMP) in the Real-Time market at which they will sell is higher than what they paid. Conversely, they will sell in the Day-Ahead market when they believe the price in the Real-Time market at which they will buy power is lower than the price at which they sold power. These transactions are often termed "virtual" only because the arbitrageur buys out its position and does not actually take delivery of power or produce power.

32. Prior to the use of marginal losses, PJM used an average loss method. Losses were not included in the calculation of LMPs, and thus, were not recovered in the LMP energy prices collected from loads. Instead, losses were recovered through a separate uplift charge. Black Oak argues in its complaint that arbitrageurs were not assigned a share of this loss uplift. The benefit to the market from arbitrage comes from its ability to cause day-ahead LMPs to converge with real-time LMPs. Since LMPs did not include a loss component during the period when average losses were used, the benefits from arbitrage would not depend on whether arbitrageurs were assigned uplift to recover loss costs. By contrast, now that PJM uses a marginal loss method, the cost of marginal losses is included in LMPs. As a result, the benefits from arbitrage depend on arbitrageurs facing the full LMP, including the marginal loss component of LMP.

33. The arbitrageur seeks to profit by buying and selling at the same local marginal price as all other market participants. Since marginal line losses are built into the LMP price at each node on its system, arbitrageurs should pay the same price as all other market participants. Such transactions do "cause" transmission line losses because they are cleared together with all transactions—"virtual" and physical—to generate LMPs in the Day-Ahead market. These financial transactions are integrated into PJM's calculation of the day-ahead LMP on an identical basis as generators and load.[65] Further, because all transactions in the Day-Ahead market (including arbitrageurs' financial transactions at issue here) may affect the costs of delivered energy by affecting the scheduling of

[64] *ISO New England, Inc.*, 113 FERC ¶ 61,055, at P 30 (2005) (describing benefits of arbitrage in organized markets).

[65] PJM Power Providers Comments at 10.

physical generation dispatch,[66] these financial or "virtual" transactions necessarily should be assigned marginal line losses for their part in causing such loss.

34. In fact, it would make little sense for there to be arbitrage without including marginal line losses. Arbitrage should take place using real market prices, which in PJM include transmission line losses. In fact, Complainants recognize that marginal losses are included in the Day-Ahead and Real-Time Energy prices.[67] But they offer no explanation as to why, if marginal line losses are included in price, these costs should be excluded from arbitrageurs' payments. Line losses are as much a part of the LMP price as all other factors, including generation cost. In effect, Complainants are contending that arbitrageurs should pay a price different from the LMP prices calculated by PJM. As the Commission stated in the May 1, 2006 Order:

> Billing on the basis of marginal costs ensures that each customer pays the proper marginal cost price for the power it is purchasing. It therefore complements and reinforces PJM's use of LMP to price electricity.[68]

Excluding marginal line losses, which are built into the LMP price, would result in arbitrage of positions that are not based on real market prices. As an example, an arbitrageur might perceive that a particular buy-sell combination is profitable only because line losses were not included in the prices that it is arbitraging.

35. As an example, suppose arbitrageurs believe that energy prices at a particular node are lower than what they will be in the Real-Time market. They would buy power at that node in the Day-Ahead market through a decrement bid in expectation of selling at higher prices in the Real-Time market. As PJM explains, by buying power at the node, the line loss component of the price would increase, because the increased demand will increase the volume at the node resulting in increased line losses.[69] If in fact, real demand at that node increases, as the arbitrageurs expect, then the real-time line losses should approximate the line losses created by the arbitrageurs' decrement bid. When the arbitrageurs sell in the Real-Time market, the price they receive also will include marginal line losses.

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[66] DP&L Comments at 4 (quoting EPIC's November 22, 2006 admission to PJM Reserve Markets Working Group).

[67] Complaint at 6, 9, 18.

[68] May 1, 2006 Order, 115 FERC ¶ 61,132 at P 22.

[69] PJM Answer at 5.

36. Complainants maintain that they are suffering significant and ongoing economic harm due to the current marginal line loss provisions of the tariff.[70] Under PJM's tariff, marginal line losses are included in the LMP that affects both the arbitrageurs' purchase and sales transactions. As one commenter points out, Complainants appear to be taking inconsistent positions by arguing for the exclusion of marginal line losses from the price of purchases in the market, but continuing to include them in the price they receive for the countervailing sale transaction.[71] Because marginal losses are included in the LMP price, these losses need to be reflected in all arbitrage transactions. In fact, depending on arbitrageurs' business acumen, the inclusion of marginal losses could increase or decrease their profits on any transaction.

37. As a simple example, suppose the Day-Ahead price at the node is $24/MW plus a $1/MW line loss bringing the total price at that node to $25.[72] The arbitrageurs' bids, by increasing volume on the line, will result in higher line losses, say $2/MW, resulting in a total price of $26 at that node. Suppose that demand increases more than the arbitrageurs predict, and so the price at the node (without line losses) increases to $27. Because of the larger demand, line losses to that node might also increase to $3/MW, for a final price of $30, allowing the arbitrageurs to settle their positions with a $4 profit. The marginal line loss calculation therefore provides an extra $1/MW profit compared to LMPs without line losses ($27 minus $24 compared with $30 minus $26).

38. On the other hand, suppose the increased demand that the arbitrageurs predict does not occur, and so the final price at the node is still $25. Because the higher volume did not appear, the marginal line loss is only $1/MW. Arbitrageurs, therefore, will settle out their positions at $26, losing $1 on the transaction. But that loss is entirely appropriate because it reflects the actual prices at that node. The arbitrageurs, in effect, lost their bet that volume—hence prices—would increase at the node, and therefore have to pay the actual costs of losing their bet. As PJM argues:

> [This result] reflects the more accurate price impact of the virtual transaction on the physical transmission system that forms the basis for both the Day-ahead and Real-time Energy Markets. To the extent that the virtual bidder loses money on this transaction under the marginal loss model when it did not lose money prior to marginal loss implementation, or simply makes less money under marginal losses than under average

[70] Complaint at 17.

[71] PJMICC Comments at 5; *see also* Answer at 8-9 (example of marginal line loss included in both the purchase and sale-side of "virtual" transactions).

[72] This example ignores the effect that the arbitrageurs' bid might have on LMPs.

> losses, this reflects the increased efficiency and accuracy of marginal loss pricing as a reflection of the impact on the transmission system of all activity in the Day-ahead and Real-time Energy Markets. Therefore, while virtual players may need to adjust their bidding strategy to account for the altered nature of price convergence between the Day-ahead and Real-time Energy Markets under marginal loss pricing, this class of Market Participants no more pays for physical losses under marginal loss pricing than it did under the average loss pricing scheme.[73]

39. Complainants cite to a series of cases standing for the proposition that customers should be charged only for the costs to serve those customers.[74] But, as discussed above, inclusion of marginal losses appropriately are part of the costs created by arbitrageurs' bidding. When an arbitrageur submits a buy bid at a node in the Day-Ahead market, PJM schedules (and pays) generation to cover the megawatts in the arbitrageur's bid. Scheduling generation to cover the arbitrageur's bid requires the recovery of line losses, just as all other physical transactions do, and we can find no reason to treat arbitrageurs' bids differently than other parties.

40. Complainants cite *Electricity Consumers* for the proposition that the Commission should not approve a rate design which results in a "rate tilt" between two customer groups without justification for the apparent difference in rate treatment.[75] In *Electricity Consumers*, the court found that the Commission had failed to explain the "rate tilt" between customers that occurred from an implementation of marginal cost price together with an adjustment to keep revenue within cost of service parameters.[76]

41. Here, however, no discrimination or rate tilt occurs because all customers are treated similarly paying the same marginal price for energy that includes marginal line losses. Arbitrageurs suffer no discrimination by being allowed to play in the same market as all other market participants at the same prices. Indeed, unlike *Electricity Consumers*, the calculation of marginal line losses contains no adjustment that compromises the correct price signals sent by the LMP.

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[73] PJM Answer at 9.

[74] Complaint at 11.

[75] 747 F.2d at 1516.

[76] *But see Norwood v. FERC*, 962 F.2d 20 (D.C. Cir. 1992) (distinguishing *Electricity Consumers* and approving marginal cost pricing).

42. Complainants maintain that arbitrageurs should not have to pay marginal losses because such losses are effectively cost-based rates. Yet, Complainants again concede that marginal losses are included in the LMP price that they are trying to arbitrage. Marginal line losses are no different than any other cost included in LMP, the system-wide energy cost and congestion cost. All three of these costs combine to produce the correct marginal energy price at each node.

43. Likewise, Complainants have failed to demonstrate that assigning financial transactions marginal line losses is causing harm to the market. The marginal loss method is producing a more efficient market by sending more accurate market signals captured in the LMPs. Exempting one class of market participants from being assigned marginal line losses would result in inefficient dispatch signals for PJM, imperfect economic motivations and outcomes for market participants, and improper forward pricing.[77] DP&L explains that PJM's algorithms take into consideration the incremental supply available, the transmission system constraints that might exist, and transmission line losses from the supply to the pricing node. Therefore, "[i]f virtual transactions were not assigned line losses, but physical transactions were, the result would be a sub-optimal solution."[78]

44. Complainants have not demonstrated that arbitrage transactions have become less economical under the marginal loss method. Indeed, the purpose of arbitrage is to try to take advantage of profitable price differences between the Day-Ahead and Real-Time markets. Since marginal losses are included in both Day-Ahead and Real-Time prices, we see no reason why arbitrageurs cannot continue to make economic decisions as to profitable price disparities between these two markets. While we agree that the marginal loss method may present another variable to enter into arbitrageurs' risk calculation,[79] such a variable is appropriate because it affects the price of energy. The point here is not to make arbitrage simpler, it is to create proper pricing signals so that arbitrage is profitable only when it reflects real price differentials between Day-Ahead and Real-Time markets. Further, we can hardly find that marginal line losses have an adverse effect on arbitrageurs when arbitrageurs' trading has increased since the marginal loss method was adopted.[80] The LMP that arbitrageurs are paying (which includes marginal line losses) is the correct marginal cost for the energy they are purchasing, and they have failed to demonstrate that charging them the same marginal cost price as other companies is unjust and unreasonable.

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[77] PJM Power Providers Comments at 5; Reliant Comments at 3.

[78] DP&L Comments at 6.

[79] *See* Complaint at 20.

[80] *See supra* note 52.

3. Crediting

45. In the May 1, 2006 Order, the Commission recognized that use of the marginal loss method will result in PJM over-recovering its expenditures,[81] which is the issue the Commission addressed in the November 1, 2006 Order and which resulted in the current allocation methodology. The Commission explained that it is a characteristic of the electric grid that marginal line losses increase as the number of megawatts of power moved on the grid increases. It is a principle of mathematics that whenever any variable is continuously increasing, the marginal value of the last unit exceeds the average of all the units. As a result, marginal losses will always exceed average losses. Using a hypothetical example, if only 100 megawatts of power is moved from a single source to a single sink, one megawatt would be lost, or a percent loss. But if 200 megawatts of power are dispatched over the line, the second 100 megawatts incur a loss of two megawatts, or a 2 percent marginal loss. (The total loss of megawatts for the 200 megawatts is three). Since each customer contributes to the amount of power dispatched, each customer should pay equally for the marginal loss of 2 percent.[82] However, PJM must purchase only three megawatts for the 200 total megawatts dispatched, so that the average loss would be 1.5 percent (i.e., a loss of 3 megawatts/200 megawatts). Therefore, because the marginal line loss always exceeds the average line loss, PJM will always collect more revenues from load than it has to pay to generators to cover the losses.

46. However, as the Commission found, no party within PJM is entitled to receive any particular amounts through disbursement of the over-collections, since the price they are paying (based on marginal line losses) is the correct marginal cost for the energy they are purchasing. As the Commission stated in the May 1, 2006 Order, the method for disbursing the amounts of any over-collections should not directly reimburse customers for their marginal line loss payments, as such a disbursement would interfere with the goal of basing prices on marginal losses:

> We further stated that "[r]efunding excess loss revenues to the participants who incurred the losses would undermine the usefulness of including marginal losses in the LMP calculations." Refunding the excess LMP revenues to those who paid would result in those purchasers no longer paying

[81] May 1, 2006 Order, 115 FERC ¶ 61,132 at P 5; *see also* November 1, 2006 Order, 117 FERC ¶ 61,169 at P 23-24.

[82] In other words, if there are two customers in this example, there is no basis to say that one customer should contribute only one megawatt, while the second customer contributes two megawatts.

the marginal cost for energy—the basic foundation of LMP.[83]

47. In the November 1, 2006 Order, the Commission entertained proposals for allocating the excess revenue collected. The Commission determined that all three proposals met the criteria by not allocating the surplus to customers in proportion to the amount of each customer's payment of marginal losses. The Commission chose the majority proposal under which excess amounts are allocated to load. The Commission explained that allocating the excess amounts to load was appropriate because load pays the fixed costs of the grid through network and point to point transmission charges.

48. Complainants maintain that failing to include arbitrageurs in the allocation of excess revenues is discriminatory because they, like load, make purchase transactions in the PJM market. We do not find that the current allocation system is unduly discriminatory. As stated above, arbitrageurs are not entitled to any allocation of the excess because they are paying the correct price for energy. As the Commission stated with respect to generators, but which is just as applicable to arbitrageurs: "all generators, including the less expensive but more remote generators, will be facing a competitive market for their generation, which is the opportunity the PJM market is designed to provide."[84]

49. Nor are arbitrageurs similarly situated to load. Unlike load, arbitrageurs do not pay network and firm point to point transmission charges covering the cost of the transmission grid. Physical load also is relatively fixed, while arbitrageurs create their own load solely by the volume of their trades. Also, unlike load, arbitrageurs make both purchase and sale transactions in which, as shown earlier, they both pay and receive marginal losses. Moreover, crediting the excess revenues to load is most consistent with protecting the ultimate consumer because such credits will be passed on to consumers in the form of lower retail rates.

50. Complainants claim that arbitrageurs should at least be compensated for their Up-To congestion trades because for such trades they pay congestion costs, which payments they allege contribute to the fixed cost of the transmission system. Up-To congestion trades are not the equivalent of network and firm point to point transmission service and do not pay for the costs of the transmission system. Congestion costs are used to hedge

[83] *See* May 1, 2006 Order, 115 FERC ¶ 61,132 at P 24 (quoting *Northeast Utils. Serv. Co.*, 109 FERC ¶ 61,204, at P 21 (2004)); *see also* November 1, 2006 Order, 117 FERC ¶ 61,169 at P 25, 27-28.

[84] November 1, 2006 Order, 117 FERC ¶ 61,169 at P 29.

positions and the payments from congestion revenue are made to the holders of the Financial Transmission Rights, not to those providing transmission service.[85]

51. Paying excess loss charges to arbitrageurs also is inconsistent with the concept of arbitrage itself. The benefits of arbitrage are supposed to result from trading acumen in being able to spot divergences between markets. As stated above, arbitrageurs create their own load by the volume of their trades. If arbitrageurs can profit from the volume of their trades, they are not reacting only to perceived price differentials in LMP or congestion, and may make trades that would not be profitable based solely on price differentials alone.

52. Complainants claim that in *Midwest ISO* the Commission ruled that adoption of marginal loss pricing "should not disadvantage virtual bidders" and that the PJM tariff creates the very harm the Commission said should not occur.[86] This isolated statement in *Midwest ISO* does not require a different determination here. First, the marginal loss pricing mechanism in the Midwest Independent Transmission System Operator, Inc. (Midwest ISO) is significantly different from that adopted in PJM. Midwest ISO's marginal loss methodology is a transitional one under which it credits back to load the marginal loss revenues collected. In contrast, as discussed above, PJM's methodology is not transitional and no party is entitled to a credit. Second, Complainants fail to cite any order in which the Commission ruled that arbitrageurs are entitled to a credit under the Midwest ISO methodology. Under the Midwest ISO tariff implementing the transition mechanism, only load is entitled to receive the credit.[87] As discussed above, we find that arbitrageurs are not being disadvantaged by PJM's marginal loss pricing methodology because they are being charged the correct marginal price for their transactions.

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[85] Congestion costs simply represent the price difference between two points or nodes on the PJM system. Under an Up-To congestion price arrangement, arbitrageurs may sell power at point A and buy power at point B in the Day-Ahead market as long as the price differential between these points is no greater than the specified amount. If during the Real-Time market, the spread between these points increases, the arbitrageur makes money; if the spread decreases, it loses money. But such transactions are not fundamentally different from other arbitrage transactions and, therefore, are not payments to cover transmission costs.

[86] 109 FERC ¶ 61,157 at P 95.

[87] Midwest ISO, Open Access Transmission Tariff, Module C, § 40.6.1 ("For a transition period not exceeding five (5) years from the start of the Day-Ahead Energy Market, the Transmission Provider will refund to Load, the difference between Marginal Losses and average losses on a Balancing Authority basis as set forth in this Section 40.6.").

The Commission orders:

The complaint is hereby denied as discussed in the body of this order.

By the Commission.

(S E A L)

Kimberly D. Bose,
Secretary.