

**UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION**

**PJM Interconnecton, L.L.C.**

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**Docket No. ER17-1138-000**

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**MOTION TO INTERVENE AND PROTEST OF THE  
MISO INDEPENDENT MARKET MONITOR RELATED TO  
PROPOSED CHANGES TO PSEUDO TIE RULES**

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Pursuant to Rules 212 and 214 of the Rules of Practice and Procedure of the Federal Energy Regulatory Commission (“FERC” or “Commission”), 18 C.F.R. §§ 385.212 and 214 (2007), Potomac Economics, Ltd. (“Potomac Economics”) respectfully moves to intervene in the above-captioned proceeding concerning the March 9, 2017 filing (“the Filing”) by PJM Interconnection, L.L.C. (“PJM”). The PJM Filing proposes to amend provisions of PJM’s Open-Access Transmission Tariff (“Tariff”) and Reliability Assurance Agreement Among Load-Serving Entities in the PJM Region (“RAA”) to modify the rules that govern pseudo-tying resources to the PJM system. Potomac Economics is the Independent Market Monitor (“IMM”) for MISO and the Market Monitoring Unit for NYISO. In those capacities, it seeks to ensure the efficiency and integrity of the MISO and NYISO markets.

**I. NOTICE AND COMMUNICATIONS**

All correspondence and communications in this matter should be addressed to:

Dr. David B. Patton  
Potomac Economics, Ltd.  
9990 Fairfax, Boulevard, Suite 560  
Fairfax, VA 22030  
(703) 383-0720

## **II. MOTION TO INTERVENE**

As the IMM for MISO, Potomac Economics is responsible for monitoring and evaluating the performance of the MISO-administered capacity, energy, and ancillary services markets, recommending market design changes to improve the performance of those markets and evaluating design changes proposed by MISO or market participants. As the IMM, Potomac Economics has a unique responsibility to ensure the efficiency and integrity of MISO wholesale power markets. Potomac Economics' interests, therefore, cannot be adequately represented by any other party. Accordingly, Potomac Economics respectfully requests that it be permitted to intervene in this proceeding with full rights as a party.

## **III. PROTEST**

### **A. The Filing concedes the problems caused by pseudo-tying large quantities of resources located in external areas**

The Filing identifies a number of operational and efficiency concerns associated with the widespread use of pseudo ties to facilitate the delivery of increasing quantities of external capacity resources. PJM argues that the changes it proposes:

...provide reasonable solutions to several challenges that can arise (and have arisen) when loads in one Balancing Authority Area<sup>1</sup> rely for capacity on generation physically located in other Balancing Authority Areas that have different planning, operating, and market rules and practices.... PJM has identified specific modeling, congestion management, planning, and operational concerns with the current Pseudo-Tie rules...<sup>1</sup>

In fact, PJM concedes that these problems are so significant that they are leading (or will lead) to outcomes that are not just and reasonable:

Delaying a resolution of those concerns would not be just and reasonable; to the contrary, delay would simply perpetuate those concerns.<sup>2</sup>

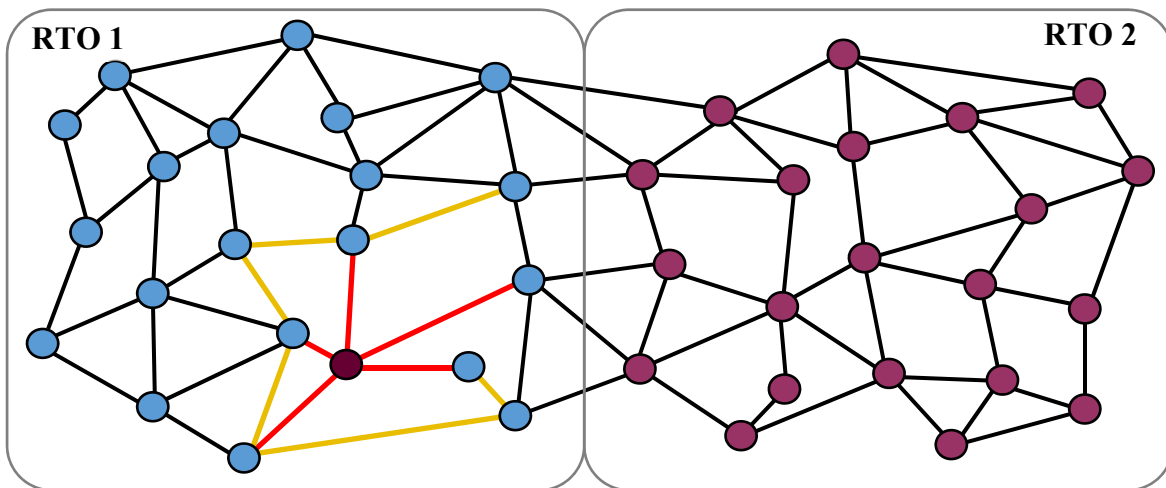
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<sup>1</sup> PJM Filing at 2.

<sup>2</sup> Id.

The Filing describes the problems that PJM experiences as a result of pseudo ties and we do not dispute that pseudo ties are causing these problems. As one should expect, the effects of pseudo ties on PJM’s neighbors is much larger than the effects on PJM because PJM’s neighbors lose dispatch control of resources whose power flows primarily occur over their transmission systems. The figure below illustrates the effects of pseudo ties by showing two adjacent RTOs where one unit in RTO 1’s control area is dispatched by RTO 2. This figure illustrates why just one unit pseudo tied from RTO 1 to RTO 2, can create a host of new market-to-market constraints, which are depicted by the red lines in Figure 3. These red transmission constraints are those that are substantially affected by this unit and that must now be coordinated between the RTOs as market-to-market constraints. As PJM indicated in its Filing, the 13 units that are currently pseudo-tied to PJM have resulted in 114 new market-to-market constraints on the MISO system.

**Market to Market Coordination with One Pseudo-Tied Unit**



*Note:* Each blue circle is a capacity resource dispatched by RTO 1 and each maroon circle is a capacity resource dispatched by RTO 2. The maroon resource in RTO 1 is pseudo-tied capacity resource for RTO 2.

The congestion management of these new market-to-market constraints will be less efficient than if RTO 1 could optimally dispatch this unit. Under market-to-market coordination, PJM’s dispatch of the unit will be reactive based on constraint information from MISO and

neither RTO can optimize the commitment and dispatch of their units prospectively. MISO will not know the output of the unit in advance (or even whether it will be online when MISO runs its day-ahead market). Likewise, PJM will always be responding the MISO's congestion on these constraints with a lag of as long as 20 minutes from when the congestion occurs to when the unit finishes moving.

It is important to recognize that the pseudo-tied unit's effects on RTO 1's constraints are not limited to these new market-to-market constraints. It will also affect many other constraints that do not pass the tests to be coordinated under the market-to-market procedures. These other constraints that are adversely affected by the pseudo tie are depicted in yellow in the figure. Because they are not coordinated, these constraints can result in even larger inefficiencies even though the pseudo-tied unit's flow impacts are smaller on these constraints.

Based on our analyses of the growing number of pseudo ties to PJM that have been implemented in MISO, we have identified substantial dispatch inefficiencies and operational concerns. We performed an analysis of the dispatch inefficiencies associated with the 12 resources that were required to be pseudo tied by PJM. We measured the value of the dispatch inefficiencies by calculating the economic value of the output deviation. The output deviation is the difference between the units' actual output (based on PJM's dispatch) and where MISO would have dispatched them (given their costs and ramp rates). The net inefficiency is the value of the output deviation to MISO (based on MISO's LMPs) minus the change in production costs to the unit of producing the optimal output. These inefficiencies are particularly large when congestion is affected by the pseudo-tied units so we calculated the net inefficiency for each unit divided by the total production costs of the units in hours when congestion was greater than \$5 per MWh at the units' locations. We found that the weighted-average inefficiency exceeded 26 percent. In other words, these units generally ran at levels that were much higher or much lower than optimal

during congested periods. This includes periods when the pseudo-tied units were not committed when they were clearly economic.

These inefficiencies are substantial, and are underestimated because they do not include cases where the units would not have been economically committed by MISO (i.e., they were uneconomically committed through the PJM markets) or inefficiencies caused by MISO committing and dispatching other units inefficiently because it does not know how the pseudo-tied units will be dispatched. PJM actually incurs some of the costs implications of these issues because inefficient congestion management will often increase congestion costs on MISO's market-to-market constraints for which PJM bears cost responsibility.

All these inefficiencies and other problems are caused by pseudo ties (including the problems PJM describes in its filing) relate specifically to pseudo tying as the means to deliver external capacity. Importantly, none of these problems would exist under more reasonable approaches for delivering external capacity. Therefore, the restrictions proposed by PJM in the Filing would not be necessary without the growth in pseudo ties caused by PJM's Capacity Performance rules that require all external capacity resources to be pseudo tied. Because this is the true source of all the problems caused by the pseudo ties, Potomac Economics will shortly be filing a separate complaint under Section 206 of the Federal Power Act to urge that the Commission eliminate PJM's requirement that external capacity resources be pseudo tied to the PJM system.

With respect to this proceeding, the next section describes why the new restrictions proposed by PJM are unjust and unreasonable. Therefore, we recommend that the Commission reject the PJM Filing and use the Section 206 proceeding that will be initiated by Potomac Economics to establish an effective and efficient remedy to the problems caused by pseudo-tied resources.

**B. PJM’s proposed solutions for addressing the problems caused by pseudo ties are discriminatory, unjust and unreasonable**

To address the problems that are caused by requiring external capacity resources to be pseudo tied to the PJM system, PJM has proposed a number of new restrictions on external resources wishing to pseudo tie to PJM. The six proposed new restrictions are:

1. *Electrical Distance Requirement.* A pseudo tie can be established for any external resource that either: a) has a minimum Electrical Distance impedance equal to or less than 0.065; or b) is within one station of a transmission bus that has a minimum Electrical Distance impedance equal to or less than 0.065.
2. *M2M Flowgate Test.* If a proposed pseudo tie would require PJM to add a coordinated flowgate, at least one PJM internal generator must have a flow impact of 1.5 percent, or the external resource will be excluded from the RPM Auction.
3. *Model Consistency Requirement.* PJM proposes that PJM and external Balancing Authorities must maintain network models that produce results for such flowgates that are within two percent of one another.
4. *Tagging Assurances.* A seller seeking a pseudo tie must secure written acknowledgement from the external Balancing Authority Areas that the Pseudo-Tie does not require tagging.
5. *Firm Flow Allocation.* The seller also must obtain acknowledgement that firm allocations associated with any coordinated flowgates applicable to the external generator under an agreed congestion management process will be allocated to PJM.
6. *Transmission Service Requirement.* PJM also proposes to require a seller of capacity to arrange for long-term firm point-to-point transmission service that is evaluated for deliverability from the unit-specific physical location of the resource to PJM load, and be evaluated in accordance with PJM deliverability criteria. The study must also be reviewed and approved by PJM.

In proposing these restrictions, PJM provides no evidence or explanation that would justify most of its proposed restrictions including its array of arbitrary parameters included in these restrictions. We discuss the key proposed restrictions below that we anticipate would make it impossible for any supplier in MISO that does not currently have a unit pseudo tied to PJM to meet these requirements to offer capacity in the RPM.

### *Electrical Distance Requirement*

While PJM's Electrical Distance Requirement would tend to minimize the harm from its pseudo-tie requirement by reducing participation from external resources in the RPM, it has no basis in reliability and no direct relationship to the deliverability of the resource.

It is easy to construct examples where a unit or units with higher impedance (more electrically distant) are in areas with robust transmission and are highly deliverable, and more highly deliverable than some units that are located in areas with low impedance. To bar such highly-deliverable units from exporting capacity to PJM is discriminatory and, therefore, unjust and unreasonable.

In reality, this new requirement is an attempt to minimize the harm from the pseudo-tie requirement, and to reduce the costs of expanding the EMS and other models to accommodate new pseudo ties. This alone, however, does not justify imposing inefficient barriers to capacity trading that will raise costs to PJM's customers.

### *M2M Flowgate Test*

Virtually any pseudo-tied unit will cause more than one new market-to-market constraint to be defined. As PJM noted, the 12 new pseudo-tied units have resulted in the definition of 114 new market-to-market constraints. A wave of new pseudo ties are scheduled to begin in June 2017, which we estimate will result in the definition of over 100 additional new market-to-market constraints.

Since nearly any pseudo tie will create new market-to-market constraints, the key component of this test is the flow requirement (the pseudo-tie will be rejected if no other PJM units have a flow impact of 1.5 percent). PJM has provided no reasonable justification for this requirement. Like the prior restriction, the fact that other PJM units do not have a 1.5 percent impact on the flow over the constraint bears no relationship to whether the unit is deliverable or to

the reliability implications of accepting the capacity import from that resource. Therefore, this test is also discriminatory, unjust, and unreasonable.

Additionally, it is not clear how PJM would intend to apply this test. Under the Joint Operating Agreement with MISO, the testing for new market-to-market constraints is a continuous process whenever new constraints bind. PJM will not have the information necessary to predict whether a new market-to-market constraint will be created by the new pseudo tie, and therefore what the flow effects of other PJM units may be on that constraint.

#### *Firm Flow Allocation*

PJM's requirement that the capacity supplier receive acknowledgement from the host balancing authority that Firm Flow Allocations associated with any coordinated constraints will be allocated to PJM is currently an absolute barrier to capacity imports from MISO and NYISO. There is no existing or proposed tariff provision or other authority for MISO or NYISO to grant Firm Flow Entitlements (FFE) under its market-to-market processes to PJM. FFEs, which represent the economic property rights to the transmission capability, are based on historical usage of network service customers. Additional FFEs may be created due to transmission upgrades that expand the capability of the system, but the existing FFEs belong to MISO and NYISO's customers that have paid for the embedded costs of the transmission system.

There is no economic basis for transferring these economic property rights to PJM just because a supplier chose to export capacity to PJM. Although MISO customers are required to have firm transmission to PJM, FERC has mandated that MISO charge zero for these firm rights. Therefore, it would be grossly inequitable for MISO to transfer these FFEs to PJM. If one assumes, therefore, that PJM will never be granted FFEs associated with the pseudo-tied resource, this test will serve as an absolute bar on any capacity exports from MISO or NYISO to PJM. New resources would immediately be barred from selling into PJM, while existing pseudo ties would be phased out.



### *Transmission Service Requirement*

Similarly, external suppliers currently have no feasible means of satisfying PJM's proposed transmission service requirement. Transmission providers sell transmission service on a Point of Receipt (POR) / Point of Delivery (POD) basis. PORs and PODs are generally balancing areas, not generator locations. Hence, this requirement can only be satisfied if external transmission providers change the methodology for conducting transmission studies. External capacity suppliers cannot compel such changes, so this requirement, like the prior proposed requirement, would bar most external suppliers from selling capacity into PJM.

Finally, PJM simply asserts that these tests and the parameters they will use are just and reasonable. PJM provides very evidentiary support for any of the proposed tests and specific parameters that would be applied pseudo ties to restrict inter-RTO capacity trading. Therefore, even if the Commission were inclined to approve PJM's proposals, it would be difficult or impossible to support such a decision on the basis of the information provided by PJM in this proceeding.

#### **C. PJM's proposed restrictions will result in capacity market outcomes in PJM that are unjust and unreasonable**

Beyond providing no evidence that its individual proposals are just and reasonable, our evaluation of these proposals discussed above demonstrates affirmatively that it will lead to unjust and unreasonable capacity market outcomes. To understand why the restrictions will lead to unjust and unreasonable capacity market outcomes, one must first understand that capacity transactions are necessary to achieve efficient capacity market outcomes.

When surplus capacity exists in a neighboring RTO region or entry costs are substantially lower, it is efficient to import capacity from the adjacent region. Absent capacity transactions, an RTO can set inflated capacity prices to motivate investment in new resources. Such prices would not be based on the interplay of competitive market forces and thus would be unjust and

unreasonable, if the RTO could satisfy its planning requirements by importing capacity at a much lower cost.

An evaluation of PJM's proposals clearly indicates that they will severely limit new and existing pseudo ties and, in doing so, will effectively eliminate capacity imports. While this may address some of substantial problems caused by the pseudo ties, it will lead to inefficient outcomes in the capacity market that are not just and reasonable. In essence, PJM is proposing restrictions that will lead to unjust and unreasonable capacity market outcomes in order to address unjust and unreasonable outcomes in the RTOs' energy markets caused by pseudo ties (by undermining optimal dispatch). Unfortunately, good competitive electricity market design is not an area where two wrongs make a right.

Ultimately, whether the PJM proposal is just and reasonable or not turns on an evaluation of the relative benefits and burdens associated with the proposal. *See Illinois Commerce Commission v. FERC*, 576 F.3d 470, 476 (7th Cir. 2009) (“we evaluate compliance with this unremarkable [cost causation] principle by comparing the costs assessed against a party to the burdens imposed or benefits drawn by that party.”). A tariff proposal that imposes substantial burdens on one or more parties that are not clearly outweighed by offsetting benefits to those parties is, by definition, unjust and unreasonable. In the context of the PJM pseudo tie proposal in this proceeding, this evaluation is straight-forward. The burdens that result from PJM's proposal include discriminatory restrictions on external suppliers that are fully deliverable to PJM and should have the opportunity to offer their resources into PJM's capacity market. Additionally, the unreasonable and uneconomic barriers PJM's proposals would erect to capacity imports will substantially inflate capacity prices and costs to PJM's customers. There is no benefit to accepting PJM's proposals that cannot more efficiently (and less disruptively) be achieved by alternative means. This is especially true in the context of the PJM and MISO markets, where the Commission has consistently encouraged coordination between the two markets.

Therefore, we recommend that the Commission reject PJM's proposed pseudo-tie restrictions in their entirety and, instead, address the true source of the problem by acting on our Section 206 complaint wherein we will request that the Commission eliminate PJM's current requirement that external capacity resources pseudo tie to PJM and direct the RTOs to implement an efficient alternative.

#### IV. CONCLUSION

WHEREFORE, for the foregoing reasons, Potomac Economics, Ltd. respectfully requests the Commission to grant its motion to intervene in this proceeding and accept this protest.

Further, we respectfully recommend that the Commission reject all of the proposed restrictions on pseudo ties made by PJM in this proceeding and grant the relief we will request in our Section 206 complaint to be filed shortly.

In that complaint, we will quantify in more detail the harm that has been caused in MISO by the 12 pseudo ties that the PJM Capacity Performance rules has prompted. An additional 6 resources plan to pseudo tie to PJM as of June 1, 2017, which will increase the inefficiencies and reliability issues caused by the pseudo ties. We will also identify the likely greater harm that would be caused by pseudo ties were they to be implemented within the NYISO system. Finally, we will describe in detail an efficient alternative that could be implemented by the RTOs to achieve PJM's objectives in an efficient, just and reasonable manner.

Respectfully submitted,

*/s/ David B. Patton*

David Patton  
President  
Potomac Economics, Ltd.

March 30, 2017

**CERTIFICATE OF SERVICE**

I hereby certify that I have this day e-served a copy of this document upon all parties listed on the official service list compiled by the Secretary in the above-captioned proceeding, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated this 30th day of March, 2017 in Fairfax, VA.

*/s/ David B. Patton*

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