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To: PJM Members

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Subject: Initial PJM Comments on Brattle/MISO Capacity Market Seam Report

A number of PJM Members and a few states have requested PJM comments on the Brattle analysis commissioned by MISO entitled "Preliminary Issue Description - MISO-PJM Capacity Market Seam". The preliminary analysis appears to rely on incomplete information regarding the volume of capacity imports offered into the RPM Base Residual Auctions and the capacity benefit to the PJM region of transmission import capability that is already accounted for in the PJM Capacity Benefit Margin.

Given the in-depth and rigorous analysis that Brattle performed recently for PJM, we were surprised at the premature release of their admittedly incomplete work with MISO. In its recent RPM Performance Assessment, Brattle raised no concerns regarding capacity market "seams", nor did Brattle report that any PJM stakeholders, many of whom also conduct business in MISO markets, raised concerns in interviews that were conducted as part of the assessment. PJM intends to meet with the authors to better understand their concerns and to provide additional data from PJM's analysis of capacity transfers.

PJM also would be pleased to meet with MISO and other neighboring regions to determine what assistance PJM and others can provide to facilitate import of capacity into MISO to help MISO meet its NERC required reserve margins in the face of the pending EPA rules. As MISO executives recently noted MISO expects its reserve margin to go quickly from 24 percent to the single digit range due to the EPA coal related environmental regulations.¹ As a result, MISO has raised concerns about its ability and that of neighboring regions to import and export capacity. The Brattle analysis does not provide sufficient detail regarding MISO's concerns relative to PJM capacity's ability to participate in MISO's market, so more discussion would be valuable.

Although MISO has expressed concerns with ensuring reliability within MISO, the Brattle report largely is focused on concerns related to the ability to export MISO capacity to PJM, and concludes that there are barriers limiting the exports. PJM's analysis of RPM auction results, however, indicates substantial capacity imports have offered into PJM's RPM auctions through the western transmission interface, suggesting there are no insurmountable barriers for western exports to PJM. Moreover, the Brattle report does not address the substantial differences in the PJM and MISO resource adequacy constructs. Addressing MISO's concerns about future reliability within MISO may require a more comprehensive review of the MISO resource adequacy construct, as well as consideration of what additional assistance may be obtained from neighboring regions.

¹ Illinois Commerce Commission, Joint Policy Committee Meeting. November 8, 2011. Transcript at 27

In response to requests for PJM comments, PJM makes the following initial observations regarding the analysis and conclusions:

- The level of capacity imports offered into PJM RPM auctions from the West has been significantly greater than the report indicates.
- Failing to account for the PJM Capacity Benefit Margin, which provides significant reliability and economic benefits for the PJM region, overstates the amount of available firm transmission capability between MISO and PJM.
- The capacity import offers from the West have been at a level roughly commensurate with the physical availability of the firm transmission transfer capability between PJM and MISO suggesting that transmission availability does not appear to hinder imports' willingness to offer.
- That not all capacity imports offered cleared in the RPM auctions suggests that the offered price exceeded the clearing price.
- Understating the level of capacity import offers and failing to account for CBM results in a significantly overstated estimate of the potential savings for the PJM region should further interregional coordination be effectuated.

PJM's Analysis of Imports

Brattle partially bases its conclusions on its estimates of the level of capacity transfers occurring between MISO and PJM. However, a more relevant metric for whether barriers to such transfers exist is how much capacity has been offered for sale from one region to the other. The fact that all of these offers may not have cleared is an indication that the offers were not competitive, not that there are barriers to such transfers. Importantly, when capacity imports offer into the RPM auction, they agree to obtain the necessary firm transmission service to deliver that capacity to the PJM region in the delivery year for which the auction is being run.

PJM has reviewed historic capacity import offers into PJM and the availability of firm transmission service from the west and offers the detail below to allow for a more complete assessment of the capacity transfer issue.

PJM's analysis indicates that 4,223 MW of capacity was offered into the 2013/14 Base Residual Auction from entities utilizing our Western import interface, which includes imports from the MISO region. A more comprehensive view of capacity imports in PJM's Base Residual capacity auctions is shown in Table 1 below.² This table illustrates the aggregate capacity imports offered through each of PJM's external transmission interfaces by delivery year. The data indicates that imports from the west, including MISO, range from 2,706 MW to 4,223 MW, substantially higher than that assumed in the preliminary Brattle analysis.

Table 1 - Capacity Imports Offered (MW) Into PJM Base Residual Auction by Delivery Year

Import Interface	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
West	2480.9	2480.1	2706.3	3668.6	3890	4223	3132.2
North	134.6	172.4	172.4	202.7	215.4	141.1	181.2
South	0	0	0	0	47	402	986

² The figures in Table 1 show capacity offered into the Base Residual Auction or capacity committed in a Fixed Resource Requirement Plan. .

The PJM resource adequacy construct includes a capacity benefit of transmission import capability, called the Capacity Benefit Margin. The Capacity Benefit Margin, which is 3500 MW, is the amount of assistance PJM estimates through detailed planning analysis it can receive from neighboring control areas during times of capacity emergency operations. The Capacity Benefit Margin reduces the PJM Installed Reserve Margin (IRM) by approximately 1.8 percent. Without Capacity Benefit Margin, PJM would need to increase the IRM, which would increase the amount of capacity that must be committed in the RPM capacity market to ensure reliability. The Capacity Benefit Margin capability provides a significant reliability benefit at no additional cost to PJM load as PJM can rely upon it to import energy not tied to specific generating units from neighboring regions whose peaks may not be coincident with PJM's peak in an emergency. To ensure that sufficient transmission import capability exists to support this external reliability assistance, the Firm Available Transmission Capability (ATC) that is made available to market participants for imports into PJM is reduced by this amount.³ The allocation of Capacity Benefit Margin to the western ties is approximately 2000 MW.

Thus, PJM's analysis does not support the conclusion in the preliminary Brattle analysis. The amount of capacity imports offered into PJM from the west appears to match fairly closely the amount of firm transmission capability available for such imports when accounting for CBM. The requirement to secure firm transmission service does not appear to be a significant factor. Additionally, the conclusion in the Brattle analysis of the potential to substantially reduce PJM capacity prices is significantly overstated as offers from imports already were accounted for in the RPM clearing for the years reviewed in the analysis.

Also, the effect of the recommendation to eliminate the firm transmission service requirement for capacity imports to PJM would be to allow capacity import transactions to override firm energy transactions. Some resource owners in MISO use their firm transmission service reservations to export firm energy to support long-term contracts with load within the PJM footprint. Assuming that the transmission capability would be available for capacity transfers would, in effect, trump those entities' use of the transmission service that they reserved in accordance with FERC's Open Access rules.

PJM Reliability Requirements

PJM's reliability requirements mandate that capacity imports adhere to the same or similar standards as internal resources to ensure the deliverability of those commitments. We view these requirements as necessary for operational reliability – to ensure that capacity resources can actually be delivered to load when needed. All capacity resources competing in the PJM capacity market must be treated equally. To allow otherwise may compromise reliability in the PJM region.

PJM would be pleased to discuss the details of these requirements with MISO and others.

A fundamental principle of the PJM resource adequacy construct is that capacity must be deliverable to load. Deliverability ensures that when the capacity resource produces electricity, that electricity may be transferred across the transmission grid for real time operations. Both imports from outside of PJM and generation resources within PJM must be deliverable to customers in order to be eligible to participate in the RPM capacity market. The purpose of a generation resource capacity product is to ensure that the energy can be produced and delivered when it is needed. The PJM deliverability analysis for internal

³ The amount reserved for CBM, however, can be utilized for non-firm imports. Those imports would be curtailed if PJM needed to import capacity from neighboring regions during emergency conditions to serve load in PJM.

resources and the requirement for Firm transmission service for external resource are fundamental requirements to ensure reliability is maintained and that transmission capability is not double counted.

Another fundamental principle in the PJM resource adequacy construct is that capacity resources must offer into the Day Ahead energy market. PJM centrally dispatches generation and demand resources in the PJM footprint, as well as those resources dynamically scheduled into the PJM footprint, to ensure reliability and the most efficient combination of resources are committed to operate. Requiring capacity resources to bid in the Day Ahead energy market is a fundamental aspect of PJM market and grid operations so that sufficient resources will be available for reliable day-ahead scheduling of energy and reserves. Removing this obligation from a subset of capacity resources would not only create inequities, it would also create potential real-time operational challenges and in the longer-term may compromise operational reliability.

Interregional Coordination

PJM is committed to working with MISO and other neighboring regions to strengthen interregional coordination. We want to ensure the resource adequacy constructs in the regions work together to provide the most efficient market and reliable grid operations possible. However, the resource adequacy constructs in PJM and MISO are fundamentally different. PJM's is a three year forward market in which resources offer a one year commitment to satisfy a PJM regional reserve margin and locational reliability requirements. MISO's current mechanism, the Voluntary Capacity Auction ("VCA"), is a monthly residual auction through which load serving entities can meet their short term resource adequacy needs that are not fulfilled via bilateral contracting and self-supply. The construct MISO has recently proposed to FERC is a one month forward, one year commitment. Complete optimization is not achievable with fundamentally different constructs, but certainly any ability to achieve greater efficiency between regions to enhance regional reliability should be pursued.

PJM stands ready to work with MISO and other entities to ensure resource adequacy across the Eastern Interconnection as the industry faces the daunting challenges posed by the forthcoming EPA rules affecting electric power generation. However, one of the most significant improvements that MISO could make to address its concerns related to resource adequacy is to develop a more comprehensive forward capacity market that will incent generation investments and will provide generation and demand response commitments on a longer term basis. PJM encourages MISO to consider this alternative.