

## Recommendations

Based on the complications discovered, the following specific actions should be taken by PJM and its members to reduce the probability of a similar failure in FTR markets and to develop more efficient markets that can grow and introduce new financial products creating opportunities for all PJM members to manage their risks in PJM markets.

Our recommendations are targeted at PJM’s wholesale energy markets group and do not encompass PJM’s larger grid operations functions.

### A) Advance Credit/Collateral Best Practices into the Tariff

Recommendation Theme	Complications Addressed
<b>A</b> PJM Advances best practices into the credit policy under the FERC tariff	1. The PJM Credit Policy Failed to Address Critical Risks

**A1)** Use the mark to auction values established in the more frequent auctions (*see* recommendation F) as the basis for “variation margin,”<sup>13</sup> charging as a current debt the value erosion between the purchase price and the current market value as determined by the latest auction.

**A1.1)** This will help to capture the credit risk for all FTRs, not just near term FTRs, and reduce the current volatility of margining due to infrequent auctions.<sup>14</sup>

**A2)** Retain the current 10¢/MWh minimum charge, in addition to purchase price, as a form of “original margin”<sup>15</sup> until such time as more precise measurements become available to determine original margin.

**A3)** Eliminate the FTR undiversified adder because it is uncorrelated to market risk.

**A4)** Define a default as any participant that is unable to meet a monthly variation margin call within two business days.

**A4.1)** require that the default be declared promptly and without negotiation.

<sup>13</sup> “Variation Margin” is to address periodic changes in forward value of the open transaction.

<sup>14</sup> N.B.: Having more frequent MTA points should reduce upfront collateral. This is because collateral needs to protect against risk until the next mark, not the ultimate settlement. In addition to collecting margin, PJM may then consider paying out variation margin to profitable portfolios (called “Pay and Collect”). These facts should mitigate initial stakeholder concerns about costs of more frequent collateral assessment.

<sup>15</sup> “Original Margin” is to address the forward value risk of the transaction at the time executed.

**B) Clarify the Role of PJM as Manager of Risk in Financial Markets**

## Recommendation Theme

## Complications Addressed

**B**

PJM bolsters how aggressively it views its role as manager of risk

2. PJM did not Take Robust Policy Actions Following Precedent Experience  
 5. PJM Surrendered an Early Opportunity to Stop or Restrain GreenHat

It is critical that the duties of PJM as a manager of the risks in its financial markets be transparent to the market participants. PJM is akin to a self-regulatory organization when it comes to market administration and oversight. FERC and PJM's stakeholders should sufficiently empower PJM, and PJM should acknowledge and take ownership of its important duties to provide a fair and orderly market that also protects market participants and other PJM members from risks that they are otherwise unable to manage for themselves. *At the same time, we find that PJM should be more assertive in pushing for action needed regarding any critical changes to credit policies, emergency discretion, and the like.*

We recognize that there are currently many hurdles, and we recommend that PJM's use of the stakeholder process and its relationship with FERC be reviewed to optimize financial market administration.

We believe that there are many distinct differences in the management of financial markets versus the management of a physical power grid. If PJM's financial markets can be more appropriately self-regulated, our recommendations herein stand to create more efficient markets that can grow and introduce new financial products creating opportunities for all PJM members to manage risk. Therefore we make these actionable recommendations:

**B1)** PJM should revisit its existing stakeholder process to better facilitate member-to-PJM directions on advances in financial market policies and procedures.

**B1.1)** Seek an equitable and efficient process centered on the relevant *expertise* that each PJM member may bring.

**B1.2)** Financial market member committees: voting attendees must be qualified member personnel, such as credit professionals, traders, or finance professionals, as appropriate for the committee duties.

**B1.3)** The number of committees involved in rule setting for financial markets should be strictly minimized to streamline decision making and assure clear accountability.

**B2)** PJM should work with FERC to establish appropriate flexibility in policies and rulemaking concerning financial markets. Following are a few specifics we see at this time:

**B2.1)** Amend tariff rules to make a parallel rule for FTR contracts, and other markets, to the provisions in Attachment Q for Peak Market Activity Transactions.

**B2.2)** Amend rules to include within the definition of Material Adverse Change in Attachment Q an inability to meet any PJM margin call within two business days.

**B2.3)** Provide rules that give PJM discretion to deal with unanticipated market emergency events.

**B2.3.1)** The financial markets Risk Oversight Committee (*see E* below), comprising independent directors, can be the check on any concern of inappropriate use of such authority.

**B3)** As benchmark for progress with B1) and B2) - Examine the specifics and the cost/benefits of outsourcing to a credible outside provider the administration of all or part of the FTR market.

**C) Build a Customer Awareness Beyond Market Procedures & Rules**

Recommendation Theme	Complications Addressed
<b>C</b> PJM builds a new keen awareness beyond just company names and market operational procedures	3. PJM Failed to Perform Adequate “Know Your Customer” Procedures

PJM should put in place certain sensible internal practices to increase customer awareness and bring more clarity around criteria used to direct its discretionary power.

- C1)** Perform outsourced background checks for any member applicant, and should the applicant not be a public company, for the three most senior officers.
- C2)** Perform due diligence by confirming that an applicant for membership actually employs the systems and processes for risk management as represented.
- C3)** Provide explicit power for the rejection of a membership application should standards of good background and regulatory history not be met.
  - C3.1)** Create an internal appeal mechanism in order to address any claims of any undue discrimination swiftly without unnecessarily involving FERC.
- C4)** Update the financial qualifications of participant companies at least annually and clarify PJM’s rights to act on a member’s failure to meet those requirements.

**D) Implement Technical Practices for Participant Risk Management**

Recommendation Theme	Complications Addressed
<b>D</b> PJM implements technical practices to protect all members from a bad actor in FTR markets	4. PJM Management Failed to Establish Robust Participant Risk Management Tools and Procedures

As demonstrated in the “Complications” section, part 4, a more robust participant risk management capability is needed to catch problems before they become crises. The following actionable recommendations begin to build such capability inside PJM and possibly establish confirming information from the IMM:

- D1)** Clarify with the IMM any PJM expectations regarding participant risk management of (some) participant behaviors and reporting such with PJM.
  - D1.1)** We understand that the IMM cannot have all information needed to effectively surveil (eg. collateral balances and member good standing status information that only PJM holds).
- D2)** Establish position limits for FTRs:
  - D2.1)** Based upon company capitalization.
  - D2.2)** Based upon position tenor (tighter limits towards the back).
- D3)** Create internal participant risk management reports that are reliably generated on a periodic basis according to the frequency of opportunities for participants to change portfolio positions.

**D3.1)** Among other measures, include statistical studies of participant exposure, tenor, collateral, MTA, and relationships between these measures.

**E) Bring On-board and Develop New Expertise in Risk Management**

Recommendation Theme	Complications Addressed
<p><b>E</b> PJM adds new expertise sorely needed for decision making in financial markets</p>	<p>6. PJM's Management Mistakenly Envisaged Greater Value Than Warranted in a GreenHat Pledge Agreement</p> <p>7. PJM Incorrectly Believed That the GreenHat Situation Would Not Worsen</p> <p>8. Qualifications and Training Were Not Adequate</p>

We understand PJM has a long planning process that involves developing the next calendar year's budget (including assumptions necessary to implement additions for staffing changes) late in the second quarter of the preceding year. However, in the case of remedying the management and staffing needs discussed below, PJM will need to accelerate that process.

**E1)** Establish the position of Chief Risk Officer (CRO) over financial markets. The CRO oversees a broad risk oversight function, makes recommendations on appropriate risk staffing and technology support, and reports directly to the Board, through the ROC (below), with a dotted line to the CEO for certain administrative matters, excluding work priorities, compensation and performance reviews.

**E2)** Create an independent committee of the Board: the financial markets "Risk Oversight Committee" (ROC), which will oversee the CRO and the risk management functions of the IMG (see E3 below), as well as many risk-based decisions that demand action (e.g., capital allocation, control violations, member alerts, new business, etc.). The ROC will also be responsible for the CRO's compensation and performance reviews.

The ROC may authorize the IMG (below) to perform various duties under the Chairmanship of the CRO.

**E3)** Form a special Independent Multi-discipline Group of PJM managers (IMG) to address risk-related challenges on a day-to-day basis. This group of managers is authorized by the ROC, and its recommendations are communicated to the ROC through the CRO.

**E3.1)** Chaired by CRO.

**E3.2)** IMG members may include CFO, Credit, Market Operations Leaders, Legal, Regulatory and other officers as agreed by the ROC.

**E4)** Implement training for risk management -

**E4.1)** Financial markets management learns to plan and practice responding to stress scenarios. This can ensure swift and decisive attention to red flags and appropriate responses. The grid operations side of PJM may likely hold good analogues, and game-play training at some energy companies provides additional useful examples.

**E4.2)** Consider risk management certifications from industry service groups.

**E5)** Stay up-to-date with advances in peer practices, professional development.

**E5.1)** Participate in an industry peer group of risk management professionals.

**F) Increase the Frequency of Long-term Auctions**

Recommendation Theme	Complications Addressed
<b>F</b> PJM Enriches forward FTR market information so that PJM & market may better assess risks & rewards	9. PJM Market Design Flaws Gave GreenHat Room to Develop

We discussed in numerous places the need for more frequent MTA information in order to reduce collateral requirements and to better manage risk and to offer more opportunity for market participants to do the same.

**F1)** Include Long Term FTRs in monthly or at least bi-monthly auctions.

**F2)** Convene a committee of FTR traders with PJM Credit & Operations to explore new approaches to make more frequent long-term auctions both more efficient to run and as liquid as possible.<sup>16</sup>

**F3)** With expert help, conduct a general review of the FTR market and other PJM markets, to evaluate the risks and rewards of potential structural reforms.

**G) Make Critical Organizational Changes**

Recommendation Theme	Complications Addressed
<b>G</b> PJM makes organizational changes to open the door to a new outlook for robust RTO financial markets	10. An Unwarranted Air of Confidence Facilitated GreenHat's Ability to Grow

One fallout of all the previous recommendations is that the business requirements of the financial markets portion of PJM is quite different from that of the rest of PJM. PJM management has as well confirmed this view. Mind-sets and skill-sets are different, and are very challenging to cultivate without aligned organizational objectives. We recommend:

**G1)** Identify the critical departmental components to the PJM financial markets business, from running auctions to managing risk, and bring them together in a well aligned organization.

**G1.1)** Avoid barriers between operations and finance within this Financial Markets organization.

**G1.2)** Ensure top management has appropriate financial market skills.

Additionally, during our interviews and our study of actions taken by PJM, we found that PJM missed opportunities that would have improved the situation if certain habits were imbued in PJM staff. We recommend:

**G2)** Create a culture and environment that encourages staff to challenge internal assertions, and test their own assumptions.

**G2.1)** Create an expectation for a “bias for action” when a plan seems unfounded or an opportunity goes unnoticed by others.

**G2.3)** Increase documentation of communications among professionals and in meetings of groups like the Executive Team and others.

<sup>16</sup> Several FTR participants expressed worthy ideas regarding such in interviews with us.