



VIA ELECTRONIC DELIVERY

September 15, 2023

The PJM Board of Managers  
c/o Mark Takahashi, Chairman  
PJM Interconnection, L.L.C.  
2750 Monroe Boulevard  
Audubon, Pennsylvania 19403

**Re: Critical Issue Fast Path – Resource Adequacy Proposals**

Dear Chairman Takahashi and PJM Board of Managers:

East Kentucky Power Cooperative (EKPC) appreciates the PJM Board undertaking the Critical issues Fast Path stakeholder process to develop important reforms for the PJM resource adequacy construct to ensure that the PJM region continues to remain reliable into the future as the industry and other factors affecting the ability to serve load evolve and create uncertainty. The importance of the issues the region is tackling is apparent from the number of proposals stakeholders developed and discussed with the PJM Board at the Stage 4 meeting. EKPC echoes the concerns raised by various stakeholders that the fast tracking of the proposal development and stakeholder discussion carries with it a measure of risk of not fully considering ideas or dismissing ideas that may appear too different from the status quo.

Although we may be able to take more time to consider and adopt certain important reforms, other reforms are needed more immediately. EKPC urges both – adoption of reforms that appear to have significant support and are needed in the short term, as well as undertaking additional stakeholder deliberations to consider important longer term, more complex reform concepts. EKPC cautions the PJM Board against being too hasty to dismiss outright ideas that depart from the status quo should such decision be driven by concerns of complexity or ease of implementation. EKPC urges the Board to adopt the reforms needed for the immediate, near term and direct PJM staff to continue stakeholder discussions on the design concepts that utilize an hourly approach to clearing the capacity market.

**Two straight-forward reforms are need for the immediate near term:**

- (1) “right-size” the risk in the capacity market design by basing the penalty and stop loss provisions on the auction clearing prices resources receive by virtue of taking on a capacity commitment; and
- (2) exercise PJM’s existing authority to dispatch resources consistent with their physical and fuel constraints, especially during times of system stress, to ensure that the region obtains the full reliability benefit of committed resources.

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Although no single proposal achieved a super-majority of stakeholder support, the voting results do reveal an important theme: a majority of stakeholders desire to “right-size” market design risk by completely removing non-performance penalties or by right-sizing non-performance penalties by basing them on the clearing prices received by committed resources. The market disruption, bankruptcies and litigation that ensued from the Winter Storm Elliott experience highlight the concern. Should the region be unfortunate to experience another significant event, and resources experience risks they alone cannot mitigate (e.g., long lead resources not dispatched, gas industry supply or transportation disruption), resulting in the assessment of extreme penalties again, it is likely more market disruption, bankruptcies, premature retirements and litigation will ensue. This, of course, is counter to the reliability objective of the capacity market.

Additionally, committed capacity resources must be able to manage and mitigate the risks they take on by assuming a capacity commitment. The Winter Storm Elliott experience clearly highlights there are gas industry risks that individual generators cannot economically mitigate as well as PJM operational and dispatch decisions (e.g., long lead time resources and gas-fired resources that must make timely gas transportation nominations or manage ratable take requirements) individual resources cannot easily avoid.

Under normal conditions, market signals drive appropriate operational behaviors, but under extreme system stress conditions, more may be needed. As the Regional Coordinator and Balancing Authority, PJM has the authority and responsibility to dispatch resources to ensure reliability utilizing its broad situational awareness of transmission system constraints, knowledge of physical and fuel constraints of generation resources, and information obtained through its efforts to coordinate with natural gas pipelines. PJM commits capacity resources understanding their physical and fuel limitations, so PJM should be expected, especially during times of system stress, to make operational decisions and dispatch resources consistent with those limitations. Individual resources should not be forced to bear unreasonable financial risk of self-scheduling, nor should PJM operators have to field numerous one-off self-schedule requests from resources when their attention should be focused on managing through challenging operational situations. EKPC’s own experience during Winter Storm Elliott demonstrates that requests to self-schedule required PJM Reliability Engineers to perform analysis before the generators received permission to operate. This process distracted PJM operations staff and delayed EKPC’s unit operation, exposing EKPC load to elevated market prices that could not be hedged by EKPC’s generation.

Capacity Resources are incented to respond to market signals – energy and reserve market price signals. Prices signal need, and resources seek the market revenue. Moreover, resources committed before Real-time market operations are exposed to Real-time prices should they fail to operate and need to replace their commitment. Thus, both market price signals and commitment and dispatch decisions are required to incent resource performance. Punitive penalties are not needed and have been demonstrated to be counter-productive to the reliability objective. Even in ISO New England where performance penalties were first adopted, the region relies on out-of-market procurement of back-up oil to ensure gas-fired resources may navigate anticipated gas supply and transportation challenges. It is important that the PJM region acknowledge what risks individual resources can assume and mitigate, and which risks PJM as the Reliability Coordinator and Balancing Authority is in a better position to make decisions to minimize the risk of compromised regional reliability.

**Design concepts adopting an hourly commitment approach are beneficial for the long-term and merit additional stakeholder discussion.**

We provide in the Attachment to this letter a high-level summary of the hourly market clearing and commitment approach proposal to allay any concerns that the PJM Board may have about departing from the status quo. Although a departure from the status quo capacity market clearing approach, the approach EKPC and IMM both recommended through the CIPF discussions is based broadly on a modified, yet simpler version of the clearing engine PJM already uses for day-ahead market. PJM has the capability. PJM also has the data to implement the hourly commitment approach. The approach would utilize the analysis and data PJM proposes to collect to establish ELCC-based accreditation values and to establish the regional resource adequacy requirement. The benefit of an hourly approach is that PJM would commit resources to serve the firm energy needs of the system, which is what the reliability requirement seeks to accomplish. Moreover, this approach is transparent. There is no black box to the accreditation value determined for individual resources. And, importantly, this approach ensures that resources are committed to do only that which they are capable of doing, e.g., no expectation of solar output at night.

EKPC appreciates the PJM Board's efforts to evaluate the myriad of proposals stakeholder invested significant time developing and consider what is required to ensure that the PJM region continues to remain reliable through all the changes anticipated to challenge the grid through the future. It was clear by the Board members engagement during the CIPF process, and especially at the Stage 4 meeting, that the Board is seeking to ensure that it makes the best decisions for the near and long-term to ensure the region is reliable and the market produces efficient results consistent with PJM's mission.

Regards,

*David Crews*

David Crews

Senior Vice President, Power Supply

## **Attachment: Summary of Hourly Commitment Approach**

Resource adequacy is a function of actual hourly load and resource availability. The principal risk that PJM must address is that the as-modeled conditions used to set the requirements and procure resources differ materially from the realized conditions. The system is at risk of shortfall when a set of low probability high impact events converge (e.g., extreme adverse weather conditions, fuel delivery failures, transmission network failures, mechanical failures, PJM load forecast error, PJM commitment and dispatch decisions). To address these risks, the IMM and EKPC adopt PJM's approach to hourly risk modeling, including weather, ambient air reductions, production profiles, and forced outages. Unavailability due to weather correlated outages, renewable production shortfalls, or fuel delivery interruptions are reflected in the hourly data performance history. Any common mode failures would be reflected in the hourly data.

Effectively, EKPC, the IMM, and PJM propose the same preferred approach to modeling the region's reliability risks. Where EKPC differs from PJM, but are aligned with the IMM, is not in the hourly data sets developed and modeled to characterize risk, but in how that data is subsequently used to establish how much capacity each resource can sell (accreditation), and how the requirements are set and subsequently cleared. Implementation of the EKPC or IMM proposal does not require PJM to develop or model any data that it is not already developing and modeling for the purpose of implementing its own proposal.

In a similar way, the proposed market clearing mechanism is straightforward and can be implemented without building complex new tools. The market clearing mechanism we propose (and the IMM similarly has proposed) is simpler to execute than PJM's marginal accreditation model and does not suffer from the deficiencies associated with assuming the reliability contributions of resources that have not yet offered or cleared in the market.

The calculated resource adequacy requirements build on PJM's detailed load forecast and equal the total supply needed to meet firm energy load in each hour of the capacity delivery year reliably. The reliability target will be based on Expected Unserved Energy, or EUE (magnitude) and Loss of Load Expectation, or LOLE (frequency). While EKPC proposed two products, Base Capacity (BC) and Emergency Capacity (EC), it is not necessary to structure the market with two products under this clearing approach. Like the IMM's proposal, EKPC's clearing approach would work with one product. Requirements are solved for in the clearing process and are a function of the load forecast and the characteristics of the offered resources (load and resource availability are correlated with weather conditions) subject to an annual reliability constraint. Simply, one could set up the model to clear the expected load (the mean of the hourly load distribution from the PJM load forecast) plus reserve (an amount above the expected load needed to satisfy the LOLE/EUE clearing constraints in all hours given the characteristics of the bid resources).

Under this approach, the capacity market simultaneously clears the lowest cost set of capacity resources that meet the requirements in all hours and locations for the delivery year. The market schedules capacity against the resource adequacy requirement expressed as hourly firm energy requirements subject to annual reliability targets to ensure that there is sufficient energy in each hour. A resource needs a schedule in only one hour to clear a capacity commitment for the year; the highest cost

resource cleared in any hour, sets the annual price for the market. EKPC has developed a bench test version of the market clearing model that successfully clears the requirements and resources representative of the fleet in PJM using load forecast distributions developed by PJM and assumed weather correlated outage and production data. The model is able to clear all resource types including storage.

Beneficially, this approach allows resource owners full transparency into the maximum amount of capacity they can sell based on the historical availability of their resources. The market model also makes no assumptions about what resources will be offered. Rather, the market takes as input the actual offers and then clears a set of resources that satisfy the reliability requirements explicitly.