



Reliability Technical Conference Comments from PJM Interconnection, L.L.C.

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Summary

On behalf of PJM Interconnection, L.L.C. ("PJM"), I, Christopher Pilon, Senior Director of Operations Planning, appreciate the opportunity to provide this written statement for the Commission's October 21, 2026 reliability technical conference.

PJM welcomes the opportunity to participate in a public discussion about the state of reliability in our changing energy landscape and, in particular, the operational challenges involved with integrating large loads and addressing evolving system dynamics.

The pace of load growth and emergence and adoption of technologies such as inverter-based resources are presenting novel challenges. PJM is working with stakeholders to respond to those reliability challenges. Both state and federal action will be critical to continuing to ensure system reliability.

My statement addresses four reliability priorities: the detailed and continuously updated information PJM needs from Large Load operators; PJM's response to the rapid interconnection of Large Loads and the growing penetration of inverter-based resources; the physical and cybersecurity risks associated with concentrated Large Loads; and the fuel-security and infrastructure implications of behind-the-meter and front-of-the-meter gas-fired generation that relies on shared natural gas pipelines.

Going forward, PJM supports a reliability framework that: requires timely, accurate, and continuously updated technical information from Large Load operators; establishes enforceable voltage and frequency ride-through requirements for both new and existing Large Loads; ensures that interconnection and energization decisions reflect the time required to develop sufficient generation and transmission; and advances coordinated electric-gas planning, cybersecurity protections, and accountability for facility performance.

Large Loads are seeking interconnection in PJM faster than the generation and transmission needed to serve them can be placed in service. A data center may seek interconnection within two years, while new generation can take three years or more to come online and major transmission facilities can take seven years or more. This timing mismatch creates a reliability risk.

Large Loads also exhibit very high and relatively constant power utilization, unlike traditional residential, industrial, and commercial load, which generally declines overnight, on weekends, and during the spring and fall shoulder seasons. Large Loads therefore raise the system's base demand across nearly all hours, producing not only higher summer and winter peaks but also higher demand during spring, fall, and other historically off-peak periods. This change makes it more difficult to maintain reliability during planned transmission and generation outages needed for construction, equipment overhauls, and major maintenance. Given their potential effect on system reliability, Large Loads must provide sufficient operational flexibility or be subject to load reductions until the generation and transmission needed to serve them have been studied and placed in service. Without those safeguards, reliability for existing customers may be placed at risk. The urgency is illustrated by PJM's increasing need to seek Department of Energy authorization under section 202(c) of the Federal Power Act to operate generation beyond otherwise applicable limits and potentially use backup generation at data centers and other sites during anticipated emergencies, including over the October 12–14, 2026 period. PJM historically has not needed to seek such relief under comparable temperatures and seasonal conditions.

RTOs Need Detailed Site Information About Large Loads Seeking to Interconnect

Because Large Loads present with various configurations that can affect reliable electric service, it is essential that RTOs receive detailed site information about Large Loads seeking to interconnect, including the specific system conditions that may trigger a load to switch ‘off grid power’ and move to its UPS or backup generator. Such information is necessary for PJM to understand and validate how the Large Load facilities will respond to system events before Large Loads interconnect with the grid, as opposed to having an unexpected response to system conditions in real time operations.

Ongoing participation of the Large Loads in furnishing detailed information to appropriate entities and either directly or ultimately to the RTOs is critical. They must provide—and be held accountable for providing—accurate information on an ongoing basis and must ensure any changes they make are appropriately coordinated with the entities they affect (e.g., Transmission Owners, Transmission Operators, Balancing Authorities, etc.).

Given wholesale and transmission system impacts, PJM is exploring pathways to ensure Large Loads are required to participate in commissioning tests, periodic validation of models and settings, prompt notice of material facility changes, event-data retention, and post-event performance reporting. Where a facility’s actual performance differs from its submitted models or approved settings, the applicable framework should provide for corrective action, operating restrictions, or other consequences proportionate to the reliability risk.

Large Load operators should be subject to consistent performance requirements and standards. PJM has already experienced multiple instances in which Large Loads unexpectedly disconnected from the grid. In July 2024, approximately 1,500 MW of load transferred off grid in response to a system fault in Northern Virginia. Two additional major events have since occurred, including the sudden transfer of approximately 3,900 MW of load off grid on July 22, 2026. PJM has also observed multiple events outside its footprint. These events demonstrate the need to implement voltage ride-through requirements without delay.

As part of its response to the June 18, 2026 Large Load show-cause order, PJM is developing voltage and frequency ride-through requirements informed by the July 22, 2026 event. Those requirements could have mitigated the event if they had applied to the affected facilities. To reduce the risk of recurrence, the requirements should apply, as legally and technically appropriate, to both new and existing Large Loads. The expected magnitude and reliability consequences of future events will increase as concentrated Large Loads continue to grow, making timely action essential.

The modeling and adherence to voltage/frequency ride through requirements also allows RTOs to direct reinforcements to the system that will support the new Large Loads while maintaining the current high level of reliability for existing customers.

PJM has actively participated in the NERC efforts to draft standards pertaining to Large Computational Loads, which will also assist in these efforts and are critical to have in place as soon as possible.

How PJM Is Responding to the Rapid Interconnection of Large Loads and Technologies like Inverter Based Resources

There are essential reliability attributes that all generators produce at varying levels that are critical to maintaining grid reliability. PJM is considering system reliability needs via markets products, and the development of enhanced Essential Reliability Services,¹ which are the building blocks of grid reliability.

PJM and other regions will need to continue to track and value Essential Reliability Services, potentially implementing market solutions. One example is PJM's Primary Frequency Response review, as the September 10, 2026 PJM Operating Committee presentation shows.²

In addition, PJM must obtain sufficient reserves via markets to address Essential Reliability Services. In this regard, PJM's Reserve Certainty Senior Task Force ("RCSTF") effort will help achieve sufficient reserves to address uncertainty and ramping. The RCSTF proposal was presented at PJM's September 24, 2026 Markets and Reliability Committee meeting.³ Stakeholders will vote on the proposal at the November Members Committee meeting, and, assuming a passing vote, PJM expects to file the proposal at the Commission in December.

Physical And Cybersecurity Risks Posed by Large Load Integration

The physical and cybersecurity risks presented by Large Load vary.

The principal physical and cybersecurity risks associated with Large Loads arise from the amount of demand concentrated at individual facilities and within geographic areas. Erratic operation, simultaneous disconnection, or malicious manipulation of multiple facilities could produce sudden load changes that affect grid frequency, voltage, and system stability.

The disruptive Large Load events observed to date appear to have been inadvertent, including the July 22 event involving the sudden disconnection of nearly 3.9 GW in Virginia. A malicious actor, however, could seek access to a data center's workload-management systems, manipulate computing activity, and create abrupt load increases or losses. Coordinated manipulation across multiple facilities could activate protection systems and compound the system effects observed during an inadvertent event. These scenarios support development of security controls, incident-reporting obligations, operational coordination protocols, and recovery requirements proportionate to the grid consequences of concentrated computational load.

¹ As described by NERC, Essential Reliability Services include frequency support, voltage support, and ramping capability on the Bulk Electric System. See NERC Essential Reliability Services Abstract Report, available at <https://www.nerc.com/globalassets/programs/rapa/ra/ers-abstract-report-final.pdf>.

² The September 10, 2026 Operating Committee presentation addressing the Primary Frequency Response Review is available at <https://www.pjm.com/-/media/DotCom/committees-groups/committees/oc/2026/20260910/20260910-item-06---primary-frequency-response-update---presentation.pdf>.

³ Reserve Certainty Senior Task Force Overview and Proposal, available at <https://www.pjm.com/-/media/DotCom/committees-groups/committees/mrc/2026/20260924/20260924-item-02a---1-pjm-rcstf-proposal-summary---presentation.pdf>.

Because large computational loads can materially affect real-time grid operations, NERC reliability standards should address the operational and cybersecurity obligations appropriate to those facilities. The standards should clarify applicability, performance expectations, coordination with Reliability Coordinators and Balancing Authorities, event reporting, model validation, and cybersecurity protections commensurate with the facilities' potential effect on the Bulk Power System.

How PJM Is Addressing Fuel Issues and Issues Posed by Behind-the-Meter and Front-of-the-Meter Gas-Fired Generation Resources on the Same Natural Gas Pipelines

PJM actively considers the implications of fuel availability for gas-fired generation to meet the additional demands of interconnecting Large Loads.

Gas-fired generation is an important component of PJM's resource mix. PJM currently has approximately 90 GW of installed gas-fired generation, of which 80% is served directly by interstate pipelines and 20% is served by local distribution companies. Approximately 29% of gas-fired resources have dual-fuel capability, and 51% have firm gas-delivery arrangements.

To minimize reliability threats posed by unavailability of fuel, PJM's Gas Electric Coordination Team works closely with generation owners and pipelines. PJM's team coordinates with generation owners and conducts surveys to ensure adequate fuel is available and secured going into peak periods. In addition, when PJM declares a maximum generation emergency, there is a focus on fuel inventory for different generation resources, including instructions to generation resources to conserve available fuel for critical periods if there is a shortage.

Recent reports indicate that as much as 30 GW of gas-fired generation may be developed to serve data-center load over the next four to five years. Whether that generation is co-located behind the meter or interconnected in front of the meter, substantial new pipeline capacity and increased gas production may be needed in some areas to support the generation while maintaining reliable service for existing customers. The need is particularly significant if the generation is expected to operate throughout the year to serve data centers with high capacity factors. Meeting rapid energization targets will require early coordination with the natural gas industry and realistic assumptions about siting, permitting, construction schedules, materials, labor, and fuel-delivery capability. These considerations reinforce the need for close gas-electric coordination.

Consideration should also be given to account for common-mode fuel risks. Multiple behind-the-meter and front-of-the-meter generators serving Large Loads may depend on the same pipeline, compressor station, local distribution system, or upstream supply path. PJM and the gas industry therefore need sufficient information to identify correlated contingencies, evaluate deliverability during peak electric and gas conditions, and determine whether firm transportation, dual-fuel capability, on-site fuel, demand flexibility, or other mitigation is needed.

Data centers with capacity factors of 80–90% increase the system's base demand and therefore the need for resources capable of serving sustained load. PJM also must retain a portfolio able to meet seasonal and weather-driven demand that varies by hour and time of year. PJM's Commission-accepted Effective Load Carrying Capability analysis ("ELCC") supports that objective by assessing each resource type's contribution to resource adequacy during the hours when the system is most constrained.

* * *

PJM respectfully requests that the Commission use this technical conference to advance a coordinated reliability framework for Large Loads—one that aligns energization with available infrastructure, requires accurate models and dependable facility performance, addresses correlated cyber and fuel risks, and preserves reliable service for existing customers as the system evolves.