



**Statement of Christopher Pilon, Director, Operations Planning
on Behalf of PJM Interconnection, L.L.C.**

2021 Annual Reliability Technical Conference
Docket No. AD21-11-000

Sept. 30, 2021

For Public Use

Introduction

PJM is pleased to provide these comments for Commission consideration as part of its Sept. 30, 2021 Annual Reliability Technical Conference.

My name is Christopher Pulong. I currently serve as the Director of Planning Operations at PJM, where my primary responsibilities include coordination of all transmission and generation outages, load forecasting, renewable (wind and solar) generation forecasting, gas-electric coordination, black start procurement, seasonal and near term reliability analysis. I hold a Bachelor of Science degree in Electrical Engineering from Lehigh University and a Master of Business Administration from Villanova University.

There are several significant factors that are challenging grid operations today. These include the changing resource mix from traditional resources to variable/inverter-based resources, the emergence of new grid technologies, the ever-increasing threats of a cyber-attack, and the increasing frequency of extreme weather. However, the threats to grid reliability of the past also remain. Therefore, while we must continue with existing Planning and Operating practices, it is also of paramount importance that we expand these activities to consider the threats, impacts, and consequences that this grid transformation introduces.

PJM has undertaken a number of initiatives to ensure that we remain both reliable and resilient as we prepare for, and navigate, this changing landscape. As an example, the introduction of our Capacity Performance product in 2015 helps us ensure that all generating resources, regardless of fuel type, are incentivized and available to perform under the most stressed systems conditions. Action on reserve pricing by the Commission will help provide further incentives for generators to remain flexible by better valuing the reserves they provide to the system to account for unexpected changes in generation and load. We have also expanded our Regional Transmission Expansion Plan (RTEP) analysis to include analysis of more probabilistic equipment failure scenarios to identify areas of risk and potential resilience enhancements to the grid. In addition to these items, we continue to perform an annual Fuel Security analysis to identify any risks to grid reliability that can result from prolonged extreme weather, coupled with fuel unavailability.

In light of the increased penetration of inverter-based resources, PJM has undertaken several initiatives. We are currently performing reliability analysis for multiple large scale off-shore projects to identify any grid enhancements needed. We are also evaluating the impacts of integrating inverter-based resources into the PJM grid with respect to their ability to provide all of the NERC-defined essential reliability services necessary to ensure a reliable system, as traditional generation resources are replaced.¹ More specifically, reliability challenges such as decreased system inertia and frequency response, ramping and balancing control, low short-circuit capability, reduced dynamic and voltage stability, a reduction in black start generation, system restoration impacts, and fuel assurance challenges need to remain a focus for the Commission, NERC, and the entire industry.

The Commission should recognize and support the efforts and the work being done through the NERC community via the NERC Reliability and Security Technical Committee (RSTC), the Energy Reliability Assessment Task Force

¹ https://www.nerc.com/comm/Other/essntlrbltysrvscstskfrDL/ERSWG_Sufficiency_Guideline_Report.pdf

(ERATF), the Inverter Based Resources Performance Working Group (IBRPWG), and other groups. The whitepapers, bulletins, guidelines, workshops, and standards that are developed through these efforts are extremely useful tools in helping to identify the appropriate reliability and resilience metrics for measuring the risks to the grid, the needed changes to help mitigate these risks, and the strategies and processes needed to effectively manage the consequences to the grid.

The Commission should also work with the energy industry to develop specific analysis that should be performed to assess the risks of extreme weather, climate change, the changing fuel mix, and growing threats from cyber/physical attack. This work should also include key metrics and requirements for system performance that would drive necessary grid enhancements, the protocols for expediting the construction of identified projects, and improvements to cost allocation when these projects provide value to customers across ISO/RTO seams. For instance, in its Comments in the Commission's original resilience proceeding in Docket No. AD18-7-000, PJM requested that the Commission and NERC set industry standards related to grid resilience to withstand extreme events.² Today's NERC standard requires transmission providers to undertake analyses, but does not provide a clear directive as to next steps to make the results of those analyses actionable. For this reason, in the original resilience proceeding in Docket No. AD18-7-000, PJM outlined several specific proposals regarding planning, developing market mechanisms, coordination with interdependent systems, and restoration activities, including, among other things:

- Market reforms and related compensation mechanisms to address resilience concerns and advance operational characteristics that support reliability and resilience, including (i) improved shortage pricing and Operating Reserve market rules, (ii) improved black start requirements, (iii) improved energy price formation that properly values resources based upon their reliability and resilience attributes, and (iv) integration of DER, storage, and other emerging technologies;³
- Tariff amendments to permit non-market operations during emergencies, extended periods of degraded operations, or unanticipated restoration scenarios, including provisions for cost-based compensation when the markets are not operational or when a wholesale supplier is directed to take certain emergency actions by PJM for which there is not an existing compensation mechanism;⁴
- Improved coordination and communication requirements between RTOs and Commission-jurisdictional natural gas pipelines to address resilience as it relates to natural gas-fired generation located in RTO footprints;⁵
- Commission support for communication and coordination with both interstate pipelines and the local distribution companies ("LDCs") that supply wholesale generation, including imposing communication and coordination obligations on natural gas suppliers that supply jurisdictional wholesale generation;⁶

² See generally *Grid Resilience in Regional Transmission Organizations and Independent System Operators*, Comments and Responses of PJM Interconnection, L.L.C., Docket No. AD18-7-000 (Mar. 9, 2018).

³ *Id.* at 6.

⁴ *Id.*

⁵ *Id.* at 6-7.

⁶ *Id.* at 8.

- Requiring dual fuel capability at all black start units and coordination across the nation of a consistent means to determine critical restoration units and development of criteria to assure dual fuel capability to such units
- Improved coordination with other critical interdependent infrastructure systems (e.g., telecommunications, water utilities) that (i) could be impacted through extreme events, or (ii) are themselves vulnerabilities that could contribute to, or amplify the impact of, such events, and similar coordination between the Commission and the Federal Communications Commission and the Department of Homeland Security to provide additional regulatory support behind such efforts.⁷

PJM also suggests that the Commission consider additional extreme weather event-related issues, including, by way of example:

- Whether additional Commission policies, NERC standards, and RTO/ISO rules should be established to enhance the focus on winterization of resources in implementation of the recently-approved NERC cold weather reliability standards,⁸ ensure adequate communication on winterization data between RTOs and the Regional Entities, and to address additional areas of resilience of both the grid and generating units
- Whether enhanced “circuit breakers” should be established in power and gas markets to protect consumers from extreme prices during periods of extended scarcity, market dysfunction, or compromised system operation
- Whether further coordination with transmission and distribution providers, fuel suppliers, and generation owners is warranted to lower the risk that supply of fuel and other critical inputs to the production of electricity is disrupted during stress conditions

Reliability and security of the bulk-power grid is PJM’s first priority and the driving purpose of the organization. PJM appreciates that the Commission is providing an opportunity for grid operators and interested stakeholders to address the need for improvements to ensure that the grid is prepared to withstand the extreme weather events the Commission has identified in the Supplemental Notice and will discuss at the Technical Conference. PJM is committed to working with the Commission, and other stakeholders, to develop criteria and processes needed to address reliability concerns related to climate change and extreme weather events.

With these thoughts in mind, PJM looks forward to further discussion of these issues at this Technical Conference.

⁷ *Id.*

⁸ *N. Am. Elec. Reliability Corp.*, 176 FERC ¶ 61,119 (2021).