

DOMINION NORTHERN VIRGINIA AREA VIOLATIONS

The Data Center Alley located in northern Virginia in the Dominion Transmission Zone is experiencing unprecedented load growth driven by increases in data center load that started in 2018 and is expected to continue growing post 2027. From 2018 to date, Dominion brought forward 44 supplemental project requests to serve 2,050 MWs of load increase through the summer of 2025. Some load additions also occurred prior to the Attachment M-3 process introduction. As part of the Attachment M-3 process do-no-harm analysis, PJM identified the need for 11 supplemental transmission reinforcements. In addition to the supplemental projects, PJM identified the need for two baseline reinforcements in the area to support its load growth.

PJM 2022 load forecast reflected the load growth within the Dominion northern Virginia area including approximately 4,000 MWs of additional load between 2020/21 and 2026/27. Because the 2027 RTEP case was not available at the time, the supplemental projects were assessed using the case available at the time (a 2025 RTEP); and at the time, the identified 11 supplemental reinforcement and 2 baseline upgrades were sufficient to serve the load increase using the 2025 RTEP case.

Once the PJM load forecast was updated for the 2027 RTEP, the system showed a need for reinforcements through additional source(s) to serve the load increase from the 500 and 230 kV transmission system nearby. PJM's 2027 RTEP analysis shows an extensive set of violations ranging between single contingencies, generation deliverability and N-1-1 reliability criteria performance violations. Area reliability violations occur even after the energization of the entire set of 11 supplemental projects and the 2 baseline upgrades. The 2027 RTEP analysis indicates there are 4 flowgate violations leading to load drop of more than 300 MW with all planned supplemental and baseline reinforcements incorporated within the model.

PJM investigated the need for transmission development in the 2024 and 2025 timeframe, evaluating the accelerated energization of baseline and supplemental upgrades. PJM identified the need for additional transmission reinforcements in the area as early as 2024 with an increase in identified reliability violations through 2025. Operationally, the area has been experiencing congestion during the outages required to implement the supplemental and baseline transmission reinforcements planned to be in service in advance of 2025. Due to the area being thermally constrained, multiple coinciding outages will be challenging to implement resulting in potential reliability issues. Because the area is constrained on all 230 kV inlet transmission segments to serve the size of load and data center load has a flat profile throughout the day, power flow control or non-wires solutions are not applicable to solve the identified transmission needs in this area. As a result, this project will be designated immediate need to address the near term reliability violations seen in 2024 and 2025 timeframe. Due to the pace and magnitude of load increase in the data center alley area, current operational and reliability constraints on the transmission system to serve load and consideration that a shortened competitive window will lead to delays of about 6 months, PJM has determined to designate Dominion construction responsibility to mitigate these immediate need violations.