



Transmission Expansion Advisory Committee (TEAC) Recommendations to the PJM Board

PJM Staff White Paper

PJM Interconnection

September 2020

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Contents

I.	Executive Summary.....	1
II.	Baseline Reliability Recommendations	1
III.	Changes to Previously Approved Projects	1
IV.	Review by the Transmission Expansion Advisory Committee (TEAC)	3
V.	Cost Allocation	3
VI.	Board Approval.....	3

I. Executive Summary

On July 28, 2020, the PJM Board of Managers approved changes to the Regional Transmission Expansion Plan (RTEP), totaling an overall net increase of \$113.05 million, to resolve baseline reliability criteria violations and address scope changes to existing projects.

Since then, PJM has identified scope changes to existing projects that result in an increase of \$7.3 million, and a project cancellation that results in a decrease of \$1.5 million. This yields an overall RTEP net increase of \$5.8 million, for which PJM recommended Board approval. With these changes, RTEP projects will total \$38,354.54 million since the first Board approvals in 2000.

PJM sought Reliability and Security Committee consideration and full Board approval of the RTEP baseline projects summarized in this white paper. On September 23, 2020, the Board approved the RTEP baseline changes as summarized in this paper.

II. Baseline Reliability Recommendations

A key dimension of PJM's RTEP process is baseline reliability evaluation, necessary before subsequent interconnection requests can be analyzed. Baseline analysis identifies system violations to reliability criteria and standards, the potential to improve the market efficiency and operational performance of the system, as well as incorporate any public policy requirements. PJM then develops transmission system enhancements to solve identified violations and reviews them with stakeholders through the Transmission Expansion Advisory Committee (TEAC) and Subregional RTEP Committees prior to recommendation to the Board. Baseline reliability transmission enhancement costs are allocated to PJM load.

III. Changes to Previously Approved Projects

PJM recommended the cancellation of the following project:

- Baseline b2594 (rebuild 1.0 mile of Brantly-Bridge Street 69 kV line with 1033 ACSR overhead conductor) is recommended for cancellation, as it was determined that the line is entirely owned by Danville, not AEP.

This change yields a net RTEP decrease of \$1.5 million.

PJM recommended modifying the scope/cost of the following projects:

- Windsor Switching Station Baseline b2900 (build a new 230/115 kV switching station connecting to Earleys-Everetts 230 kV network) has undergone a scope change. The original scope included the installation of three single-phase 30 MVA 230/115 kV transformers with a spare. As a part of the scope change, two (2) three-phase 84 MVA transformers will be installed, one of which will be normally offline as a spare, instead of four single-phase transformers. The substation design of the three single-phase transformers and one spare causes unnecessary maintenance outages to the cooperative customers. The new three-phase design, with one (1) three-phase spare normally offline, will allow Dominion to provide the customer continuous service by energizing the spare and then de-energizing the in-service transformer during maintenance activities. The scope change

has increased the total cost of the project from \$11.5 million to \$17.4 million. This change yields an RTEP increase of \$5.9 million.

- Homer City Baseline b2767 (construct a new 345 kV breaker string with three 345 kV breakers at Homer City and move the North autotransformer connection to this new breaker string) has undergone a scope change. The revised scope is to install one new 345 kV breaker and relocate the Homer City-Mainesburg 345 kV line terminal and Homer City 345/230 kV North transformer terminal. The revised scope requires less space by using an existing bay, whereas the original scope would have added a new bay. The scope change has increased the total cost of the project from \$6.6 million to \$7 million. However, if the cost of both scopes were estimated today, the original scope would be more expensive. This change yields a net RTEP increase of \$0.4 million.
- Chemical Station Baseline b3100 (replace 138 kV motor-operated air-break switch “YY” with a new 138 kV circuit switcher on the high side of Chemical transformer #6) has undergone a scope change. The revised scope is to relocate 138 kV circuit breaker “W” between 138 kV bus #1 extension and bus #2 as well as the installation a new 138 kV circuit breaker between bus #1 and bus #1 extension. The addition of the 138 kV circuit breaker “W1” on the #6 200 MVA transformer creates an improved operational configuration where no single event would cause both 138 kV buses to be outaged (which in turn would outage all three of the 138/46 kV transformers) at Chemical Station. The revised scope creates three 138 kV buses allowing for significantly increased flexibility to both schedule maintenance outages and withstand forced outages on the 138 kV equipment at Chemical Station. The project scope was revisited as AEP completed engineering for the associated supplemental solution. The cost of the project remains the same; it only affects the layout of the high side of the station. However, as outlined in the ancillary benefits, it allows for much greater operational flexibility.
- Mullens Baseline b3116 (replace existing Mullens 138/46 kV 30 MVA transformer #4 and associated protective equipment with a new 138/46 kV 90 MVA transformer and associated protective equipment) requires additional scope. The additional scope is to install required high-side transformer protection by replacing the existing ground motor-operated air-break switch with a new 138 kV high-side circuit breaker. By installing a breaker, a fault on the transformer is isolated to only the transformer, bringing the protection package up to AEP standards. The scope addition has increased the total cost of the project from \$3 million to \$4 million. This change yields a net RTEP increase of \$1 million.
- South Buffalo Baseline b3040.6 (install a 28.8 MVAR capacitor bank at South Buffalo 138 kV) has undergone a scope change. The revised scope is to install a 34.6 MVAR capacitor bank at South Buffalo 138 kV. In working with vendors to ensure the most cost-effective equipment is available, AEP changed their standard equipment list with respect to capacitor banks. The 28.8 MVAR capacitor banks were removed as part of this review, so the next size available is 34.6 MVAR. This change has no cost impact on the project.
- Messrick Road Baseline b3158 (replace line relays on the Ridgeley Terminal at Messick Rd. 138 kV substation) resolves violations identified for the Dickerson 1, 2 and 3 deactivation. The original required in-service date was December 2024; however, the project is being expedited, and the revised required in-service date was moved up to August 2020 to align with the deactivation of the units. The expected in-service date for this project is June 2021. This change has no cost impact on the project.

These changes yield a net RTEP increase of \$7.3 million.

IV. Review by the Transmission Expansion Advisory Committee (TEAC)

Project needs and recommended solutions as discussed in this report were reviewed with stakeholders during 2020, most recently at the August 2020 TEAC and Subregional RTEP Committee meetings. Written comments were requested to be submitted to PJM to communicate any concerns with project recommendations. No comments have been received as of this white paper publication date.

V. Cost Allocation

Cost allocations for recommended projects are shown in Attachment A (for allocation to a single zone) and Attachment B (for allocation to multiple zones). All projects included in this white paper are either changes to the scope of existing RTEP projects or cancellation of an existing RTEP project. None of these baseline upgrades require reallocation of the existing RTEP projects filed with the FERC.

Cost allocations are calculated in accordance with Schedule 12 of the Open Access Transmission Tariff (OATT). Baseline reliability project allocations are calculated using a distribution factor methodology that allocates cost to the load zones that contribute to the loading on the new facility.

VI. Board Approval

The PJM Reliability and Security Committee was requested to endorse the changes to the RTEP proposed in this white paper, and recommended to the full Board for approval of the changes to existing RTEP projects as detailed in this white paper to be included in PJM's RTEP. On September 23, 2020, the Board approved the RTEP baseline changes as summarized in this paper. The RTEP will be published on PJM's website.