



Reliability Analysis Update

Transmission Expansion Advisory
Committee
June 2, 2020

First Review

Baseline Reliability Projects



Dominion Transmission Zone: Baseline 500kV Line #514 Rebuild (End of Life Criteria)

Process Stage: First Review

Criteria: Dominion's FERC 715 Planning Criteria (C.2.9 – End of Life Criteria)

Assumption Reference: FERC 715 Planning Criteria

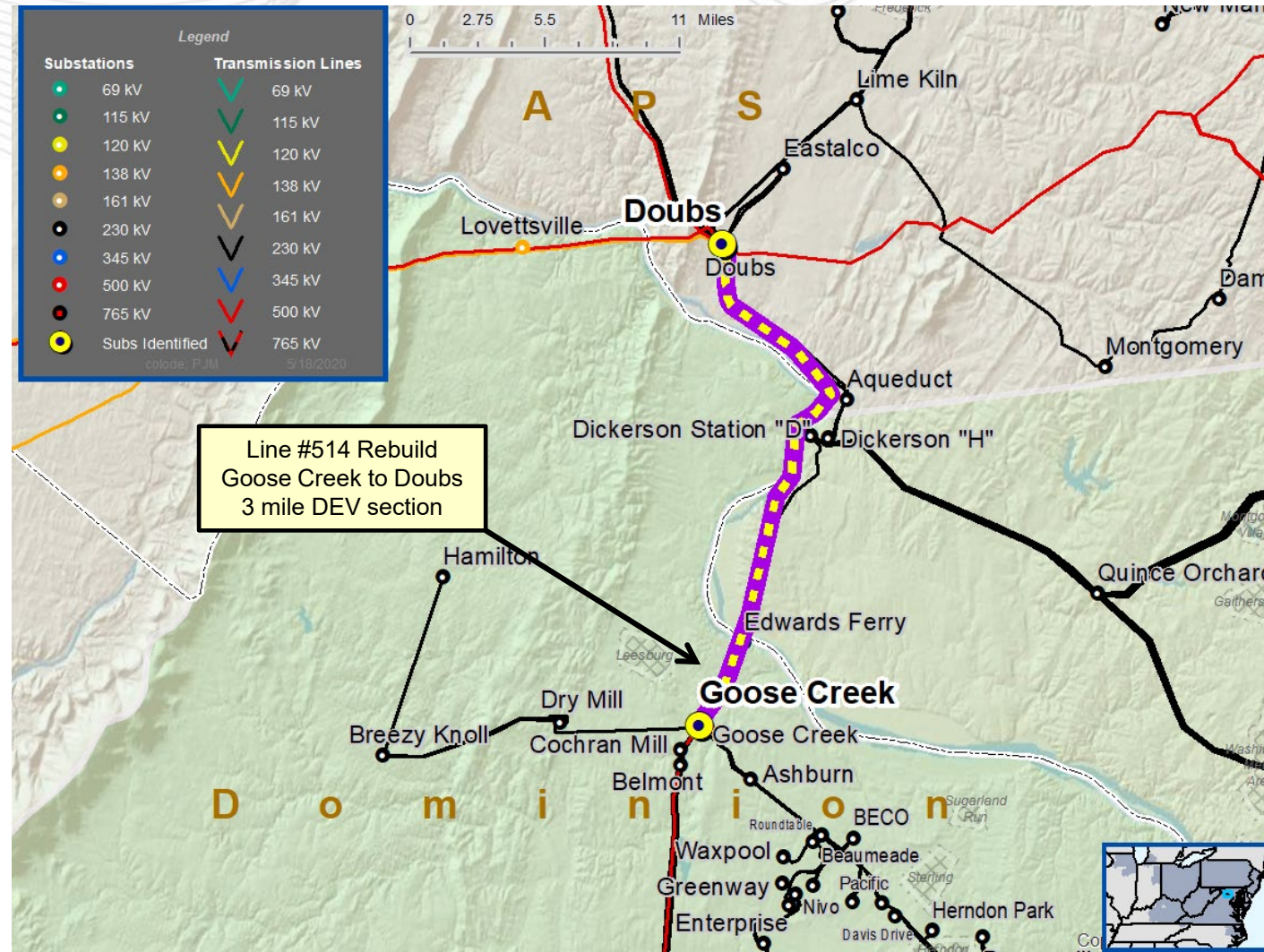
Model Used for Analysis: 2020 Series 2025 Winter RTEP

Problem Statement:

- The Doubs(FE) - Goose Creek(DEV) 500kV transmission Line #514 is an approximately 18-mile long line(3-miles is DEV owned) primarily constructed on weathering (COR-TEN®) steel lattice structures.
- Third party assessment has determined that the towers have corroded to a point where they exhibit pre-mature thinning of structure members and packout at joints. If left unaddressed these issues could result in failure of structures and potentially the collapse for the line.
- **A stability assessment conducted by DEV on PJM's 2020 Winter 2025 RTEP Case indicates for the scenario with the Doubs to Goose Creek 500 kV Line removed from service that an outage of the Bismark – Doubs 500 kV Line results in a Non-Convergent Case as local generation is no longer able to maintain synchronism with the system.**
- **Line 514 is an important 500kV tie-line between Dominion, APS, and the rest of PJM. It serves the high load growth area of Northern Virginia and is needed for operational flexibility/performance, and to maintain transfer capability between Dominion, APS, and PJM.**

Existing Facility Rating: 2323/2323/2671 MVA

Note: The End of Life issue identified for Line #514 is linked to the M-3 need identified as APS-2020-011



- PJM proposing to pursue 30 day window which would open on July 1 with 2025 RTEP window
- Shortened window due to Immediate Need for project
- Stakeholders requested to ensure they are properly registered for the 2025 RTEP window which will allow them to participate in this additional 30 day window



MCRP Project Cost Update

JCP&L Transmission Zone: Baseline Monmouth County 34.5 kV Solution

Process Stage: Update

Criteria: PJM and FirstEnergy Planning Criteria

Assumption Reference: Voltage Drop, Voltage Magnitude, and Loss of Load

Model Used for Analysis: 2018 Series 2021 and 2023 Summer RTEP

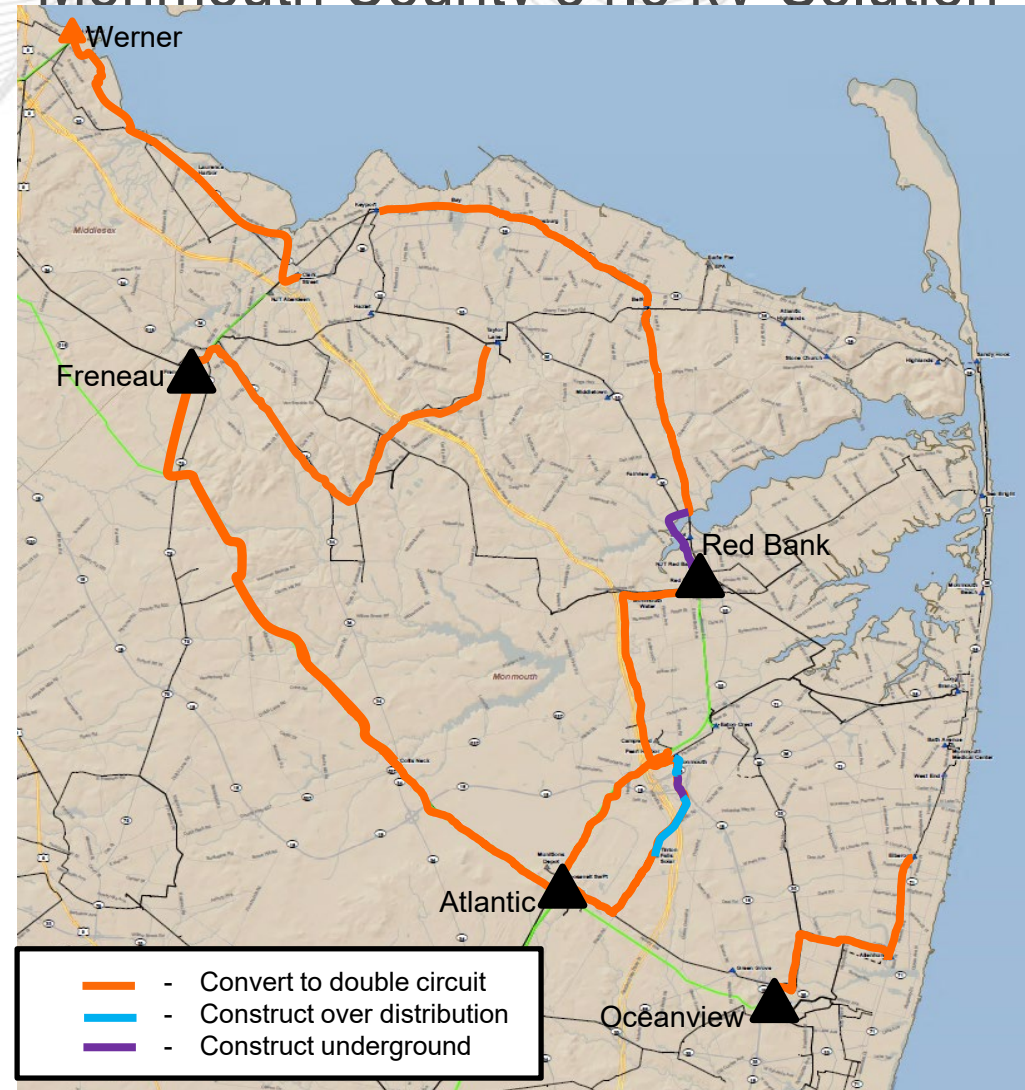
Proposal Window Exclusion: Immediate Need

Problem Statement:

- Severe voltage drop violation on the Red Bank bus for towerline outage loss of Atlantic – Red Bank 230 kV (T2020 & S1033) circuits.
- Severe voltage drop violation on the Red Bank bus for N-1-1 contingency loss of Atlantic – Red Bank 230 kV (T2020 & S1033) circuits.
- Several JCP&L 34.5 kV lines severely overloaded for the towerline outage loss of Atlantic – Red Bank 230 kV (T2020 & S1033) circuits requiring dynamic cascade analysis.
 - FirstEnergy performed dynamic cascade analysis
 - The dynamic cascade analysis resulted in tripping significant number of 34.5 kV lines and loss of >520 MW load due to voltage collapse.

Existing Facility Rating: N/A

Continued on next slide...





Previously Presented Solution:

ID	Description	Projected IS Date
B3130.1	Construct a new 34.5 kV circuit from Oceanview to Allenhurst 34.5 kV (4.0 Miles) - (replaces B1690)	9/1/2021
B3130.2	Construct a new 34.5 kV circuit from Atlantic to Red Bank 34.5 kV (12.0 Miles) - (replaces B1690)	7/1/2023
B3130.3	Construct a new 34.5 kV circuit from Freneau to Taylor Lane 34.5 kV (6.5 Miles) - (replaces B1690)	12/1/2024
B3130.4	Construct a new 34.5 kV circuit from Keyport to Belford 34.5 kV (6.0 Miles) - (replaces B1690)	12/1/2022
B3130.5	Construct a new 34.5 kV circuit from Red Bank to Belford 34.5 kV (5.0 Miles) - (replaces B1690)	7/1/2026
B3130.6	Construct a new 34.5 kV circuit from Werner to Clark Street (7.0 Miles) - (replaces B1690)	12/1/2021
B3130.7	Construct a new 34.5 kV circuit from Atlantic to Freneau (13.0 Miles) - (replaces B1690)	4/1/2024
B3130.8	Rebuild/Reconductor the Atlantic to Camp Woods Switch Point (3.5 Miles) 34.5 kV circuit - (replaces B1690)	12/1/2024
B3130.9	Rebuild/Reconductor the Allenhurst to Elberon (2.0 Miles) 34.5 kV circuit - (replaces B1690)	12/1/2022
B3130.10	Install 2 nd 115-34.5 kV Transformer at Werner Substation - (replaces B1690)	6/1/2021

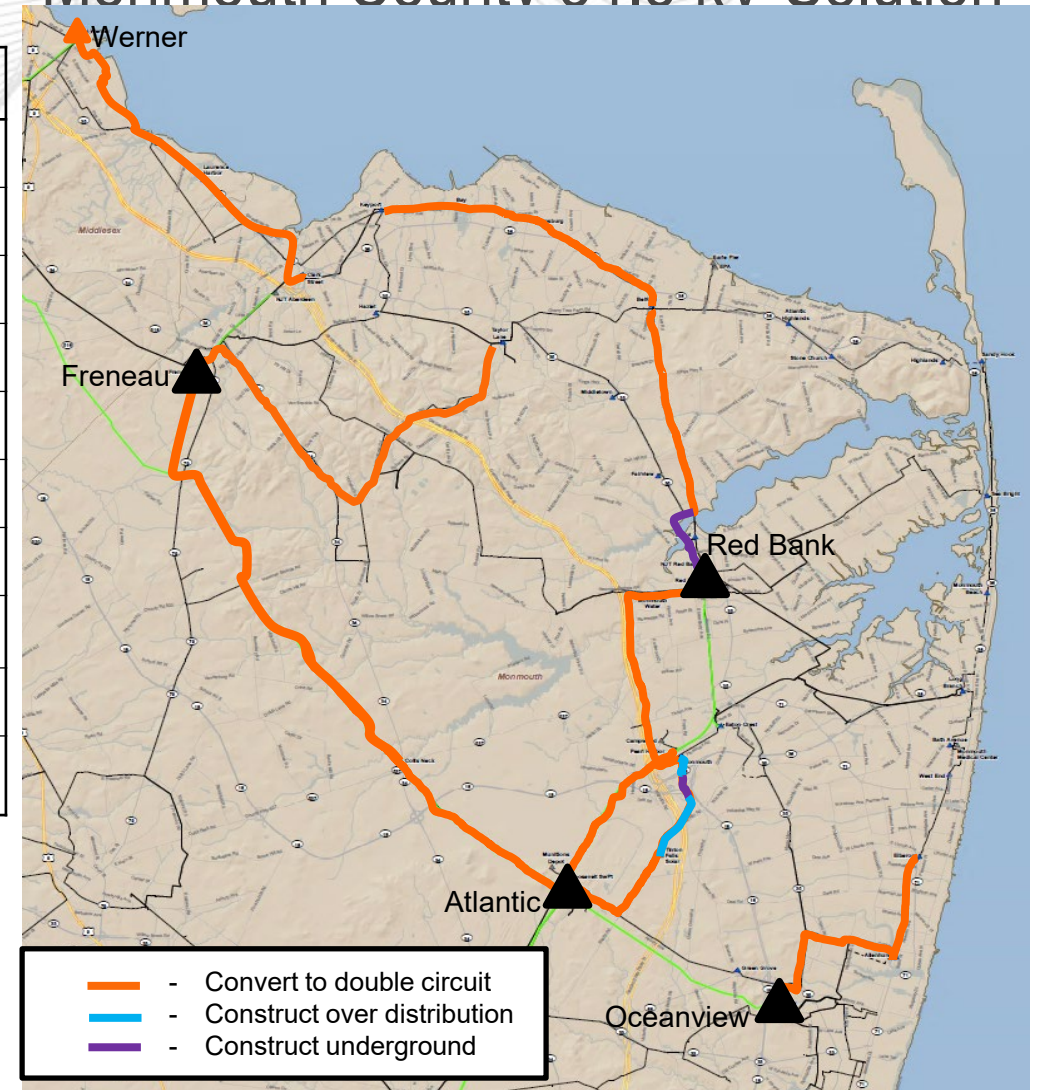
Estimated Project Total Cost: \$175M

Required In-Service: Immediate Need

Project Status: Conceptual

* - 44.1 miles will be converting existing single circuit to double circuit 34.5 kV construction; 9.4 miles will be adding 34.5 kV circuit to existing distribution pole lines.

JCP&L Transmission Zone: Baseline Monmouth County 34.5 kV Solution





Updated Recommended Solution:

ID	Description	Projected IS Date
B3130.1	Construct a new 34.5 kV circuit from Oceanview to Allenhurst 34.5 kV (3.9 Miles) - (replaces B1690)	6/1/2022
B3130.2	Construct a new 34.5 kV circuit from Atlantic to Red Bank 34.5 kV (10.3 Miles) - (replaces B1690)	6/1/2023
B3130.3	Construct a new 34.5 kV circuit from Freneau to Taylor Lane 34.5 kV (10.7 Miles) - (replaces B1690)	12/1/2025
B3130.4	Construct a new 34.5 kV circuit from Keyport to Belford 34.5 kV (5.6 Miles) - (replaces B1690)	6/1/2022
B3130.5	Construct a new 34.5 kV circuit from Red Bank to Belford 34.5 kV (5.7 Miles) - (replaces B1690)	6/1/2025
B3130.6	Construct a new 34.5 kV circuit from Werner to Clark Street (7.3 Miles) - (replaces B1690)	6/1/2024
B3130.7	Construct a new 34.5 kV circuit from Atlantic to Freneau (13.3 Miles) - (replaces B1690)	9/1/2023
B3130.8	Rebuild/Reconductor the Atlantic to Camp Woods Switch Point (3.5 Miles) 34.5 kV circuit - (replaces B1690)	12/1/2024
B3130.9	Rebuild/Reconductor the Allenhurst to Elberon (2.0 Miles) 34.5 kV circuit - (replaces B1690)	12/1/2023
B3130.10	Install 2 nd 115-34.5 kV Transformer at Werner Substation - (replaces B1690)	6/1/2022

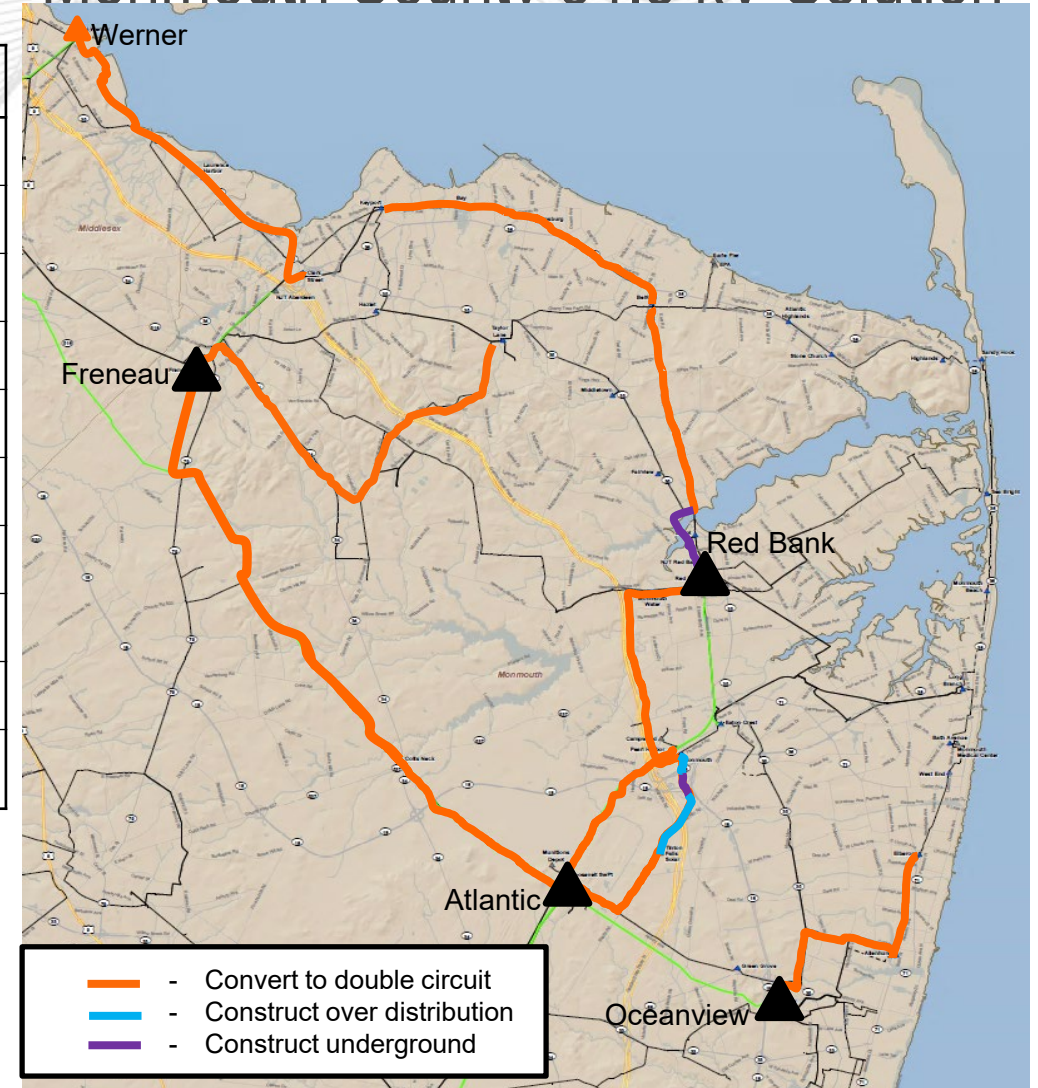
Estimated Project Total Cost: \$223M

Required In-Service: Immediate Need

Project Status: Engineering

52.4 miles will be converting existing single circuit to double circuit 34.5 kV construction, 2.3 miles will be adding 34.5 kV circuit to existing distribution pole lines, and 2.1 miles of new 34.5 kV underground.

JCP&L Transmission Zone: Baseline Monmouth County 34.5 kV Solution



2020 RTEP Analysis Update

- Post Summer peak case in March
 - Posted on February 28
 - Update posted most recently on May 22
- Post preliminary violations
 - Thermal violations – summer N-1 and generator deliverability – May 13
 - Thermal violations – winter/light load N-1 and generator deliverability – May 22

Currently anticipate two reliability windows:

- Open 30 day proposal window for an immediate need violation
 - Target July 1
- Open 60 day proposal window
 - Target July 1

Questions?



2020

- TEAC meetings are the following Tuesdays or Wednesday in 2020
- 1/7, 2/4, 3/10, 4/14, 5/12, 6/2, 7/7, 8/4, 9/1, 10/6, 11/4 (Wednesday), 12/1.

- V1 – 5/28/2020 – Original slides posted
- V2 – 5/28/2020 – Added slide 6 to 9 for JCPL MCRP project update
- V3 – 6/29/2020 – Following further review, slide 3 was updated to remove the reference to a stability concern with the 500kV Line #514 rebuild project.