Reliability Analysis Update

Sub Regional RTEP Committee - PJM West

September 17, 2021

First Review

Baseline Reliability Projects

Dayton Transmission Zone: Baseline Marysville Reactive Support

Process Stage: First Review

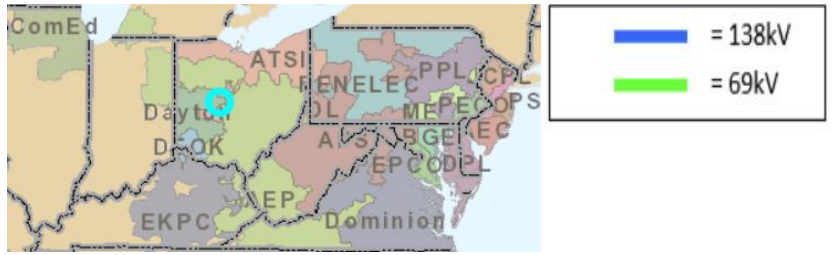
Criteria: Dayton 715 Criteria

Assumption Reference: 2026 RTEP assumption

Model Used for Analysis: 2026 RTEP cases

Proposal Window Exclusion: Below 200 kV

Problem Statement:
FG: Dayton- VM1
In 2026 Summer RTEP case, low voltage violation at the Marysville 69kV bus is identified for a N-1 contingency.



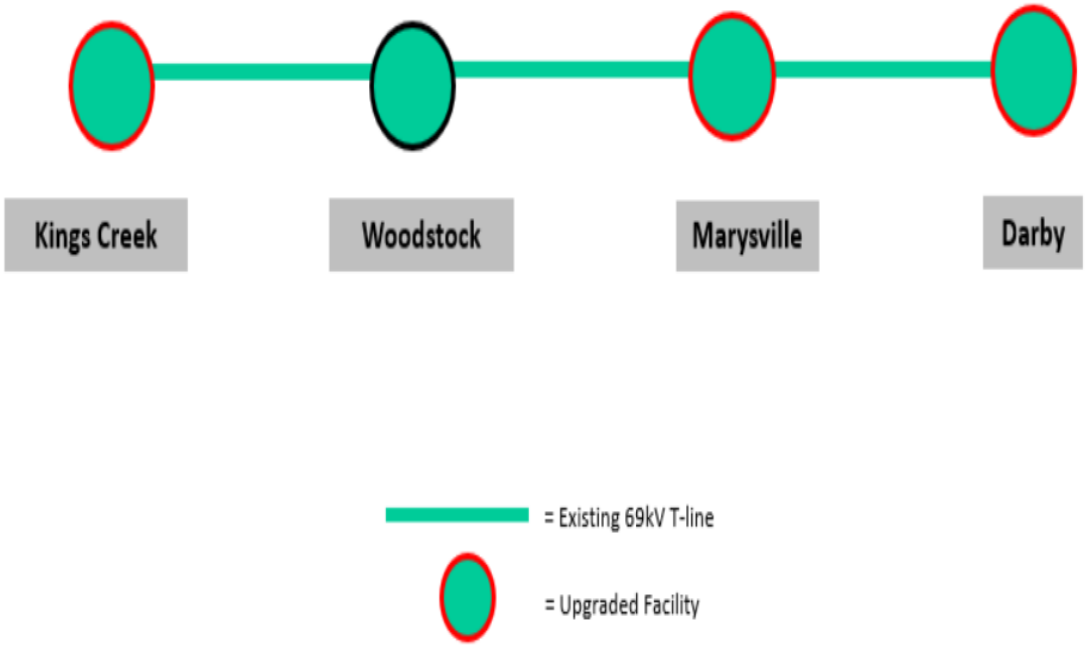
Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
09MARYSV -09WOODST 69KV	50/55/50/55

Dayton Transmission Zone: Baseline Marysville Reactive Support

Proposed Solution:
Marysville Substation: Install two 69kV 16.6 MVAR cap banks; Install five 69kV circuit breakers; Upgrade station relaying; Replace 600A wave trap on the Marysville -Kings Creek 69kV (6660) Circuit. Estimated Cost: $2.43M
Darby Substation: Upgrade remote end relaying at Darby substation Estimated Cost: $0.25M
Kings Creek: Upgrade remote end relaying at Kings Creek Estimated Cost: $0.25M
*Replacement of 600A wave trap on the Maryville - Kings Creek 69kV (6660) circuit is required as part of the project since the additional breaker installation on the Marysville - Darby 69kV circuit would result in a N-1 thermal overload of the 600A wave trap.
Total Estimated Cost: $2.93M
Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
09MARYSV -09WOODST 69KV	80/96/101/112



Alternatives: None
Required IS date: 6/1/2026
Projected IS date: 3/1/2026

AEP Transmission Zone: Baseline
Kenny 138kV Breakers “102” and “106” Replacement

Process Stage: First Read

Criteria: Over Duty Breaker

Assumption Reference: 2026 RTEP assumption

Model Used for Analysis: 2026 short circuit model

Proposal Window Exclusion: Below 200kV

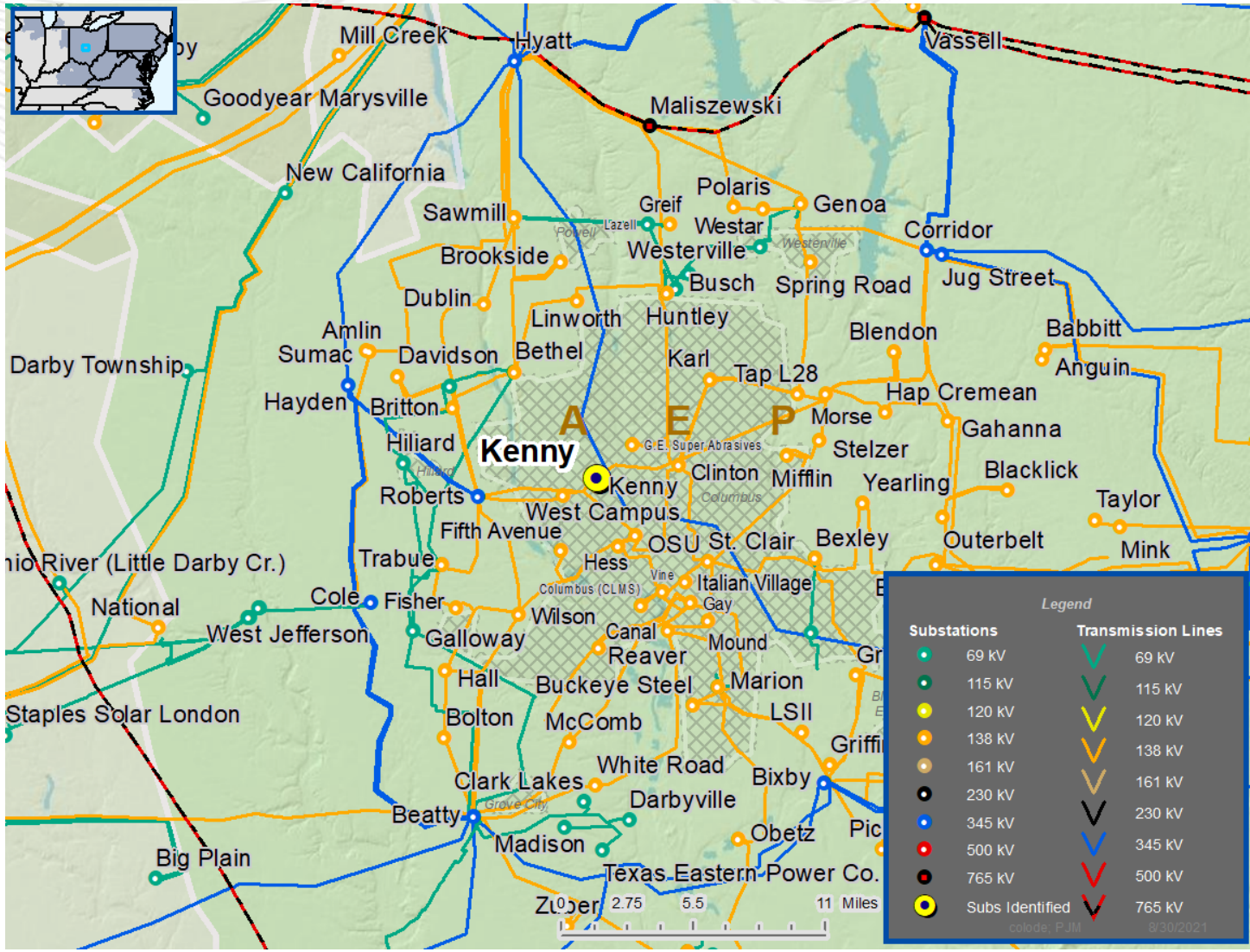
Problem Statement: Flowgates SC-3, SC-4

In 2026 RTEP short circuit model, Two (2) Kenny 138kV breakers are over duty: “102” (SC-3) and “106” (SC-4)

Existing Facility Rating: 2000A, 40 kA interrupting rating

Proposed Solution:
Replace the two (2) Kenny 138kV breakers , “102” (SC-3) and “106” (SC-4), each with a 3000A, 63 kA interrupting breaker

Estimated Cost: $0.76M Total or $0.38M Each
Required In-Service: 6/1/2026
Projected In-Service: 9/1/2025



AEP Transmission Zone: Baseline
Canal 138kV Breaker "3" Replacement

Process Stage: First Read

Criteria: Over Duty Breaker

Assumption Reference: 2026 RTEP assumption

Model Used for Analysis: 2026 short circuit model

Proposal Window Exclusion: Below 200kV

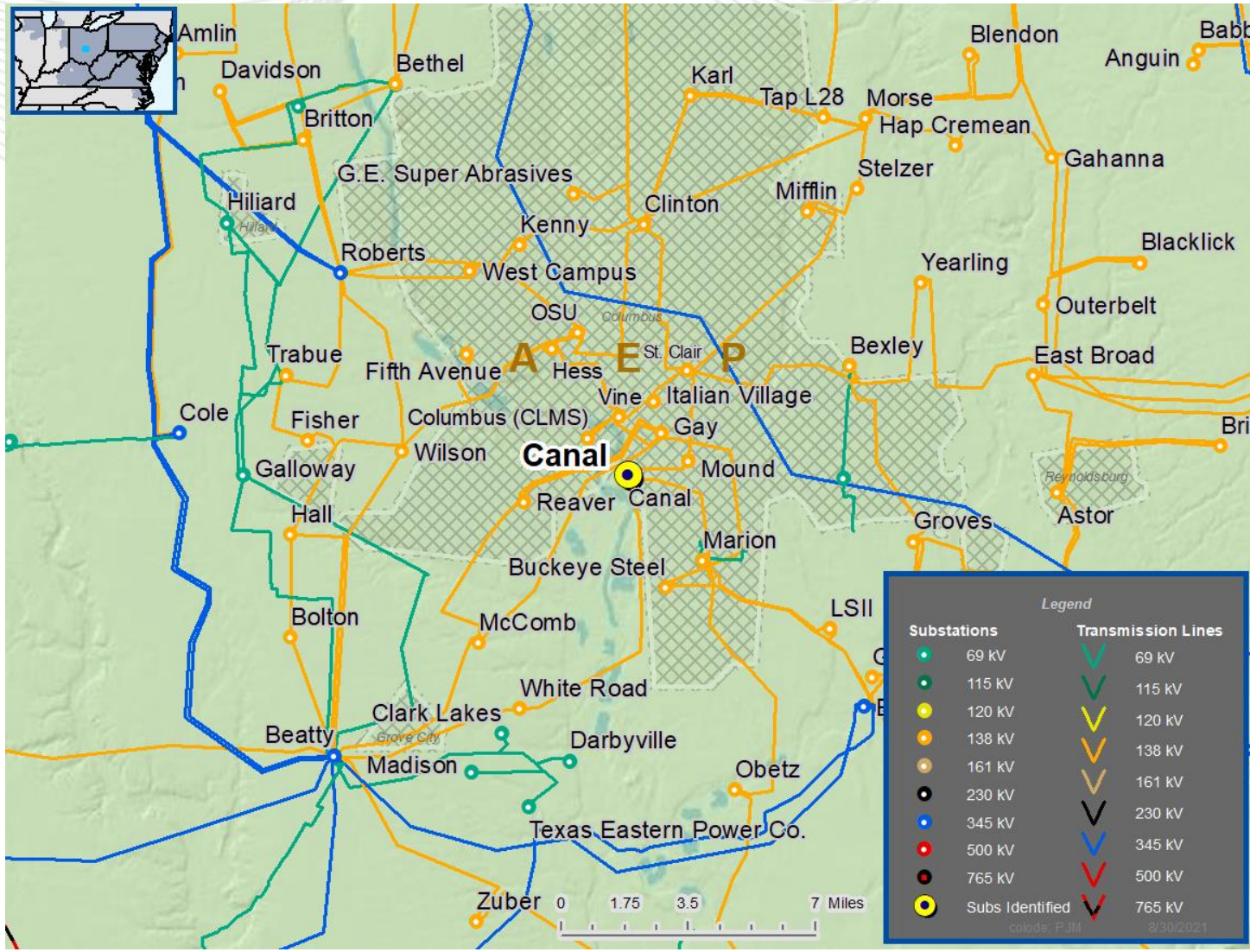
Problem Statement: Flowgate SC-5

In 2026 RTEP short circuit model, One (1) Canal 138kV breaker is over duty: "3"

Existing Facility Rating: 3000A, 40 kA interrupting rating

Proposed Solution:
Replace the one (1) Canal 138kV breaker "3" with 3000A, 63 kA breaker

Estimated Cost: $0.48M
Required In-Service: 6/1/2026
Projected In-Service: 9/1/2025



AEP Transmission Zone: Baseline
Hyatt 138kV Breaker "101N" Replacement

Process Stage: First Read

Criteria: Over Duty Breaker

Assumption Reference: 2026 RTEP assumption

Model Used for Analysis: 2026 short circuit model

Proposal Window Exclusion: Below 200kV

Problem Statement: Flowgate SC-6

In 2026 RTEP short circuit model, One (1) Hyatt 138kV breaker is over duty: "AB1(101N)"

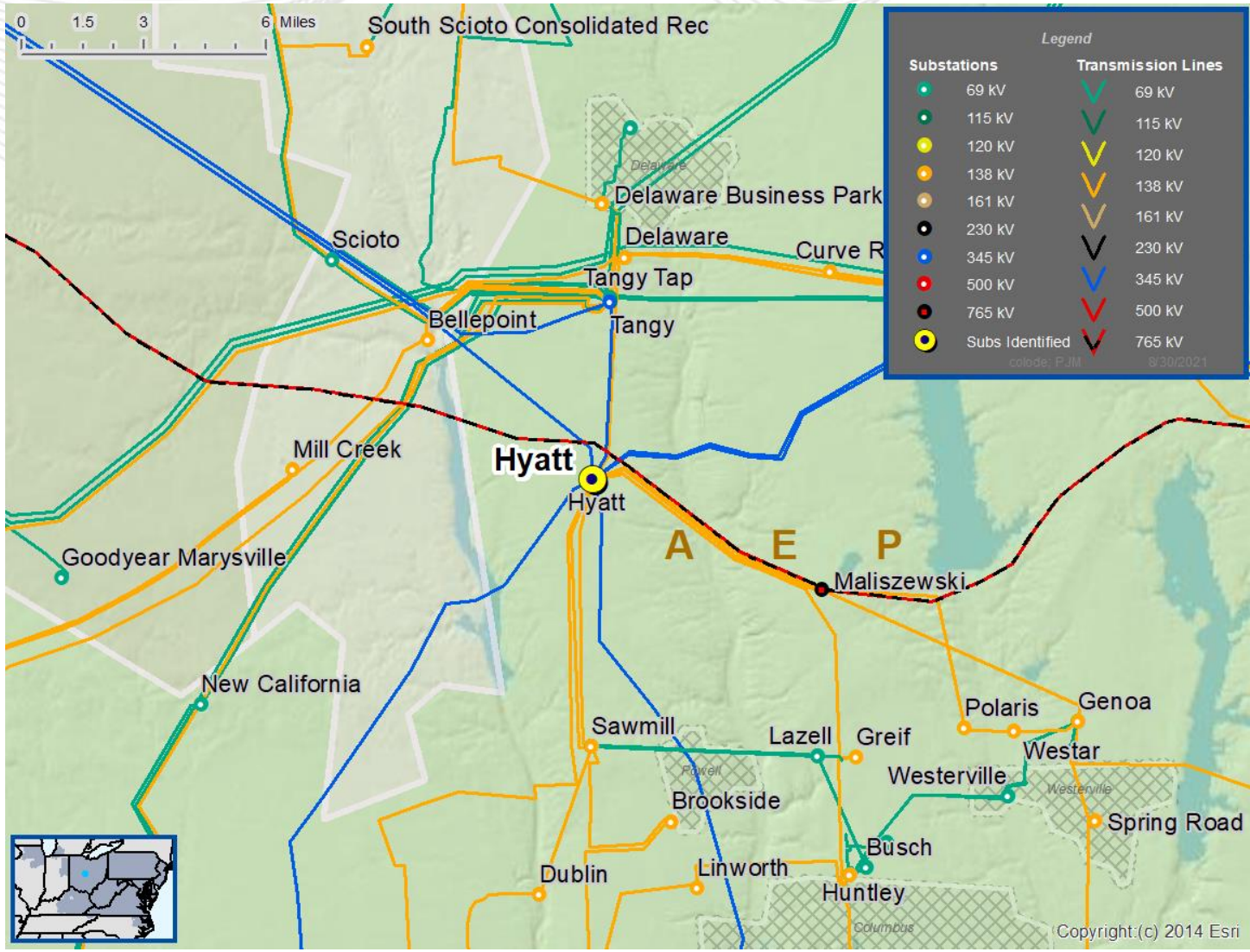
Existing Facility Rating: 3000A, 50 kA interrupting rating

Proposed Solution:
Replace the one (1) Hyatt 138kV breaker "AB1(101N)" with 3000A, 63 kA interrupting breaker

Estimated Cost: $0.48M

Required In-Service: 6/1/2026

Projected In-Service: 9/1/2025



DLC Transmission Zone: Baseline
Cheswick 138kV Breaker "Z-53 LF_3" Replacement

Process Stage: First Read

Criteria: Over Duty Breaker

Assumption Reference: 2026 RTEP assumption

Model Used for Analysis: 2026 short circuit model

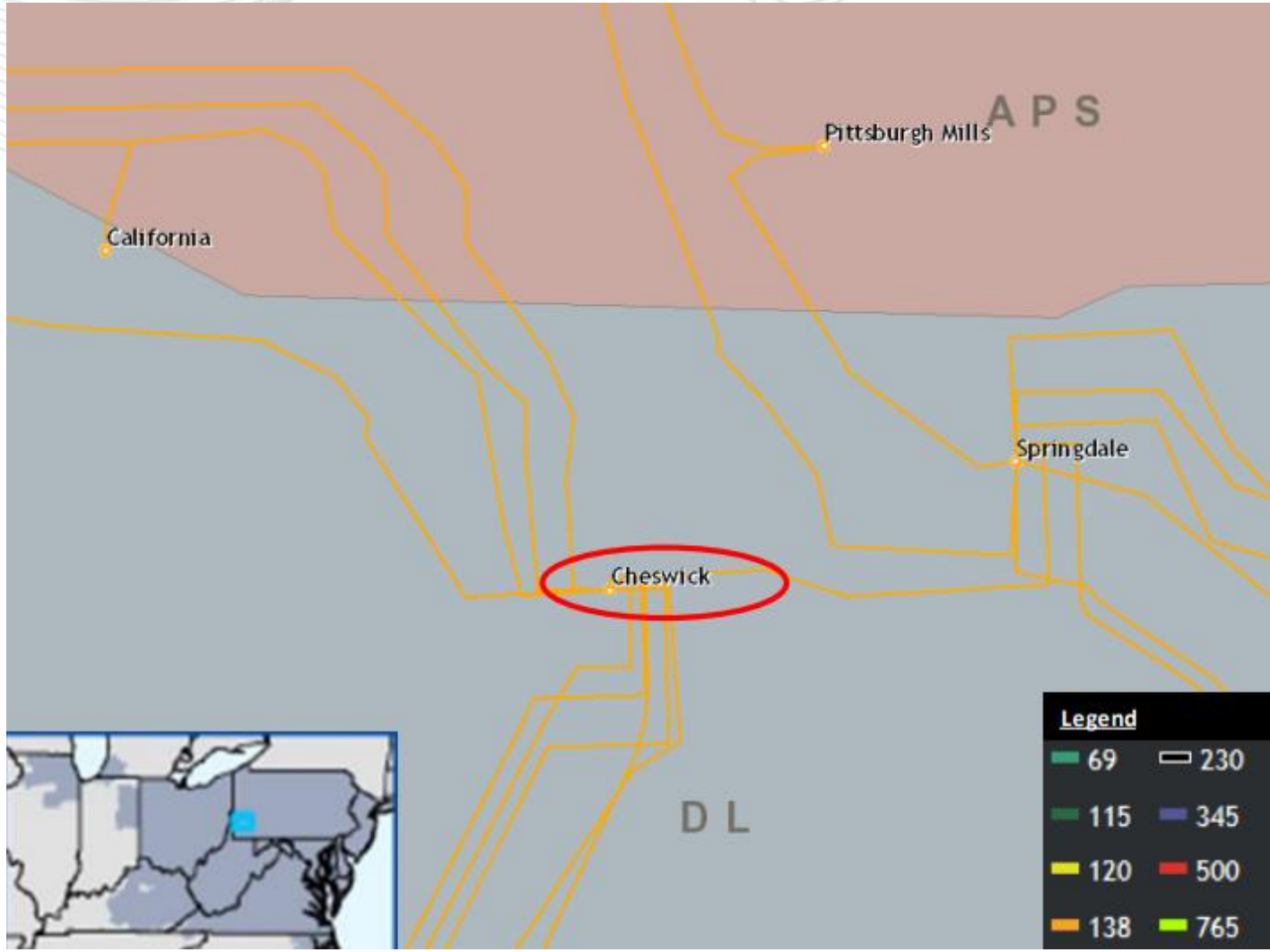
Proposal Window Exclusion: Below 200kV

Problem Statement: Flowgate SC-1

In 2026 RTEP short circuit model, One (1) Cheswick 138kV breaker is over duty: "Z-53 LF_3"

Existing Facility Rating: 15000 MVA interrupting rating

Proposed Solution:
Replace the one (1) Cheswick 138kV breaker with 63kA breaker: "Z-53 LF_3"
Estimated Cost: $0.35M
Required In-Service: 6/1/2026
Projected In-Service: 6/1/2026



Revision History

- V1 – 9/14/2021 – Original slides posted
- V2 – 9/17/2021 – Slide #7, Corrected typo from “Canal” to “Hyatt”