

Reliability Analysis Update

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Transmission Expansion Advisory Committee August 04, 2020



First Review Baseline Reliability Projects



Dominion Transmission Zone: Baseline Clifton 230kV Breaker "201182" and "XT2011" Replacements

Process Stage: First Review

Criteria: Over Duty Breaker

Assumption Reference: none

Model Used for Analysis: 2024 short circuit model

Proposal Window Exclusion: FERC 715 (TO Criteria) **Baseline Reliability:** TO Criteria Violation (FERC 715 (TO Criteria) Exclusion) *This project inherits the exclusion of its parent project.

Problem Statement:

The Clifton 230kV breakers "201182" and "XT2011" are overdutied.

Existing Facility Rating: 50kA interrupting duty **Significant Driver:**

 b3110: Rebuild Line #2008 between Loudoun to Dulles Junction. Retire Line #156 from Loudoun to Bull Run. Cut and loop Line #265 (Clifton – Sully) into Bull Run Substation. Add three (3) 230kV breakers at Bull Run to accommodate the new line and upgrade the substation. (Dominion "End of Life Criteria")

Proposed Solution:

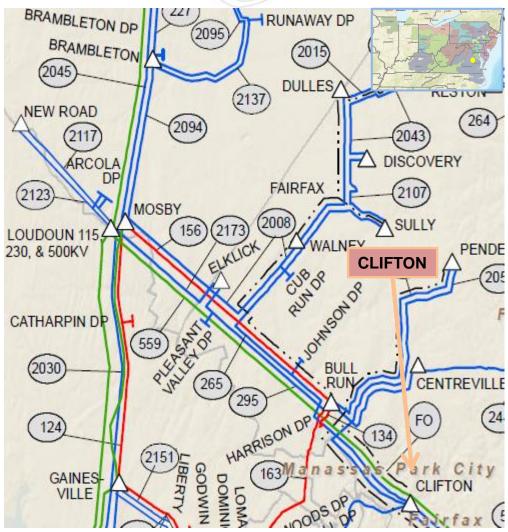
Replace the Clifton 230kV breakers "201182" and "XT2011" with 63kA breakers

Estimated Cost: \$0.934M (\$0.467M each)

Alternatives: None

Required In-Service: 12/31/2021

COLOR	VOLTAGE	TRANSMISSION LINE NUMBER
-	500 KV.	500 thru 599
_	230 KV.	200 thru 299 & 2000 thru 2099
-	115 KV.	1 thru 199
	138 KV.	AS NOTED
	69 KV.	AS NOTED





2020 RTEP Analysis Update



2020 RTEP Progress Update

Window 1

May 15, 2020

- Preliminary 2025 results posted
 - Summer Baseline and N-1 Thermal
 - Summer Generator Deliverability

July 1, 2020

- Proposal Window No.1 opened

August 31, 2020

– Proposal Window No.1 closes

Window 2

July 1, 2020

- Proposal Window No.2 opened

July 31, 2020

- Proposal Window No.2 closes



Overview of 2025 Results Total of 3228 flowgates identified

- 207 flowgates are eligible
 - 165 in the PJM West Region
 - 31 in the PJM South Region
 - 11 in PJM Mid-Atlantic Region
- 3021 flowgates excluded
 - 2226 due to the below 200 kV exclusion
 - 122 due to the substation equipment exclusion
 - 545 fixed by existing baseline
 - 108 Dominion Immediate Need
 - 11 fixed by supplemental project already in service due to customer needs or required as part of the customer service due to do no harm studies
 - 6 Non PJM Facility
 - 3 suspended queue generator

Analysis of 2025 - Violations

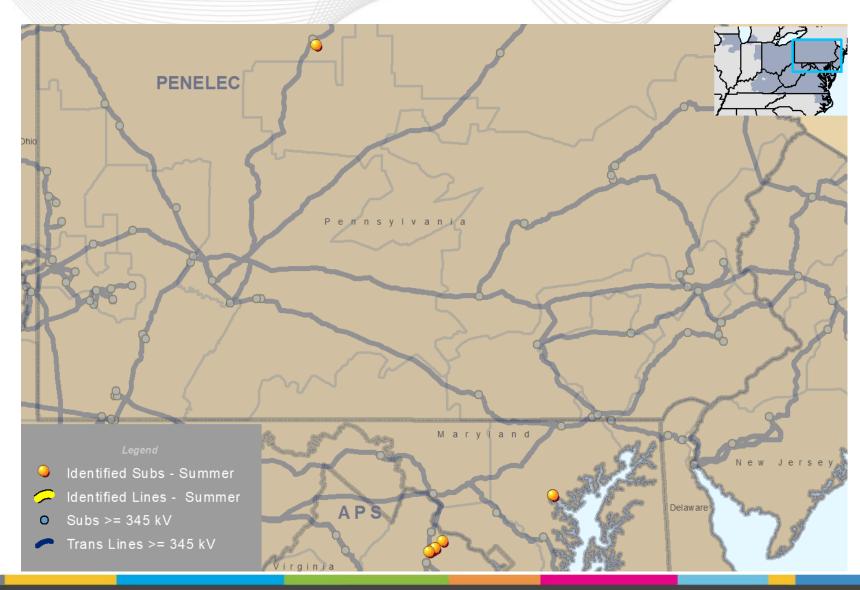




2025 Summer conditions

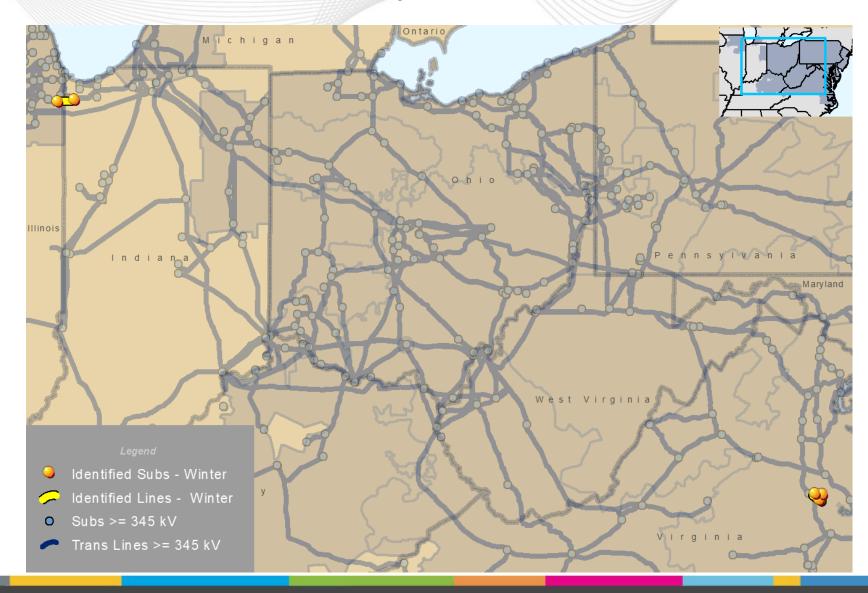
- 26 included violations
 - 22 N-1-1
 - 4 generation deliverability

Analysis of 2025 - Violations





Analysis of 2025 - Violations



2025 Winter conditions

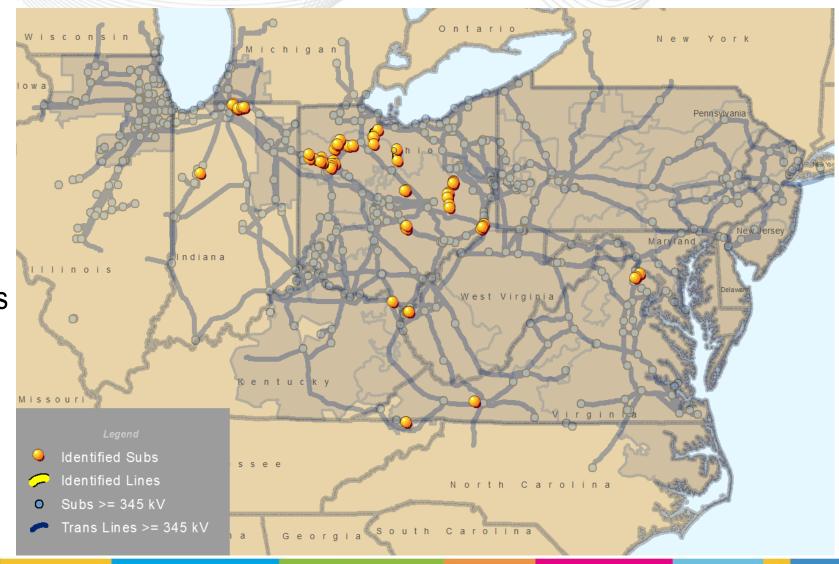
- 15 included violations
 - 13 N-1-1
 - 2 generation deliverability



2025 FERC Form 715

• 165 included thermal violations

Analysis of 2025 - Violations





Analysis of 2025 - Violations

Lehigh Portland Ceme Carroll Nipetow Bedington ۵ Wakersville Frostown Jct. Boonsboro Eagle irqinia Old Farm Monocac Shepherdstown Col Pipe Reisterstow Deer Park Tap Eaglehead (McCai evs ville Mt. Airy Pleas an New Market Dolfield Vanvill Frederick Hills White Rock Harrisonvi Lime Kiln Baltimore Inwood Metro A Granite Ρ Α Area Eastalco Hollofiel Sleepy Hollow Chestnut Hill Lovettsville Doubs Damascus Pine Orchard Feagan's Mill Frederick Rd. Stonewall Milbrill Stephens on A Aqueduc Montgomen Wilde Lake Marvland Dickerson Station "D Brighton Dickerson "H Mt. Zion West Winchester Redbud Columbia Simpsonville Hamilton Snowden Ri Old Chapel High Ridge Dorsey Run Greenwood Norbed Crystal Springs Bartonville Quince Orchard Edwards Ferry Dorsey Tap Pleasant Sandy Spring Russett East A Dry Mill View Ε 0 Goose Creek С Burtonsville Mapes Road Violations Included WIndows -As hbur Belmon Washington Stonewater Roundtabl Jericho Park Subs BECO n i a Bells Mill Bowie Metzerott Rd mulus Violations Included WIndows -Bethesda Dranesville 0 n Lines Buena Vista Harrison Sunset Hills Swinks Mill Takoma urg 🌔 Brambleton Park Tap Reston Tys ons Van Ness Dulles Subs >= 345 kV Bladensburg Ö Lanhan Yardley Ridge District of Columbia Dis covery New Road Arcola L"O" St. Sub Trans Lines >= 345 kV Poland Road Loudoun Subs < 345 kVMosby Cub-Run D E Buzzard Point Pleas ant Valley D.F Elk Lick D Oak Grove Trans Lines < 345 kV Alabama Ave Catharoin Blue Plains Bull Run Burke Pender

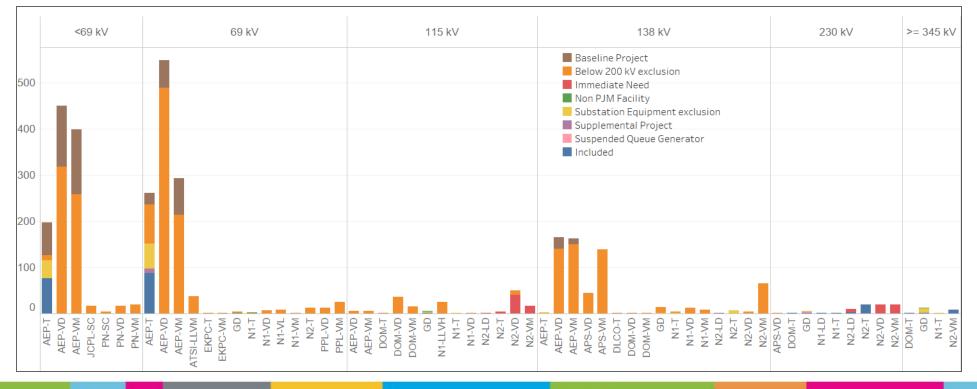
2025 Dominion Local TO Criterion for End of Life

• 1 C2.9 End of Life Criteria



2025 Analysis Violations

Voltage									
					Substation		Suspended	Window Included	Total
	Baseline	Below 200 kV	Immediate	Non PJM	Equipment	Supplemental	Queue		Total
	Project	exclusion	Need	Facility	exclusion	Project	Generator		
<69 kV	345	642			40			76	1,103
69 kV	163	898		4	55	10		87	1,217
115 kV		99	61	1	3			2	166
138 kV	37	585			12	1			635
230 kV		2	47		1		3	30	83
345 kV				1	10			11	22
500 kV								1	1
765 kV					1				1
Total	545	2,226	108	6	122	11	3	207	3,228



11



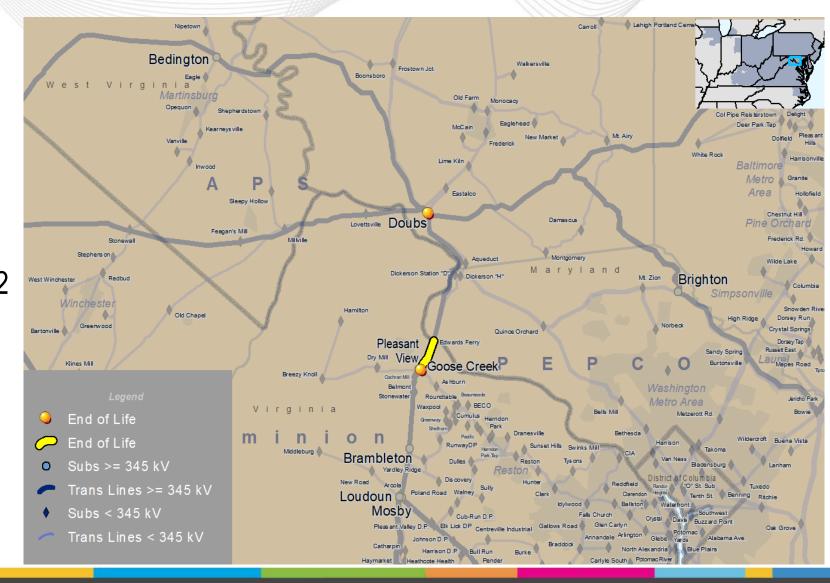
207 flowgates are eligible for Window 1

2020 RTEP Proposal Window 1 - Violations



Jpjm

2020 RTEP Proposal Window 2 - Violations



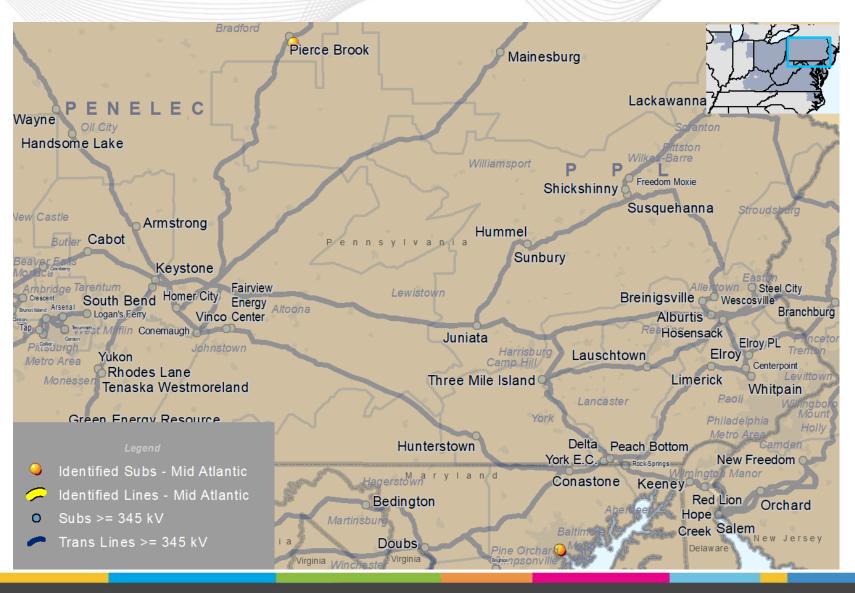
1 flowgate is eligible for Window 2



2020 RTEP Proposal Window 1 – Mid-Atlantic Results

11 Eligible Flowgates

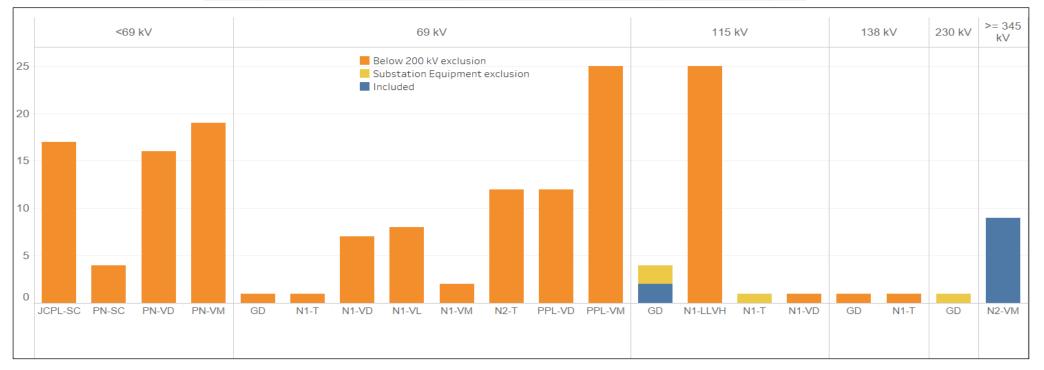
- 9 Voltage
- 2 Generation Deliverability
- 156 Flowgates Excluded from Window
- 152 Below 200kV
- 4 Substation Equipment





2020 RTEP Proposal Window 1 – Mid-Atlantic Results

Voltaga	Window	Window Included	Total	
Voltage	Below 200 kV exclusion Substation Equipment exclusion			window included
<69 kV	56			56
69 kV	68			68
115 kV	26	3	2	31
138 kV	2			2
230 kV		1		1
345 kV			9	9
Total	152	4	11	167



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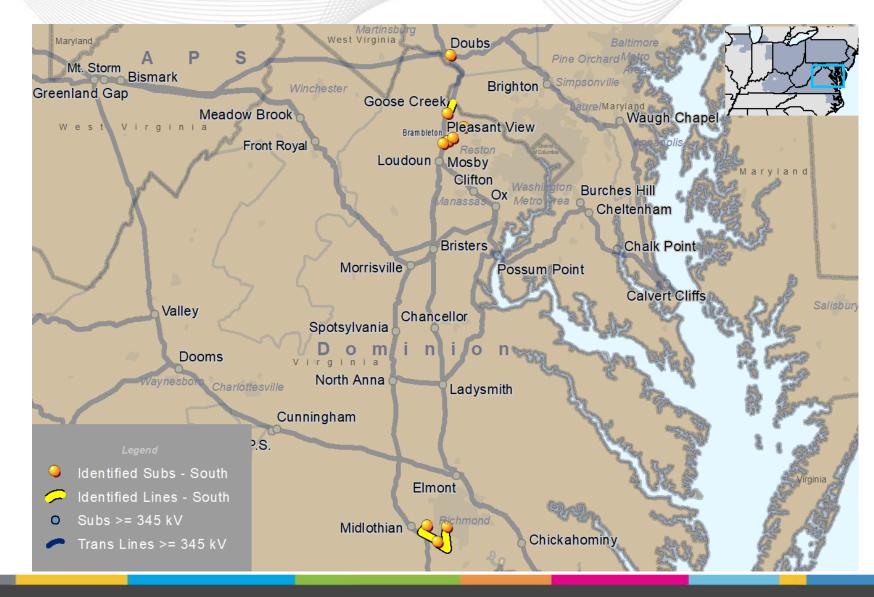
2020 RTEP Proposal Window 1 – South Results

30 Eligible Flowgates

- 2 Generation Deliverability
- 23 Thermal
- 5 Load Drop

180 Flowgates Excluded from Window

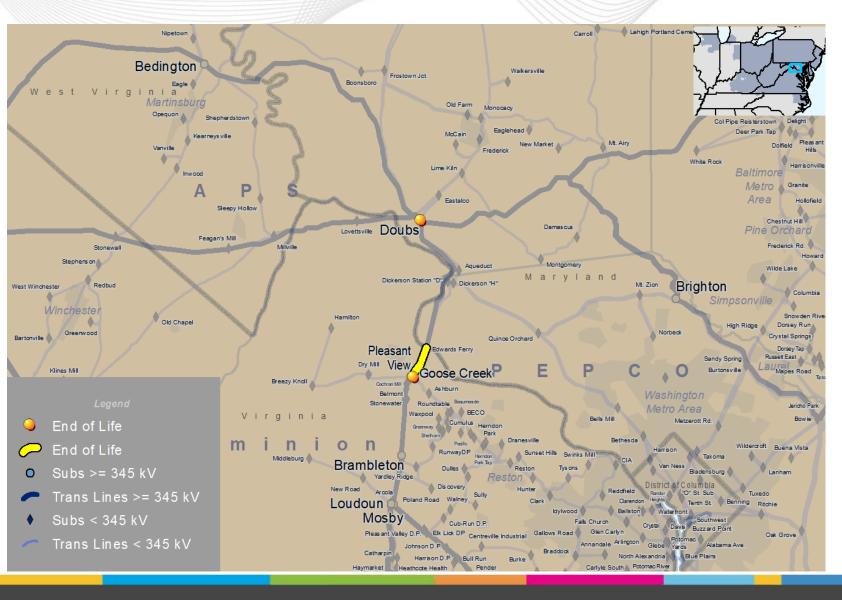
- 68 Below 200kV
- 108 Immediate Need
- 1 Non PJM Facility
- 3 Suspended Queue Generator





2020 RTEP Proposal Window 2 – South Results

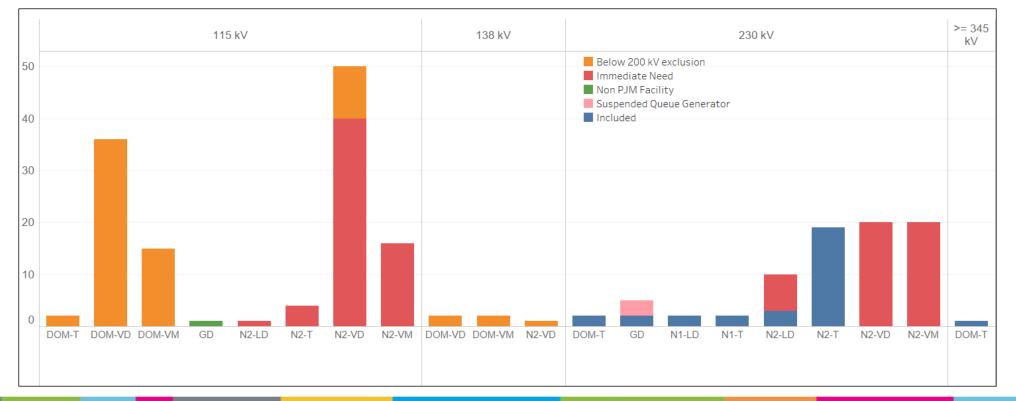
- 1 Eligible Flowgates
- End of Life Criteria





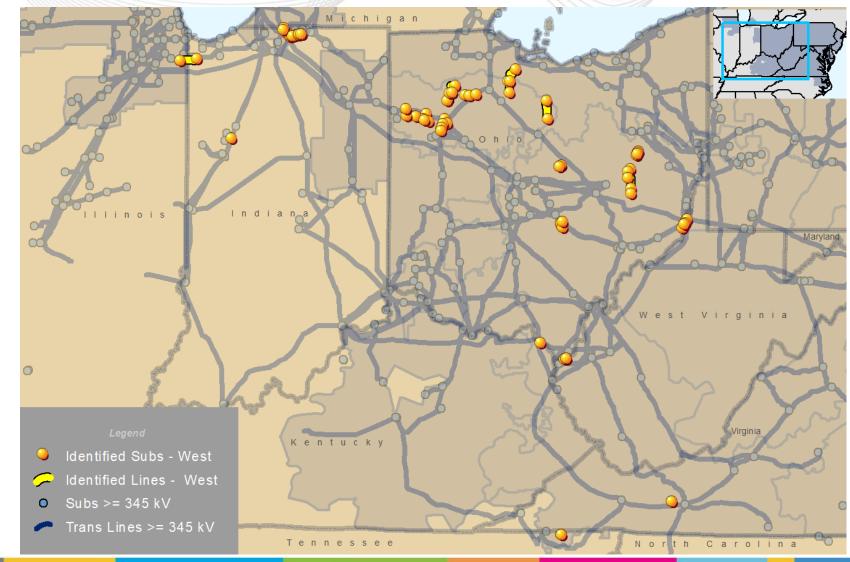
2020 RTEP Proposal Window 1 & 2 – South Results

Voltage		Window				
	Below 200 kV exclusion	Immediate Need	Non PJM Facility	Suspended Queue Generator	Window Included	Total
115 kV	63	61	1			125
138 kV	5					5
230 kV		47		3	30	80
500 kV					1	1
Total	68	108	1	3	31	211





2020 RTEP Proposal Window 1 – West Results



165 Eligible Flowgates

- 2 Generation Deliverability
- 163 Thermal

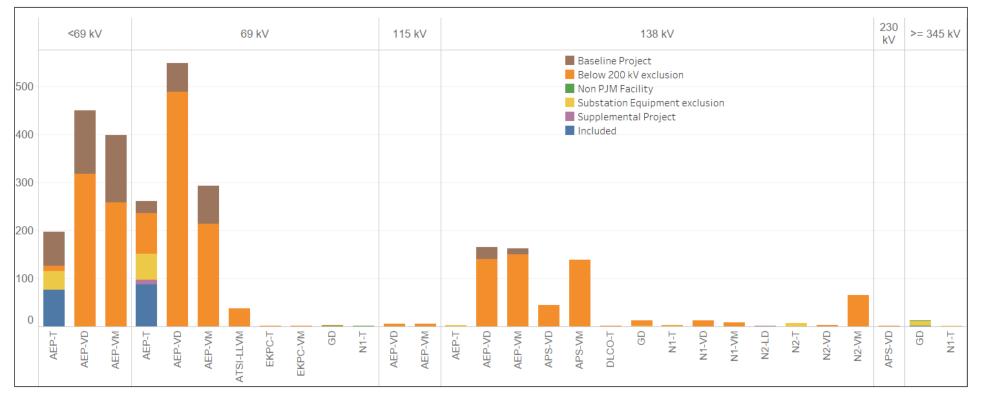
2685 Excluded Flowgates

- 2006 Below 200 kV
- 118 Substation Equipment
- 545 Existing Baseline
- 11 fixed by supplemental project already in service due to customer needs or required as part of the customer service due to do no harm studies
- 5 Non PJM Facility



2020 RTEP Proposal Window 1 – West Results

		N					
Voltage	Baseline Project	Below 200 kV exclusion	Non PJM Facility	Substation Equipment exclusion	Supplemental Project	Window Included	Total
<69 kV	345	586		40		76	1,047
69 kV	163	830	4	55	10	87	1,149
115 kV		10					10
138 kV	37	578		12	1		628
230 kV		2					2
345 kV			1	10		2	13
765 kV				1			1
Total	545	2,006	5	118	11	165	2,850





Competitive Planner Contact Information

- If you have any questions related to Competitive Planning Process and Competitive Planner Tool, please contact <u>ProposalWindow-Admin@pjm.com</u>
- If you need an assistance with registration to Competitive Planner Tool, please contact <u>AccountManager@pjm.com</u>
- PJM Competitive Planning Process Webpage <u>https://www.pjm.com/planning/competitive-planning-process.aspx</u>
- Access Competitive Planner tool through PJM Planning Center Webpage
 <u>https://www.pjm.com/markets-and-operations/etools/planning-center.aspx</u>
- Competitive Planner Tool Updates at Tech Change Forum <u>https://www.pjm.com/committees-and-groups/tech-change-forum.aspx</u>



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SME/Presenter: Aaron Berner, Aaron.Berner@pjm.com

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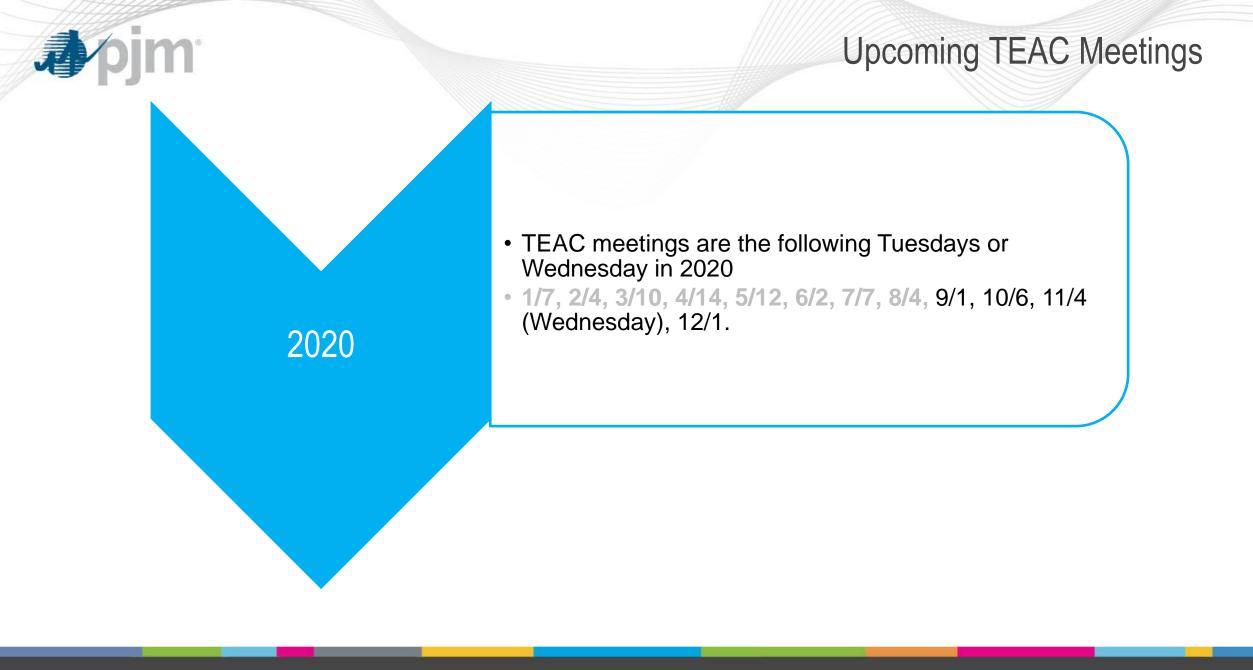
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Questions?







Revision History

• V1 – 7/30/2020 – Original slides posted