Initial Review and Screening
2023 RTEP Proposal Window 1 - Cluster No. 1

January 9, 2024

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2023 RTEP Proposal Window No. 1 - Cluster No. 1

Final Review and Recommendation

As part of its 2023 RTEP process cycle of studies, PJM identified clustered groups of flowgates that were put forward for proposals as part of 2023 RTEP Window No. 1. Specifically, Cluster No. 1 - discussed in this Final Review and Recommendation report - includes those flowgates listed in **Table 1**.

Table 1. 2023 RTEP Proposal Window No. 1 – Cluster No. 1 List of Flowgates

Flowgate	kV Level	Driver
2023W1-GD-S499, 2023W1-GD-S500, 2023W1-GD-S501, 2023W1-GD-S87, 2023W1-GD-S89, 2023W1-GD-S80	765/500	Thermal

Proposals Submitted to PJM

PJM conducted 2023 RTEP Proposal Window No. 1 for 60 days beginning July 24, 2023 and closing September 22, 2023. During the window, several entities submitted six proposals through PJM's Competitive Planner Tool. The proposals are summarized in **Table 2**. Publicly available redacted versions of the proposals can be found on PJM's web site: https://www.pjm.com/planning/competitive-planning-process/redacted-proposals.aspx.

Table 2. 2023 RTEP Proposal Window No. 1– Cluster No.1 List of Proposals

Proposal ID#	Project Type	Project Description	Total Construction Cost M$	Cost Capping Provisions (Y/N)
903	Upgrade	Replace the Belmont 765/500 kV Transformer #5 with a new transformer bank consisting of three single-phase transformers and an additional single phase spare transformer.	42.05	N
851	Greenfield	New Greenfield Cork 765kV substation will be roughly 0.55 miles from existing Belmont substation. The new substation will be a ring bus design with existing Kammer to Belmont and Mountaineer to Belmont line 765 kV lines terminating at the new Cork substation. The proposal also upgrades First Energy's existing Belmont 765/500 kV transformer.	60.05	Y
850	Upgrade	Install second 765/500 kV transformer (#6) consisting of three single-phase transformers and a single phase spare unit, in parallel with the existing Transformer #5. Install 765 kV four-breaker ring bus and two 500 kV breakers. Replace 500 kV disconnect switches.	123.4	N
831	Greenfield	New Greenfield Polecat Station will be roughly 3 miles from the existing Belmont Subation . The new 765/500kV Station that features a 765kV three-position ring bus and a 500kV three-position ring bus. The 765kV ring bus connects Belmont-Mountaineer 765kV, Kammer 765kV, and a new 765/500 transformer. The 500kV ring bus connects the new transformer, Belmont 500kV, and Flint Run 500kV transmission lines. 765kV	145.7	Y

Proposal ID#	Project Type	Project Description	Total Construction Cost M$	Cost Capping Provisions (Y/N)
		circuit breaker upgrades will be completed at Mountaineer Station to meet the required 5000A rating.		
605	Greenfield	This project enhances 2023-W1-905 by using 954 KCMIL Rail ACSR which increases the throughput of power by increasing the line conductor ampacity by 8%.Install reactor at New London and Oppossum Creek substation. Upgrade (3) wavetraps and (2) Circuit Breakers to 5000A equipment at Jacksons Ferry 765kV and Upgrade (2) Circuit Breakers to 5000A equipment at Cloverdale 765kV. Upgrade (1) Circuit Breaker to 5000A equipment at Broadford 765kV.	857.33	Y
905	Greenfield	New roughly 114 mi 765 kV line between Jousha Falls to new Transource Substation Yeat. Add (2) 765kV breakers at Joshua Falls to create a 2-breaker ring with the transformer still connected off the bus. New Yeat 765/500/230kV will be near existing Bristers 500/230kV substation. This substation will have (10) 500kV breakers, (2) 765/500kV transformers, (2) 500/230kV transformers, (2) 230kV CB's and (1) 765kV CB. Cut in Bristers–Ox 500kV and Meadowbrook–Vint Hill 500kV lines into Yeat's 500kV yard. AEP installs a new 12-mile dbl ckt BOLD (Breakthrough Overhead Line Design) 230kV line from Yeat–CloverHIll. Dominion installs a new 7.5-mile dbl ckt BOLD (Breakthrough Overhead Line Design) 230kV line from Warrenton–Wheeler. Dominion installs (2) 230kV breakers at Wheeler substation. Dominion installs new 0.1% reactor at Vinthill on Vinthill–Morrisville. Dominion Install new 0.1% reactor at Vinthill on Vinthill–Loudoun 1. Dominion Rebuilds 1.7 miles 230kV line from Marsh Run–RemingtonCt as double circuit. Dominion replaces remote end equipment to bring rating up on 230kV line from Wheeler–Linton Tap–Atlantic. Dominion rebuilds the 0.23-mile line between Bristers 500kV and Yeat 500kV.	1,300.86	Y

Final Review

PJM completed a final review of the proposals listed in **Table 2** and PJM identified the option described in the preceding section based on data and information provided by the project sponsors as part of their submitted proposals. This review included the following analytical quality assessment:

1. *Performance Review* – PJM evaluated whether or not the project proposal solved the required reliability criteria violation drivers posted as part of the open solicitation process.
2. *Planning Level Cost Review* – PJM reviewed the estimated project cost submitted by the project sponsor and any relevant cost containment mechanisms submitted as well.
3. *Feasibility Review* – PJM reviewed the overall proposed implementation plan to determine if the project, as proposed, can feasibly be constructed.

4. *Additional Benefits Review* – PJM reviewed information provided by the proposing entity to determine if the project, as proposed, provides additional benefits such as the elimination of other needs on the system.

Performance reviews yielded the following results:

- Proposal 903 resolves the Generation Deliverability Reliability Criteria violation at Belmont 765/500 kV # 5 transformer at Belmont substation and has the lowest cost upgrade.
- Proposal 851 also resolves the Generation Deliverability Criteria violation. Proposal 851 is a greenfield project and costs roughly $18M more than proposal 903 in spite of having cost containment.
- Proposal 850 has roughly three time higher cost than proposal 903.
- Proposal 831 is a greenfield project with roughly three times higher cost than proposal 903 in spite of having cost containment.
- Proposal 605 and 905 are green project and have roughly thirty times higher cost than proposal 903 in spite of the having cost containment.

Final cost reviews show a cost commitment provision was included in Proposal Nos. 851, 831, 605, and 905 offering, in summary, a cap on capital costs. Proposal No. 903 and 850 did not include cost commitment provisions.

PJM also notes that the PJM identified option, Proposal Nos. 851, 831, 605 and 905 incorporate greenfield construction which may impact the ability to timely complete the project. A high level review of the plans identified in the proposals does not reveal concerns at this stage of review.

Additional Benefits

Proposal 851 allows for additional expansion such as larger transformer that appears limited for the existing Belmont substation given its location and topography around the side. The new Cork 765 kV substation would also allow for future expansion of additional 765 kV line which is important for future growth.

Proposal 831 allows for expandability for new generation or replacement generation. The new Polecat station can accommodate a new generator feed and is designed for additional power outlet to other part of the grid, such as additional 500 kV circuit or 765 kV to existing Flint Run substation.

Proposal 605 assumes that 2023-W1-905 is awarded. If such, will provide enhanced power to other parts of PJM by increasing the line conductor ampacity.

Proposal 905 allows for additional transfer from southwest to northern VA area via 765 kV line to enhance transfers capability. Proposal 905 offers more flexibility to meet needs in the south as load growth occurs and will reduce flows on several 500 kV lines from west to east.

Final Review Conclusions

Proposal no. 903 solves the identified reliability criteria violation for cluster no. 1 and doesn't cause new reliability criteria violations. Proposal 850 resolves the reliability criteria violation and is proposing to add second 765/500 kV (#6) transformer which is not required at this point. Proposal 851 and 831 also revolve the reliability criteria violation and are greenfield projects adjacent to existing substation with higher cost. Proposal 605 and 905 are greenfield projects with extremely high cost proposing a 135 mile 765 kV greenfield line.

Recommended Solution

Based on the summary above, PJM identified option of replacing the Belmont 765/500 kV transformer # 5 is the most efficient and cost-effective solution in solution 1, with a total cost of $42.05M and a projected and required in-service date of 06/01/2028.

PJM's planning level cost review and feasibility review suggests that further constructability review and financial analysis would not materially contribute to the analysis of other proposals submitted in this cluster.

PJM reviewed this Recommended Solution with stakeholders on the January 9, 2024 TEAC. A final recommendation will be made to the PJM board at its meeting scheduled in February 2024 for PJM Board review and approval.