

# Install 5MW Battery Energy Storage System (BESS) at Gordonsville substation

## General Information

Proposing entity name	The redacted information is proprietary to the Company, therefore it is privileged and confidential.
Company proposal ID	The redacted information is proprietary to the Company, therefore it is privileged and confidential.
PJM Proposal ID	632
Project title	Install 5MW Battery Energy Storage System (BESS) at Gordonsville substation
Project description	Proposal 16 is to install 5MW battery energy storage system at Gordonsville 230 kV substation.
Project in-service date	09/2023
Tie-line impact	No
Interregional project	No
Is the proposer offering a binding cap on capital costs?	No
Additional benefits	The redacted information is proprietary to the Company, therefore it is privileged and confidential.

## Project Components

1. 5 MW Battery Energy Storage Systems Installation near Gordonsville Subst...
2. Transmission Facilities Supporting New 5 MW Battery Energy Storage Syste...

## Greenfield Substation Component

Component title	5 MW Battery Energy Storage Systems Installation near Gordonsville Substation
Substation name	To be determined
Substation description	New 5 MW Battery Bank near Gordonsville Substation Location: lat: 38.127154, lon: -78.219868 Size: approximately 350' x 205'
Nominal voltage	AC

Nominal voltage 230kV

### Transformer Information

	<b>Name</b>	<b>Capacity (MVA)</b>		
Transformer	TBD	22.4		
	<b>High Side</b>	<b>Low Side</b>	<b>Tertiary</b>	
Voltage (kV)	230	34.5	N/A	
Major equipment description	<p>Proposal 16 provides for the installation of a 5 MW Battery Bank at near Gordonsville Substation. The scope includes one 230-34.5 kV Transformer and two branches of 2 MW BESS and one branch of 1 MW BESS. Each string consists of a 34.5 kV Circuit Breaker, associated switches, underground getaway, 34.5 kV-480V Pad mount Transformer, DC-AC converter/inverter, two (2) MW battery trailers, and one (1) MW battery trailer. A property next to Gordonsville Substation will be purchased and battery bank will be installed there and connected to line 2088. The project will install 230 kV line switches, a 230 kV Circuit Switcher and Motor Operated Switch on high side of the Transformer. The 230 kV backbone, static poles and static wires will be installed. This project will require a New Control Enclosure and station service system. Additionally, by creating a 3-point line, the Line Relays at Gordonsville sub and Louisa CT Sub will need to be replaced with 3-point SEL-311L. Purchase and install substation material: 1. One (1), 230-34.5 kV, 22.4 MVA, Transformer 2. Three (3), 180 kV, 144 kV MCOV surge arresters 3. Three (3), 30 kV, 24.4 kV MCOV surge arresters 4. Three (3), 2.5 MVA, 34.5 kV-480V, Pad mount Transformers 5. Three (3), 34.5 kV, 2000A, 25 kA Circuit Breakers 6. Twenty-four (24), 34.5 kV, 1200A Hook-stick Disconnect Switches 7. Nine (9), 30 kV, 24.4 kV MCOV surge arresters 8. Three (3), 34.5 kV Distribution bays 9. Three (3), 34.5 kV Getaway stand and foundation 10. One (1), 230kV, 1200A, 40 KAIC Circuit Switcher 11. One (1), Motor Operator, 20 IN-LB 12. Three (3), 34.5 kV PT, Relay Accuracy 13. Seven (7), 34.5 kV, SMD-20 fuses with appropriate fuse links 14. Seven (7), 23 kV, 12A current limiting fuses 15. Oil Containment for the Transformers 16. One (1), 24'x30', Control Enclosure 17. One (1), 125 VDC, 200 AH Substation Battery 18. One (1), 125 VDC, 50 A Battery Charger 19. Four (4), 167 KVA Station Service Transformers 20. Two (2), 2 MW Battery Trailers 21. One (1), 1 MW Battery Trailer 22. Three (3), 2 MW Inverter/Rectifier Units 23. Nine (9), Bushing CTs Pad Mount TX Low side 24. Site preparation, grading and access road for the new Substation 25. Ground Grid and fencing as per Dominion Energy Standards 26. Conductors, connectors, foundations, structural steel, grounding, conduits, power cables, control cables, as per Dominion Standards</p>			

**Normal ratings**

**Emergency ratings**

Summer (MVA)	1140.000000	1140.000000
Winter (MVA)	1219.000000	1219.000000
Environmental assessment	Please review section A.4 Assessment of Potential Environmental Impacts in the attached Proposal 16 - Permitting and Real Estate Summary document attached in the supporting documents.	
Outreach plan	Please review section A.6 Discussion of Potential Public Opposition in the attached Proposal 16 - Permitting and Real Estate Summary document attached in the supporting documents.	
Land acquisition plan	Please review section A.2 Land Acquisition by Segment in the attached Proposal 16 - Permitting and Real Estate Summary document attached in the supporting documents.	
Construction responsibility	The redacted information is proprietary to the Company, therefore it is privileged and confidential.	
Additional comments	The redacted information is proprietary to the Company, therefore it is privileged and confidential.	

**Component Cost Details - In Current Year \$**

Engineering & design	The redacted information is proprietary to the Company, therefore it is privileged and confidential.	
Permitting / routing / siting	The redacted information is proprietary to the Company, therefore it is privileged and confidential.	
ROW / land acquisition	The redacted information is proprietary to the Company, therefore it is privileged and confidential.	
Materials & equipment	The redacted information is proprietary to the Company, therefore it is privileged and confidential.	
Construction & commissioning	The redacted information is proprietary to the Company, therefore it is privileged and confidential.	
Construction management	The redacted information is proprietary to the Company, therefore it is privileged and confidential.	
Overheads & miscellaneous costs	The redacted information is proprietary to the Company, therefore it is privileged and confidential.	
Contingency	The redacted information is proprietary to the Company, therefore it is privileged and confidential.	
Total component cost	\$17,898,713.00	
Component cost (in-service year)	\$19,169,520.00	

**Transmission Line Upgrade Component**

Component title	Transmission Facilities Supporting New 5 MW Battery Energy Storage Systems Installation
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Impacted transmission line	2088
Point A	Gordonsville Substation
Point B	Louisa CT Switching Station
Point C	N/A
Terrain description	This stretch is characterized by gently rolling terrain with some scattered wooded areas.
<b>Existing Line Physical Characteristics</b>	
Operating voltage	230kV
Conductor size and type	2-571 ACSS/TW/HS MOT - 200°C
Hardware plan description	Existing line hardware will not be removed as part of this project with the exception two spans (approximately 0.10 miles) of 49x49 mm Fiber between 2088/281 and the new station.
Tower line characteristics	Line 2088 was reconducted in 2020 using 2-571 ACSS/TW/HS between Gordonsville substation (2088/281) and Louisa CT switching station (2088/272). The existing structures include single circuit wood poles and engineered monopoles.

**Proposed Line Characteristics**

	<b>Designed</b>	<b>Operating</b>
Voltage (kV)	230.000000	230.000000
	<b>Normal ratings</b>	<b>Emergency ratings</b>
Summer (MVA)	1140.000000	1140.000000
Winter (MVA)	1219.000000	1219.000000
Conductor size and type	Conductor size and type will not change	
Shield wire size and type	DNO-11410 Optical Ground Wire (OPGW) from new station to backbone structure 2088/281 inside Gordonsville substation.	
Rebuild line length	Line will not be rebuilt	

Rebuild portion description	Proposal 16 requires existing Line #2088 to be cut and transferred to a new backbone structure inside the new station. Additionally, new DNO-11410 Optical Ground Wire (OPGW) will be installed between the new station backbone structure and backbone structure 2088/281 inside Gordonsville substation. Specifically, the project scope includes: 1. Remove two spans (approximately 0.10 miles) of 49x49 mm Fiber between 2088/281 and new station. 2. Install one new Backbone with foundations in the New Station. 3. Install two (2) new Galvanized Steel Static Pole (9.008) and foundation at the new station outside of Gordonsville Sub. 4. Install three spans (approximately 900 feet) of 7#7 Alumoweld shield wire tying in the new static poles to the new backbone. 5. Cut and Transfer 0.05 miles of 2-571 ACSS/TW/HS from Str. # 2088/279 to the new Backbone and from the Backbone to Str. # 2088/280 6. Cut two Existing 49x49 mm2 fibers and splice into new Station. 7. Install two spans (approximately 0.10 miles) of new two DNO 11410 Fibers from New Station to Backbone Str 2088/281 inside Gordonsville Sub.
Right of way	No new or additional right of way is required to complete this portion of the project.
Construction responsibility	The redacted information is proprietary to the Company, therefore it is privileged and confidential.
Additional comments	The redacted information is proprietary to the Company, therefore it is privileged and confidential.
<b>Component Cost Details - In Current Year \$</b>	
Engineering & design	The redacted information is proprietary to the Company, therefore it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company, therefore it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company, therefore it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company, therefore it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company, therefore it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company, therefore it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company, therefore it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company, therefore it is privileged and confidential.
Total component cost	\$872,193.00
Component cost (in-service year)	\$934,120.00

## Congestion Drivers

CD #	From Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type
ME-3	235479	01JUNCTN	235467	01FRNCHM	1	138	201	Market Efficiency
ME-5	314749	6CHARLVL	314772	6PROFFIT	1	230	345	Market Efficiency
ME-7	207950	CUMB TR2	208004	JUNI BU1	1	230	229	Market Efficiency

## Existing Flowgates

None

## New Flowgates

The redacted information is proprietary to the Company, therefore it is privileged and confidential.

## Financial Information

Capital spend start date 01/2022

Construction start date 01/2023

Project Duration (In Months) 20

## Additional comments

None