

Grover Substation: Install two reactors and install line breakers

General Information

Proposing entity name	Company specific
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Yes
Company proposal ID	Company specific
PJM Proposal ID	498
Project title	Grover Substation: Install two reactors and install line breakers
Project description	At Grover 230 kV Substation – Install dual reactors on existing straight bus
Email	Company specific
Project in-service date	06/2026
Tie-line impact	No
Interregional project	No
Is the proposer offering a binding cap on capital costs?	No
Additional benefits	Company specific

Project Components

1. Bridge Street 230 kV Substation (AA1-144) : Adjust relaying
2. At Marshall 230 kV Substation: Update Relaying
3. Grover 230 kV Substation: Install two reactors and two line breakers.

Substation Upgrade Component

Component title	Bridge Street 230 kV Substation (AA1-144) : Adjust relaying
-----------------	---

Project description	Bridge Street 230 kV Substation (AA1-144) : Adjust relaying
Substation name	Bridge Street 230 kV Substation (AA1-144)
Substation zone	Penelec
Substation upgrade scope	Bridge Street 230 kV Substation (AA1-144) : Adjust relaying

Transformer Information

	Name	Capacity (MVA)	
Transformer	na	na	
	High Side	Low Side	Tertiary
Voltage (kV)	na	na	na
New equipment description	na		
Substation assumptions	None		
Real-estate description	None		
Construction responsibility	Company specific		
Benefits/Comments			

Component Cost Details - In Current Year \$

Engineering & design	This information is considered confidential and proprietary
Permitting / routing / siting	This information is considered confidential and proprietary
ROW / land acquisition	This information is considered confidential and proprietary
Materials & equipment	This information is considered confidential and proprietary
Construction & commissioning	This information is considered confidential and proprietary
Construction management	This information is considered confidential and proprietary

Overheads & miscellaneous costs	This information is considered confidential and proprietary
Contingency	This information is considered confidential and proprietary
Total component cost	\$24,976.85
Component cost (in-service year)	\$28,723.37

Substation Upgrade Component

Component title	At Marshall 230 kV Substation: Update Relaying
Project description	At Marshall 230 kV Substation: Update Relaying
Substation name	Marshall
Substation zone	Penelec
Substation upgrade scope	At Marshall 230 kV Substation: Update Relaying

Transformer Information

	Name	Capacity (MVA)	
Transformer	na	na	
	High Side	Low Side	Tertiary
Voltage (kV)	na	na	na
New equipment description	Relay & Control: Replace existing line relaying with (1) line protection panel with (1) SEL421, (1) SEL-411L, (1) SEL-501, (1) RFL-9785, (1) PCM5350 and (1) SATEC PM-174 Revise wiring and relay settings for SEL-311B BU relay for AA1-111 (formerly Moshannon) 230kV line to incorporate automatic reclosing of 230kV breaker B1		
Substation assumptions	At Marshall Substation: The AC & DC systems are adequate. The SCADA RTU has adequate amount of spare points. The control house has room for new panel(s). Existing RFL-9780 relays in Frame 5 will be reused for dual channel transfer trip for BF. Existing wavetraps and line tuner can be reused and retuned as needed if frequencies change At Grover Substation: The AC system is adequate. The SCADA RTU has adequate amount of spare points. The control house has room for new panels. Existing 1200A breaker disconnect switches are adequate. There is adequate room to install the new wave traps. Existing line CVTs are adequate for reuse		

Real-estate description	Not applicable
Construction responsibility	Company specific
Benefits/Comments	
Component Cost Details - In Current Year \$	
Engineering & design	This information is considered confidential and proprietary
Permitting / routing / siting	This information is considered confidential and proprietary
ROW / land acquisition	This information is considered confidential and proprietary
Materials & equipment	This information is considered confidential and proprietary
Construction & commissioning	This information is considered confidential and proprietary
Construction management	This information is considered confidential and proprietary
Overheads & miscellaneous costs	This information is considered confidential and proprietary
Contingency	This information is considered confidential and proprietary
Total component cost	\$321,385.08
Component cost (in-service year)	\$368,137.00

Substation Upgrade Component

Component title	Grover 230 kV Substation: Install two reactors and two line breakers.
Project description	Grover 230 kV Substation: Install two reactors and two line breakers.
Substation name	Grover 230 kV
Substation zone	Penelec

Substation upgrade scope

Below Grade -Foundations, conduit, oil containment and grounding for new equipment Above Grade -Install (2) 230kV, 3000A, 63kAIC circuit breakers -Install (2) 230kV, 3000A, 63kAIC circuit breaker with independent pole operation & point-on-wave switching controller for reactor -Install (2) 230kV, 3000A disconnect switches -Install (4) 230kV, 2000A disconnect switches -Install (2) 230kV, 46.6MVAR shunt reactors -Install (1) firewall between reactors -Install (1) set of slip-over CTs on the 230kV bushings of the No 1 Transformer -Install (2) 230kV wideband wavetraps and (2) wideband tuners (include coax) -Replace limiting 1033.5 ACSR line drops with new conductor that meets or exceeds ratings of 536/666/619/790MVA SN/SSTE/WN/WSTE -Install (1) lot of rigid bus, connectors, cable, and steel structures Relay & Control -Install (2) line protection panels with (1) SEL421, (1) SEL411L, (1) SEL501 BFT, (1) breaker maintenance control switch, and (1) SATEC Meter -Install (2) carrier panels with (1) RFL9785, (3) RFL9780, and (1) lot PCM5350 -Install (1) SEL-3530 RTAC -Install (1) standard bus protection panel with (2) SEL487B relays -Install (2) reactor protection panel with (1) SEL587Z, (1) SEL487E, (1) Bitronics M871 meter, and (1) SEL501 BFT -Install capacitor interlock scheme -Install (1) 125V DC panel Additional Equipment to be Removed -Remove (2) existing wavetraps on 230kV side of No 1 Transformer and on No 1 Cap Bank tap -Remove (2) existing 230kV line air switches A4 and A6, and associated automatic control schemes -Remove (2) 230kV ground switches G7 and G5

Transformer Information

None

New equipment description

Above Grade -Install (2) 230kV, 3000A, 63kAIC circuit breakers -Install (2) 230kV, 3000A, 63kAIC circuit breaker with independent pole operation & point-on-wave switching controller for reactor -Install (2) 230kV, 3000A disconnect switches -Install (4) 230kV, 2000A disconnect switches -Install (2) 230kV, 46.6MVAR shunt reactors -Install (1) firewall between reactors -Install (1) set of slip-over CTs on the 230kV bushings of the No 1 Transformer -Install (2) 230kV wideband wavetraps and (2) wideband tuners (include coax) -Replace limiting 1033.5 ACSR line drops with new conductor that meets or exceeds ratings of 536/666/619/790MVA SN/SSTE/WN/WSTE -Install (1) lot of rigid bus, connectors, cable, and steel structures Relay & Control -Install (2) line protection panels with (1) SEL421, (1) SEL411L, (1) SEL501 BFT, (1) breaker maintenance control switch, and (1) SATEC Meter -Install (2) carrier panels with (1) RFL9785, (3) RFL9780, and (1) lot PCM5350 -Install (1) SEL-3530 RTAC -Install (1) standard bus protection panel with (2) SEL487B relays -Install (2) reactor protection panel with (1) SEL587Z, (1) SEL487E, (1) Bitronics M871 meter, and (1) SEL501 BFT -Install capacitor interlock scheme -Install (1) 125V DC panel

Substation assumptions

The AC system is adequate. The SCADA RTU has adequate amount of spare points. The control house has room for new panels. Existing 1200A breaker disconnect switches are adequate. There is adequate room to install the new wave traps. Existing line CVTs are adequate for reuse

Real-estate description

Substation is not expected to be expanded at this time.

Construction responsibility

Company specific

Benefits/Comments

Component Cost Details - In Current Year \$

Engineering & design	This information is considered confidential and proprietary
Permitting / routing / siting	This information is considered confidential and proprietary
ROW / land acquisition	This information is considered confidential and proprietary
Materials & equipment	This information is considered confidential and proprietary
Construction & commissioning	This information is considered confidential and proprietary
Construction management	This information is considered confidential and proprietary
Overheads & miscellaneous costs	This information is considered confidential and proprietary
Contingency	This information is considered confidential and proprietary
Total component cost	\$4,965,415.21
Component cost (in-service year)	\$5,664,816.42

Congestion Drivers

None

Existing Flowgates

FG #	From Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
N1-WVM2	200908	26CHAPMAN+	200908	26CHAPMAN+	0	230	226	Winter Baseline Voltage Magnitude	Included
N2-WVM5	200908	26CHAPMAN+	200908	26CHAPMAN+	0	230	226	Winter N-1-1 Voltage Magnitude	Included
N2-WVM1	200908	26CHAPMAN+	200908	26CHAPMAN+	0	230	226	Winter N-1-1 Voltage Magnitude	Included
N2-SVM1	200908	26CHAPMAN+	200908	26CHAPMAN+	0	230	226	Summer N-1-1 Voltage Magnitude	Included
N1-SVM2	200701	26GROVER	200701	26GROVER	0	230	226	Summer N-1 Voltage Magnitude	Included
N1-WVM4	200701	26GROVER	200701	26GROVER	0	230	226	Winter Baseline Voltage Magnitude	Included
N2-WVM4	200701	26GROVER	200701	26GROVER	0	230	226	Winter N-1-1 Voltage Magnitude	Included

FG #	From Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
N2-WVM8	200701	26GROVER	200701	26GROVER	0	230	226	Winter N-1-1 Voltage Magnitude	Included
N2-SVM2	200701	26GROVER	200701	26GROVER	0	230	226	Summer N-1-1 Voltage Magnitude	Included
N2-SVM3	200701	26GROVER	200701	26GROVER	0	230	226	Summer N-1-1 Voltage Magnitude	Included
N1-WVM1	200909	26LOBO+	200909	26LOBO+	0	230	226	Winter Baseline Voltage Magnitude	Included
N2-WVM2	200909	26LOBO+	200909	26LOBO+	0	230	226	Winter N-1-1 Voltage Magnitude	Included
N2-WVM6	200909	26LOBO+	200909	26LOBO+	0	230	226	Winter N-1-1 Voltage Magnitude	Included
N2-SVM4	200909	26LOBO+	200909	26LOBO+	0	230	226	Summer N-1-1 Voltage Magnitude	Included
N2-SVM5	200909	26LOBO+	200909	26LOBO+	0	230	226	Summer N-1-1 Voltage Magnitude	Included
N1-SVM1	200857	26MARSHALL	200857	26MARSHALL	0	230	226	Summer N-1 Voltage Magnitude	Included
N1-WVM3	200857	26MARSHALL	200857	26MARSHALL	0	230	226	Winter Baseline Voltage Magnitude	Included
N2-WVM7	200857	26MARSHALL	200857	26MARSHALL	0	230	226	Winter N-1-1 Voltage Magnitude	Included
N2-WVM3	200857	26MARSHALL	200857	26MARSHALL	0	230	226	Winter N-1-1 Voltage Magnitude	Included
N2-SVM6	200857	26MARSHALL	200857	26MARSHALL	0	230	226	Summer N-1-1 Voltage Magnitude	Included
N2-SVM7	200857	26MARSHALL	200857	26MARSHALL	0	230	226	Summer N-1-1 Voltage Magnitude	Included

New Flowgates

None

Financial Information

Capital spend start date 06/2024

Construction start date 12/2025

Project Duration (In Months) 24

Additional Comments

None