

# Frenchs Mill-Junction 138 kV Line Terminal Upgrades and Reconductor Messick Road-Ridgeley 138 kV Line

## 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?	
Company proposal ID	Company Specific
PJM Proposal ID	425
Project title	Frenchs Mill-Junction 138 kV Line Terminal Upgrades and Reconductor Messick Road-Ridgeley 138 kV Line
Project description	Replace terminal equipment on the Frenchs Mill-Junction 138 kV Line to achieve ratings of 221/268 MVA SN/SE and 250/317 MVA WN/WE. Reconductor the existing 556.5 ACSR line segments on the Messick Road-Ridgeley WC4 138 kV Line with 954 45/7 ACSR to achieve 308/376 MVA SN/SE and 349/445 MVA WN/WE ratings. Replace the remote end equipment for the Messick Road-Ridgeley WC4 138 kV Line to achieve 308/376 MVA SN/SE and 349/445 MVA WN/WE ratings.
Email	
Project in-service date	06/2025
Tie-line impact	No
Interregional project	No
Is the proposer offering a binding cap on capital costs?	No
Additional benefits	This facility is commonly seen to overload for the loss of various 500 kV lines. The upgrade of the Frenchs Mill-Junction 138 kV Line alone potentially will create more adverse impact on the Messick Road-Ridgeley 138 kV Line resulting in more operational switching to alleviate potential N-1 overloads.

## Project Components

1. Messick Road Line Terminal Upgrades at Ridgeley Substation
2. Ridgeley Line Terminal Equipment at Messick Road
3. Messick Road-Ridgeley WC4 138 kV Line Reconductoring (Maryland Portion)
4. Messick Road-Ridgeley WC4 138 kV Line Reconductoring (West Virginia Port...)
5. Frenchs Mill Line Terminal Upgrades at Junction Substation
6. Junction Line Terminal Upgrades at Frenchs Mill Substation

### Substation Upgrade Component

Component title	Messick Road Line Terminal Upgrades at Ridgeley Substation
Project description	
Substation name	Ridgeley
Substation zone	201
Substation upgrade scope	Replace (1) 138kV line trap with a 2000 Amp unit. Replace limiting 954 ACSR and 1024.5 ACAR with conductor that exceeds ratings of: 308/376/34/445MVA SN/SSTE/WN/WSTE Replace existing Messick Road line relaying and carrier equipment with (1) line relaying panel consisting of (1) SEL-421, (1) SEL411L, (1) SEL-501 BFT, (1) RFL-9785, and (1) PCM-5350.

### Transformer Information

None	
New equipment description	138 kV line trap - 2000 Amp Line terminal conductor to exceed 308/376/34/445MVA SN/SSTE/WN/WE ratings New line relaying and carrier equipment
Substation assumptions	Upgrade of existing Messick Road line terminal equipment at Ridgeley Substation to ratings above the new transmission line conductor rating.
Real-estate description	no additional real estate needed
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	\$420,079.48
Component cost (in-service year)	\$458,700.00

### **Substation Upgrade Component**

Component title	Ridgeley Line Terminal Equipment at Messick Road
Project description	
Substation name	Messick Road
Substation zone	201
Substation upgrade scope	-Replace (1) 138kV circuit breaker with a 138 kV, 3000 Amp, 40 kA interrupting rating breaker. -Replace (1) 138 kV line trap with a 2000 Amp wide band unit. -Replace limiting 1024.5 ACAR with conductor that exceeds ratings of: 308/376/34/445MVA SN/SSTE/WN/WSTE -Install (1) set of slip-over CTs on the No. 1 transformer high side bushings -Separate existing PR/BU Ridgeley line relay connections using the new slip-over CTs -Replace existing Ridgeley line meters with (1) SATEC PM174.

### **Transformer Information**

None

New equipment description	New Ridgeley 138 kV, 3000 Amp circuit breaker New Ridgeley 138 kV, 2000 Amp line trap New substation conductor exceeding rating of 308/376/34/445MVA SN/SSTE/WN/WSTE
Substation assumptions	Upgrade of existing Ridgeley line terminal equipment at Messick Road Substation to ratings above the new transmission line conductor rating.
Real-estate description	no additional real estate needed
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	\$737,797.24
Component cost (in-service year)	\$807,500.00

**Transmission Line Upgrade Component**

Component title	Messick Road-Ridgeley WC4 138 kV Line Reconductoring (Maryland Portion)
Project description	
Impacted transmission line	Messick Road-Ridgeley WC4 138 kV Line
Point A	Messick Road Substation

Point B	Ridgeley Substation
Point C	
Terrain description	Reconductor the Messick Road-Ridgeley 138 kV Line from the Messick Road Substation (Maryland) to the Ridgeley Substation (West Virginia) with 954 kcmil 45/7 ACSR conductor, the length of the line is approximately 5.0 miles. Line is located in West Virginia and Maryland. The terrain is hilly. The line crosses CSX Railway once and the North Branch of the Potomac River three times.

**Existing Line Physical Characteristics**

Operating voltage	138 kV
Conductor size and type	556 kcmil 26/7 ACSR
Hardware plan description	The Maryland portion of the line is located between: -Messick Road Substation to structure WC-304 approx. 1.75 miles. -Structure WC-315 to structure WC-325 approx. 1.25 miles. Per Plan & Profile drawings from Messick Road Substation to WC-301A (11 structures) are double circuit steel & wood davit arm structures. The conductor is listed as 954 kcmil 45/7 ACSR conductor and shielded by 7#9 Alumoweld. approx. 1.3 miles. The remaining Maryland portion of Messick Road-Ridgeley 138 kV Line is comprised of: -(12) Wood H-frame structures with a typical above ground height of 60 Ft -(2) 3-Pole deadend structures -1.7 miles of 556.5 kcmil 26/7 ACSR conductor shield by (2) 1/2" 7 strand EHS steel.
Tower line characteristics	Nothing remarkable about the line. Age of the existing facilities ranges from .....

**Proposed Line Characteristics**

	<b>Designed</b>	<b>Operating</b>
Voltage (kV)	138.000000	138.000000
	<b>Normal ratings</b>	<b>Emergency ratings</b>
Summer (MVA)	308.000000	376.000000
Winter (MVA)	349.000000	445.000000
Conductor size and type	954 ACSR 45/7	
Shield wire size and type	(2) 1/2" 7 Strand EHS Steel	

Rebuild line length	1.7 Miles
Rebuild portion description	Rebuild 1.7 Miles of the 3 total line miles in Maryland -Install (12) wood H-frame structures (TR-138045) -Install (2) wood 3-pole Deadend structures (TR-138075) -Install new insulators and conductor hardware at existing steel pole #301A -Install 1.7 miles of 954 kcmil 45/7 ACSR conductor -Removal of (12) wood H-frame structures -Removal of (2) wood 3-pole DE structures -Removal of insulators and conductor hardware at existing steel pole #301A -Removal of 1.7 miles of 556.5 kcmil 26/7 ACSR -Transfer of (2) shield wires to (12) suspension structures -Transfer of (2) shield wires to (2) DE structures.
Right of way	Assume all work will be performed within the existing ROW and no new ROW will be required.
Construction responsibility	Company specific
Benefits/Comments	
<b>Component Cost Details - In Current Year \$</b>	
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	\$5,060,434.31
Component cost (in-service year)	\$5,616,300.00
<b>Transmission Line Upgrade Component</b>	
Component title	Messick Road-Ridgeley WC4 138 kV Line Reconductoring (West Virginia Portion)
Project description	

Impacted transmission line	Messick Road-Ridgeley WC4 138 kV Line
Point A	Messick Road Substation
Point B	Ridgeley Substation
Point C	
Terrain description	Reconductor the Messick Road-Ridgeley 138 kV Line from the Messick Road Substation (Maryland) to the Ridgeley Substation (West Virginia) with 954 kcmil 45/7 ACSR conductor, the length of the line is approximately 5.0 miles. Line is located in West Virginia and Maryland. The terrain is hilly. The line crosses CSX Railway once and the North Branch of the Potomac River three times.

**Existing Line Physical Characteristics**

Operating voltage	138 kV
Conductor size and type	556 kcmil 26/7 ACSR
Hardware plan description	The West Virginia portion of the line is located between: -Structure WC-305 to Structure WC-314 approx. 1.3 miles -Structure WC-326 to Ridgeley Substation approx. 0.7 miles. Per Plan & Profile drawings from structure 3A to Ridgeley Substation (4 structures) are double circuit steel davit arm structures. The conductor is listed as 954 kcmil 45/7 ACSR conductor and shielded by 7#9 Alumoweld. Approx. 0.25 miles. The remaining West Virginia portion of Messick Road – Ridgeley 138kV line is comprised of: -(7) Horizontal post wood structures with typical pole size of 100 Ft class H4 -(2) 3-pole wood DE structure with typical pole size of 115 Ft class H1 -(3) Steel DE structures -(6) Wood H-frame structures with a typical above ground height of 60 Ft -(3) 3-pole DE structures with unknown pole size -1.75 miles of 556.5 kcmil 26/7 ACSR conductor shield by (2) 1/2" 7 strand EHS steel.
Tower line characteristics	Nothing remarkable about the line. Age of the existing facilities ranges from ..... This facility is commonly seen to overload for the loss of various 500 kV lines. The upgrade of the Frenchs Mill-Junction 138 kV Line potentially will create more adverse impact on the Messick Road-Ridgeley 138 kV line resulting in more operational switching to alleviate potential N-1 overloads.

**Proposed Line Characteristics**

	<b>Designed</b>	<b>Operating</b>
Voltage (kV)	138.000000	138.000000
	<b>Normal ratings</b>	<b>Emergency ratings</b>

Summer (MVA)	308.000000	376.000000
Winter (MVA)	349.000000	445.000000
Conductor size and type	954 ACSR 45/7	
Shield wire size and type	(2) 1/2" 7 Strand EHS Steel	
Rebuild line length	1.75 Miles	
Rebuild portion description	Rebuild 1.75 Miles of 2 line miles in West Virginia Proposed work to include: -Install (6) wood H-frame structures (TR-138045). -Install (3) wood 3-pole DE structures (TR-138075). -Install new insulators and conductor hardware at existing steel pole #3A. -Install 1.75 miles of 954 kcmil 45/7 ACSR conductor. -Removal of (6) wood H-frame structures. -Removal of (3) wood 3-pole DE structures. -Removal of insulators and conductor hardware at existing steel pole #3A. -Removal of 1.75 miles of 556.5 kcmil 26/7 ACSR. -Transfer of new conductor to (7) existing suspension structures. -Transfer of new conductor to (5) existing deadend structures. -Transfer of (2) shield wires to (6) suspension structures. -Transfer of (2) shield wires to (4) DE structures.	
Right of way	Assume all work will be performed within the existing ROW and no new ROW will be required.	
Construction responsibility	Company Specific	
Benefits/Comments		
<b>Component Cost Details - In Current Year \$</b>		
Engineering & design	This information is considered confidential and proprietary	
Permitting / routing / siting	This information is considered confidential and proprietary	
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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	\$3,895,487.42
Component cost (in-service year)	\$4,329,100.00

### **Substation Upgrade Component**

Component title	Frenchs Mill Line Terminal Upgrades at Junction Substation
Project description	
Substation name	Junction
Substation zone	201
Substation upgrade scope	Replace (1) 138 kV line trap with a 2000 Amp unit, Replace (1) 138 KV gang operated air switch with a 1200 Amp switch, and replace the limiting substation conductor on the breaker and disconnects with a conductor that exceeds 221/268/250/317 MVA SN/SE/WN/WE ratings.

### **Transformer Information**

None	
New equipment description	138 kV line trap - 2000 Amp 138 kV airswitch - 1200 Amp Terminal substation conductor to exceed 221/268/250/317 MVA SN/SE/WN/WE ratings.
Substation assumptions	Upgrade of existing Frenchs Mill line terminal equipment at Junction Substation to exceed ratings above the transmission line conductor rating.
Real-estate description	No additional real estate needed.
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	\$218,182.27
Component cost (in-service year)	\$244,400.00

### **Substation Upgrade Component**

Component title	Junction Line Terminal Upgrades at Frenchs Mill Substation
Project description	
Substation name	Frenchs Mill
Substation zone	201
Substation upgrade scope	Install (1) set of slip-over CTs on the No. 1 transformer high side bushings Install (1) set of slip-over CTs on the 138 kV Junction breaker bus side bushings Replace existing Junction line relaying and carrier equipment with (1) line relaying panel consisting of (1) SEL-421, (1) SEL411L, (1) SEL-501 BFT, (1) RFL-9785, and (1) PCM-5350. Modify existing SCADA RTU at French Mill

### **Transformer Information**

None	
New equipment description	(1) set of slip-over CTs on No. 1 transformer high side bushings (1) set of slip-over CTs on the 138 kV Junction breaker bus side bushings Replace existing Junction line relaying and carrier Equipment with (1) line relaying panel consisting of (1) SEL-421, (1) SEL411L, (1) SEL-501 BFT, (1) RFL-9785, and (1) PCM-5350.
Substation assumptions	Upgrade of existing Frenchs Mill line terminal equipment at Junction Substation to ratings above the transmission line conductor rating.
Real-estate description	No additional real estate needed
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	\$472,603.45
Component cost (in-service year)	\$529,300.00

### Congestion Drivers

CD #	From Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
ME-3	235479	01JUNCTN	235467	01FRNCHM	1	138	201	Market Efficiency	Included

### Existing Flowgates

None

### New Flowgates

None

### Financial Information

Capital spend start date	06/2021
Construction start date	06/2025
Project Duration (In Months)	48

**Additional Comments**

None