

TMI 500 / 230 kV Transformer Addition

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	880
Project title	TMI 500 / 230 kV Transformer Addition
Project description	Install second 500/230kV Transformer with additional 500 and 230 bus expansions.
Email	Company specific
Project in-service date	06/2027
Tie-line impact	No
Interregional project	No
Is the proposer offering a binding cap on capital costs?	No
Additional benefits	

Project Components

1. Re-Terminate existing 230kV Jackson - TMI 1051 Line at TMI 230
2. Connect TMI Generating Unit 2 500kV Bus Tie
3. Modify Relay Settings on TMI 230 terminal at Jackson
4. Add terminals and breakers to TMI 230 Substation
5. TMI 500: Expand bus and install second 500-230 kV Transformer.

Transmission Line Upgrade Component

Component title	Re-Terminate existing 230kV Jackson - TMI 1051 Line at TMI 230
Project description	Re-terminate the existing Line 1051 (Jackson-Three Mile Island) 230kV
Impacted transmission line	Jackson - TMI 230kV 1051 Line
Point A	Jackson
Point B	Three Mile Island 230
Point C	
Terrain description	work will primarily take place within substation, on Three Mile Island

Existing Line Physical Characteristics

Operating voltage	230 kV
Conductor size and type	1033.5 kcmil 54/7 ACSR
Hardware plan description	Existing conductor and shield wire are in good condition and can be transferred to the new structures.
Tower line characteristics	2- pole steel H structure. it is assumed existing structures have adequate capacity to handle the new loading.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	541.000000	659.000000
Winter (MVA)	612.000000	781.000000
Conductor size and type	1033.5 kcmil 54/7 ACSR	

Shield wire size and type	OPGW FOCAS Skylite 36 Fiber
Rebuild line length	none
Rebuild portion description	Existing conductor and shield wire is to be re-terminated into the modified substation.
Right of way	All work will be performed within the existing ROW or on substation property and no new ROW will be required
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	\$282,611.28
Component cost (in-service year)	\$318,550.76

Transmission Line Upgrade Component

Component title	Connect TMI Generating Unit 2 500kV Bus Tie
Project description	Use the 500 kV TMI generating unit 2 bus tie to connect the 230 kV from TMI 500 to TMI 230 yards. This will serve as the low side lead conductor on the new transformer.
Impacted transmission line	TMI 500 - TMI 230

Point A	TMI 500	
Point B	TMI 230	
Point C		
Terrain description	Line crosses a river.	
Existing Line Physical Characteristics		
Operating voltage	230 kV	
Conductor size and type	2493 54/37 ACAR	
Hardware plan description	Existing structure and line to be reused. Assumed existing structures have adequate capacity to handle new loading	
Tower line characteristics	Assumed existing structures have adequate capacity to handle new loading	
Proposed Line Characteristics		
	Designed	Operating
Voltage (kV)	500.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1692.000000	2089.000000
Winter (MVA)	1960.000000	2531.000000
Conductor size and type	2493 54/37 ACAR	
Shield wire size and type	existing shield wire to be reused.	
Rebuild line length	No rebuild	
Rebuild portion description	Existing structure and line to be reused.	
Right of way	All work will be performed within the existing ROW or on substation property and no new ROW will be required	

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

\$388,121.86

Component cost (in-service year)

\$439,459.57

Substation Upgrade Component

Component title

Modify Relay Settings on TMI 230 terminal at Jackson

Project description

Update relay settings on TMI 230 line terminal at Jackson

Substation name

Jackson

Substation zone

ME

Substation upgrade scope

relay setting changes

Transformer Information

None

New equipment description

no new equipment

Substation assumptions	none
Real-estate description	
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	\$125,240.71
Component cost (in-service year)	\$140,708.28

Substation Upgrade Component

Component title	Add terminals and breakers to TMI 230 Substation
Project description	Upgrades to TMI 230kV substation for 500/230kV Transformer addition.
Substation name	TMI 230
Substation zone	ME

Substation upgrade scope

Add 2 230kV circuit breakers and associated disconnects for new line terminal. Relocate existing 500/230kV Bank 1 line to new terminal. Terminate new 500/230kV Bank 2 transmission line where Bank 1 line used to be connected. Below Grade -Foundations, conduit and grounding for new equipment and structures. -Grading, grounding, conduit, and fence for substation expansion as indicated on the attached layout. Above Grade -Install (2) 230kV circuit breaker -Relocate the existing 500/230kV Bank 1 line to this new terminal (previously the Jackson dead end structure) -Install (4) 230kV breaker disconnect switches -Install (3) 230kV CVTs -Install (3) 230kV class surge arresters -Install (1) 230kV line MOAB -Install (1) 230kV dead end structure for the Jackson line -Install (1) 230kV dead end structure for the No. 2 Bank transformer from the 500kV yard -Install (2) 230kV transmission line structures as indicated on the attached layout for the No. 2 Bank 230kV line -Install (1) lot of bus, conductor, insulators, and support structures as indicated on the attached layout. -Terminate new 500/230kV Bank 2 transmission line where the Bank 1 line use to be connected Relay & Control -Modify relay settings on existing 500/230kV TMI line -Install (1) prewired relaying panel for the new 500/230kV TMI line -Install (1) prewired breaker control panel for two SEL-451's -Modify relay settings on the 230kV 1051 line to Jackson -Install PMU monitoring

Transformer Information

	Name	Capacity (MVA)		
Transformer	TMI 500/230kV Bank 2	750		
	High Side	Low Side	Tertiary	
Voltage (kV)	500	230		
New equipment description	2 new 230kV circuit breakers. new 230kV terminals for 230kV sides of 500/230kV Bank 1, and 2. new 230kV terminal for Jackson - TMI 230kV 1051 line. ratings for new equipment associated with the new 500/230kV Bank 2 transformer should meet or exceed 972 / 1100 / 1182 / 1364 MVA SN / SE / WN / WE. Below Grade -Foundations, conduit and grounding for new equipment and structures. -Grading, grounding, conduit, and fence for substation expansion as indicated on the attached layout. Above Grade -Install (2) 230kV circuit breaker -Relocate the existing 500/230kV Bank 1 line to this new terminal (previously the Jackson dead end structure) -Install (4) 230kV breaker disconnect switches -Install (3) 230kV CVTs -Install (3) 230kV class surge arresters -Install (1) 230kV line MOAB -Install (1) 230kV dead end structure for the Jackson line -Install (1) 230kV dead end structure for the No. 2 Bank transformer from the 500kV yard -Install (2) 230kV transmission line structures as indicated on the attached layout for the No. 2 Bank 230kV line -Install (1) lot of bus, conductor, insulators, and support structures as indicated on the attached layout. -Terminate new 500/230kV Bank 2 transmission line where the Bank 1 line use to be connected Relay & Control -Modify relay settings on existing 500/230kV TMI line -Install (1) prewired relaying panel for the new 500/230kV TMI line -Install (1) prewired breaker control panel for two SEL-451's -Modify relay settings on the 230kV 1051 line to Jackson -Install PMU monitoring			

Substation assumptions	-Existing control building has adequate space for new panels. -Existing AC, DC, and SCADA are sufficient for upgrades -FE can use/purchase the property for the substation expansion.
Real-estate description	property acquisition required for substation expansion
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	\$5,593,322.76
Component cost (in-service year)	\$6,330,406.43

Substation Upgrade Component

Component title	TMI 500: Expand bus and install second 500-230 kV Transformer.
Project description	Upgrades to TMI 500kV Substation for 500/230kV Transformer addition
Substation name	TMI 500
Substation zone	ME

Substation upgrade scope

Install 500/230kV transformer bank. Install 230kV circuit breaker and associated equipment. Install 2 500kV circuit breakers and associated bus work and equipment for new 500/230kV Bank 1 500kV terminal. Install 1 new 500kV circuit breaker and associated equipment for new Lauschtown - TMI 500 5026 line terminal. Relocate 5026 line to new terminal. New 500/230kV Bank 2 Transformer to terminate where 5026 line used to terminate. Below Grade -Foundations, conduit and grounding for new equipment and structures -Grading, grounding, conduit, and fence for substation expansion as indicated on the attached layout. Above Grade -Install (1) 500/230kV transformer bank (three single phase transformers) -Install (1) 230kV circuit breaker -Install (1) 230kV line disconnect switch -Install (3) 230kV class surge arresters -Install (3) 230kV CVTs -Install (1) 230kV dead end structure -Install (1) 500kV dead end structure -Install (1) 500kV MOAB disconnect switch -Install (3) 500kV CVTs -Replace (1) 500kV line trap for the 5026 500kV line -Install (1) 500kV circuit breaker for the relocated 5026 500kV line -Install (2) 500kV breaker disconnect switches -Install (3) 230kV transformer tap structures as indicated on the attached layout -Install (3) 500kV bus supports for the neutral bus -Install (2) 500kV circuit breakers for the No. 1 Bank line terminal -Install (4) 500kV disconnect switches for the No. 1 Bank line terminal -Install (1) lot of bus, conductor, insulators, support structures as indicated on the attached layout. -All new equipment and conductor should exceed ratings assumed to be: 972/1100/1182/1364 SN/SSTE/WN/WSTE MVA Relay & Control -Modify existing 500/230kV relaying as needed -Install (2) prewired transformer relaying panels -Install (1) prewired relaying panel -Install (4) prewired breaker control panel -Modify relay settings on the existing Lauschtown (PPL) line -Install PMU monitoring

Transformer Information

	Name	Capacity (MVA)		
Transformer	TMI 500/230kV Bank 2	750		
	High Side	Low Side	Tertiary	
Voltage (kV)	500	230		

New equipment description	<p>3 new 500kV circuit breakers and associated bus work and equipment. new terminal for 500kV Laushtown - TMI 500 5026 line. New terminals for 500/230kV Transformer bank 1 and 2. Ratings for new transformer equipment should meet or exceed 972 / 1100 / 1182 / 1364 MVA SN / SE / WN / WE. Below Grade -Foundations, conduit and grounding for new equipment and structures -Grading, grounding, conduit, and fence for substation expansion as indicated on the attached layout. Above Grade -Install (1) 500/230kV transformer bank (three single phase transformers) -Install (1) 230kV circuit breaker -Install (1) 230kV line disconnect switch -Install (3) 230kV class surge arresters -Install (3) 230kV CVTs -Install (1) 230kV dead end structure -Install (1) 500kV dead end structure -Install (1) 500kV MOAB disconnect switch -Install (3) 500kV CVTs -Replace (1) 500kV line trap for the 5026 500kV line -Install (1) 500kV circuit breaker for the relocated 5026 500kV line -Install (2) 500kV breaker disconnect switches -Install (3) 230kV transformer tap structures as indicated on the attached layout -Install (3) 500kV bus supports for the neutral bus -Install (2) 500kV circuit breakers for the No. 1 Bank line terminal -Install (4) 500kV disconnect switches for the No. 1 Bank line terminal -Install (1) lot of bus, conductor, insulators, support structures as indicated on the attached layout. -All new equipment and conductor should exceed ratings assumed to be: 972/1100/1182/1364 SN/SSTE/WN/WSTE MVA Relay & Control -Modify existing 500/230kV relaying as needed -Install (2) prewired transformer relaying panels -Install (1) prewired relaying panel -Install (4) prewired breaker control panel -Modify relay settings on the existing Laushtown (PPL) line -Install PMU monitoring</p>
Substation assumptions	<p>-Existing control building has adequate space for new panels. -Existing AC, DC, and SCADA are sufficient for upgrades -FE can use/purchase the property for the substation expansion.</p>
Real-estate description	
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	\$23,808,007.40
Component cost (in-service year)	\$26,734,802.35

Congestion Drivers

None

Existing Flowgates

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2022W1-GD-S29	200016	3 MILE I	204514	27TMI	1	500/230	227	Summer Gen Deliv	Included
2022W1-GD-S634	200016	3 MILE I	204514	27TMI	1	500/230	227	Summer Gen Deliv	Included
2022W1-GD-W36	200016	3 MILE I	204514	27TMI	1	500/230	227	Winter Gen Deliv	Included

New Flowgates

None

Financial Information

Capital spend start date	01/2023
Construction start date	01/2026
Project Duration (In Months)	53

Additional Comments

None