

Upgrades for Cardiff 2700 MW Injection

General Information

Proposing entity name	NEETMH
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Yes
Company proposal ID	1A-C27
PJM Proposal ID	793
Project title	Upgrades for Cardiff 2700 MW Injection
Project description	Upgrades for 2-C27 injection
Email	Johnbinh.Vu@nexteraenergy.com
Project in-service date	10/2025
Tie-line impact	No
Interregional project	No
Is the proposer offering a binding cap on capital costs?	No
Additional benefits	

Project Components

1. Reconductor Lewis#1 - Cardiff 138kV OH line
2. Reconductor Lewis#2 - Cardiff 138kV OH line
3. Eliminate conditions which derate Oyster - Manitou 230 kV OH line Ckt. 1...
4. Eliminate conditions (contingencies such as as "JC-P2-3-JCC-230-11") w...
5. Add 1x Phase Shifting Transformer (PST) at New Freedom 230 kV substation...
6. New Freedom 230 kV substation upgrade and reconfiguring existing line te...

7. Add 1x Phase Shifting Transformer (PST) at Cardiff 230 kV substation
8. Increase Cardiff 230/138 kV T6 transformer ratings
9. Increase Cardiff 230/69 kV T1 transformer ratings
10. Cardiff 230kV Substation Upgrade
11. Add 1x Phase Shifting Transformer (PST) at Hope Creek 230 kV substation ...
12. Add 1x Phase Shifting Transformer (PST) at Hope Creek substation for Hop...

Transmission Line Upgrade Component

Component title	Reconductor Lewis#1 - Cardiff 138kV OH line
Project description	Reconductor Lewis#1 - Cardiff 138kV OH line
Impacted transmission line	Lewis #1 to Cardiff 138 kV line
Point A	Lewis #1
Point B	Cardiff
Point C	
Terrain description	Expect to utilize existing easements/utility owned property, no expansion anticipated

Existing Line Physical Characteristics

Operating voltage	138
Conductor size and type	Same as existing
Hardware plan description	Utilize existing line hardware to extent practicable
Tower line characteristics	Utilize existing towers to extent practicable

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	138.000000	138.000000

	Normal ratings	Emergency ratings
Summer (MVA)	401.000000	492.000000
Winter (MVA)	401.000000	492.000000
Conductor size and type	795 kcmil Drake ACSS/TW HS: 1C	
Shield wire size and type	Utilize existing shield wire to extent practicable	
Rebuild line length	5.05	
Rebuild portion description	Proposing to reconductor the entire line (or necessary portion) to achieve the specified rating	
Right of way	Use of existing ROW, no expansion anticipated	
Construction responsibility	AEC	
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process	
Component Cost Details - In Current Year \$		
Engineering & design	Confidential competitive information	
Permitting / routing / siting	Confidential competitive information	
ROW / land acquisition	Confidential competitive information	
Materials & equipment	Confidential competitive information	
Construction & commissioning	Confidential competitive information	
Construction management	Confidential competitive information	
Overheads & miscellaneous costs	Confidential competitive information	
Contingency	Confidential competitive information	
Total component cost	\$5,030,000.00	
Component cost (in-service year)	\$5,470,000.00	

Transmission Line Upgrade Component

Component title	Reconductor Lewis#2 - Cardiff 138kV OH line
Project description	Reconductor Lewis#2 - Cardiff 138kV OH line
Impacted transmission line	Lewis #2 to Cardiff 138 kV line
Point A	Lewis #2
Point B	Cardiff
Point C	
Terrain description	Expect to utilize existing easements/utility owned property, no expansion anticipated

Existing Line Physical Characteristics

Operating voltage	138
Conductor size and type	Same as existing
Hardware plan description	Utilize existing line hardware to extent practicable
Tower line characteristics	Utilize existing towers to extent practicable

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	138.000000	138.000000
	Normal ratings	Emergency ratings
Summer (MVA)	478.000000	578.000000
Winter (MVA)	478.000000	578.000000
Conductor size and type	1033.5 kcmil Curlew ACSS HS: 1C	
Shield wire size and type	Utilize existing shield wire to extent practicable	

Rebuild line length	5.25 miles
Rebuild portion description	Proposing to reconductor the entire line (or necessary portion) to achieve the specified rating
Right of way	Use of existing ROW, no expansion anticipated
Construction responsibility	AEC
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year \$

Engineering & design	Confidential competitive information
Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	\$5,240,000.00
Component cost (in-service year)	\$5,680,000.00

Transmission Line Upgrade Component

Component title	Eliminate conditions which derate Oyster - Manitou 230 kV OH line Ckt. 1 short term emergency ratings
Project description	Eliminate conditions (contingencies such as as "JC-P2-3-JCC-230-11") which derate emergency ratings of Oyster - Manitou 230 OH line Ckt 1
Impacted transmission line	Oyster Creek to Manitou 230 kV line Ckt 1
Point A	Oyster Creek

Point B	Manitou	
Point C		
Terrain description	Expect to utilize existing easements/utility owned property, no expansion anticipated	
Existing Line Physical Characteristics		
Operating voltage	230	
Conductor size and type	Same as existing	
Hardware plan description	Utilize existing line hardware to extent practicable	
Tower line characteristics	Utilize existing towers to extent practicable	
Proposed Line Characteristics		
	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	709.000000	869.000000
Winter (MVA)	709.000000	869.000000
Conductor size and type	Same as existing	
Shield wire size and type	Utilize existing shield wire to extent practicable	
Rebuild line length	0	
Rebuild portion description	Proposing to upgrade necessary equipment to achieve the existing emergency ratings	
Right of way	Use of existing ROW, no expansion anticipated	
Construction responsibility	JCPL	
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process	

Component Cost Details - In Current Year \$

Engineering & design	Confidential competitive information
Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	\$5,000,000.00
Component cost (in-service year)	\$5,410,000.00

Transmission Line Upgrade Component

Component title	Eliminate conditions (contingencies such as as "JC-P2-3-JCC-230-11") which derate emergency ratings of Oyster - Manitou 230 OH line Ckt 2
Project description	Eliminate conditions (contingencies such as as "JC-P2-3-JCC-230-11") which derate emergency ratings of Oyster - Manitou 230 OH line Ckt 1
Impacted transmission line	Oyster Creek to Manitou 230 kV line Ckt 2
Point A	Oyster Creek
Point B	Manitou
Point C	
Terrain description	Expect to utilize existing easements/utility owned property, no expansion anticipated

Existing Line Physical Characteristics

Operating voltage	230
-------------------	-----

Conductor size and type	Same as existing
Hardware plan description	Utilize existing line hardware to extent practicable
Tower line characteristics	Utilize existing towers to extent practicable

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	709.000000	869.000000
Winter (MVA)	709.000000	869.000000
Conductor size and type	Same as existing	
Shield wire size and type	Utilize existing shield wire to extent practicable	
Rebuild line length	0	
Rebuild portion description	Proposing to upgrade necessary equipment to achieve the existing emergency ratings	
Right of way	Use of existing ROW, no expansion anticipated	
Construction responsibility	JCPL	
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process	

Component Cost Details - In Current Year \$

Engineering & design	Confidential competitive information
Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information

Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	\$5,000,000.00
Component cost (in-service year)	\$5,410,000.00

Substation Upgrade Component

Component title	Add 1x Phase Shifting Transformer (PST) at New Freedom 230 kV substation to prevent downstream overload on New Freedom- Hilltop 230kV OH line
Project description	Add 1x Phase Shifting Transformer at New Freedom 230 kV substation to prevent downstream overload on New Freedom- Hilltop 230kV OH line
Substation name	New Freedom 230 kV
Substation zone	PSEG
Substation upgrade scope	Add 1x Phase Shifting Transformer (PST) at New Freedom 230 kV substation to prevent downstream overload on New Freedom- Hilltop 230kV OH line

Transformer Information

	Name	Capacity (MVA)	
Transformer	New Freedom 230 kV PST	766	
	High Side	Low Side	Tertiary
Voltage (kV)	230	230	
New equipment description	AC Substation : Phase Shifter		
Substation assumptions	Use available space in sub to add phase shifting transformer		
Real-estate description	No expansion of substation fence anticipated		

Construction responsibility	PSEG
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year \$

Engineering & design	Confidential competitive information
Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	\$15,000,000.00
Component cost (in-service year)	\$16,240,000.00

Substation Upgrade Component

Component title	New Freedom 230 kV substation upgrade and reconfiguring existing line termination
Project description	Add one new line position #9 (1 CB) at New Freedom 230 kV substation. Reconfigure 230kV sub to move existing Silver Lake 230 kV line at position #9, Marlton 230 kV line at #10 and the new NEETMA proposed Reega to New Freedom 230 kV OH Line at #12
Substation name	New Freedom 230 kV
Substation zone	PSEG
Substation upgrade scope	Add 1 CB

Transformer Information

None	
New equipment description	AC Substation : Upgrade - add one position
Substation assumptions	Open positions available per TO provided one-lines
Real-estate description	No expansion of substation fence anticipated
Construction responsibility	PSEG
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year \$

Engineering & design	Confidential competitive information
Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	\$10,000,000.00
Component cost (in-service year)	\$10,820,000.00

Substation Upgrade Component

Component title	Add 1x Phase Shifting Transformer (PST) at Cardiff 230 kV substation
Project description	Add 1x Phase Shifting Transformer (PST) at Cardiff substation to prevent downstream overload on Cardiff - Cedar 230kV OH line
Substation name	Cardiff 230/138 kV
Substation zone	AEC

Substation upgrade scope

Add 1x Phase Shifting Transformer (PST) at Cardiff substation to prevent downstream overload on Cardiff - Cedar 230kV OH line

Transformer Information

	Name	Capacity (MVA)	
Transformer	Cardiff 230 kV PST	766	
	High Side	Low Side	Tertiary
Voltage (kV)	230	230	
New equipment description	AC Substation: Phase Shifter		
Substation assumptions	Use available space in sub to add phase shifting transformer		
Real-estate description	No expansion of substation fence anticipated		
Construction responsibility	AEC		
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process		
Component Cost Details - In Current Year \$			
Engineering & design	Confidential competitive information		
Permitting / routing / siting	Confidential competitive information		
ROW / land acquisition	Confidential competitive information		
Materials & equipment	Confidential competitive information		
Construction & commissioning	Confidential competitive information		
Construction management	Confidential competitive information		
Overheads & miscellaneous costs	Confidential competitive information		
Contingency	Confidential competitive information		
Total component cost	\$15,000,000.00		

Component cost (in-service year) \$16,240,000.00

Substation Upgrade Component

Component title Increase Cardiff 230/138 kV T6 transformer ratings
Project description Increase Cardiff 230/138 kV T6 transformer ratings
Substation name Cardiff 230/138 kV
Substation zone AEC
Substation upgrade scope Increase Cardiff 230/138 kV T6 transformer ratings

Transformer Information

	Name	Capacity (MVA)		
Transformer	Cardiff 230/138 kV T6 Transformer	450		
		High Side	Low Side	Tertiary
Voltage (kV)		230	138	
New equipment description	AC Substation : Transformer			
Substation assumptions	Transformer upgrade is feasible			
Real-estate description	No expansion of substation fence anticipated			
Construction responsibility	AEC			
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process			

Component Cost Details - In Current Year \$

Engineering & design Confidential competitive information
Permitting / routing / siting Confidential competitive information
ROW / land acquisition Confidential competitive information

Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	\$10,000,000.00
Component cost (in-service year)	\$10,820,000.00

Substation Upgrade Component

Component title	Increase Cardiff 230/69 kV T1 transformer ratings
Project description	Increase Cardiff 230/69 kV T1 transformer ratings
Substation name	Cardiff 230/69 kV
Substation zone	AEC
Substation upgrade scope	Increase Cardiff 230/69 kV T1 transformer ratings

Transformer Information

	Name	Capacity (MVA)	
Transformer	Cardiff 230/69 kV T1 Transformer	261	
	High Side	Low Side	Tertiary
Voltage (kV)	230	69	
New equipment description	AC Substation : Transformer		
Substation assumptions	Transformer upgrade is feasible		
Real-estate description	No expansion of substation fence anticipated		

Construction responsibility	AEC
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process
Component Cost Details - In Current Year \$	
Engineering & design	Confidential competitive information
Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	\$10,000,000.00
Component cost (in-service year)	\$10,820,000.00

Substation Upgrade Component

Component title	Cardiff 230kV Substation Upgrade
Project description	Add one new line position (1 CB) at Ring Bus at Cardiff substation to land the new Cardiff-NEETMA proposed 230 kV OH line
Substation name	Cardiff 230 kV
Substation zone	AEC
Substation upgrade scope	Add 1 CB

Transformer Information

None

New equipment description	AC Substation : Upgrade - add one position
Substation assumptions	Open positions available per TO provided one-lines
Real-estate description	No expansion of substation fence anticipated
Construction responsibility	AEC
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year \$

Engineering & design	Confidential competitive information
Permitting / routing / siting	Confidential competitive information
ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	\$4,030,000.00
Component cost (in-service year)	\$4,370,000.00

Substation Upgrade Component

Component title	Add 1x Phase Shifting Transformer (PST) at Hope Creek 230 kV substation for Hope-Creek LS Power Cable Ckt. 1
Project description	Add 1x Phase Shifting Transformer (PST) at Hope Creek substation to prevent downstream overload on Hope Creek- LS Power 230kV Cable Ckt. 1
Substation name	Hope Creek 230 kV
Substation zone	PSEG

Substation upgrade scope

Add 1x Phase Shifting Transformer (PST) at Hope Creek substation to prevent downstream overload on Hope Creek- LS Power 230kV Cable Ckt. 1

Transformer Information

	Name	Capacity (MVA)	
Transformer	Hope Creek 230 kV PST - Ckt. 1	766	
	High Side	Low Side	Tertiary
Voltage (kV)	230	230	
New equipment description	AC Substation : Phase Shifter		
Substation assumptions	Use available space in sub to add phase shifting transformer		
Real-estate description	No expansion of substation fence anticipated		
Construction responsibility	PSEG		
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process		
Component Cost Details - In Current Year \$			
Engineering & design	Confidential competitive information		
Permitting / routing / siting	Confidential competitive information		
ROW / land acquisition	Confidential competitive information		
Materials & equipment	Confidential competitive information		
Construction & commissioning	Confidential competitive information		
Construction management	Confidential competitive information		
Overheads & miscellaneous costs	Confidential competitive information		
Contingency	Confidential competitive information		
Total component cost	\$15,000,000.00		

Component cost (in-service year) \$16,240,000.00

Substation Upgrade Component

Component title Add 1x Phase Shifting Transformer (PST) at Hope Creek substation for Hope Creek- LS Power 230kV Cable Ckt. 2

Project description Add 1x Phase Shifting Transformer (PST) at Hope Creek substation to prevent downstream overload on Hope Creek- LS Power 230kV Cable Ckt. 2

Substation name Hope Creek 230 kV

Substation zone PSEG

Substation upgrade scope Add 1x Phase Shifting Transformer (PST) at Hope Creek substation to prevent downstream overload on Hope Creek- LS Power 230kV Cable Ckt. 2

Transformer Information

	Name	Capacity (MVA)	
Transformer	Hope Creek 230 kV PST - Ckt. 2 766		
	High Side	Low Side	Tertiary
Voltage (kV)	230	230	
New equipment description	AC Substation : Phase Shifter		
Substation assumptions	Use available space in sub to add phase shifting transformer		
Real-estate description	No expansion of substation fence anticipated		
Construction responsibility	PSEG		
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process		
Component Cost Details - In Current Year \$			
Engineering & design	Confidential competitive information		
Permitting / routing / siting	Confidential competitive information		

ROW / land acquisition	Confidential competitive information
Materials & equipment	Confidential competitive information
Construction & commissioning	Confidential competitive information
Construction management	Confidential competitive information
Overheads & miscellaneous costs	Confidential competitive information
Contingency	Confidential competitive information
Total component cost	\$15,000,000.00
Component cost (in-service year)	\$16,240,000.00

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

None

Financial Information

Capital spend start date	12/2022
Construction start date	12/2022
Project Duration (In Months)	34

Additional Comments

None