2021 SAA Proposal to Support NJ OSW: Option 1b

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 specific
Company proposal ID	Company specific
PJM Proposal ID	453
Project title	2021 SAA Proposal to Support NJ OSW: Option 1b
Project description	Project proposal to build the necessary transmission to meet New Jersey’s goal of facilitating the delivery of a total of 7,500 MW of offshore wind by 2035.
Email	Company specific
Project in-service date	12/2032
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. Atlantic 230 kV Substation - Convert to Double-Breaker Double-Bus
2. Freneau Substation - Update relay settings
3. Smithburg Substation - Update relay settings
4. Oceanview Substation - Update relay settings
5. Red Bank Substation - Update relay settings

6. South River Substation - Update relay settings
7. Larrabee Substation - Update relay settings
8. Atlantic Substation - Install line terminal
9. Larrabee Substation - Reconfigure substation
10. Larrabee substation: 230kV equipment for direct connection
11. Lakewood Gen Substation - Update relay settings
12. G1021 (Atlantic-Smithburg) 230kV
13. R1032 (Atlantic-Larrabee) 230kV
14. New Larrabee Converter-Atlantic 230kV
15. Larrabee-Oceanview 230kV
16. B54 Larrabee-South Lockwood 34.5kV Line Transfer
17. Larrabee Converter-Larrabee 230kV New Line
18. Larrabee Converter-Smithburg No1 500kV Line (New Asset)
19. Larrabee Converter-Smithburg No2 500kV Line (New Asset)
20. B1042 Cookstown-Larrabee 230kV
21. L220 Hyson-Larrabee 34.5kV
22. K219 Hyson-Larrabee 34.5kV
23. E83 Line 115kV (NIS)
24. G1021 Atlantic-Smithburg 230kV
25. H2008 Larrabee Smithburg No2 230kV
26. D2004 Larrabee-Smithburg No1 230kV
27. Smithburg Substation 500 kV Expansion
28. Larrabee Substation
29. Smithburg Substation 500 kv 3 Brk Ring

Substation Upgrade Component

Component title	Atlantic 230 kV Substation - Convert to Double-Breaker Double-Bus
Project description	Convert Atlantic 230 kV substation to a double-breaker double-bus configuration and install a new 230 kV line terminal & substation exit for the interconnection of 1200 MW of wind generation.

Substation name	Atlantic 230 kV (Bus # 206286)
Substation zone	JCP&L, Area 228, Zone 226
Substation upgrade scope	Atlantic 230 kV: Foundations, conduit, and grounding for new equipment Grading, stone, ground grid, fence for substation expansion Install (1) prefabricated control building Install (19) 230kV circuit breakers Install (36) 230kV breaker disconnect switches Install (9) 230kV MOAB line disconnect switches Install (33) 230kV CVTs Install (27) 230kV surge arresters Install (1) 230kV line trap, line tuner, and coax for the Freneau line terminal Install (1) 230kV line trap, line tuner, and coax for the South River line terminal Install (1) lot bus, insulators, steel supports, fittings, and conductor Install (1) prewired relaying panels for the T2020 Red Bank terminal Install (1) prewired relaying panels for the Y2024 Oceanview terminal Install (1) prewired relaying panels for the Y2025 Oceanview terminal Install (1) prewired relaying panels for the S1033 Red Bank terminal Install (1) prewired relaying panels for the H1022 Freneau terminal Install (1) prewired carrier relaying panel for H1022 Freneau line Install (1) prewired relaying panels for the R1032 Larrabee terminal Install (1) prewired relaying panels for the G1021 Smithburg terminal Install (1) prewired relaying panels for the P1030 South River terminal Install (1) prewired carrier relaying panel for the P1030 South River line Install (2) prewired relaying panels for the 230/69kV No. 1 TR Install (2) prewired relaying panels for the 230/69kV No. 3 TR Install (1) breaker panel with SEL-451 for Cap 3 and Cap 4 Install (4) prewired relaying panels for bus diff 1 and bus diff 2 Install (19) prewired breaker control panels Install (1) SCADA RTU, RTAC, HMI, and standard communication equipment including fiber Remove (9) 230kV circuit breakers Remove (20) 230kV breaker disconnect switches Remove (1) lot bus, insulators, bus support structures, foundations Forestry, Real Estate, Environmental, and Right-of Way Install (2) 230kV circuit breakers Install (4) 230kV disconnect switches Install (1) 230kV line disconnect switch Install (3) 230kV surge arresters Install (3) 230kV CVTs Install (1) 230kV dead end structure Install (1) lot bus, insulators, steel supports, fittings, and conductor Install (1) prewired relaying panels for OSW Generator 1 Install (2) prewired breaker control panel Redundant fiber path between Atlantic and generator Modify relay settings on the 230 kV Atlantic terminals at: Freneau, Smithburg, Oceanview, Red Bank, South River, and Larrabee substations.

Transformer Information

None

New equipment description	Atlantic 230 kV: Foundations, conduit, and grounding for new equipment Grading, stone, ground grid, fence for substation expansion Install (1) prefabricated control building Install (19) 230kV circuit breakers Install (36) 230kV breaker disconnect switches Install (9) 230kV MOAB line disconnect switches Install (33) 230kV CVTs Install (27) 230kV surge arresters Install (1) 230kV line trap, line tuner, and coax for the Freneau line terminal Install (1) 230kV line trap, line tuner, and coax for the South River line terminal Install (1) lot bus, insulators, steel supports, fittings, and conductor Install (1) prewired relaying panels for the T2020 Red Bank terminal Install (1) prewired relaying panels for the Y2024 Oceanview terminal Install (1) prewired relaying panels for the Y2025 Oceanview terminal Install (1) prewired relaying panels for the S1033 Red Bank terminal Install (1) prewired relaying panels for the H1022 Freneau terminal Install (1) prewired carrier relaying panel for H1022 Freneau line Install (1) prewired relaying panels for the R1032 Larrabee terminal Install (1) prewired relaying panels for the G1021 Smithburg terminal Install (1) prewired relaying panels for the P1030 South River terminal Install (1) prewired carrier relaying panel for the P1030 South River line Install (2) prewired relaying panels for the 230/69kV No. 1 TR Install (2) prewired relaying panels for the 230/69kV No. 3 TR Install (1) breaker panel with SEL-451 for Cap 3 and Cap 4 Install (4) prewired relaying panels for bus diff 1 and bus diff 2 Install (19) prewired breaker control panels Install (1) SCADA RTU, RTAC, HMI, and standard communication equipment including fiber Remove (9) 230kV circuit breakers Remove (20) 230kV breaker disconnect switches Remove (1) lot bus, insulators, bus support structures, foundations Forestry, Real Estate, Environmental, and Right-of Way Install (2) 230kV circuit breakers Install (4) 230kV disconnect switches Install (1) 230kV line disconnect switch Install (3) 230kV surge arresters Install (3) 230kV CVTs Install (1) 230kV dead end structure Install (1) lot bus, insulators, steel supports, fittings, and conductor Install (1) prewired relaying panels for OSW Generator 1 Install (2) prewired breaker control panel Redundant fiber path between Atlantic and generator Modify relay settings on the 230 kV Atlantic terminals at: Freneau, Smithburg, Oceanview, Red Bank, South River, and Larrabee substations.
Substation assumptions	BF relaying will fit in the new relay panels. Fiber is not existing on H1022 and P1030 lines. If fiber is existing, PLC equipment can be removed. Existing dead end structures can be reused. 69 kV yard will provide station service to the new control building. Existing ground grid is sufficient and will only need additional materials for the expansion. Line MOABs can be mounted on existing structures.
Real-estate description	Substation fence will be expanded. Additional land will not be required, and costs for environmental and right of way have been included in the estimates.
Construction responsibility	Company specific
Benefits/Comments	The substation conversion to double-breaker double-bus will enable the direct connection of the OSW generator along with providing greater reliability, operational flexibility, and reducing common mode contingency risk.

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	$31,471,490.95
Component cost (in-service year)	$38,292,996.65

Substation Upgrade Component

Component title	Freneau Substation - Update relay settings
Project description	At Freneau Substation, modify relay settings on the Atlantic 230 kV Line.
Substation name	Freneau
Substation zone	JCPL
Substation upgrade scope	At Freneau Substation, modify relay settings on the Atlantic 230 kV Line.

Transformer Information

None

New equipment description	No new equipment is needed for this upgrade
Substation assumptions	Existing relays will be re-used and settings will be adjusted, as necessary.
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	$33,286.65
Component cost (in-service year)	$41,715.64

Substation Upgrade Component

Component title	Smithburg Substation - Update relay settings
Project description	At Smithburg Substation, modify relay settings on the Atlantic 230 kV Line.
Substation name	Smithburg
Substation zone	JCPL
Substation upgrade scope	At Smithburg Substation, modify relay settings on the Atlantic 230 kV Line.

Transformer Information

None

New equipment description	No new equipment is needed for this upgrade
Substation assumptions	Existing relays will be re-used and settings will be adjusted, as necessary.
Real-estate description	The upgrade will occur within the confines of the existing substation.

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	$33,286.65
Component cost (in-service year)	$41,715.64

Substation Upgrade Component

Component title	Oceanview Substation - Update relay settings
Project description	At Oceanview Substation, modify relay settings on the Atlantic 230 kV lines.
Substation name	Oceanview
Substation zone	JCPL
Substation upgrade scope	At Oceanview Substation, modify relay settings on the Atlantic 230 kV lines.

Transformer Information

None

New equipment description	No new equipment is needed for this upgrade

Substation assumptions	Existing relays will be re-used and settings will be adjusted, as necessary.
Real-estate description	Upgrade should be within the existing substation.
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	$39,568.61
Component cost (in-service year)	$49,466.91

Substation Upgrade Component

Component title	Red Bank Substation - Update relay settings
Project description	At Red Bank Substation, modify relay settings on the Atlantic 230 kV lines.
Substation name	Red Bank
Substation zone	JCPL
Substation upgrade scope	At Red Bank Substation, modify relay settings on the Atlantic 230 kV lines.

Transformer Information

None

New equipment description	No new equipment is needed for this upgrade
Substation assumptions	Existing relays will be re-used and settings will be adjusted, as necessary.
Real-estate description	Upgrade will occur within the confines of the existing substation.
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	$39,568.61
Component cost (in-service year)	$49,466.91

Substation Upgrade Component

Component title	South River Substation - Update relay settings
Project description	At South River Substation, modify relay settings on the Atlantic 230 kV Line.
Substation name	South River

Substation zone	JCPL
Substation upgrade scope	At South River Substation, modify relay settings on the Atlantic 230 kV Line.

Transformer Information

None

New equipment description	No new equipment is needed for this upgrade
Substation assumptions	Existing relays will be re-used and settings will be adjusted, as necessary.
Real-estate description	Upgrade will occur within in confines of the existing substation.
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	$33,286.65
Component cost (in-service year)	$41,715.64

Substation Upgrade Component

Component title	Larrabee Substation - Update relay settings

Project description	At Larrabee Substation, modify relay settings on the Atlantic 230 kV Line.
Substation name	Larrabee
Substation zone	JCPL
Substation upgrade scope	At Larrabee Substation, modify relay settings on the Atlantic 230 kV Line.

Transformer Information

None

New equipment description	No new equipment is needed for this upgrade
Substation assumptions	Existing relays will be re-used and settings will be adjusted, as necessary.
Real-estate description	The upgrade will occur within the confines of the existing substation.
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	$33,286.65
Component cost (in-service year)	$41,715.64

Substation Upgrade Component

Component title	Atlantic Substation - Install line terminal
Project description	Construct a new 230 kV line terminal position to accept the generator lead line from the offshore wind converter substation.
Substation name	Atlantic
Substation zone	JCPL
Substation upgrade scope	Below Grade Foundations, conduit, and grounding for new line terminal. Above Grade Install (2) 230kV circuit breakers Install (4) 230kV disconnect switches Install (1) 230kV line disconnect switch Install (3) 230kV surge arresters Install (3) 230kV CVTs Install (1) 230kV dead end structure Install (1) lot bus, insulators, steel supports, fittings, and conductor as indicated on the attached layout (see double breaker component for substation drawings). Relay & Control Install (1) prewired relaying panels for OSW Generator 1. Install (2) prewired breaker control panel.

Transformer Information

None

New equipment description	Above Grade Install (2) 230kV circuit breakers Install (4) 230kV disconnect switches Install (1) 230kV line disconnect switch Install (3) 230kV surge arresters Install (3) 230kV CVTs Install (1) 230kV dead end structure Install (1) lot bus, insulators, steel supports, fittings, and conductor as indicated on the attached layout (see double breaker component for substation drawings). Relay & Control Install (1) prewired relaying panels for OSW Generator 1. Install (2) prewired breaker control panel.
Substation assumptions	Project component to convert Atlantic Substation to a double breaker-double bus configuration will include provisions for this additional line terminal position. Generation developer's converter substation will be designed in compliance with FE connection standards, including FE's "Requirements for Transmission Connected Facilities" document.
Real-estate description	Upgrade is expected to be within the confines of the existing substation.
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	$4,949,433.97
Component cost (in-service year)	$5,929,630.27

Substation Upgrade Component

Component title	Larrabee Substation - Reconfigure substation
Project description	Install a new 230kV line terminal with two new breakers
Substation name	Larrabee 230 kV
Substation zone	JCPL
Substation upgrade scope	Below Grade Foundations, conduit, and grounding for new equipment as indicated on the attached layout. Above Grade Install (1) 230kV circuit breakers Install (2) 230kV breaker disconnect switches Install (1) lot of bus, fittings, insulators, and bus supports as indicated on the attached layout Relay & Control Modify relay settings for 230kV southwest bus diff Modify relay settings for 230kV northeast bus diff Modify relay settings for 230kV K2011 line to Lakewood Install (1) breaker control panels

Transformer Information

None

New equipment description	Above Grade Install (1) 230kV circuit breakers Install (2) 230kV breaker disconnect switches Install (1) lot of bus, fittings, insulators, and bus supports as indicated on the attached layout Relay & Control Modify relay settings for 230kV southwest bus diff Modify relay settings for 230kV northeast bus diff Modify relay settings for 230kV K2011 line to Lakewood Install (1) breaker control panels

Substation assumptions	None
Real-estate description	Upgrade to occur within the confines of the existing substation.
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	$4,235,670.57
Component cost (in-service year)	$5,217,174.59

Substation Upgrade Component

Component title	Larrabee substation: 230kV equipment for direct connection
Project description	Install a new 230kV line terminal with two new breakers.
Substation name	Larrabee 230kV
Substation zone	JCPL
Substation upgrade scope	Below Grade Foundations, conduit, and grounding for new equipment as indicated on the attached layout.

Transformer Information

None

New equipment description	Above Grade Install (1) 230kV circuit breakers Install (2) 230kV breaker disconnect switches Install (1) 230kV motor operated line disconnect switch Install (1) 230kV H frame dead end structure Install (3) 230kV CVTs for generator line terminal Install (3) 230kV surge arresters Relay & Control Install (1) pre-fabricated line relaying panel for the generator line terminal. Install (1) breaker control panels Additional Equipment to be Removed
Substation assumptions	None
Real-estate description	Upgrade to occur within the confines of the existing substation
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	$4,771,134.75
Component cost (in-service year)	$5,850,845.15

Substation Upgrade Component

Component title	Lakewood Gen Substation - Update relay settings

Project description	Install a new 230kV line terminal with two new breakers.
Substation name	lakewood 230 kV
Substation zone	JCPL
Substation upgrade scope	Relay & Control Modify relay settings on the K2011 Larrabee line

Transformer Information

None

New equipment description	None- Relay adjustment
Substation assumptions	None
Real-estate description	Upgrade to occur within the confines of the existing substation
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	$31,119.30
Component cost (in-service year)	$38,587.93

Transmission Line Upgrade Component

Component title	G1021 (Atlantic-Smithburg) 230kV
Project description	Install new 230kV line from Atlantic Substation to new Larrabee Converter Substation.
Impacted transmission line	G1021 (Atlantic-Smithburg) 230kV
Point A	Atlantic 230kV
Point B	Smithburg 230kV
Point C	
Terrain description	The line traverses an urbanized area with moderate deciduous trees crossing a costal plane.

Existing Line Physical Characteristics

Operating voltage	230 kV
Conductor size and type	1590 kcmil 45/7 ACSR
Hardware plan description	Hardware Assemblies Removed 88 – 230kV Suspension Clamps 68 – 230kV Deadend Clamps
Tower line characteristics	At Atlantic Substation, the G1021 circuit currently terminates on the southern most bay with conductor and shield wires exiting to lattice tower deadend Structure 1 directly east of the station. For approximately 7.9 miles south of Atlantic Substation, the G1021 (Atlantic-Smithburg) circuit is supported on steel monopoles. Structures are designed for a future second circuit capable of supporting a variety of 1590 kcmil conductors. Conductor for the G1021 circuit is 1590 kcmil 45/7 ACSR and the circuit is shielded with 7#6 Alumoweld and 1 – AFL DNO-6525 OPGW. Existing Structures include: 44 Steel Pole Tangents 17 Steel Pole Deadends

Proposed Line Characteristics

	Designed	**Operating**
Voltage (kV)	230.000000	230.000000
	Normal ratings	**Emergency ratings**
Summer (MVA)	709.000000	869.000000

Winter (MVA)	805.000000	1031.000000
Conductor size and type	1590 kcmil 45/7 ACSR	
Shield wire size and type	7#6 Alumoweld and 1 – AFL DNO-6525 OPGW.	
Rebuild line length	7.9 miles	
Rebuild portion description	Project involves relocating the circuit to a new bay position to be installed south of the existing bay at Atlantic Substation. Additionally, the project includes modifying existing tubular steel monopole structures in the 7.9 miles south of Atlantic Substation to support the G1021 (Atlantic-Smithburg) 230kV circuit on the west side of the structures. These structures were designed as double circuit, but presently only support the G1021 (Atlantic-Smithburg) 230kV circuit. 1590 kcmil 45/7 ACSR conductor is installed in a modified delta configuration with one phase occupying the top west side of the structures and the other two phases located on the east side in the top and middle phase positions. Tangent structures will need to have new braced post insulator assemblies installed (two on the west side of the structure in the middle and bottom phase positions. Angle/Deadend structures will need to have arms installed in the middle and bottom phase positions along with insulator assemblies. New 1590 kcmil 45/7 ACSR conductor pulled in for these two phases. Structure 15179 is the structure furthest south that will need to be modified.	
Right of way	Assume full application submittal to BPU. The rebuild will attempt to use the existing corridor.	
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	$9,677,176.76
Component cost (in-service year)	$12,077,575.72

Transmission Line Upgrade Component

Component title	R1032 (Atlantic-Larrabee) 230kV
Project description	Install new 230kV line from Atlantic Substation to new Larrabee Converter Substation.
Impacted transmission line	R1032 (Atlantic-Larrabee) 230kV
Point A	Atlantic 230kV
Point B	Larrabee 230kV
Point C	
Terrain description	The line traverses an urbanized area with some deciduous trees and is primarily costal plain.

Existing Line Physical Characteristics

Operating voltage	230 kV
Conductor size and type	1590 kcmil 45/7 ACSR
Hardware plan description	Structures Removed – None Insulators Assemblies Removed 94 – 230kV Deadend TR-020370 from the 7.9-mile lattice tower portion of the line 147 – 230kV Suspension TR-020250 from the 7.9-mile lattice tower portion of the line 21 – 230kV Braced Post TR-020325 from the 3.7-mile steel pole portion of the line Hardware Assemblies Removed 60 – 230kV Suspension Clamps off the existing suspension jumpers Wire Removed 7.9 miles of 1590 kcmil 54/19 ACSS/AW 3.7 miles of 1590 kcmil 42/19 ACSS/TW/HS285 (1-Phase)

Tower line characteristics	Existing Conditions The existing R1032 circuit is located on the eastern lattice tower/steel pole line in the Atlantic-Larrabee corridor but will be relocated onto the western structures currently supporting the G1021 circuit. Steel poles are installed for the 3.7 miles south of structure 63 to The Larrabee substation. The R1032 (Atlantic-Larrabee) 230kV circuit is supported with 2 phases on the east side of these structures and 1 phase on the west side of these structures. The conductor is 1590 kcmil 42/19 ACSS/TW/HS285 shielded by (2) 7#6 alumoweld shieldwires. Lattice towers are installed for the 7.9 miles north from Structure 63 to Atlantic Substation. The Larrabee-Oceanview 230kV circuit is supported on the west side of these structures and the R1032 (Atlantic-Larrabee) 230kV circuit occupies the east side. From Structure 63 to Structure 4 (approximately 7.5 miles) 1590 kcmil 54/19 ACSS/AW is used for both circuits. The lines are shielded by (1) OPGW AFL AC-71/571 and (1) 7#6 alumoweld shieldwire. The existing conditions for the G1021 line can be seen below: The existing steel monopole structures in this ~7.9 mile segment from Structure 1 outside of Atlantic Substation to Structure 15179 currently support the G1021 (Atlantic-Smithburg) circuit. The structures are designed for a future second circuit capable of supporting a variety of 1590 kcmil conductors. Conductor for the G1021 circuit is 1590 kcmil 45/7 ACSR and the circuit is shielded with (1) 7#6 Alumoweld and (1) AFL DNO-6525 OPGW. Existing Structures include: 44 Steel Pole Tangents 17 Steel Pole Deadends

Proposed Line Characteristics

	Designed	**Operating**
Voltage (kV)	230.000000	230.000000
	Normal ratings	**Emergency ratings**
Summer (MVA)	1104.000000	1273.000000
Winter (MVA)	1106.000000	1390.000000
Conductor size and type	1590 kcmil 42/19 ACSS/TW/HS285	
Shield wire size and type	(1) 7#6 Alumoweld and (1) AFL DNO-6525 OPGW	
Rebuild line length	~7.9 miles	

Rebuild portion description	Description of Work Project includes modifying existing steel pole structures currently supporting the G1021 (Atlantic-Smithburg) 230kV circuit to accommodate new conductor for the R1032 (Atlantic-Larrabee) 230kV circuit on the east side of the steel pole structures for approximately 7.9 miles to Structure 15179. Tangent structures will need to have new braced post insulator assemblies installed in the bottom phase position on the west side of the structures. Angle/Deadend structures will need to have arms installed in the bottom phase positions along with insulator assemblies. The existing1590 kcmil 45/7 ACSR conductor currently installed in the upper and middle phase positions for the G1021 (Atlantic-Smithburg) 230kV circuit will need to be replaced with new 1590 kcmil 42/19 ACSS/TW/HS285 wire. New 1590 kcmil 42/19 ACSS/TW/HS285 wire will be installed for the bottom phase on the east side as well. The existing assets located on the eastern most tower/steel pole line will need to be removed to accommodate the Atlantic-New Larrabee Converter 230kV Line estimated in JC-T-583A.
Right of way	Assume full application submittal to BPU. Upgrade will attempt to use existing corridor as much as possible.
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	$14,499,814.44
Component cost (in-service year)	$18,117,364.94

Transmission Line Upgrade Component

Component title	New Larrabee Converter-Atlantic 230kV
Project description	Install new 230kV line from Atlantic Substation to new Larrabee Converter Substation.
Impacted transmission line	Atlantic-New Larrabee Converter 230kV Line (New Asset)
Point A	Atlantic 230kV
Point B	New Larrabee Converter 230kV
Point C	
Terrain description	The line traverses an urbanized area that is relatively flat coastal plain with some deciduous forest.
Existing Line Physical Characteristics	
Operating voltage	230 kV
Conductor size and type	n/a
Hardware plan description	All new hardware is anticipated. Insulator Assemblies Installed 138 – 230kV Deadends TR-020370 147 – 230kV Suspension TR-020250 63 – 230kV Braced Posts TR-020325 Hardware Installations 60 – 230kV Suspension Clamps on the existing suspension jumpers Wire Installed Bundled 636 ACSS 26/7 “Grosbeak” – 23.2 Total Miles SFPOC SFSJ-J-6641 48 Fiber OPGW – 0.25 Miles to the new Larrabee Converter Substation 7#6 Alumoweld – 0.25 miles to the new Larrabee Converter Substation

Tower line characteristics	Existing Conditions The existing structures that will be utilized to support the new circuit consists of steel monopole structures and lattice towers. The conductor varies along the corridor, see below for the details related to each section of the project: The existing steel monopole structures, located between Larrabee Substation and lattice structure 63, currently support the R1032 (Atlantic-Larrabee) 230kV circuit with 2 phases on the east side of the structure and 1 phase on the west side of the structure. The conductor is 1590 kcmil 42/19 ACSS/TW/HS285 shielded by (2)7#6 alumoweld shieldwires. Lattice towers are installed for the 7.9 miles north from Structure 63 to Atlantic Substation. The Larrabee-Oceanview 230kV circuit is supported on the west side of these structures and the R1032 (Atlantic-Larrabee) 230kV circuit occupies the east side. From Structure 63 to Structure 4 (approximately 7.5 miles) 1590 kcmil 54/19 ACSS/AW is used for both circuits. The lines are shielded by (1) OPGW AFL AC-71/571 and (1) 7#6 alumoweld shieldwire. the Larrabee-Oceanview conductor is supported on separate structures and leaves the ROW north of Structure 4. The R1032 (Atlantic-Larrabee) 230kV circuit continues north and into Atlantic Substation. A total of 90 existing structures will be used to support the new circuit including: 28 Steel Poles 62 Lattice Towers

Proposed Line Characteristics

	Designed	**Operating**
Voltage (kV)	230.000000	230.000000
	Normal ratings	**Emergency ratings**
Summer (MVA)	1260.000000	1447.000000
Winter (MVA)	1259.000000	1523.000000
Conductor size and type	636 ACSS 26/7	
Shield wire size and type	SFPOC SFSJ-J-6641 48 Fiber OPGW – 0.25 Miles	
Rebuild line length	11.6	

Rebuild portion description	Description of Work Project involves adding a 230kV circuit between Atlantic Substation and new Larrabee Converter substation assumed to be constructed to the east of the existing Larrabee Substation. The new line will be conductored with bundled 636 ACSS 26/7 “Grosbeak” on the east side of the existing structures starting at Structure 15207 located just outside of Larrabee Substation and will continue north to Atlantic Substation, approximately 11.6 miles. For 3.7 miles between Structure 15207 and Structure 63, the existing steel monopoles structures will need to be modified to accommodate the new bundled circuit. Tangent structures will need to have (3) new braced post insulator assemblies installed and the deadend structures will need (6) deadend insulator assemblies installed on the existing vacant arms. For the 7.9 miles between Structure 63 and Atlantic Substation, the new circuit will be supported on lattice towers and will replace the existing 1590 kcmil 54/19 ACSS/AW currently used for the R1032 (Atlantic-Larrabee) 230kV circuit on the east side of the structures. The angled/deadend structures will require reinforcement to accommodate the bundled conductor. Per the preliminary converter station layout, we’ve assumed that two new deadend structures will be utilized to get to the existing Atlantic-Larrabee ROW.
Right of way	Assume full application submittal to BPU. It is assumed that new ROW will be required to accommodate the termination of the line into the Larrabee converter substation, approximately 0.25 miles total.
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	$17,071,087.06

Component cost (in-service year)	$21,243,775.56

Transmission Line Upgrade Component

Component title	Larrabee-Oceanview 230kV
Project description	Install new 230kV line from Atlantic Substation to new Larrabee Converter Substation.
Impacted transmission line	Larrabee-Oceanview 230kV
Point A	Larrabee 230kV
Point B	Oceanview 230kV
Point C	
Terrain description	The line traverses an urbanized area that is relatively flat coastal plain with some deciduous forest.

Existing Line Physical Characteristics

Operating voltage	230 kV
Conductor size and type	1590 kcmil 54/19 ACSS/AW shielded by (1) 7#6 and (1) OPGW AFL AC-71/571
Hardware plan description	Structures Removed - None Insulators Assemblies Removed - None Wire Removed - None
Tower line characteristics	The existing Larrabee-Oceanview 230kV circuit is supported on double circuit lattice towers mutual with the G1021 230kV circuit on the western side of the Atlantic-Larrabee corridor. The existing conductor is 1590 kcmil 54/19 ACSS/AW shielded by (1) 7#6 and (1) OPGW AFL AC-71/571 mutual with the G1021 circuit. The eastern structures in the 3.7 mile section between Larrabee Substation and Structure 63 currently support the R1032 (Atlantic-Larrabee) 230kV circuit. Tubular steel monopoles designed for double circuit 230kV lines are installed in this portion of the line. Phases for the R1032 circuit are arranged in a modified delta configuration occupying the upper phase position on the east and west side of the structures as well as the middle phase position on the west side of the structure. 1590 kcmil 42/19 ACSS/TW/HS285 conductor is installed. The line is shielded by (1) 7#6 Alumoweld on the east side and (1) AFL DNO-6525 on the west side of the structures. For the 3.7 mile section between Larrabee Substation and Structure 63, there are a total of 30 structures, including: 1 double-circuit Lattice Tower (Structure 63) 21 double-circuit steel monopole tangents 8 double-circuit steel monopole deadends

Proposed Line Characteristics

	Designed	**Operating**

Voltage (kV)	230.000000	230.000000
	Normal ratings	**Emergency ratings**
Summer (MVA)	1104.000000	1273.000000
Winter (MVA)	1106.000000	1339.000000
Conductor size and type	1590 kcmil 42/19 ACSS/TW/HS285	
Shield wire size and type	(1) 7#6 Alumoweld on the east side and (1) AFL DNO-6525	
Rebuild line length	~3.7 mile section	
Rebuild portion description	Project involves modifying structures in the first 3.7 miles north of Larrabee substation so that the Larrabee-Oceanview circuit can be supported on the west side of the eastern 230kV steel poles. A new braced post insulator assembly will be installed for the bottom phase on the west side of the tangent structures and new deadend assemblies will be installed on the angle/deadend structures between Structure 15207 and Structure 63. New 1590 kcmil 42/19 ACSS/TW/HS285 conductor will be strung in this bottom phase position, which will match the existing conductor that is currently used for the R1032 (Atlantic-Larrabee) 230kV circuit. North of Structure 63 the Larrabee-Oceanview 230kV circuit is supported on the west side of the eastern 230kV structures until it leaves the ROW just south of Atlantic Substation and heads to Oceanview. No modifications will be required north of Structure 63.	
Right of way	Assume full application submittal to BPU. Line will attempt to use existing corridors.	
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	$6,003,655.66
Component cost (in-service year)	$7,499,999.38

Transmission Line Upgrade Component

Component title	B54 Larrabee-South Lockwood 34.5kV Line Transfer
Project description	Install (1) new 230kV line from Larrabee Converter to the Larrabee Substation.
Impacted transmission line	Larrabee-South Lockwood 34.5kV Line
Point A	South Lockwood 34.5kV Line
Point B	Larrabee 34.5kV Line
Point C	
Terrain description	The line traverses an urbanized area that is relatively flat coastal plain with some deciduous forest.

Existing Line Physical Characteristics

Operating voltage	34.5 kV
Conductor size and type	na
Hardware plan description	Wire Installed Transfer the existing conductor and shieldwire to the new 85’ 230kV monopole deadend structure captured in the JC-T-602A estimate. It is assumed the wires are in adequate condition to be transferred. Structures Removed (1) 34.5kV single circuit wood monopole tangent structure (see location of orange line in kmz) Insulator Assemblies Removed 3 – 34.5kV post insulators
Tower line characteristics	There is no new structure needed for this install

Proposed Line Characteristics

	Designed	**Operating**

Voltage (kV)	34.500000	34.500000
	Normal ratings	**Emergency ratings**
Summer (MVA)	65.000000	77.000000
Winter (MVA)	79.000000	88.000000
Conductor size and type	na	
Shield wire size and type	na	
Rebuild line length	None	
Rebuild portion description	Description of Work Project involves removing an existing tangent structure and transferring the existing conductor and shield wire onto a newly built 230kV deadend monopole structure captured in the JC-T-602A estimate. See attached KMZ for preliminary line layout. Structures Installed None. The structure required for the wire transfer is captured in another portion of the Larrabee Converter-Larrabee 230kV New Line project	
Right of way	No new right of way will be required for this relocation	
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	$312,982.04
Component cost (in-service year)	$380,750.77

Greenfield Transmission Line Component

Component title	Larrabee Converter-Larrabee 230kV New Line
Project description	Install (1) new 230kV line from Larrabee Converter to the Larrabee Substation.
Point A	Larrabee 230 kV
Point B	Larrabee Converter 230 kv
Point C	

	Normal ratings	**Emergency ratings**
Summer (MVA)	1418.000000	1739.000000
Winter (MVA)	1610.000000	2062.000000

Conductor size and type	double bundle 1590 ACSR– 0.3 Circuit Miles
Nominal voltage	AC
Nominal voltage	230 kV
Line construction type	Overhead
General route description	Project involves building a new 230kV line from the Larrabee Converter Substation to the Larrabee Substation as a single circuit line on self-supporting steel structures with drilled shaft foundations. Reference the provided KMZ for theoretical line routing.
Terrain description	The line will be constructed entirely on substation property.
Right-of-way width by segment	Right-of way width is planned to be ~125 feet for all sections of the new line.
Electrical transmission infrastructure crossings	(8) 34.5 kV transmission entrance wires into Larrabee, Potential crossing of the new Larrabee Converter-Smithburg 500kV line
Civil infrastructure/major waterway facility crossing plan	This is not applicable.

Environmental impacts	Assume full application submittal to BPU.
Tower characteristics	Project involves building a new 230kV line from the Larrabee Converter Substation to the Larrabee Substation as a single circuit line on self-supporting steel structures with drilled shaft foundations. Assuming the line will cross under a new Larrabee Converter-Smithburg 500kV line and over multiple 34.5kV lines east of the existing Larrabee Substation, the following single circuit 230kV steel structures on drilled shaft foundations will be required: Conductor will be double bundle 2312 kcmil 76/19 ACSR “Thrasher” with SFPOC SFSJ-J-6641 48 Fiber OPGW
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	$7,522,433.84
Component cost (in-service year)	$8,311,738.78

Greenfield Transmission Line Component

Component title	Larrabee Converter-Smithburg No1 500kV Line (New Asset)
Project description	Install (2) new 500kV lines from Larrabee Converter to the Smithburg Substation. New 500kV lines will be built double circuit to accommodate a 500kV line and a 230kV line.
Point A	Larrabee Converter

Point B	Smithburg	
Point C		
	Normal ratings	**Emergency ratings**
Summer (MVA)	3678.000000	4541.000000
Winter (MVA)	4262.000000	5503.000000
Conductor size and type	Double Bundled 2493 kcmil 54/37 ACAR – 12.2 Circuit Miles	
Nominal voltage	AC	
Nominal voltage	500 kV	
Line construction type	Overhead	
General route description	The line will parallel existing lattice towers for the D2004/H2008 lines the following double circuit 500kV/230kV steel monopoles on drilled shaft foundations will be required. See provided KMZ file.	
Terrain description	The line traverses an urbanized area that is a relatively flat coastal plain with some deciduous forest.	
Right-of-way width by segment	This line will be in a corridor with multiple other transmission facilities the overall right of way width will remain ~300 ft for all circuits.	
Electrical transmission infrastructure crossings	It is anticipacte there may a a crossing near Smithburg 230 kv station, Preliminary discussions indicate that the new Larrabee Converter Substation will be located to the East of the existing Larrabee Substation. To terminate the line in the new substation the line will cross over the Larrabee-Oceanview 230kV line, the R1032 (Atlantic-Larrabee) 230kV line, (3) distribution lines and (1) underground distribution line just north of the existing Larrabee substation.	
Civil infrastructure/major waterway facility crossing plan	There are no anticipated major waterway crossings. It is anticipated that the line will cross 195	
Environmental impacts	Assume full application submittal to BPU.	

Tower characteristics	Structures Installed Assuming the line will parallel existing lattice towers for the D2004/H2008 lines the following double circuit 500kV/230kV steel monopoles on drilled shaft foundations will be required: 56 – Steel Tangents Single circuit 500kV steel structures on drilled shaft foundations: 15 – Steel Monopole Deadends 3 – Steel 2-pole H-frame Deadend crossing structures The exact location and layout of the Larrabee Converter substation will have a large impact on the proposed structures located around the Larrabee substation. A detailed analysis will be required once the finalized substation layout/location are determined. See the attached KMZ for a preliminary route layout. Insulator Assemblies Installed 108 – 500kV Deadends 168 – 500kV V-Strings 6 – 500kV Substation Deadends Wire Installed Double Bundled 2493 kcmil 54/37 ACAR – 12.2 Circuit Miles SFPOC SFSJ-J-6641 48 Fiber OPGW – 12.2 Circuit Miles
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	$150,348,137.10
Component cost (in-service year)	$196,782,968.15

Greenfield Transmission Line Component

Component title	Larrabee Converter-Smithburg No2 500kV Line (New Asset)
Project description	Install (2) new 500kV lines from Larrabee Converter to the Smithburg Substation. New 500kV lines will be built double circuit to accommodate a 500kV line and a 230kV line.

Point A	Larrabee Converter	
Point B	Smithburg	
Point C		
	Normal ratings	**Emergency ratings**
Summer (MVA)	3678.000000	4541.000000
Winter (MVA)	4262.000000	5503.000000
Conductor size and type	Double Bundled 2493 kcmil 54/37 ACAR – 12.2 Circuit Miles	
Nominal voltage	AC	
Nominal voltage	500 kV	
Line construction type	Overhead	
General route description	The rebuilt structures will maintain the existing D2004 Larrabee-Smithburg No1 230kV structure spacing until around structure 260. After which, the 500kV line wraps around the south and east side of the Larrabee substation and crosses over (3) 230kV lines, (8) 34.5kV lines, and then runs parallel to the 34.5kV lines to enter the Larrabee Converter substation from the West. See attached KMZ for preliminary line layout.	
Terrain description	The line traverses an urbanized area that is a relatively flat coastal plain with some deciduous forest.	
Right-of-way width by segment	The line line's ROW will range from 180 ft to 340 ft as it shares its corridor with several other circuits. Reference the provided PDF of the ROW cross section to see the different anticipated widths in relation to the circuits within the ROW.	
Electrical transmission infrastructure crossings	Preliminary discussions indicate that the new Larrabee Converter Substation will be located to the East of the existing Larrabee Substation. To terminate the line in the new substation the line will cross over the B1042 (Cookstown-Larrabee-Whitings) 230kV line, the Z2026 (Lakewood Gen-Larrabee No2) 230kV line, K2011 (Lakewood Gen-Larrabee No1) 230kV line, and (8) 34.5kV lines just south of the existing Larrabee substation.	
Civil infrastructure/major waterway facility crossing plan	The line will likely cross interstate 195.	
Environmental impacts	Assume full application submittal to BPU.	

Tower characteristics	Structures Installed Assuming the line will be located in the same tower locations as the D2004/H2008 line until structure 235 after which it will match the tower spacing until structure 260. The following double circuit 500kV/230kV steel monopoles on drilled shaft foundations will be required: 56 – Steel Tangents Single circuit 500kV steel structures on drilled shaft foundations: 15 – Steel Monopole Deadends 2 – Steel 2-pole H-frame Deadend crossing structures 2 – Steel 3-pole Deadend structures The exact location and layout of the Larrabee Converter substation will have a large impact on the proposed structures located around the Larrabee substation. A detailed analysis will be required once the finalized substation layout/location are determined. See the attached KMZ for a preliminary route layout. Insulator Assemblies Installed 102 – 500kV Deadends 168 – 500kV V-Strings 6 – 500kV Substation Deadends Wire Installed Double Bundled 2493 kcmil 54/37 ACAR – 12.2 Circuit Miles SFPOC SFSJ-J-6641 48 Fiber OPGW – 12.2 Circuit Miles
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	$111,712,229.22
Component cost (in-service year)	$129,625,144.15

Transmission Line Upgrade Component

Component title	B1042 Cookstown-Larrabee 230kV

Project description	Install (2) new 500kV lines from Larrabee Converter to the Smithburg Substation. New 500kV lines will be built double circuit to accommodate a 500kV line and a 230kV line.
Impacted transmission line	Cookstown-Larrabee 230kV
Point A	Larrabee 230kV
Point B	Cookstown 230kV
Point C	
Terrain description	The line traverses an urbanized area that is relatively flat coastal plain with some deciduous forest.

Existing Line Physical Characteristics

Operating voltage	230 KV
Conductor size and type	1590 kcmil 45/7 ACSR “Lapwing”– 3.2 Circuit Miles
Hardware plan description	Line to be entirely rebuilt.
Tower line characteristics	Existing Conditions The existing line is constructed on double circuit lattice towers with (1) vacant side. The existing conductor is 1590 kcmil 45/7 ACSR shielded by (1) 7#6 alumoweld shieldwire. See the attached cross sections PDF for the approximate ROW cross sections along the corridor.

Proposed Line Characteristics

	Designed	**Operating**
Voltage (kV)	230.000000	230.000000
	Normal ratings	**Emergency ratings**
Summer (MVA)	709.000000	869.000000
Winter (MVA)	805.000000	1031.000000
Conductor size and type	1590 kcmil 45/7 ACSR “Lapwing”– 3.2 Miles	
Shield wire size and type	SFPOC SFSJ-J-6641 48 Fiber OPGW – 3.2 Miles	
Rebuild line length	3.2 Miles	

Rebuild portion description	Rebuild the B1042 Cookstown-Larrabee 230kV line between Structure 20 and the Larrabee Substation as a triple circuit 230kV/34.5kV/34.5kV line on self-supporting steel monopole structures with drilled shaft foundations. The 230kV circuit is assumed to be framed with delta suspension arms above double circuit 34.5kV lines supported on suspension arms.
Right of way	No anticipated change to right of way.
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	$39,785,153.85
Component cost (in-service year)	$46,187,956.72

Transmission Line Upgrade Component

Component title	L220 Hyson-Larrabee 34.5kV
Project description	Install (2) new 500kV lines from Larrabee Converter to the Smithburg Substation. New 500kV lines will be built double circuit to accommodate a 500kV line and a 230kV line.
Impacted transmission line	Hyson-Larrabee 34.5kV
Point A	Larrabee 34.5kV

Point B	Hyson 34.5kV
Point C	
Terrain description	The line traverses an urbanized area that is relatively flat coastal plain with some deciduous forest.

Existing Line Physical Characteristics

Operating voltage	34.5 kV
Conductor size and type	556 kcmil 26/7 ACSR
Hardware plan description	The line is to be entirely demolished and rebuilt.
Tower line characteristics	The existing line is constructed on double circuit wood monopole structures shared with the K219 Hyson-Larrabee 34.5kV line. The conductor is 795 kcmil ACSR 26/7

Proposed Line Characteristics

	Designed	**Operating**
Voltage (kV)	34.500000	34.500000
	Normal ratings	**Emergency ratings**
Summer (MVA)	70.000000	85.000000
Winter (MVA)	79.000000	100.000000
Conductor size and type	795 kcmil 26/7 ACSR	
Shield wire size and type	n/a	
Rebuild line length	3.2 Circuit Miles	
Rebuild portion description	Description of Work Project involves rebuilding the L220 Hyson-Larrabee 34.5kV line from Structure 95 to structure 8 as a triple circuit 230kV/34.5kV/34.5kV line on self-supporting steel monopole structures with drilled shaft foundations. The 230kV circuit is assumed to be framed with delta suspension arms above double circuit 34.5kV lines supported on suspension arms	
Right of way	No major Right of way changes are anticipated	

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	$13,565,460.15
Component cost (in-service year)	$15,850,790.71

Transmission Line Upgrade Component

Component title	K219 Hyson-Larrabee 34.5kV
Project description	Install (2) new 500kV lines from Larrabee Converter to the Smithburg Substation. New 500kV lines will be built double circuit to accommodate a 500kV line and a 230kV line.
Impacted transmission line	Hyson-Larrabee 34.5kV line
Point A	Larrabee 34.5kV
Point B	Hyson 34.5kV
Point C	
Terrain description	The line traverses an urbanized area that is relatively flat coastal plain with some deciduous forest.

Existing Line Physical Characteristics

Operating voltage	34.5
Conductor size and type	795 kcmil 26/7 ACSR
Hardware plan description	Line is being rebuilt.
Tower line characteristics	The existing line is constructed on double circuit wood monopole structures shared with the L220 Hyson-Larrabee 34.5kV line. The conductor is 795 kcmil ACSR 26/7 unshielded

Proposed Line Characteristics

	Designed	**Operating**
Voltage (kV)	34.500000	34.500000
	Normal ratings	**Emergency ratings**
Summer (MVA)	70.000000	85.000000
Winter (MVA)	79.000000	100.000000
Conductor size and type	795 kcmil 26/7 ACSR	
Shield wire size and type	N/A	
Rebuild line length	3.2 circuit miles	
Rebuild portion description	Rebuilding the K219 Hyson-Larrabee 34.5kV line from Structure 95 to structure 8 as a triple circuit 230kV/34.5kV/34.5kV line on self-supporting steel monopole structures with drilled shaft foundations. The 230kV circuit is assumed to be framed with delta suspension arms above double circuit 34.5kV lines supported on suspension arms.	
Right of way	No major Right of way changes are anticipated	
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	$10,327,762.49
Component cost (in-service year)	$12,016,676.15

Transmission Line Upgrade Component

Component title	E83 Line 115kV (NIS)
Project description	Install (2) new 500kV lines from Larrabee Converter to the Smithburg Substation. New 500kV lines will be built double circuit to accommodate a 500kV line and a 230kV line.
Impacted transmission line	E83 Line 115kV (Not In Service)
Point A	N/A
Point B	N/A
Point C	
Terrain description	The line traverses an urbanized area that is relatively flat coastal plain with some deciduous forest.

Existing Line Physical Characteristics

Operating voltage	N/A
Conductor size and type	N/A
Hardware plan description	Existing Hardware and Towers to be removed.

Tower line characteristics	The existing line is not in service. The line is primarily constructed on single circuit wood H-frame structures. Per TAMI, the existing conductor is unknown and it is shielded by (2) 3#6 copperweld shieldwires.

Proposed Line Characteristics

	Designed	**Operating**
Voltage (kV)	0.000000	0.000000
	Normal ratings	**Emergency ratings**
Summer (MVA)	0.000000	0.000000
Winter (MVA)	0.000000	0.000000

Conductor size and type	N/A
Shield wire size and type	N/A
Rebuild line length	N/A
Rebuild portion description	N/A - Remove the existing E83 Line 115kV (NIS) to accommodate the new 500kV/230kV lines (approximately 7.7 miles).
Right of way	N/A - This component removes the existing E83 Line 115kV (NIS) to accommodate the new 500kV/230kV lines.
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	$8,473,633.22
Component cost (in-service year)	$9,878,388.09

Transmission Line Upgrade Component

Component title	G1021 Atlantic-Smithburg 230kV
Project description	Install (2) new 500kV lines from Larrabee Converter to the Smithburg Substation. New 500kV lines will be built double circuit to accommodate a 500kV line and a 230kV line.
Impacted transmission line	G1021 Atlantic-Smithburg 230kV
Point A	Atlantic 230 kV
Point B	Smithburg 230 kV
Point C	New Prospect Road 230 kV
Terrain description	The line traverses an urbanized area that is relatively flat coastal plain with some deciduous forest.

Existing Line Physical Characteristics

Operating voltage	230 kV
Conductor size and type	Mix of 1590 KCMIL 45/7 ACSR and six wire 795 26/7 ACSR
Hardware plan description	New hardware will be used.
Tower line characteristics	Project requires a rebuild of the line to a double circuit configuration.

Proposed Line Characteristics

	Designed	**Operating**

Voltage (kV)	230.000000	230.000000
	Normal ratings	**Emergency ratings**
Summer (MVA)	709.000000	869.000000
Winter (MVA)	805.000000	1031.000000
Conductor size and type	1590 KCMIL 45/7 ACSR	
Shield wire size and type	SFPOC SFSJ-J-6641 48 Fiber OPGW	
Rebuild line length	12.2	
Rebuild portion description	Project involves rebuilding the G1021 Atlantic-Smithburg 230kV line between the Larrabee and Smithburg Substations as a double circuit 500kV/230kV line on self-supporting steel monopole structures with drilled shaft foundations. The rebuilt structures will parallel the other 500kV/230kV line. Entire length of the line is anticipated to be rebuilt. Structures Installed: -Single Circuit 230kV Steel Monopoles on drilled shaft foundations: -14 – Steel Monopole Deadends parallel with the new 500kV deadends -2 – Steel Monopole Deadends to loop into the New Prospect Road Substation. -1 – Steel 2-Pole In-Line Deadend Insulator Assemblies Installed: -Steel structures: -102 – 230kV Deadends on new structures -168 – 230kV V-Strings -9 – 230kV Substation Deadends Wire Installed: -1590 kcmil 45/7 ACSR “Lapwing”– 12.2 Circuit Miles -SFPOC SFSJ-J-6641 48 Fiber OPGW – 12.2 Circuit Miles -Transfer the existing conductor and shieldwire onto existing structure 92 on the North side of the Larrabee substation. -It is assumed that the wire is in adequate condition to be transferred.	
Right of way	Project will utilize existing ROW.	
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	$62,849,415.31
Component cost (in-service year)	$82,349,711.26

Transmission Line Upgrade Component

Component title	H2008 Larrabee Smithburg No2 230kV
Project description	Install (2) new 500kV lines from Larrabee Converter to the Smithburg Substation. New 500kV lines will be built double circuit to accommodate a 500kV line and a 230kV line.
Impacted transmission line	H2008 Larrabee Smithburg No2 230kV
Point A	Larrabee 230 kV
Point B	Smithburg 230 kV
Point C	
Terrain description	The line traverses an urbanized area that is relatively flat coastal plain with some deciduous forest.

Existing Line Physical Characteristics

Operating voltage	230 kV
Conductor size and type	1590 45/7 ACSR
Hardware plan description	N/A - See Component E83 Line 115kV (NIS) for construction of the new line.
Tower line characteristics	N/A - See Component #23 E83 Line 115kV (NIS) for construction of the new line.

Proposed Line Characteristics

	Designed	**Operating**

Voltage (kV)	230.000000	230.000000
	Normal ratings	**Emergency ratings**
Summer (MVA)	0.000000	0.000000
Winter (MVA)	0.000000	0.000000
Conductor size and type	N/A - See Component #23 E83 Line 115kV (NIS) for construction of the new line.	
Shield wire size and type	N/A - See Component #23 E83 Line 115kV (NIS) for construction of the new line.	
Rebuild line length	N/A - See Component #23 E83 Line 115kV (NIS) for construction of the new line.	
Rebuild portion description	Remove the existing H2008 Larrabee Smithburg No2 230kV to accommodate the new 500kV/230kV lines. See Component #23 E83 Line 115kV (NIS) for construction of the new line.	
Right of way	N/A - See Component #23 E83 Line 115kV (NIS) for construction of the new line.	
Construction responsibility	Company specific	
Benefits/Comments	N/A - See Component #23 E83 Line 115kV (NIS) for construction of the new line.	
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	$8,469,250.17	

Component cost (in-service year)	$9,847,121.13

Transmission Line Upgrade Component

Component title	D2004 Larrabee-Smithburg No1 230kV
Project description	Install (2) new 500kV lines from Larrabee Converter to the Smithburg Substation. New 500kV lines will be built double circuit to accommodate a 500kV line and a 230kV line.
Impacted transmission line	D2004 Larrabee-Smithburg No1 230kV
Point A	Larrabee 230 kV
Point B	Smithburg 230 kV
Point C	
Terrain description	The line traverses an urbanized area that is a relatively flat coastal plain with some deciduous forest.

Existing Line Physical Characteristics

Operating voltage	230 kV
Conductor size and type	1590 KCMIL 45/7 ACSR
Hardware plan description	Entire line to be rebuilt
Tower line characteristics	The existing line is constructed on double circuit lattice towers shared with the H2008 Larrabee Smithburg No2 230kV line. The existing conductor is 1590 kcmil 45/7 ACSR shielded by (2) 7#6 alumoweld shieldwires mutual with the H2008 line. 53 – Lattice Double Circuit Tangents 5 – Lattice Double Circuit Running Angles 11 – Lattice Double Circuit Deadends

Proposed Line Characteristics

	Designed	**Operating**
Voltage (kV)	230.000000	230.000000
	Normal ratings	**Emergency ratings**
Summer (MVA)	709.000000	869.000000

Winter (MVA)	805.000000	1031.000000
Conductor size and type	1590 KCMIL 45.7 ACSR	
Shield wire size and type	SFPOC SFSJ-J-6641 48 Fiber OPGW	
Rebuild line length	12.2	
Rebuild portion description	Project involves rebuilding the D2004 Larrabee-Smithburg No1 230kV line between the Larrabee and Smithburg Substations as a double circuit 500kV/230kV line on self-supporting steel monopole structures with drilled shaft foundations. The rebuilt structures will parallel the other 500kV/230kV line. Entire length of the line is to be rebuilt. Structures Installed: -Installation of the 500kV/230kV structures will be captured in component #23. -Single Circuit 230kV Steel Monopoles on drilled shaft foundations: -12 – Steel Monopole Deadends parallel with the new 500kV deadends captured in component #23. -1 – Steel 2-Pole In-Line Deadend Insulator Assemblies Installed: -Steel structures: -78 – 230kV Deadends on new structures -168 – 230kV V-Strings -6 – 230kV Substation Deadends Wire Installed: -1590 kcmil 45/7 ACSR “Lapwing”– 12.2 Circuit Miles -SFPOC SFSJ-J-6641 48 Fiber OPGW – 12.2 Circuit Miles	
Right of way	Project will utilize existing ROW.	
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	$44,765,142.56
Component cost (in-service year)	$51,983,270.63

Substation Upgrade Component

Component title	Smithburg Substation 500 kV Expansion
Project description	Expand Smithburg 500kV ring bus for offshore wind generation interconnection.
Substation name	Smithburg
Substation zone	JCPL
Substation upgrade scope	Expand Smithburg 500kV ring bus for offshore wind generation interconnection.

Transformer Information

None

New equipment description	Install (1) 500kV circuit breaker Install (2) 500kV breaker disconnect switches Install (1) 500kV motor operated line disconnect switch Install (1) 500kV A-Frame dead end structure Install (3) 500kV CVTs Install (3) 500kV surge arresters Install (1) lot of bus, fittings, insulators, and bus supports as indicated on the attached layout Install (1) pre-fabricated line relaying panel for the Generator line terminal. Install (1) pre-fabricated breaker failure relaying panel.
Substation assumptions	Upgrade to occur within the existing substation. New terminal bays will be made available by component #33.
Real-estate description	N/A
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	$5,811,877.15
Component cost (in-service year)	$7,517,215.30

Substation Upgrade Component

Component title	Larrabee Substation
Project description	Install new 230kV line from Atlantic Substation to new Larrabee Converter Substation.
Substation name	Larrabee 230kV
Substation zone	JCPL
Substation upgrade scope	Above Grade None Relay & Control Rewire 230kV breakers B96 and B93 CT wiring and associated CCVTs from Oceanview line relaying to R-1032 Atlantic line relaying Rewire 230kV breakers B60 and B63 CT wiring and associated CCVTs from R-1032 Atlantic line relaying to Oceanview line relaying Relay setting changes for 230kV Oceanview and R-1032 Atlantic lines Drawing and nameplate changes to reflect swapped line positions Additional Equipment to be Removed None

Transformer Information

None

New equipment description	Relay & Control Rewire 230kV breakers B96 and B93 CT wiring and associated CCVTs from Oceanview line relaying to R-1032 Atlantic line relaying Rewire 230kV breakers B60 and B63 CT wiring and associated CCVTs from R-1032 Atlantic line relaying to Oceanview line relaying Relay setting changes for 230kV Oceanview and R-1032 Atlantic lines Drawing and nameplate changes to reflect swapped line positions
Substation assumptions	230kV Oceanview and R-1032 Atlantic lines can be swapped. No relaying will be replaced
Real-estate description	This project is expected to be completed within the confines of the existing substation.

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	$856,718.74
Component cost (in-service year)	$1,051,607.00

Substation Upgrade Component

Component title	Smithburg Substation 500 kv 3 Brk Ring
Project description	Smithburg -500 kV, 230 kV. Rebuild the 500 kV and 230 KV Substations. • Remove 500kV GIS yard and rebuild as an open air 3 breaker ring bus for Offshore Wind Generation Interconnection. • Remove 230kV GIS yard and rebuild as an open air yard. • Remove 34.5kV yard and rebuild in new location.
Substation name	Smithburg
Substation zone	JCPL
Substation upgrade scope	• Remove 500kV GIS yard and rebuild as an open air 3 breaker ring bus for Offshore Wind Generation Interconnection. • Remove 230kV GIS yard and rebuild as an open air yard. • Remove 34.5kV yard and rebuild in new location.

Transformer Information

None

New equipment description	500kV Yard • Install (3) 500kV circuit breakers • Install (6) 500kV breaker disconnect switches • Install (3) 500kV motor operated disconnect switches • Install (3) 500kV A-Frame dead end structures • Install (9) 500kV CVTs • Install (9) 500kV surge arresters • Install (2) 500kV wave traps, line tuners, and COAX for the Deans line terminal. • Install (1) lot of open air bus, fittings, insulators, and bus supports as indicated on the attached layout 230kV Yard • Install (9) 230kV circuit breakers • Install (7) 230kV H-Frame dead end structures • Install (18) 230kV breaker disconnect switches • Install (6) 230kV motor operated disconnect switches • Install (24) 230kV CVTs • Install (18) 230kV surge arresters • Install (1) lot of open air bus, fittings, insulators, and bus supports as indicated on the attached layout • Install (2) 230kV SSVTs 34.5kV Yard • Install (4) 34.5kV circuit breakers • Install (7) 34.5kV manual disconnect switches • Install (2) 34.5kV motor operated disconnect switches • Install (3) 34.5kV bus PT's • Install (2) 34.5kV H-Frame dead end structures • Install (6) 34.5kV surge arresters • Install (1) 34.5kV capacitor bank • Install (1) lot of bus, fittings, insulators, and bus supports
Substation assumptions	Substation expansion within JCPL owned real-estate.
Real-estate description	Substation expansion within JCPL owned real-estate.
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	$62,438,262.28
Component cost (in-service year)	$66,570,492.28

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

None

Financial Information

Capital spend start date	01/2023
Construction start date	06/2026
Project Duration (In Months)	119

Additional Comments

I had to change the file extension from .dxt to .txt for the short circuit files to be able to upload the zip file.