

# Central Jersey Grid Upgrades

## General Information

Proposing entity name	PSEG
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Yes
Company proposal ID	CJGU
PJM Proposal ID	180
Project title	Central Jersey Grid Upgrades
Project description	1) Brunswick to Deans Subproject - Construct two (2) additional breaker and a half bays. - Loop the Brunswick to Devils Brook 230kV (T-2351) circuit into and out of new positions at the PSE&G Deans 230kV Switching Station. 2) Linden Inside Plant Subproject - Install a 345/230kV transformer at the PSE&G Linden 345kV Switching Station. - Install new 230kV strain bus connecting Linden 230kV yard to Linden 345kV yard through the new transformer. - Relocate the TOSCO to Linden 230kV (B-2254) circuit from the Linden 230kV to the existing 345/230kV transformer at Linden 345kV. 3) Windsor to Clarksville Subproject - Terminate and reconfigure the Windsor to Clarksville 230kV (C-1017) circuit at Clarksville and the JCP&L's Windsor Substation. 4) Deans Inside Plant Subproject - Increase the fault rating of the PSE&G Deans 230kV Switching Station from 63kA to 80kA, via replacement of twelve (12) 230kV 4000A circuit breakers, replacement of insulators, bus, grounding, controls, etc. to achieve desired rating. 5) Bergen Inside Plant Subproject - Upgrade the Bergen 138kV ring bus by installing one (1) 138kV 80kA breaker along with the foundation, piles, and relays to existing ring bus, install breaker isolation switches on existing foundations, install one(1) new monopole, foundation, overhead strain bus, install one(1) new H-frame, foundations, and modify and extend bus work.
Email	lauren.thomas@pseg.com
Project in-service date	01/2028
Tie-line impact	Yes
Interregional project	No
Is the proposer offering a binding cap on capital costs?	No

Additional benefits

## Project Components

1. Brunswick to Deans Subproject (OP)
2. Deans Subproject (IP)
3. Linden Subproject (IP)
4. Linden Subproject (OP)
5. Windsor to Clarksville Subproject (OP)
6. Windsor to Clarksville Subproject (IP)
7. Bergen Subproject

## Transmission Line Upgrade Component

Component title	Brunswick to Deans Subproject (OP)
Project description	- Construct two (2) additional breaker and a half bays. - Loop the Brunswick to Devils Brook 230kV (T-2351) circuit into and out of new positions at the PSE&G Deans 230kV Switching Station.
Impacted transmission line	T-2351
Point A	Brunswick 230kV
Point B	Deans 230kV
Point C	Devil's Brook 230kV
Terrain description	Flat terrain.
<b>Existing Line Physical Characteristics</b>	
Operating voltage	230kV
Conductor size and type	Single 1590 ACSR
Hardware plan description	Three existing spans will be reused for this configuration. This existing span is in acceptable operating conditions. Condition to be accessed.

Tower line characteristics

Existing towers to be reused are originally built in 1979. Existing conditions are acceptable and there have been no structural concerns in any recent inspections.

**Proposed Line Characteristics**

	<b>Designed</b>	<b>Operating</b>
Voltage (kV)	230.000000	230.000000
	<b>Normal ratings</b>	<b>Emergency ratings</b>
Summer (MVA)	731.000000	885.000000
Winter (MVA)	821.000000	978.000000
Conductor size and type	1590 ACSR 54/19 (limiting section)	
Shield wire size and type	48 count OPGW .646 & .742"	
Rebuild line length	.56 miles	
Rebuild portion description	Existing spans will be reused to loop the T-2351 circuit into Deans and additional spans will be built to accommodate other existing circuits.	
Right of way	The circuit re-routing into Deans station will require additional easement property.	
Construction responsibility	PSEG	
Benefits/Comments		
<b>Component Cost Details - In Current Year \$</b>		
Engineering & design	Confidential	
Permitting / routing / siting	Confidential	
ROW / land acquisition	Confidential	
Materials & equipment	Confidential	
Construction & commissioning	Confidential	

Construction management	Confidential
Overheads & miscellaneous costs	Confidential
Contingency	Confidential
Total component cost	\$16,554,190.00
Component cost (in-service year)	\$18,127,692.00

### **Substation Upgrade Component**

Component title	Deans Subproject (IP)
Project description	- Increase the fault rating of the PSE&G Deans 230kV Switching Station from 63kA to 80kA, via replacement of twelve (12) 230kV 4000A circuit breakers, replacement of insulators, bus, grounding, controls, etc. to achieve desired rating.
Substation name	Deans 230kV
Substation zone	PSEG
Substation upgrade scope	Increase the fault rating of the PSE&G Deans 230kV Switching Station from 63kA to 80kA, via replacement of twelve (12) 230kV 4000A circuit breakers, replacement of insulators, bus, grounding, controls, etc. to achieve desired rating.

### **Transformer Information**

None	
New equipment description	(16) 230kV 80kA breakers including connections, control cables, conduit and grounding (22) 230kV disconnect switches support stands (8) 230kV 3000A disconnect switches and supports (2) 230kV 3000A disconnect switches with ground switches 230kV bus, required bus supports, dampener wire, fittings and transitions (4) 230kV A-frames including grounding Relay protection for new line positions within existing control house Above grade grounding as required Station Lighting (Allowance) Fence Grounding System
Substation assumptions	There is sufficient room to accommodate the breaker installation. Existing 230kV disconnect switches will be reused Hand excavation is not required No Piles are required. Outages will be available Permits will be available Resources will be available No additional property purchase and leasing cost for IP scope No modification to underground utilities No work associated with removal of contaminated materials and hazardous waste

Real-estate description

Construction responsibility

PSEG

Benefits/Comments

**Component Cost Details - In Current Year \$**

Engineering & design

Confidential

Permitting / routing / siting

Confidential

ROW / land acquisition

Confidential

Materials & equipment

Confidential

Construction & commissioning

Confidential

Construction management

Confidential

Overheads & miscellaneous costs

Confidential

Contingency

Confidential

Total component cost

\$33,987,428.00

Component cost (in-service year)

\$37,208,275.00

**Substation Upgrade Component**

Component title

Linden Subproject (IP)

Project description

Install a new 345/230kV transformer in the new Linden 345kV Switch

Substation name

Linden 345kV

Substation zone

PSEG

Substation upgrade scope

- Install a 345/230kV transformer at the PSE&G Linden 345kV Switching Station - Install new 230kV strain bus connecting Linden 230kV yard to Linden 345kV yard through the new transformer.

**Transformer Information**

	<b>Name</b>	<b>Capacity (MVA)</b>	
Transformer	345-2	1000	
	<b>High Side</b>	<b>Low Side</b>	<b>Tertiary</b>
Voltage (kV)	345	230	
New equipment description	(1) 345kV A-frames including grounding (1) 345/230kV transformer 1000 MVA including oil processing, connections, power cables, control cables, conduit and grounding (1) 345kV disconnect switch with ground switches and connections (1) 230kV disconnect switch with ground switches and connections Site fence grounding		
Substation assumptions	Sufficient room to allow for station expansion to accommodate a new transformer and associated connections Hand excavation is not required Outages will be available Permits will be available Resources will be available No modification to underground utilities needed No work associated with removal of contaminated materials and hazardous waste		
Real-estate description			
Construction responsibility	PSEG		
Benefits/Comments			
<b>Component Cost Details - In Current Year \$</b>			
Engineering & design	Confidential		
Permitting / routing / siting	Confidential		
ROW / land acquisition	Confidential		
Materials & equipment	Confidential		
Construction & commissioning	Confidential		
Construction management	Confidential		
Overheads & miscellaneous costs	Confidential		
Contingency	Confidential		

Total component cost	\$16,357,697.00
Component cost (in-service year)	\$18,019,373.00

**Transmission Line Upgrade Component**

Component title	Linden Subproject (OP)
Project description	Relocate the TOSCO to Linden 230kV (B-2254) circuit from the Linden 230kV to the existing 345/230kV transformer at Linden 345kV.
Impacted transmission line	B-2254
Point A	Tosco 230kV
Point B	Linden 230kV
Point C	Linden 345kV
Terrain description	Flat terrain in the vicinity of existing stations

**Existing Line Physical Characteristics**

Operating voltage	230kV
Conductor size and type	1590 ACSS 54/19
Hardware plan description	Reusing 2 spans/towers. They are in acceptable operating condition.
Tower line characteristics	One structure being reused is recently built in excellent condition. Another structure was built in 1960 and there is no indication of structural inadequacy based on recent inspection.

**Proposed Line Characteristics**

	<b>Designed</b>	<b>Operating</b>
Voltage (kV)	230.000000	230.000000
	<b>Normal ratings</b>	<b>Emergency ratings</b>
Summer (MVA)	934.000000	1080.000000

Winter (MVA)	999.000000	1143.000000
Conductor size and type	1590 ACSS 54/19	
Shield wire size and type	48 count OPGW .646 & .742"	
Rebuild line length	0.25 miles	
Rebuild portion description	Existing circuit B-2254 will be reconfigured to a new position using existing/new structures. In addition, other existing circuit to be relocated on new structures.	
Right of way	No new ROW needed	
Construction responsibility	PSEG	
Benefits/Comments		

**Component Cost Details - In Current Year \$**

Engineering & design	Confidential
Permitting / routing / siting	Confidential
ROW / land acquisition	Confidential
Materials & equipment	Confidential
Construction & commissioning	Confidential
Construction management	Confidential
Overheads & miscellaneous costs	Confidential
Contingency	Confidential
Total component cost	\$8,563,152.00
Component cost (in-service year)	\$9,329,241.00

**Transmission Line Upgrade Component**

Component title	Windsor to Clarksville Subproject (OP)
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Project description	Creating a paired conductor path between Clarksville and JCP&L Windsor Switch
Impacted transmission line	C-1017
Point A	Clarksville 230kV
Point B	Windsor 230kV
Point C	
Terrain description	Flat terrain along existing ROW
<b>Existing Line Physical Characteristics</b>	
Operating voltage	230kV
Conductor size and type	1590 ACSR Lapwing 45/7 - To be confirmed by First Energy
Hardware plan description	Existing line hardware will be reused except at the new structure installation locations. The hardware condition is pending First Energy assessment.
Tower line characteristics	Existing First Energy Tower data unknown. New structures will be tubular steel poles.

**Proposed Line Characteristics**

	<b>Designed</b>	<b>Operating</b>
Voltage (kV)	230.000000	230.000000
	<b>Normal ratings</b>	<b>Emergency ratings</b>
Summer (MVA)	1428.000000	1668.000000
Winter (MVA)	1528.000000	1728.000000
Conductor size and type	Bundled/Paired 1590 ACSR Lapwing 45/7 - To be confirmed by First Energy	
Shield wire size and type	Existing OPGW available - To be confirmed by First Energy	
Rebuild line length	1.3 miles	

Rebuild portion description -Add jumper loops on various existing dead-end structures -Wreck and rebuild one suspension tower outside Clarksville Station to carry the new twin bundle conductor spans into the station A-Frame -Wreck and rebuild (if required) an existing structure outside of Windsor to carry the new twin bundle conductor span

Right of way No new ROW required

Construction responsibility FirstEnergy

Benefits/Comments

**Component Cost Details - In Current Year \$**

Engineering & design Confidential

Permitting / routing / siting Confidential

ROW / land acquisition Confidential

Materials & equipment Confidential

Construction & commissioning Confidential

Construction management Confidential

Overheads & miscellaneous costs Confidential

Contingency Confidential

Total component cost \$4,281,157.00

Component cost (in-service year) \$4,685,276.00

**Substation Upgrade Component**

Component title Windsor to Clarksville Subproject (IP)

Project description

Substation name Windsor, Clarksville

Substation zone PSE&G

Substation upgrade scope

Upgrade all terminal equipment at Windsor & Clarksville as necessary to create a paired conductor path between Clarksville & JCP&L East Windsor Switch

## Transformer Information

None

New equipment description

(2) 230kV steel monopoles, (1) outside of Clarksville Station, and (1) outside Windsor Station 230kV wire and hardware as required OPGW and hardware as required

Substation assumptions

Typical construction matting and stone is included. All equipment will be received when needed and no temporary accommodations will be required Outages will be available Permits will be available Resources will be available No additional property purchase required Assumes no contaminated materials and hazardous waste No environmental remediation needed

Real-estate description

Construction responsibility

PSEG

Benefits/Comments

### Component Cost Details - In Current Year \$

Engineering & design

Confidential

Permitting / routing / siting

Confidential

ROW / land acquisition

Confidential

Materials & equipment

Confidential

Construction & commissioning

Confidential

Construction management

Confidential

Overheads & miscellaneous costs

Confidential

Contingency

Confidential

Total component cost

\$1,493,101.00

Component cost (in-service year)

\$1,602,995.00

## Substation Upgrade Component

Component title	Bergen Subproject
Project description	
Substation name	Bergen Switching Station
Substation zone	PSEG
Substation upgrade scope	Upgrade the Bergen 138kV ring bus by installing one (1) 138kV 80kA breaker along with the foundation, piles, and relays to existing ring bus, install breaker isolation switches on existing foundations and modify and extend bus work.

## Transformer Information

None	
New equipment description	(1) 138kV 80kA breakers including connections, control cables, conduit and grounding (2) 138kV disconnect switches and support stands 138 kV bus, required bus supports, dampener wire, fittings and transitions (1) 138kV H-frames (1) 138kV monopole Overhead connections and hardware from monopole to new H-frame and to existing H-frame Relay protection for new line positions within existing control house Above grade grounding
Substation assumptions	Estimate includes removal and replacement of all 230kV breaker foundations Existing 230kV disconnect switches will be reused Hand excavation is not required Contingency not required Piles are required Site remediation not required All equipment will be received when needed and no temporary accommodations will be required Outages will be available Permits will be available Resources will be available No property purchase and leasing cost needed No modification to underground utilities needed
Real-estate description	
Construction responsibility	PSEG
Benefits/Comments	
<b>Component Cost Details - In Current Year \$</b>	
Engineering & design	Confidential
Permitting / routing / siting	Confidential

ROW / land acquisition	Confidential
Materials & equipment	Confidential
Construction & commissioning	Confidential
Construction management	Confidential
Overheads & miscellaneous costs	Confidential
Contingency	Confidential
Total component cost	\$5,530,089.00
Component cost (in-service year)	\$6,032,315.00

## Congestion Drivers

None

## Existing Flowgates

FG #	From Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
28-GD-S2-W90	218345	ALDENE_6	216911	SPRINGRD_3	1	230	231	Gen Deliv (winter)	Included
28-GD-S2-S1	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (Summer)	Included
28-GD-S2-S2	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (Summer)	Included
28-GD-S2-W72	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (winter)	Included
28-GD-S2-W62	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (winter)	Included
28-GD-S2-W92	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (winter)	Included
28-GD-S2-W92	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (winter)	Included
28-GD-S2-W92	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (winter)	Included
28-GD-S2-S137	218300	LINDEN	219046	TOSCO_3	1	230	231	Gen Deliv (Summer)	Excluded
28-GD-S2-S138	218343	TOSCO_2	218441	VFT_2	1	230	231	Gen Deliv (Summer)	Excluded
35-GD-S2-S6	218307	ALDENE_2	218430	STANTER_1	1	230/230	231/231	Gen Deliv (Summer)	Included
35-GD-S2-S9	218307	ALDENE_2	218430	STANTER_1	1	230/230	231/231	Gen Deliv (Summer)	Included

FG #	From Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
35-GD-S2-S8	218345	ALDENE_6	216911	SPRINGRD_3	1	230/230	231/231	Gen Deliv (Summer)	Included
35-GD-W13	218345	ALDENE_6	216911	SPRINGRD_3	1	230/230	231/231	Gen Deliv (winter)	Included
35-GD-S2-W9	218345	ALDENE_6	216911	SPRINGRD_3	1	230/230	231/231	Gen Deliv (winter)	Included
35-GD-S2-W13	218306	DEANS	218304	BRUNSWCK	1	230/230	231/231	Gen Deliv (winter)	Included
35-GD-S2-W15	218306	DEANS	218304	BRUNSWCK	1	230/230	231/231	Gen Deliv (winter)	Included
35-GD-S2-W16	218306	DEANS	218304	BRUNSWCK	1	230/230	231/231	Gen Deliv (winter)	Included
35-GD-W4	218306	DEANS	218304	BRUNSWCK	1	230/230	231/231	Gen Deliv (winter)	Included
35-GD-W7	218306	DEANS	218304	BRUNSWCK	1	230/230	231/231	Gen Deliv (winter)	Included
35-GD-W9	218306	DEANS	218304	BRUNSWCK	1	230/230	231/231	Gen Deliv (winter)	Included
35-GD-S2-S2	218306	DEANS	218304	BRUNSWCK	1	230/230	231/231	Gen Deliv (Summer)	Included
35-GD-S14	218300	LINDEN	219046	TOSCO_3	1	230/230	231/231	Gen Deliv (Summer)	Included
35-GD-S13	218343	TOSCO_2	218441	VFT_2	1	230/230	231/231	Gen Deliv (Summer)	Included
28-GD-S66	206316	28WINDSOR	219752	CLRKSVLL_1	1	230	228/231	Gen Deliv (Summer)	Included
28-GD-S2-S3	206316	28WINDSOR	219752	CLRKSVLL_1	1	230	228/231	Gen Deliv (Summer)	Included
28-GD-W12	218345	ALDENE_6	216911	SPRINGRD_3	1	230	231	Gen Deliv (winter)	Included
28-GD-S72	219104	CLRKSVLL_2	217150	LAWRENCE	1	230	231	Gen Deliv (Summer)	Included
28-GD-L14	218306	DEANS	218304	BRUNSWCK	1	230	231	Light Load - Gen Deliv	Included
35-GD-L14	218306	DEANS	218304	BRUNSWCK	1	230	231	Light Load - Gen Deliv	Included
28-GD-S64	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (Summer)	Included
28-GD-S65	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (Summer)	Included
28-GD-W109	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (winter)	Included
28-GD-W108	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (winter)	Included
28-GD-W3	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (winter)	Included
28-GD-W8	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (winter)	Included
28-GD-W6	218306	DEANS	218304	BRUNSWCK	1	230	231	Gen Deliv (winter)	Included
28-GD-S73	200006	DEANS C	218306	DEANS	3	500/230	231	Gen Deliv (Summer)	Included

## New Flowgates

Confidential

## **Financial Information**

Capital spend start date 01/2024

Construction start date 10/2025

Project Duration (In Months) 48

## **Additional Comments**

None