



# **Generation Interconnection**

## **Feasibility Study Report**

**for**

**Queue Project AG1-001**

**US SILICA-UNIMIN 69 KV**

**11.78 MW Capacity / 31 MW Energy**

January 2021

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## 1 Introduction

This Feasibility Study has been prepared in accordance with the PJM Open Access Transmission Tariff, 36.2, as well as the Feasibility Study Agreement between the Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is AEC.

## 2 Preface

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, may also contribute to the need for the same network reinforcement. Cost allocation rules for network upgrades can be found in PJM Manual 14A, Attachment B. The possibility of sharing the reinforcement costs with other projects may be identified in the feasibility study, but the actual allocation will be deferred until the impact study is performed.

The Interconnection Customer seeking to interconnect a wind or solar generation facility shall maintain meteorological data facilities as well as provide that meteorological data which is required per Schedule H to the Interconnection Service Agreement and Section 8 of Manual 14D.

The Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

### 3 General

The Interconnection Customer (IC), has proposed a Solar generating facility located in Cumberland County, New Jersey. The installed facilities will have a total capability of 31 MW with 11.78 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is March 01, 2023. This study does not imply a TO commitment to this in-service date.

<b>Queue Number</b>	<b>AG1-001</b>
<b>Project Name</b>	US SILICA-UNIMIN 69 KV
<b>State</b>	New Jersey
<b>County</b>	Cumberland
<b>Transmission Owner</b>	AEC
<b>MFO</b>	31
<b>MWE</b>	31
<b>MWC</b>	11.78
<b>Fuel</b>	Solar
<b>Basecase Study Year</b>	2024

Any new service customers who can feasibly be commercially operable prior to June 1st of the basecase study year are required to request interim deliverability analysis.

## 4 Point of Interconnection

AG1-001 will interconnect with the AEC transmission system tapping the US Silica #1 to Unimin 69 kV Line.

## 5 Cost Summary

The AG1-001 project will be responsible for the following costs:

Description	Total Cost
<b>Total Physical Interconnection Costs</b>	\$6,400,000
<b>Total System Network Upgrade Costs</b>	\$41,331,000
<b>Total Costs</b>	\$47,731,000

This cost excludes a Federal Income Tax Gross Up charges. This tax may or may not be charged based on whether this project meets the eligibility requirements of IRS Notice 2016-36, 2016-25 I.R.B. (6/20/2016). If at a future date it is determined that the Federal Income Tax Gross charge is required, the Transmission Owner shall be reimbursed by the Interconnection Customer for such taxes.

Cost allocations for any System Upgrades will be provided in the System Impact Study Report.

## 6 Transmission Owner Scope of Work

### Substation Interconnection Estimate

Scope: Design and construct a new 3-breaker ring bus substation. Two terminals will be designated for the US Silica-Unimin 69 kV line, with the third terminal being designated for the interconnecting generator.

### Required Relaying and Communications

ACE requires that an IC circuit breaker is located within 500 feet of the ACE substation to facilitate the relay protection scheme between ACE and the IC at the Point of Interconnection (POI).

The project may require re-wiring and adjustment of existing relay schemes at Newport and South Millville substations to accommodate the new 69 kV substation.

### **Estimate Assumptions:**

Developer responsible for land purchase for the substation, price is not included.

Site clearing and grading performed by Developer.

Assumed Greenfield Substation Site Area to develop of 250' x 250'

Relaying and communication adjustments cost not included.

The total physical interconnection costs is given in the table below:

Description	Total Cost
<b>Total Physical Interconnection Costs</b>	<b>\$6,400,000</b>

## 7 Schedule

**Construction Time:** 36 to 48 months

## 8 Transmission Owner Analysis

None.

## 9 Interconnection Customer Requirements

### **Interconnection Customer Scope of Direct Connection Work**

The IC is responsible for all design and construction related to activities on their side of the Point of Interconnection. Site preparation, including grading and an access road, as necessary, is assumed to be by the IC. Route selection, line design, and right-of-way acquisition of the direct connect facilities is not included in this report and is the responsibility of the IC. Protective relaying and metering design and installation must comply with ACE's applicable standards. The IC is also required to provide revenue metering and real-time telemetering data to PJM in conformance with the requirements contained in PJM Manuals M-01 and M-14 and the PJM Tariff.

### **ACE Interconnection Customer Scope of Direct Connection Work Requirements:**

- ACE requires that an IC circuit breaker is located within 500 feet of the ACE substation to facilitate the relay protection scheme between ACE and the IC at the Point of Interconnection (POI).

### **Special Operating Requirements**

1. ACE will require the capability to remotely disconnect the generator from the grid by communication from its System Operations facility. Such disconnection may be facilitated by a generator breaker, or other method depending upon the specific circumstances and the evaluation by ACE.
2. ACE reserves the right to charge the Interconnection Customer operation and maintenance expenses to maintain the Interconnection Customer attachment facilities, including metering and telecommunications facilities, owned by ACE.

### **Additional Interconnection Customer Responsibilities:**

1. An Interconnection Customer entering the New Services Queue on or after October 1, 2012 with a proposed new Customer Facility that has a Maximum Facility Output equal to or greater than 100 MW shall install and maintain, at its expense, phasor measurement units (PMUs). See Section 8.5.3 of Appendix 2 to the Interconnection Service Agreement as well as section 4.3 of PJM Manual 14D for additional information.

2. The Interconnection Customer may be required to install and/or pay for metering as necessary to properly track real time output of the facility as well as installing metering which shall be used for billing purposes. See Section 8 of Appendix 2 to the Interconnection Service Agreement as well as Section 4 of PJM Manual 14D for additional information.
3. The Interconnection Customer seeking to interconnect a wind generation facility shall maintain meteorological data facilities as well as provide that meteorological data which is required per item 5.IV of Schedule H to the Interconnection Service Agreement.

## **10 Revenue Metering and SCADA Requirements**

### **10.1 PJM Requirements**

The Interconnection Customer will be required to install equipment necessary to provide Revenue Metering (KWH, KVARH) and real time data (KW, KVAR) for IC's generating Resource. See PJM Manuals M-01 and M-14D, and PJM Tariff Section 8 of Attachment O.

### **10.2 Meteorological Data Reporting Requirements**

The solar generation facility shall provide the Transmission Provider with site-specific meteorological data including:

- Back Panel temperature (Fahrenheit) - (Required for plants with Maximum Facility Output of 3 MW or higher)
- Irradiance (Watts/meter<sup>2</sup>) - (Required for plants with Maximum Facility Output of 3 MW or higher)
- Ambient air temperature (Fahrenheit) - (Accepted, not required)
- Wind speed (meters/second) - (Accepted, not required)
- Wind direction (decimal degrees from true north) - (Accepted, not required)

### **10.3 Interconnected Transmission Owner Requirements**

The IC will be required to comply with all Interconnected Transmission Owner's revenue metering requirements for generation interconnection customers located at the following link:

<http://www.pjm.com/planning/design-engineering/to-tech-standards/>

A three phase 69 kV revenue metering point will need to be established within the Interconnection Customer Facilities at the Point of Interconnection. The Interconnection Customer will purchase and install all metering instrument transformers as well as construct a metering structure per ACE's specifications. The secondary wiring connections at the instrument transformers will be completed by the Interconnection Customer and inspected by ACE, while the connections at the metering enclosure will be completed by ACE. The metering control cable and meter cabinets will be supplied by ACE and installed by the Interconnection Customer. The Interconnection Customer will install conduit for the control cable between the instrument transformers and the metering enclosure. The location of the metering enclosure will be determined during construction. The

Interconnection Customer will provide 120V power to the meter cabinet. ACE will provide, program, install, and own the primary & backup solid state multi-function meters for the new metering position.

Each meter will be equipped with load profile, telemetry, and DNP outputs. The Interconnection Customer will be provided with one-meter DNP output for each meter. ACE will supply a wireless modem for MV90 interrogation. In the event that a wireless modem is unable to reliably communicate, the IC will be required to make provisions for a POTS (Plain Old Telephone Service) line or equivalent technology approved by ACE within approximately three feet of the ACE metering position to facilitate remote interrogation and data collection. It is the Interconnection Customer's responsibility to send the data that PJM and ACE require directly to PJM. The Interconnection Customer will grant permission for PJM to send ACE the following telemetry that the Interconnection Customer sends to PJM: real time MW, MVAR, volts, amperes, generator status, and interval MWH and MVARH.

ACE's revenue meters will be the official meters and must be the source for reporting generation output to PJM. The Interconnection Customer is responsible for installing telemetry equipment necessary to obtain the revenue meter data and submitting the data to PJM.

## 11 Summer Peak - Load Flow Analysis

The Queue Project AG1-001 was evaluated as a 31.0 MW (Capacity 11.8 MW) injection tapping the US Silica #1 to Unimin 69 kV Line in the AEC area. Project AG1-001 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-001 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

### 11.1 Generation Deliverability

(Single or N-1 contingencies for the Capacity portion only of the interconnection)

None

### 11.2 Multiple Facility Contingency

(Double Circuit Tower Line, Fault with a Stuck Breaker, and Bus Fault contingencies for the full energy output)

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
165192691	219756	BEAVERBK_2	230.0	PSE&G	219110	GLOUCSTR	230.0	PSE&G	1	PS_P7-1_O2241+V2274_LT	tower	740.0	99.73	100.17	DC	3.25

### 11.3 Contribution to Previously Identified Overloads

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
166636747	228130	TUCKAHOE	69.0	AE	227946	MILL#2	69.0	AE	1	AE_P7-1 AE7TOWER	tower	146.0	107.37	107.96	DC	1.89
166636720	228217	DENNIS	69.0	AE	228130	TUCKAHOE	69.0	AE	1	AE_P7-1 AE7TOWER	tower	146.0	112.51	113.09	DC	1.89
166636698	228714	CNTRL N	69.0	AE	228504	SHLDLY T	69.0	AE	1	AE_P7-1 AE7TOWER	tower	143.0	110.01	114.28	DC	6.11
166636699	228714	CNTRL N	69.0	AE	228504	SHLDLY T	69.0	AE	1	AE_P7-1 AE18TOWER	tower	143.0	106.79	111.07	DC	6.12
166636677	228716	S121TAP	69.0	AE	228714	CNTRL N	69.0	AE	1	AE_P7-1 AE7TOWER	tower	107.0	141.41	142.24	DC	1.97
166636678	228716	S121TAP	69.0	AE	228714	CNTRL N	69.0	AE	1	AE_P7-1 AE6TOWER	tower	107.0	114.82	115.65	DC	1.97

### 11.4 Potential Congestion due to Local Energy Deliverability

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which shall study all overload conditions associated with the overloaded element(s) identified.

ID	FROM BUS#	FROM BUS	kV	FRO M BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Ratin g MVA	PRE PROJEC T LOADIN G %	POST PROJEC T LOADIN G %	AC D C	MW IMPAC T
167544188	227903	MILL #1	138.0	AE	227902	LEWIS #1	138.0	AE	1	AE_P1-2 BLE-ML-LEW2	operatio n	306.0	138.55	139.14	DC	4.02
167544310	227904	MILL #2	138.0	AE	227945	LEWIS #2	138.0	AE	1	AE_P1-2 BLE-ML-LEW1	operatio n	282.0	115.51	116.05	DC	3.4
167544149	227905	SCULL#1	138.0	AE	227903	MILL #1	138.0	AE	1	AE_P1-2 BLE-SC-ML2	operatio n	306.0	156.31	156.97	DC	4.45
167544151	227905	SCULL#1	138.0	AE	227903	MILL #1	138.0	AE	1	Base Case	operatio n	218.0	122.13	122.66	DC	2.56
167544146	227906	SCULL#2	138.0	AE	227904	MILL #2	138.0	AE	1	AE_P1-2 BLE-SC-ML1	operatio n	306.0	157.74	158.4	DC	4.45
167544148	227906	SCULL#2	138.0	AE	227904	MILL #2	138.0	AE	1	Base Case	operatio n	218.0	123.14	123.67	DC	2.56
167544154	228110	BLE	138.0	AE	227905	SCULL#1	138.0	AE	1	AE_P1-2 BLE-SC-ML2	operatio n	331.0	151.85	152.45	DC	4.45
167544157	228110	BLE	138.0	AE	227906	SCULL#2	138.0	AE	1	AE_P1-2 BLE-SC-ML1	operatio n	331.0	151.02	151.63	DC	4.45
167780971	228210	UNION	138.0	AE	228108	CORSON 3	138.0	AE	1	AE_P1-2 CUMB-DENN	operatio n	478.0	105.83	106.33	DC	5.25
167780722	228215	BALFSTNT	69.0	AE	228233	WHTN A T	69.0	AE	1	AE_P1-2 BUT-LINC	operatio n	94.0	92.44	111.6	DC	18.01
167780670	228228	SO MVLL E	69.0	AE	228215	BALFSTNT	69.0	AE	1	AE_P1-2 BUT-LINC	operatio n	88.0	98.75	119.21	DC	18.01
167780648	228233	WHTN A T	69.0	AE	228225	2ND ST#1	69.0	AE	1	AE_P1-2 BUT-LINC	operatio n	83.0	104.69	126.39	DC	18.01
167780908	228252	CRLS CR2	69.0	AE	940000	AE1-240 TAP	69.0	AE	1	AE_P1-2 ORCH-CUMB	operatio n	93.0	114.72	114.86	DC	1.61
167780877	228256	SHRMAN# 1	69.0	AE	945730	AF1-238 TAP	69.0	AE	1	AE_P1-2 CNT-V-BUT	operatio n	132.0	111.33	115.01	DC	4.85
167780858	228311	CHAMBERS	230.0	AE	228312	PEDRKTW N	230.0	AE	1	AE_P1-2 ORCHAR D XF	operatio n	551.0	115.71	116.39	DC	8.57
167780870	228313	BRIDGPR T	230.0	AE	228401	MCKLTON	230.0	AE	1	AE_P1-2 ORCHAR D XF	operatio n	804.0	116.68	117.16	DC	8.52
167780889	228504	SHLDLY T	69.0	AE	228511	LANDIS T	69.0	AE	1	AE_P1-2 ORCH-CUMB	operatio n	158.0	103.85	108.51	DC	7.36
167780891	228511	LANDIS T	69.0	AE	228409	MONROE# 3	69.0	AE	1	AE_P1-2 ORCH-CUMB	operatio n	158.0	103.79	108.45	DC	7.36
167780962	228716	S121TAP	69.0	AE	228714	CNTRL N	69.0	AE	1	AE_P1-2 CORSON-UNION	operatio n	107.0	106.66	107.46	DC	1.89
169513584	939500	AE1-179 TAP	69.0	AE	228228	SO MVLL E	69.0	AE	1	CARLL-240 TAP-SHERM-A	operatio n	89.0	97.44	120.1	DC	20.16
169513585	939500	AE1-179 TAP	69.0	AE	228228	SO MVLL E	69.0	AE	1	Base Case	operatio n	66.0	83.09	112.0	DC	19.08
169513629	940000	AE1-240 TAP	69.0	AE	228226	SHRMAN# 2	69.0	AE	1	AE_P1-2 ORCH-CUMB	operatio n	93.0	152.04	152.18	DC	1.61
169513631	940000	AE1-240 TAP	69.0	AE	228226	SHRMAN# 2	69.0	AE	1	Base Case	operatio n	82.0	117.07	118.56	DC	2.72

## 11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
166636698,166636699	4	CNTRL N 69.0 kV - SHLDLY T 69.0 kV Ckt 1	ACE: at0711r0001 (107) : To mitigate the (ACE) Sheildalloy Tap Central Tap 69 kV line (from bus 228504 to bus 228714 ckt 1) overload, it will require increasing the emergency rating of the Sheildalloy Tap to Central North (Vineland) 230 kV line by rebuilding the circuit. The rebuild will include the installation of new poles, foundations, insulators, and conductor. Project Type : FAC Cost : \$1,300,000 Time Estimate : 24-48 Months	\$1,300,000
166636677,166636678	5	S121TAP 69.0 kV - CNTRL N 69.0 kV Ckt 1	ACE: 20-095 (2) : Line Upgrade West Sherman Substation, including the installation of new poles, foundations, insulators, and conductor. Project Type : FAC Cost : \$3,125,000 Time Estimate : 18.0 Months  20-096 (3) : Ring Bus for AF1-238 & AF1-239- New 69kV class substation and associated relaying, fiber, etc. Project Type : CON Cost : \$7,405,000 Time Estimate : 34.0 Months  20-097 (4) : Line Upgrade CN-G10, including the installation of new poles, circuit breaker, relaying, foundations, insulators, and conductor. Project Type : FAC Cost : \$2,501,000 Time Estimate : 12.0 Months	\$13,031,000
165192691	1	BEAVERBK_2 230.0 kV - GLOUCSTR 230.0 kV Ckt 1	PSEG: PSEG stated that there is no overload for this facility. Rating of the line is greater than the PSS/e case rating.	\$0
166636720	3	DENNIS 69.0 kV - TUCKAHOE 69.0 kV Ckt 1	ACE: at0750r0001 (113) : To mitigate the (ACE) Dennis Tuckahoe 69 kV line (from bus 228217 to bus 228130 ckt 1) overload, it will require increasing the emergency rating of the Dennis to Tuckahoe 69 kV line by rebuilding the circuit. The rebuild will include the installation of new poles, foundations, insulators, and conductor. In addition, various terminal reinforcements are required at Tuckahoe. Project Type : FAC Cost : \$7,000,000 Time Estimate : 36-60 Months	\$7,000,000
166636747	2	TUCKAHOE 69.0 kV - MILL#2 69.0 kV Ckt 1	ACE: at0750r0002 (114) : To mitigate the (ACE) Tuckahoe Mill#2 69 kV line (from bus 228130 to bus 227946 ckt 1) overload, it will require increasing the emergency rating of the Tuckahoe to Mill#2 69 kV line by rebuilding the circuit. The rebuild will include the installation of new poles, foundations, insulators, and conductor. Project Type : FAC Cost : \$20,000,000 Time Estimate : 36-60 Months	\$20,000,000
			<b>TOTAL COST</b>	<b>\$41,331,000</b>

## 11.6 Flow Gate Details

The following indices contain additional information about each facility presented in the body of the report. For each index, a description of the flowgate and its contingency was included for convenience. The intent of the indices is to provide more details on which projects/generators have contributions to the flowgate in question. All New Service Queue Requests, through the end of the Queue under study, that are contributors to a flowgate will be listed in the indices. Please note that there may be contributors that are subsequently queued after the queue under study that are not listed in the indices. Although this information is not used "as is" for cost allocation purposes, it can be used to gage the impact of other projects/generators. It should be noted the project/generator MW contributions presented in the body of the report are Full MW Impact contributions which are also noted in the indices column named "Full MW Impact", whereas the loading percentages reported in the body of the report, take into consideration the PJM Generator Deliverability Test rules such as commercial probability of each project as well as the ramping impact of "Adder" contributions. The MW Impact found and used in the analysis is shown in the indices column named "Gendeliv MW Impact".

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11.6.1 Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPAC T
16519269 1	21975 6	BEAVERBK_2	PSE&G	21911 0	GLOUCST R	PSE&G	1	PS_P7-1_O2241+V2274_L T	tower	740.0	99.73	100.17	DC	3.25

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200062	SALEM G3	2.6380	Adder	3.1
219123	BCRR_COGEN (Deactivation : 26/04/2020)	-0.3589	Adder	-0.42
219137	THOSOLAR C (Deactivation : 01/06/2015)	0.0463	Adder	0.05
219138	THOSOLAR E	0.0755	Adder	0.09
219259	KINSLEYDEP E	0.2516	Adder	0.3
219623	KINSLEYBEA C	0.2489	50/50	0.2489
219624	KINSLEYBEA E	1.6260	50/50	1.6260
227801	ONTC&DCT	3.3486	Adder	3.94
227842	MARINGEN	0.6766	Adder	0.8
227881	GRENWCHG	0.1443	Adder	0.17
227928	V4-067E	0.1390	Adder	0.16
228102	BLE#2 ST (Deactivation : 30/04/2019)	13.0601	Adder	15.36
228201	CARL#2CT	0.5271	50/50	0.5271
228251	CARLLS#4	0.5006	50/50	0.5006
228260	V4-054C	0.0626	50/50	0.0626
228261	V4-054E	0.6472	50/50	0.6472
228343	QUINTN#1 (Deactivation : 26/04/2020)	0.1471	Adder	0.17
228357	V2-046E	1.0675	Adder	1.26
228702	WEST CT	0.3980	50/50	0.3980
228712	V2-041E	0.2161	Adder	0.25
228717	S121	0.7820	50/50	0.7820
228720	V2-035C	0.0134	50/50	0.0134
228721	V2-035E	0.0380	50/50	0.0380
228727	W2-039G	0.7453	50/50	0.7453
228728	W1-130C	0.0576	50/50	0.0576
902092	W1-130E	0.6507	50/50	0.6507
902432	W2-030 E	0.5211	Adder	0.61
924051	AB2-049 C	0.1455	50/50	0.1455
924052	AB2-049 E	0.2373	50/50	0.2373
924531	AB2-102 C	19.1805	Adder	22.57
924532	AB2-102 E	0.4262	Adder	0.5
924702	AB2-122 E (Withdrawn : 05/05/2020)	0.1043	Adder	0.12
930002	AB1-001 E	0.1098	Adder	0.13
930722	AB1-116 E	0.0974	50/50	0.0974
930732	AB1-119 E	0.0921	50/50	0.0921

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
933962	AD1-019 E	0.6593	Adder	0.78
936501	AD2-065 C	0.1240	50/50	0.1240
936502	AD2-065 E	0.1711	50/50	0.1711
937011	AD2-135 C	0.0840	50/50	0.0840
937012	AD2-135 E	0.1429	50/50	0.1429
938421	AE1-061 C	0.3139	50/50	0.3139
938422	AE1-061 E	0.3139	50/50	0.3139
938431	AE1-062 C	1.1736	50/50	1.1736
938781	AE1-104 C O1	12.1049	Adder	14.24
938782	AE1-104 E O1	30.9657	Adder	36.43
938871	AE1-115 C	0.8528	Adder	1.0
939301	AE1-161 C	2.3438	50/50	2.3438
939302	AE1-161 E	3.5157	50/50	3.5157
939501	AE1-179 C O1	3.6796	50/50	3.6796
939502	AE1-179 E O1	2.5967	50/50	2.5967
939821	AE1-218 C O1	0.0990	50/50	0.0990
939822	AE1-218 E O1	0.1485	50/50	0.1485
939931	AE1-229 C O1	9.5114	50/50	9.5114
939932	AE1-229 E O1	6.4443	50/50	6.4443
940001	AE1-240 C O1	3.0389	50/50	3.0389
940002	AE1-240 E O1	2.1692	50/50	2.1692
940361	AE2-020 C	9.2591	Adder	10.89
940362	AE2-020 E	43.3518	Adder	51.0
940371	AE2-021 C	9.2591	Adder	10.89
940372	AE2-021 E	43.3518	Adder	51.0
940381	AE2-022 C	5.4011	Adder	6.35
940382	AE2-022 E	25.2886	Adder	29.75
942101	AE2-222 C	7.3124	Adder	8.6
942102	AE2-222 E	18.7104	Adder	22.01
942381	AE2-251 C	29.3327	Adder	34.51
942382	AE2-251 E	75.0541	Adder	88.3
943071	AE2-334 C	3.2578	50/50	3.2578
943072	AE2-334 E	2.1718	50/50	2.1718
943732	AF1-041 E	0.2081	Adder	0.24
944951	AF1-160 C	1.1736	50/50	1.1736
945431	AF1-208 C O1	2.3707	Adder	2.79
945432	AF1-208 E O1	1.5805	Adder	1.86
945731	AF1-238 C O1	5.4106	50/50	5.4106
945732	AF1-238 E O1	8.1159	50/50	8.1159
945741	AF1-239 C	1.2731	50/50	1.2731
945742	AF1-239 E	1.9096	50/50	1.9096
945961	AF1-261	-0.0682	Adder	-0.08
945971	AF1-262	0.1007	50/50	0.1007
957221	AF2-016 C	10.5009	Adder	12.35
957222	AF2-016 E	15.7513	Adder	18.53
957251	AF2-019 C	0.6913	Adder	0.81
957252	AF2-019 E	1.0369	Adder	1.22
957261	AF2-020 C	0.7092	Adder	0.83
957262	AF2-020 E	1.0638	Adder	1.25
957291	AF2-023 C	1.4490	Adder	1.7
957292	AF2-023 E	2.1736	Adder	2.56
957301	AF2-024 C	0.8131	Adder	0.96

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957302	AF2-024 E	1.2196	Adder	1.43
957311	AF2-025 C	0.6940	Adder	0.82
957312	AF2-025 E	1.0410	Adder	1.22
958811	AF2-172 C (Withdrawn : 01/14/2021)	0.3982	50/50	0.3982
958812	AF2-172 E (Withdrawn : 01/14/2021)	0.6497	50/50	0.6497
961621	AG1-001 C	1.2357	50/50	1.2357
961622	AG1-001 E	2.0162	50/50	2.0162
962611	AG1-110	2.3472	50/50	2.3472
962621	AG1-111	0.4520	Adder	1.0
962801	AG1-129 C O1	3.7764	50/50	3.7764
962802	AG1-129 E O1	2.5176	50/50	2.5176
962813	AG1-130 BAT	0.2362	Merchant Transmission	0.2362
964001	AG1-254 C	1.1700	Adder	2.6
964002	AG1-254 E	0.5873	Adder	1.3
964011	AG1-255 C	1.8238	Adder	4.05
964012	AG1-255 E	0.9119	Adder	2.02
964083	AG1-263 BAT	4.1366	50/50	4.1366
964371	AG1-299 C	0.0826	Adder	0.18
964372	AG1-299 E	0.0550	Adder	0.12
964381	AG1-300 C	0.1376	Adder	0.31
964382	AG1-300 E	0.0917	Adder	0.2
966061	AG1-475 C	0.3872	Adder	0.86
966062	AG1-475 E	0.2581	Adder	0.57
966071	AG1-476	1.4239	Adder	3.16
966301	AG1-499 C	0.3483	Adder	0.77
966302	AG1-499 E	0.2322	Adder	0.52
G-007A	G-007A	0.4747	Confirmed LTF	0.4747
CALDERWOOD	CALDERWOOD	0.0378	Confirmed LTF	0.0378
NY	NY	0.2533	Confirmed LTF	0.2533
PRAIRIE	PRAIRIE	0.2221	Confirmed LTF	0.2221
O-066	O-066	3.7890	Confirmed LTF	3.7890
SIGE	SIGE	0.0499	Confirmed LTF	0.0499
CHEOAH	CHEOAH	0.0380	Confirmed LTF	0.0380
COTTONWOOD	COTTONWOOD	0.1701	Confirmed LTF	0.1701
HAMLET	HAMLET	0.0347	Confirmed LTF	0.0347
GIBSON	GIBSON	0.0486	Confirmed LTF	0.0486
BLUEG	BLUEG	0.1545	Confirmed LTF	0.1545
TRIMBLE	TRIMBLE	0.0495	Confirmed LTF	0.0495
CATAWBA	CATAWBA	0.0228	Confirmed LTF	0.0228

## 11.6.2 Index 2

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
166636747	228130	TUCKAHOE	AE	227946	MILL#2	AE	1	AE_P7-1 AE7TOWER	tower	146.0	107.37	107.96	DC	1.89

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
227842	MARINGEN	-0.4664	Adder	-0.55
228102	BLE#2 ST (Deactivation : 30/04/2019)	21.3929	50/50	21.3929
228251	CARLLS#4	0.2094	Adder	0.25
228261	V4-054E	0.2707	Adder	0.32
228712	V2-041E	0.1870	Adder	0.22
228732	V1-021 C	0.0526	50/50	0.0526
924531	AB2-102 C	16.6713	Adder	19.61
924532	AB2-102 E	0.3705	Adder	0.44
938781	AE1-104 C O1	19.8283	50/50	19.8283
938782	AE1-104 E O1	50.7228	50/50	50.7228
939501	AE1-179 C O1	1.9326	Adder	2.27
939502	AE1-179 E O1	1.3638	Adder	1.6
940001	AE1-240 C O1	1.6084	Adder	1.89
940002	AE1-240 E O1	1.1481	Adder	1.35
945731	AF1-238 C O1	2.9829	Adder	3.51
945732	AF1-238 E O1	4.4744	Adder	5.26
945741	AF1-239 C	0.7019	Adder	0.83
945742	AF1-239 E	1.0528	Adder	1.24
957223	AF2-016 BAT	16.5840	Merchant Transmission	16.5840
957251	AF2-019 C	1.2046	50/50	1.2046
957252	AF2-019 E	1.8070	50/50	1.8070
957261	AF2-020 C	0.3479	Adder	0.41
957262	AF2-020 E	0.5218	Adder	0.61
957313	AF2-025 BAT	1.4246	Merchant Transmission	1.4246
958811	AF2-172 C (Withdrawn : 01/14/2021)	0.1899	Adder	0.22
958812	AF2-172 E (Withdrawn : 01/14/2021)	0.3099	Adder	0.36
961621	AG1-001 C	0.3227	Adder	0.72
961622	AG1-001 E	0.5265	Adder	1.17
962801	AG1-129 C O1	0.9862	Adder	2.19
962802	AG1-129 E O1	0.6575	Adder	1.46
964371	AG1-299 C	0.0761	Adder	0.17
964372	AG1-299 E	0.0507	Adder	0.11
964381	AG1-300 C	0.1268	Adder	0.28
964382	AG1-300 E	0.0845	Adder	0.19
CALDERWOOD	CALDERWOOD	0.0084	Confirmed LTF	0.0084
NY	NY	0.0453	Confirmed LTF	0.0453
PRAIRIE	PRAIRIE	0.0465	Confirmed LTF	0.0465
O-066	O-066	0.7941	Confirmed LTF	0.7941
SIGE	SIGE	0.0105	Confirmed LTF	0.0105

<b>Bus #</b>	<b>Bus</b>	<b>Gendeliv MW Impact</b>	<b>Type</b>	<b>Full MW Impact</b>
<b>CHEOAH</b>	CHEOAH	0.0085	Confirmed LTF	0.0085
<b>COTTONWOOD</b>	COTTONWOOD	0.0357	Confirmed LTF	0.0357
<b>G-007</b>	G-007	0.2583	Confirmed LTF	0.2583
<b>HAMLET</b>	HAMLET	0.0092	Confirmed LTF	0.0092
<b>GIBSON</b>	GIBSON	0.0098	Confirmed LTF	0.0098
<b>BLUEG</b>	BLUEG	0.0312	Confirmed LTF	0.0312
<b>TRIMBLE</b>	TRIMBLE	0.0100	Confirmed LTF	0.0100
<b>CATAWBA</b>	CATAWBA	0.0056	Confirmed LTF	0.0056

### 11.6.3 Index 3

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
166636720	228217	DENNIS	AE	228130	TUCKAHOE	AE	1	AE_P7-1 AE7TOWER	tower	146.0	112.51	113.09	DC	1.89

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
227842	MARINGEN	-0.4664	Adder	-0.55
228102	BLE#2 ST (Deactivation : 30/04/2019)	21.3929	50/50	21.3929
228251	CARLLS#4	0.2094	Adder	0.25
228261	V4-054E	0.2707	Adder	0.32
228712	V2-041E	0.1870	Adder	0.22
228732	V1-021 C	0.0526	50/50	0.0526
924531	AB2-102 C	16.6713	Adder	19.61
924532	AB2-102 E	0.3705	Adder	0.44
938781	AE1-104 C O1	19.8283	50/50	19.8283
938782	AE1-104 E O1	50.7228	50/50	50.7228
939501	AE1-179 C O1	1.9326	Adder	2.27
939502	AE1-179 E O1	1.3638	Adder	1.6
940001	AE1-240 C O1	1.6084	Adder	1.89
940002	AE1-240 E O1	1.1481	Adder	1.35
945731	AF1-238 C O1	2.9829	Adder	3.51
945732	AF1-238 E O1	4.4744	Adder	5.26
945741	AF1-239 C	0.7019	Adder	0.83
945742	AF1-239 E	1.0528	Adder	1.24
957223	AF2-016 BAT	16.5840	Merchant Transmission	16.5840
957251	AF2-019 C	1.2046	50/50	1.2046
957252	AF2-019 E	1.8070	50/50	1.8070
957261	AF2-020 C	0.3479	Adder	0.41
957262	AF2-020 E	0.5218	Adder	0.61
957313	AF2-025 BAT	1.4246	Merchant Transmission	1.4246
958811	AF2-172 C (Withdrawn : 01/14/2021)	0.1899	Adder	0.22
958812	AF2-172 E (Withdrawn : 01/14/2021)	0.3099	Adder	0.36
961621	AG1-001 C	0.3227	Adder	0.72
961622	AG1-001 E	0.5265	Adder	1.17
962801	AG1-129 C O1	0.9862	Adder	2.19
962802	AG1-129 E O1	0.6575	Adder	1.46
964371	AG1-299 C	0.0761	Adder	0.17
964372	AG1-299 E	0.0507	Adder	0.11
964381	AG1-300 C	0.1268	Adder	0.28
964382	AG1-300 E	0.0845	Adder	0.19
CALDERWOOD	CALDERWOOD	0.0084	Confirmed LTF	0.0084
NY	NY	0.0453	Confirmed LTF	0.0453
PRAIRIE	PRAIRIE	0.0465	Confirmed LTF	0.0465
O-066	O-066	0.7941	Confirmed LTF	0.7941
SIGE	SIGE	0.0105	Confirmed LTF	0.0105

<b>Bus #</b>	<b>Bus</b>	<b>Gendeliv MW Impact</b>	<b>Type</b>	<b>Full MW Impact</b>
<b>CHEOAH</b>	CHEOAH	0.0085	Confirmed LTF	0.0085
<b>COTTONWOOD</b>	COTTONWOOD	0.0357	Confirmed LTF	0.0357
<b>G-007</b>	G-007	0.2583	Confirmed LTF	0.2583
<b>HAMLET</b>	HAMLET	0.0092	Confirmed LTF	0.0092
<b>GIBSON</b>	GIBSON	0.0098	Confirmed LTF	0.0098
<b>BLUEG</b>	BLUEG	0.0312	Confirmed LTF	0.0312
<b>TRIMBLE</b>	TRIMBLE	0.0100	Confirmed LTF	0.0100
<b>CATAWBA</b>	CATAWBA	0.0056	Confirmed LTF	0.0056

#### 11.6.4 Index 4

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
166636698	228714	CNTRL N	AE	228504	SHLDLY T	AE	1	AE_P7-1 AE7TOWER	tower	143.0	110.01	114.28	DC	6.11

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
<b>228102</b>	<b>BLE#2 ST (Deactivation : 30/04/2019)</b>	<b>13.9039</b>	<b>Adder</b>	<b>16.36</b>
228200	CARL#1CT	0.7389	50/50	0.7389
228201	CARL#2CT	0.7821	50/50	0.7821
228206	SHRMN CT	1.8441	50/50	1.8441
228251	CARLLS#4	0.7452	50/50	0.7452
228260	V4-054C	0.0952	50/50	0.0952
228261	V4-054E	0.9842	50/50	0.9842
<b>228343</b>	<b>QUINTN#1 (Deactivation : 26/04/2020)</b>	<b>0.1005</b>	<b>Adder</b>	<b>0.12</b>
228702	WEST CT	1.1161	50/50	1.1161
228712	V2-041E	0.3240	Adder	0.38
228717	S121	2.3380	50/50	2.3380
228727	W2-039G	1.7281	50/50	1.7281
924531	AB2-102 C	18.9376	Adder	22.28
924532	AB2-102 E	0.4208	Adder	0.5
938781	AE1-104 C O1	12.8870	Adder	15.16
938782	AE1-104 E O1	32.9662	Adder	38.78
939501	AE1-179 C O1	7.4900	50/50	7.4900
939502	AE1-179 E O1	5.2858	50/50	5.2858
940001	AE1-240 C O1	5.8249	50/50	5.8249
940002	AE1-240 E O1	4.1578	50/50	4.1578
945431	AF1-208 C O1	2.6514	Adder	3.12
945432	AF1-208 E O1	1.7676	Adder	2.08
945731	AF1-238 C O1	13.2126	50/50	13.2126
945732	AF1-238 E O1	19.8189	50/50	19.8189
945741	AF1-239 C	3.1088	50/50	3.1088
945742	AF1-239 E	4.6633	50/50	4.6633
957251	AF2-019 C	0.7304	Adder	0.86
957252	AF2-019 E	1.0956	Adder	1.29
957261	AF2-020 C	1.0522	Adder	1.24
957262	AF2-020 E	1.8568	50/50	1.8568
<b>958811</b>	<b>AF2-172 C (Withdrawn : 01/14/2021)</b>	<b>0.7180</b>	<b>50/50</b>	<b>0.7180</b>
<b>958812</b>	<b>AF2-172 E (Withdrawn : 01/14/2021)</b>	<b>1.1715</b>	<b>50/50</b>	<b>1.1715</b>
961621	AG1-001 C	2.3221	50/50	2.3221
961622	AG1-001 E	3.7886	50/50	3.7886
962801	AG1-129 C O1	7.0963	50/50	7.0963
962802	AG1-129 E O1	4.7309	50/50	4.7309
964011	AG1-255 C	0.9255	Adder	2.05
964012	AG1-255 E	0.4628	Adder	1.03

<b>Bus #</b>	<b>Bus</b>	<b>Gendeliv MW Impact</b>	<b>Type</b>	<b>Full MW Impact</b>
<b>964371</b>	AG1-299 C	0.1086	Adder	0.24
<b>964372</b>	AG1-299 E	0.0724	Adder	0.16
<b>964381</b>	AG1-300 C	0.1811	Adder	0.4
<b>964382</b>	AG1-300 E	0.1207	Adder	0.27
<b>CALDERWOOD</b>	CALDERWOOD	0.0244	Confirmed LTF	0.0244
<b>NY</b>	NY	0.0393	Confirmed LTF	0.0393
<b>PRAIRIE</b>	PRAIRIE	0.1266	Confirmed LTF	0.1266
<b>O-066</b>	O-066	0.5384	Confirmed LTF	0.5384
<b>SIGE</b>	SIGE	0.0033	Confirmed LTF	0.0033
<b>CHEOAH</b>	CHEOAH	0.0245	Confirmed LTF	0.0245
<b>COTTONWOOD</b>	COTTONWOOD	0.1029	Confirmed LTF	0.1029
<b>G-007</b>	G-007	0.0588	Confirmed LTF	0.0588
<b>HAMLET</b>	HAMLET	0.0277	Confirmed LTF	0.0277
<b>GIBSON</b>	GIBSON	0.0268	Confirmed LTF	0.0268
<b>BLUEG</b>	BLUEG	0.0851	Confirmed LTF	0.0851
<b>TRIMBLE</b>	TRIMBLE	0.0273	Confirmed LTF	0.0273
<b>CATAWBA</b>	CATAWBA	0.0172	Confirmed LTF	0.0172

11.6.5 Index 5

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
166636677	228716	S121TAP	AE	228714	CNTRL N	AE	1	AE_P7-1 AE7TOWER	tower	107.0	141.41	142.24	DC	1.97

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
228102	BLE#2 ST (Deactivation : 30/04/2019)	7.3329	Adder	8.63
228251	CARLLS#4	0.3002	Adder	0.35
228261	V4-054E	0.3367	Adder	0.4
228702	WEST CT	1.8523	50/50	1.8523
228712	V2-041E	0.1710	Adder	0.2
228717	S121	4.4081	50/50	4.4081
924531	AB2-102 C	9.9794	Adder	11.74
924532	AB2-102 E	0.2218	Adder	0.26
938781	AE1-104 C O1	6.7966	Adder	8.0
938782	AE1-104 E O1	17.3864	Adder	20.45
939501	AE1-179 C O1	1.8835	Adder	2.22
939502	AE1-179 E O1	1.3292	Adder	1.56
940001	AE1-240 C O1	3.0508	50/50	3.0508
940002	AE1-240 E O1	2.1776	50/50	2.1776
945431	AF1-208 C O1	1.1996	Adder	1.41
945432	AF1-208 E O1	0.7997	Adder	0.94
945731	AF1-238 C O1	14.8252	50/50	14.8252
945732	AF1-238 E O1	22.2378	50/50	22.2378
945741	AF1-239 C	3.4883	50/50	3.4883
945742	AF1-239 E	5.2324	50/50	5.2324
957251	AF2-019 C	0.3852	Adder	0.45
957252	AF2-019 E	0.5778	Adder	0.68
957261	AF2-020 C	0.4979	Adder	0.59
957262	AF2-020 E	0.7468	Adder	0.88
958811	AF2-172 C (Withdrawn : 01/14/2021)	0.2053	Adder	0.24
958812	AF2-172 E (Withdrawn : 01/14/2021)	0.3350	Adder	0.39
961621	AG1-001 C	0.3369	Adder	0.75
961622	AG1-001 E	0.5497	Adder	1.22
962801	AG1-129 C O1	1.0297	Adder	2.29
962802	AG1-129 E O1	0.6865	Adder	1.52
964371	AG1-299 C	0.0573	Adder	0.13
964372	AG1-299 E	0.0382	Adder	0.08
964381	AG1-300 C	0.0956	Adder	0.21
964382	AG1-300 E	0.0637	Adder	0.14
CALDERWOOD	CALDERWOOD	0.0199	Confirmed LTF	0.0199
NY	NY	0.0288	Confirmed LTF	0.0288
PRAIRIE	PRAIRIE	0.1033	Confirmed LTF	0.1033
O-066	O-066	0.3769	Confirmed LTF	0.3769
SIGE	SIGE	0.0017	Confirmed LTF	0.0017

<b>Bus #</b>	<b>Bus</b>	<b>Gendeliv MW Impact</b>	<b>Type</b>	<b>Full MW Impact</b>
<b>CHEOAH</b>	CHEOAH	0.0200	Confirmed LTF	0.0200
<b>COTTONWOOD</b>	COTTONWOOD	0.0840	Confirmed LTF	0.0840
<b>G-007</b>	G-007	0.0451	Confirmed LTF	0.0451
<b>HAMLET</b>	HAMLET	0.0231	Confirmed LTF	0.0231
<b>GIBSON</b>	GIBSON	0.0218	Confirmed LTF	0.0218
<b>BLUEG</b>	BLUEG	0.0694	Confirmed LTF	0.0694
<b>TRIMBLE</b>	TRIMBLE	0.0223	Confirmed LTF	0.0223
<b>CATAWBA</b>	CATAWBA	0.0140	Confirmed LTF	0.0140

## 11.7 Queue Dependencies

The Queue Projects below are listed in one or more indices for the overloads identified in your report. These projects contribute to the loading of the overloaded facilities identified in your report. The percent overload of a facility and cost allocation you may have towards a particular reinforcement could vary depending on the action of these earlier projects. The status of each project at the time of the analysis is presented in the table. This list may change as earlier projects withdraw or modify their requests.

Queue Number	Project Name	Status
AB1-001	Absecon 12 kV	In Service
AB1-116	Egg Harbor Road 12kV	In Service
AB1-119	Tansboro Road 12kV	In Service
AB2-049	Gloucester Township 12kV	Engineering and Procurement
AB2-102	Cumberland 230kV	Active
AB2-122	Egg Harbor 12kV	Withdrawn
AD1-019	Ontario 23 kV	Active
AD2-065	Berlin 12kV	Engineering and Procurement
AD2-135	Williamstown 12kV	Active
AE1-061	Minotola 12 kV	Active
AE1-062	Silver Lake 69 kV	Active
AE1-104	BL England 138 kV	Active
AE1-115	Churchtown 69 kV	Active
AE1-161	Landis 138 kV	Active
AE1-179	South Millville-Newport 69 kV	Active
AE1-218	Glassboro 12 kV	Engineering and Procurement
AE1-229	Deepwater-Upper Pittsgrove 138 kV	Active
AE1-240	Carlls Corner-Sherman Avenue 69 kV	Active
AE2-020	Cardiff 230 kV I	Active
AE2-021	Cardiff 230 kV II	Active
AE2-022	Cardiff 230 kV III	Active
AE2-222	Higbee 69 kV	Active
AE2-251	Cardiff 230 kV	Active
AE2-334	Clayton-Williamstown 69 kV	Active
AF1-041	Absecon 12.47 kV	In Service
AF1-160	Silver Lake 69 kV	Active
AF1-208	Quinton-Roadstown 69 kV	Active
AF1-238	Sherman Ave. 69 kV	Active
AF1-239	Sherman Ave-Vineland 69 kV	Active
AF1-261	Burlington 26 kV	Engineering and Procurement
AF1-262	Upper Pittsgrove 12 kV	Active
AF2-016	Lewis 138 kV	Active
AF2-019	Middle 69 kV	Active
AF2-020	Carll's Corner 69 kV	Active
AF2-023	Churchtown 69 kV	Active
AF2-024	Mickleton 69 kV	Active
AF2-025	Missouri Ave 69 kV	Active
AF2-172	Newport 12 kV	Withdrawn
AG1-001	US Silica-Unimin 69 kV	Active

<b>Queue Number</b>	<b>Project Name</b>	<b>Status</b>
<b>AG1-110</b>	Silver Lake 69 kV	Active
<b>AG1-111</b>	Churchtown 69 kV	Active
<b>AG1-129</b>	US Silica 69 kV	Active
<b>AG1-130</b>	Burlington 26 kV	Active
<b>AG1-254</b>	Salem-Woodstown 69 kV	Active
<b>AG1-255</b>	Churchtown-Orchard 230 kV	Active
<b>AG1-263</b>	Gloucester 230 kV	Active
<b>AG1-299</b>	U.S. Silica 12.47 kV	Active
<b>AG1-300</b>	U.S Silica II 12.47 kV	Active
<b>AG1-475</b>	Mickelton 230 kV	Active
<b>AG1-476</b>	Mickelton 230 kV II	Active
<b>AG1-499</b>	Henry Harris 69 kV	Active
<b>V1-021</b>	Cape May County 12kV	In Service
<b>V2-035</b>	Pittsgrove	In Service
<b>V2-041</b>	Clayville 12kV	In Service
<b>V2-046</b>	Pilesgrove Township 12kV	In Service
<b>V4-054</b>	Fairfield Township 12kV	In Service
<b>V4-067</b>	Cates Road Egg Harbor Township 12kV	In Service
<b>W1-130</b>	Vine Road 12kV	In Service
<b>W2-030</b>	Egg Harbor Township	In Service
<b>W2-039</b>	Clayville 69kV	In Service

## 11.8 Contingency Descriptions

Contingency Name	Contingency Definition
<b>AE_P1-2 BLE-ML-LEW1</b>	CONTINGENCY 'AE_P1-2 BLE-ML-LEW1' DISCONNECT BUS 227903 / DISCONNECT BUS 227905 / DISCONNECT BUS 227929 / END
<b>AE_P7-1 AE7TOWER</b>	CONTINGENCY 'AE_P7-1 AE7TOWER' DISCONNECT BUS 227905 /* #1 BLE TO SCULL TO MILL 138 KV DISCONNECT BUS 227929 /* #1 SCULL 12 KV DISCONNECT BUS 227906 /* #2 BLE TO SCULL TO MILL 138 KV DISCONNECT BUS 227930 /* #2 SCULL 12 KV END
<b>AE_P1-2 ORCH-CUMB</b>	CONTINGENCY 'AE_P1-2 ORCH-CUMB' OPEN LINE FROM BUS 228002 TO BUS 228207 CIRCUIT 1 / END
<b>AE_P1-2 BLE-ML-LEW2</b>	CONTINGENCY 'AE_P1-2 BLE-ML-LEW2' DISCONNECT BUS 227904 / DISCONNECT BUS 227906 / DISCONNECT BUS 227930 / 227930 CIRCUIT 1 / END
<b>AE_P7-1 AE18TOWER</b>	CONTINGENCY 'AE_P7-1 AE18TOWER' DISCONNECT BUS 227903 /* #1 MILL TO LEWIS 138 KV DISCONNECT BUS 227904 /* #2 MILL TO LEWIS 138 KV END
<b>AE_P7-1 AE6TOWER</b>	CONTINGENCY 'AE_P7-1 AE6TOWER' DISCONNECT BRANCH FROM BUS 228197 TO BUS 228106 CKT 1 /* MERION TO CORSON 138 KV DISCONNECT BUS 228111 /* BLE TO CORSON 138 KV END
<b>AE_P1-2 BLE-SC-ML2</b>	CONTINGENCY 'AE_P1-2 BLE-SC-ML2' DISCONNECT BUS 227906 / DISCONNECT BUS 227930 / END
<b>AE_P1-2 CORSON-UNION</b>	CONTINGENCY 'AE_P1-2 CORSON-UNION' OPEN LINE FROM BUS 228108 TO BUS 228210 CIRCUIT 1 / END

Contingency Name	Contingency Definition
CARLL-240 TAP-SHERM-A	CONTINGENCY 'CARLL-240 TAP-SHERM-A' OPEN LINE FROM BUS 228252 TO BUS 940000 CIRCUIT 1 / END
AE_P1-2 CUMB-DENN	CONTINGENCY 'AE_P1-2 CUMB-DENN' OPEN LINE FROM BUS 228207 TO BUS 228213 CIRCUIT 1 / END
AE_P1-2 BLE-SC-ML1	CONTINGENCY 'AE_P1-2 BLE-SC-ML1' DISCONNECT BUS 227905 / DISCONNECT BUS 227929 / END
PS_P7-1_O2241+V2274_LT	CONTINGENCY 'PS_P7-1_O2241+V2274_LT' DISCONNECT BUS 219762 /* THOROFARE BS 2 DISCONNECT BUS 219759 /* EAGLE POINT BS 3 CLOSE LINE FROM BUS 219211 TO BUS 219212 CKT Z /* THOROFARE 10/20 MOVE 8 MW LOAD FROM BUS 219211 TO BUS 219255 DISCONNECT BUS 219757 /* DEPTFORD SECTION 2 DISCONNECT BRANCH FROM BUS 219110 TO BUS 219128 CKT 1 /* GLOUCESTER 220-1 CLOSE LINE FROM BUS 219255 TO BUS 219256 CKT Z /* DEPTFORD T30/40 MOVE 8 MW LOAD FROM BUS 219256 TO BUS 219162 MOVE 8 MW LOAD FROM BUS 219256 TO BUS 219163 CLOSE LINE FROM BUS 219180 TO BUS 219181 CKT Z /* DEPTFORD T10/20 END
Base Case	
AE_P1-2 ORCHARD XF	CONTINGENCY 'AE_P1-2 ORCHARD XF' OPEN LINE FROM BUS 200063 TO BUS 228002 CIRCUIT 1 / END
AE_P1-2 BUT-LINC	CONTINGENCY 'AE_P1-2 BUT-LINC' OPEN BRANCH FROM BUS 228703 TO BUS 228725 CKT 1 END
AE_P1-2 CNT-V-BUT	CONTINGENCY 'AE_P1-2 CNT-V-BUT' DISCONNECT BUS 228713 / END

## 12 Short Circuit Analysis

The following Breakers are overdutied

Bus Number	Bus Name	BREAKER	Type	Capacity (Amps)	Duty Percentage Post Queue	Duty Percentage Pre Queue

### 12.1 System Reinforcements - Short Circuit

## 13 Affected Systems

None

## 14 Attachment 1: One Line Diagram