Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-255

CHURCHTOWN-ORCHARD 230 KV

100 MW Capacity / 150 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.

An Interconnection Customer 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.

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 Salem County, New Jersey. The installed facilities will have a total capability of 150 MW with 100 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is December 31, 2023. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-255
Project Name	CHURCHTOWN-ORCHARD 230 KV
State	New Jersey
County	Salem
Transmission Owner	AEC
MFO	150
MWE	150
MWC	100
Fuel	Solar
Basecase Study Year	2024

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

4 Point of Interconnection

AG1-255 will interconnect with the AEC transmission system tapping the 230 kV line between Quinton to Churchtown.

5 Cost Summary

The AG1-255 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$6,400,000
Total System Network Upgrade Costs	$63,490,000
Total Costs	$69,890,000

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 Churchtown-Quinton 69 kV line, with the third terminal being designated for the interconnecting generator.

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.

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 will require re-wiring and adjustment of existing relay schemes at Churchtown and Quinton substations to accommodate the new 69 kV substation.

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

Description	Total Cost
Total Physical Interconnection Costs	$6,400,000

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/meter2) - (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 AG1-255 was evaluated as a 60 MW (Capacity 40 MW) injection tapping the 230 kV line between Quinton to Churchtown in the AEC area. Project AG1-255 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-255 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	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
165314494	228312	PEDRKTWN	230.0	AE	228313	BRIDGPRT	230.0	AE	1	JC-P7-1-JCC-230-13	tower	804.0	99.06	100.92	DC	17.42

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	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
165314160	214010	WANEETA2	230.0	PECO	213817	N PHILA	230.0	PECO	1	PECO_P2-2_CHI230B1 /* $ DELCO $ PECO_P2-2_CHI230B1 $ B	bus	621.0	113.69	114.18	DC	6.98
165314142	214206	RICHRE29	230.0	PECO	214274	RICHMOND 29	230.0	PECO	1	PECO_P2-2_CHI230B1 /* $ DELCO $ PECO_P2-2_CHI230B1 $ B	bus	1344.0	118.66	119.04	DC	15.11
165314435	214206	RICHRE29	230.0	PECO	214274	RICHMOND 29	230.0	PECO	1	JC-P7-1-JCC-230-13	tower	1344.0	111.59	111.95	DC	14.02
165314120	214277	RICHMOND 35	230.0	PECO	214012	WANEETA3	230.0	PECO	1	PECO_P2-2_CHI230B1 /* $ DELCO $ PECO_P2-2_CHI230B1 $ B	bus	1180.0	122.78	123.29	DC	13.92
165314420	214277	RICHMOND 35	230.0	PECO	214012	WANEETA3	230.0	PECO	1	JC-P7-1-JCC-230-13	tower	1180.0	112.63	113.1	DC	12.75
165314430	219125	CAMDEN	230.0	PSE&G	214206	RICHRE29	230.0	PECO	1	JC-P7-1-JCC-230-13	tower	1344.0	111.59	111.95	DC	14.02
166740491	228218	LAUREL	69.0	AE	228360	WOODTWN 2	69.0	AE	1	AE_P7-1 AE2TOWER	tower	107.0	103.49	104.91	DC	3.38
167903792	228228	SO MVLLE	69.0	AE	228215	BALFSTNT	69.0	AE	1	AE_P1-2 BUT-LINC	single	88.0	100.27	102.57	DC	2.02
167903771	228233	WHTN A T	69.0	AE	228225	2ND ST#1	69.0	AE	1	AE_P1-2 BUT-LINC	single	83.0	106.31	108.75	DC	2.02
165314394	228313	BRIDGPRT	230.0	AE	228401	MCKLTON	230.0	AE	1	JC-P7-1-JCC-230-13	tower	804.0	124.46	126.49	DC	17.35
166740438	228714	CNTRL N	69.0	AE	228504	SHLDLY T	69.0	AE	1	AE_P7-1 AE7TOWER	tower	143.0	122.56	123.53	DC	3.08
166740439	228714	CNTRL N	69.0	AE	228504	SHLDLY T	69.0	AE	1	AE_P7-1 AE18TOWER	tower	143.0	119.36	120.33	DC	3.09

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	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
167648817	214206	RICHRE29	230.0	PECO	214274	RICHMOND 29	230.0	PECO	1	Base Case	operation	1075.0	106.81	107.24	DC	13.59
167648818	214206	RICHRE29	230.0	PECO	214274	RICHMOND 29	230.0	PECO	1	JC-P1-2-JCC-500-003	operation	1344.0	104.2	104.58	DC	15.16
167648628	214277	RICHMOND 35	230.0	PECO	214012	WANEETA3	230.0	PECO	1	Base Case	operation	760.0	132.8	133.51	DC	12.41
167648629	214277	RICHMOND 35	230.0	PECO	214012	WANEETA3	230.0	PECO	1	JC-P1-2-JCC-500-003	operation	1180.0	103.4	103.9	DC	13.71
167648702	219108	CUTHBERT_1	230.0	PSE&G	219125	CAMDEN	230.0	PSE&G	1	PS_P1-2_U-2299_LT	operation	771.0	120.65	121.09	DC	10.62
167648704	219108	CUTHBERT_1	230.0	PSE&G	219125	CAMDEN	230.0	PSE&G	1	Base Case	operation	500.0	109.45	109.85	DC	6.32
167648654	219110	GLOUCSTR	230.0	PSE&G	219755	CUTHBERT_4	230.0	PSE&G	1	PS_P1-2_C-2308	operation	758.0	128.48	128.9	DC	9.92
167648656	219110	GLOUCSTR	230.0	PSE&G	219755	CUTHBERT_4	230.0	PSE&G	1	Base Case	operation	550.0	114.88	115.25	DC	6.44
167648693	219110	GLOUCSTR	230.0	PSE&G	219125	CAMDEN	230.0	PSE&G	1	Base Case	operation	500.0	123.52	123.93	DC	6.58
167648694	219110	GLOUCSTR	230.0	PSE&G	219125	CAMDEN	230.0	PSE&G	1	PS_P1-2_D-2282	operation	771.0	108.76	109.12	DC	8.83
167648708	219110	GLOUCSTR	230.0	PSE&G	219753	CUTHBERT_3	230.0	PSE&G	1	PS_P1-2_D-2282	operation	771.0	119.76	120.14	DC	9.4
167648710	219110	GLOUCSTR	230.0	PSE&G	219753	CUTHBERT_3	230.0	PSE&G	1	Base Case	operation	500.0	110.59	110.95	DC	5.63
167648815	219125	CAMDEN	230.0	PSE&G	214206	RICHRE29	230.0	PECO	1	Base Case	operation	1075.0	106.82	107.25	DC	13.59
167648816	219125	CAMDEN	230.0	PSE&G	214206	RICHRE29	230.0	PECO	1	JC-P1-2-JCC-500-003	operation	1344.0	104.2	104.59	DC	15.16
167648736	219754	CUTHBERT_2	230.0	PSE&G	219125	CAMDEN	230.0	PSE&G	1	PS_P1-2_Z-2305_LT	operation	792.0	115.33	115.75	DC	10.36
167903887	228222	US SLC T	69.0	AE	939500	AE1-179 TAP	69.0	AE	1	CARLL-240 TAP-SHERM-B	operation	89.0	131.58	138.48	DC	6.14
167903889	228222	US SLC T	69.0	AE	939500	AE1-179 TAP	69.0	AE	1	Base Case	operation	66.0	99.76	101.98	DC	3.24
167904028	228252	CRLS CR2	69.0	AE	940000	AE1-240 TAP	69.0	AE	1	AE_P1-2 ORCH-CUMB	operation	93.0	115.37	116.65	DC	6.85

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
167903978	228311	CHAMBERS	230.0	AE	228312	PEDRKTWN	230.0	AE	1	AE_P1-2 ORCHARD XF	operation	551.0	120.71	124.77	DC	23.1
167903990	228313	BRIDGPRT	230.0	AE	228401	MCKLTON	230.0	AE	1	AE_P1-2 ORCHARD XF	operation	804.0	120.21	123.07	DC	22.99
167903991	228313	BRIDGPRT	230.0	AE	228401	MCKLTON	230.0	AE	1	Base Case	operation	650.0	119.16	121.64	DC	16.93
167903881	228360	WOODTWN 2	69.0	AE	228332	WOODTWN 1	69.0	AE	1	CARLL-240 TAP-SHERM-B	operation	74.0	129.47	139.16	DC	7.17
167903883	228360	WOODTWN 2	69.0	AE	228332	WOODTWN 1	69.0	AE	1	Base Case	operation	74.0	105.24	108.4	DC	5.19
167904009	228504	SHLDLY T	69.0	AE	228511	LANDIS T	69.0	AE	1	AE_P1-2 ORCH-CUMB	operation	158.0	117.53	118.51	DC	3.42
167904011	228511	LANDIS T	69.0	AE	228409	MONROE#3	69.0	AE	1	AE_P1-2 ORCH-CUMB	operation	158.0	117.47	118.44	DC	3.42
167904141	228714	CNTRL N	69.0	AE	228504	SHLDLY T	69.0	AE	1	AE_P1-2 WOOD-LAUR	operation	143.0	100.5	101.54	DC	3.31
169650840	939500	AE1-179 TAP	69.0	AE	228228	SO MVLLE	69.0	AE	1	CARLL-240 TAP-SHERM-A	operation	89.0	165.3	172.2	DC	6.14
169650841	939500	AE1-179 TAP	69.0	AE	228228	SO MVLLE	69.0	AE	1	Base Case	operation	66.0	167.95	170.16	DC	3.24
169650885	940000	AE1-240 TAP	69.0	AE	228226	SHRMAN#2	69.0	AE	1	AE_P1-2 ORCH-CUMB	operation	93.0	152.69	153.96	DC	6.85
169650887	940000	AE1-240 TAP	69.0	AE	228226	SHRMAN#2	69.0	AE	1	Base Case	operation	82.0	123.2	132.07	DC	7.27
169651166	945430	AF1-208 TAP	69.0	AE	228259	LAUREL#2	69.0	AE	1	AE_P1-2 CHCH-QUINT-A	operation	71.0	27.32	111.83	DC	60.0

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
165314430	5	CAMDEN 230.0 kV - RICHRE29 230.0 kV Ckt 1	PECO: **pe002 (137) : Replace 1 piece of station cable in Richmond substation on Richmond-Camden tie line** **Project Type : FAC** **Cost : $45,000** **Time Estimate : 24.0 Months** **pe003 (138) : Replace reactor in Richmond substation on Richmond-Camden tie line** **Project Type : FAC** **Cost : $2,254,000** **Time Estimate : 36.0 Months** **pe004 (139) : Replace 2 circuit breakers in Richmond substation on Richmond-Camden tie line** **Project Type : FAC** **Cost : $752,000** **Time Estimate : 36.0 Months**	$3,051,000
165314494	1	PEDRKTWN 230.0 kV - BRIDGPRT 230.0 kV Ckt 1	ACE: **ACEPedBridge230fourCBsr01 (1576) : To mitigate the (ACE) Bridgeport to Pedricktown 230 kV line (from bus 228313 to bus 228312 ckt 1) overload, it will require replacing 2000 amp CBs C and A at both ends with 3000 amp CBs.** **Project Type : FAC** **Cost : $2,800,000** **Time Estimate : 24-30 Months** **at2311r0001_af1f (1694) : To mitigate the (ACE) Bridgeport to Pedricktown 230 kV line (from bus 228313 to bus 228312 ckt 1) overload, it will require increasing the emergency rating of the Bridgeport to Predricktown 230 kV line by rebuilding the circuit. The rebuild will include the installation of new poles, foundations, insulators, and conductor.** **Project Type : FAC** **Cost : $5,500,000** **Time Estimate : 36-60 Months**	$8,300,000
165314394	9	BRIDGPRT 230.0 kV - MCKLTON 230.0 kV Ckt 1	ACE: **as2315r0001_af1f (1625) : To mitigate the (ACE) Bridgeport to Mickleton 230 kV line (from bus 228313 to bus 228401 ckt 1) overload, terminal reinforcement is required at both substation.** **Project Type : FAC** **Cost : $1,000,000** **Time Estimate : 12-24 Months**	$1,000,000

ID	Idx	Facility	Upgrade Description	Cost
165314160	2	WANEETA2 230.0 kV - N PHILA 230.0 kV Ckt 1	PECO: **pe016 (148) : Reconductor the North Philadelphia-Waneeta 230 kV line with Pecos conductor (Does not include permitting)** **Project Type : FAC** **Cost : $6,335,000** **Time Estimate : 36.0 Months** **pe017 (149) : Replace 1 disconnect switch on Waneeta- N. Phila line** **Project Type : FAC** **Cost : $207,000** **Time Estimate : 24.0 Months** **pe018 (150) : Replace 6 pieces of station cable on Waneeta- N. Phila line** **Project Type : FAC** **Cost : $272,000** **Time Estimate : 36.0 Months**	$6,814,000
165314120,165314420	4	RICHMOND35 230.0 kV - WANEETA3 230.0 kV Ckt 1	PECO: **pe010 (143) : Add a second pair of underground cables in parallel with the existing underground portion of the Richmond - Waneeta 230 kV line (Does not include permitting)** **Project Type : FAC** **Cost : $19,000,000** **Time Estimate : 84.0 Months** **pe011 (144) : Rebuild the aerial portion of the Richmond-Waneeta 230 kV line with bundled Pecos conductors (Does not include permitting)** **Project Type : FAC** **Cost : $15,855,000** **Time Estimate : 84.0 Months** **pe012 (145) : Replace 3 circuit breakers on Richmond-Waneeta line** **Project Type : FAC** **Cost : $1,129,000** **Time Estimate : 36.0 Months**	$35,984,000

ID	Idx	Facility	Upgrade Description	Cost
165314142,165314435	3	RICHRE29 230.0 kV - RICHMOND29 230.0 kV Ckt 1	PEPCO: **pe002 (137) : Replace 1 piece of station cable in Richmond substation on Richmond-Camden tie line** **Project Type : FAC** **Cost : $45,000 ($0 – Same Cost as above in Idx #5)** **Time Estimate : 24.0 Months** **pe003 (138) : Replace reactor in Richmond substation on Richmond-Camden tie line** **Project Type : FAC** **Cost : $2,254,000 ($0 – Same Cost as above in Idx #5)** **Time Estimate : 36.0 Months** **pe004 (139) : Replace 2 circuit breakers in Richmond substation on Richmond-Camden tie line** **Project Type : FAC** **Cost : $752,000 ($0 – Same Cost as above in Idx #5)** **Time Estimate : 36.0 Months** **pe005 (140) : Replace 6 disconnect switches in Richmond substation on Richmond-Camden tie line** **Project Type : FAC** **Cost : $1,241,000** **Time Estimate : 36.0 Months**	$1,241,000
166740491	6	LAUREL 69.0 kV - WOODTWN2 69.0 kV Ckt 1	ACE: **as0740r0001_af1f (1588) : To mitigate the (ACE) Laurel to Woodstown 69 kV line (from bus 228218 to bus 228360 ckt 1) overload, it will require reinforcement of terminal equipment at Woodstown #2 substation.** **Project Type : FAC** **Cost : $100,000** **Time Estimate : 12-24 Months**	$100,000
166740438,166740439	10	CNTRL N 69.0 kV - SHLDLY T 69.0 kV Ckt 1	ACE: **at0711r0004 (1662) : 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. Also, upgrades to the terminal equipment at Central North Substation will be required.** **Project Type : FAC** **Cost : $4,600,000** **Time Estimate : 24-48 Months**	$4,600,000
167903792	7	SO MVLLE 69.0 kV - BALFSTNT 69.0 kV Ckt 1	ACE: **ACESoMillvilleBallsr01 (1577) : To mitigate South Millve-Ball foster overload requires upgrading a 300 CU strand bus at South Millville.** **Project Type : FAC** **Cost : $200,000** **Time Estimate : 12-24 Months**	$200,000

ID	Idx	Facility	Upgrade Description	Cost
167903771	8	**WHTN A T 69.0 kV - 2ND ST#1 69.0 kV Ckt 1**	ACE: **ACE#2SecStWheatAlttapr01 (1557) : To mitgate the #2 Second Street-Wheaton alt tap overload requires rebuilding and reconductoring 0.93 miles of 69 kV line and upgrading a 600 amp CT at Second St.** **Project Type : FAC** **Cost : $2,200,000** **Time Estimate : 24-36 Months**	$2,200,000
			TOTAL COST	**$63,490,000**

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".

11.6.1 Index 1

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
165314494	228312	PEDRKTWN	AE	228313	BRIDGPRT	AE	1	JC-P7-1-JCC-230-13	tower	804.0	99.06	100.92	DC	17.42

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
219137	THOSOLAR C (Deactivation : 01/06/2015)	-0.0333	Adder	-0.04
227801	ONTC&DCT	3.9418	Adder	4.64
227842	MARINGEN	0.7961	Adder	0.94
227928	V4-067E	0.1620	Adder	0.19
228102	BLE#2 ST (Deactivation : 30/04/2019)	17.6317	Adder	20.74
228200	CARL#1CT	0.9123	50/50	0.9123
228201	CARL#2CT	0.9657	50/50	0.9657
228203	P06	2.0375	50/50	2.0375
228251	CARLLS#4	0.9158	50/50	0.9158
228260	V4-054C	0.1139	50/50	0.1139
228261	V4-054E	1.1777	50/50	1.1777
228306	PCLP STM	6.0578	50/50	6.0578
228307	PCLP GT	6.0578	50/50	6.0578
228309	CCLP NUG	17.9721	50/50	17.9721
228343	QUINTN#1 (Deactivation : 26/04/2020)	0.4618	50/50	0.4618
228351	V2-046C	0.2782	50/50	0.2782
228357	V2-046E	2.7357	50/50	2.7357
228712	V2-041E	0.3431	Adder	0.4
228720	V2-035C	0.0243	50/50	0.0243
228721	V2-035E	0.0688	50/50	0.0688
902092	W1-130E	0.5501	Adder	0.65
902432	W2-030 E	0.6247	Adder	0.73
924531	AB2-102 C	33.0996	Adder	38.94
924532	AB2-102 E	0.7355	Adder	0.87
924702	AB2-122 E (Withdrawn : 05/05/2020)	0.1215	Adder	0.14
930002	AB1-001 E	0.1421	Adder	0.17
933962	AD1-019 E	0.7761	Adder	0.91
938421	AE1-061 C	0.2654	Adder	0.31
938422	AE1-061 E	0.2654	Adder	0.31
938781	AE1-104 C O1	16.3421	Adder	19.23
938782	AE1-104 E O1	41.8049	Adder	49.18
938871	AE1-115 C	3.1823	50/50	3.1823
939301	AE1-161 C	1.8960	Adder	2.23
939302	AE1-161 E	2.8440	Adder	3.35
939501	AE1-179 C O1	4.9052	Adder	5.77
939502	AE1-179 E O1	3.4617	Adder	4.07
939931	AE1-229 C O1	25.5537	50/50	25.5537

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939932	AE1-229 E O1	17.3133	50/50	17.3133
940001	AE1-240 C O1	4.1434	Adder	4.87
940002	AE1-240 E O1	2.9575	Adder	3.48
940161	AE2-000 C O1	21.0965	Adder	24.82
940162	AE2-000 E O1	53.9787	Adder	63.5
940361	AE2-020 C	10.3222	Adder	12.14
940362	AE2-020 E	48.3292	Adder	56.86
940371	AE2-021 C	10.3222	Adder	12.14
940372	AE2-021 E	48.3292	Adder	56.86
940381	AE2-022 C	6.0213	Adder	7.08
940382	AE2-022 E	28.1920	Adder	33.17
942101	AE2-222 C	8.6043	Adder	10.12
942102	AE2-222 E	22.0161	Adder	25.9
942381	AE2-251 C	32.7005	Adder	38.47
942382	AE2-251 E	83.6713	Adder	98.44
943732	AF1-041 E	0.2429	Adder	0.29
944331	AF1-101 C O1	20.6825	Adder	24.33
944332	AF1-101 E O1	52.9207	Adder	62.26
945431	AF1-208 C O1	6.0615	50/50	6.0615
945432	AF1-208 E O1	4.0410	50/50	4.0410
945731	AF1-238 C O1	6.5038	Adder	7.65
945732	AF1-238 E O1	9.7557	Adder	11.48
945741	AF1-239 C	1.5303	Adder	1.8
945742	AF1-239 E	2.2955	Adder	2.7
945971	AF1-262	0.1821	50/50	0.1821
957221	AF2-016 C	12.3389	Adder	14.52
957222	AF2-016 E	18.5084	Adder	21.77
957251	AF2-019 C	1.0232	Adder	1.2
957252	AF2-019 E	1.5348	Adder	1.81
957261	AF2-020 C	1.5285	50/50	1.5285
957262	AF2-020 E	2.2927	50/50	2.2927
957271	AF2-021 C	0.7533	Adder	0.89
957272	AF2-021 E	1.1300	Adder	1.33
957291	AF2-023 C	5.4279	50/50	5.4279
957292	AF2-023 E	8.1419	50/50	8.1419
957311	AF2-025 C	0.8171	Adder	0.96
957312	AF2-025 E	1.2256	Adder	1.44
958811	**AF2-172 C (Withdrawn : 01/14/2021)**	**0.6697**	**50/50**	**0.6697**
958812	**AF2-172 E (Withdrawn : 01/14/2021)**	**1.0927**	**50/50**	**1.0927**
961621	AG1-001 C	0.9157	Adder	2.03
961622	AG1-001 E	1.4940	Adder	3.32
962621	AG1-111	3.1823	50/50	3.1823
962801	AG1-129 C O1	2.7983	Adder	6.21
962802	AG1-129 E O1	1.8655	Adder	4.14
963401	AG1-189 C	0.1658	Adder	0.37
963402	AG1-189 E	0.2243	Adder	0.5
964001	AG1-254 C	6.4902	50/50	6.4902
964002	AG1-254 E	3.2579	50/50	3.2579
964011	AG1-255 C	11.6104	50/50	11.6104
964012	AG1-255 E	5.8052	50/50	5.8052
964371	AG1-299 C	0.1332	Adder	0.3

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
964372	AG1-299 E	0.0888	Adder	0.2
964381	AG1-300 C	0.2221	Adder	0.49
964382	AG1-300 E	0.1481	Adder	0.33
966301	AG1-499 C	0.5110	Adder	1.13
966302	AG1-499 E	0.3407	Adder	0.76
CALDERWOOD	CALDERWOOD	0.0333	Confirmed LTF	0.0333
NY	NY	0.1239	Confirmed LTF	0.1239
PRAIRIE	PRAIRIE	0.1808	Confirmed LTF	0.1808
O-066	O-066	1.8507	Confirmed LTF	1.8507
SIGE	SIGE	0.0214	Confirmed LTF	0.0214
CHEOAH	CHEOAH	0.0335	Confirmed LTF	0.0335
COTTONWOOD	COTTONWOOD	0.1449	Confirmed LTF	0.1449
G-007	G-007	0.2037	Confirmed LTF	0.2037
HAMLET	HAMLET	0.0358	Confirmed LTF	0.0358
GIBSON	GIBSON	0.0388	Confirmed LTF	0.0388
BLUEG	BLUEG	0.1233	Confirmed LTF	0.1233
TRIMBLE	TRIMBLE	0.0395	Confirmed LTF	0.0395
CATAWBA	CATAWBA	0.0224	Confirmed LTF	0.0224

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
165314160	214010	WANEETA2	PECO	213817	N PHILA	PECO	1	PECO_P2-2_CHI230B1/* $ DELCO $ PECO_P2-2_CHI230B1 $ B	bus	621.0	113.69	114.18	DC	6.98

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
213554	DALEVLLE	-0.3030	Adder	-0.36
213606	**FAIRLESS (Deactivation : 01/06/2020)**	**5.6636**	**Adder**	**6.66**
213878	**PENNSBRY (Deactivation : 01/06/2020)**	**0.5738**	**Adder**	**0.68**
213918	RICHMD91	1.7133	50/50	1.7133
213919	RICHMD92	1.7133	50/50	1.7133
214030	WAYNEJCT	0.3565	50/50	0.3565
218661	EHAMPSOLAR E	0.1863	Adder	0.22
219117	HARTZZ_E	0.1956	Adder	0.23
219123	**BCRR_COGEN (Deactivation : 26/04/2020)**	**0.5737**	**Adder**	**0.67**
219124	CAMDEN_STG	1.7352	50/50	1.7352
219126	CAMDEN_CTG	2.1318	50/50	2.1318
219137	**THOSOLAR C (Deactivation : 01/06/2015)**	**0.0858**	**50/50**	**0.0858**
219138	THOSOLAR E	0.1400	50/50	0.1400
219229	EAGLEPT_ST1	1.0708	50/50	1.0708
219230	EAGLEPT_G1	2.1167	50/50	2.1167
219231	EAGLEPT_G2	2.1156	50/50	2.1156
219235	EAGLEPT_ST2	0.7649	50/50	0.7649
219236	SOUTHERNHQ C	0.0089	50/50	0.0089
219237	SOUTHERNHQ E	0.0938	50/50	0.0938
219240	MANTUACREK E	0.3374	50/50	0.3374
219241	PENNAS_GAS	0.1286	50/50	0.1286
219242	PENNAS_SOLA	0.0139	50/50	0.0139
219258	KINSLEYDEP C	0.0675	50/50	0.0675
219259	KINSLEYDEP E	0.4987	50/50	0.4987
219267	GLOU CO RR	0.3007	50/50	0.3007
219273	CLEANLIGHT E	0.1906	Adder	0.22
219286	CAMD CO RR	0.6387	50/50	0.6387
219288	REEVES ST E	0.6937	Adder	0.82
219292	REEVESSO E	0.0640	Adder	0.08
219305	NAMERICA E	0.3931	Adder	0.46
219349	LDSOLAR E	0.4343	Adder	0.51
219608	WPEMNERT E	0.4960	Adder	0.58
219611	FLORENCE E	1.4171	Adder	1.67
219615	MILLCREEK C	0.0276	50/50	0.0276

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
219619	MILLCREEK E	0.3169	50/50	0.3169
219623	KINSLEYBEA C	0.0578	50/50	0.0578
219624	KINSLEYBEA E	0.3776	50/50	0.3776
219647	COOPERSOLA E	0.0668	50/50	0.0668
219687	LUMSOLAR_N E	0.2136	Adder	0.25
219689	LUMSOLAR_S E	0.2234	Adder	0.26
219726	BAT.STORG E	0.1647	50/50	0.1647
219728	YARDVSOLFA C	0.1096	Adder	0.13
219729	YARDVSOLFA E	0.1788	Adder	0.21
219765	PARADISE E	0.5398	50/50	0.5398
219766	PARADISE C	0.0506	50/50	0.0506
219912	PENNSAU2 C	0.8815	50/50	0.8815
219913	PENNSAU2 E	1.4456	50/50	1.4456
219914	CINNAMSOL C	0.1057	50/50	0.1057
219915	CINNAMSOL E	1.0930	50/50	1.0930
227801	ONTC&DCT	3.1612	Adder	3.72
227842	MARINGEN	0.6389	Adder	0.75
227881	GRENWCHG	0.1918	Adder	0.23
227928	V4-067E	0.1297	Adder	0.15
228102	**BLE#2 ST (Deactivation : 30/04/2019)**	**12.4439**	**Adder**	**14.64**
228251	CARLLS#4	0.4453	Adder	0.52
228261	V4-054E	0.5751	Adder	0.68
228343	**QUINTN#1 (Deactivation : 26/04/2020)**	**0.1664**	**Adder**	**0.2**
228357	V2-046E	1.2174	Adder	1.43
228712	V2-041E	0.2116	Adder	0.25
228721	V2-035E	0.0330	Adder	0.04
230404	Q90 GT1-CC	4.5063	50/50	4.5063
230405	Q90 GT2-CC	4.5063	50/50	4.5063
230406	Q90 ST-CC	7.5560	50/50	7.5560
902092	W1-130E	0.5328	Adder	0.63
902432	W2-030 E	0.4910	Adder	0.58
902692	W2-056 E	0.7093	Adder	0.83
910862	OWENSCORIN E	0.2764	50/50	0.2764
917471	Z2-083	1.6559	50/50	1.6559
924051	AB2-049 C	0.1105	Adder	0.13
924052	AB2-049 E	0.1804	Adder	0.21
924531	AB2-102 C	18.7234	Adder	22.03
924532	AB2-102 E	0.4161	Adder	0.49
924702	**AB2-122 E (Withdrawn : 05/05/2020)**	**0.0973**	**Adder**	**0.11**
925391	AC1-010 C	1.0121	50/50	1.0121
925392	AC1-010 E	0.6410	50/50	0.6410
925451	AC1-017 C	0.0323	50/50	0.0323
925452	AC1-017 E	0.3373	50/50	0.3373
925561	AC1-030 C	0.0243	50/50	0.0243
925562	AC1-030 E	0.2429	50/50	0.2429
930002	AB1-001 E	0.1106	Adder	0.13
930722	AB1-116 E	0.0772	Adder	0.09
930732	AB1-119 E	0.0701	Adder	0.08
932361	AC2-050 C O1	0.3815	Adder	0.45
932362	AC2-050 E O1	0.6224	Adder	0.73

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
933962	AD1-019 E	0.6224	Adder	0.73
936501	AD2-065 C	0.1044	Adder	0.12
936502	AD2-065 E	0.1440	Adder	0.17
937011	AD2-135 C	0.0566	Adder	0.07
937012	AD2-135 E	0.0962	Adder	0.11
938421	AE1-061 C	0.2570	Adder	0.3
938422	AE1-061 E	0.2570	Adder	0.3
938431	AE1-062 C	0.9625	Adder	1.13
938781	AE1-104 C O1	11.5338	Adder	13.57
938782	AE1-104 E O1	29.5047	Adder	34.71
938871	AE1-115 C	1.0050	Adder	1.18
939301	AE1-161 C	1.9295	Adder	2.27
939302	AE1-161 E	2.8943	Adder	3.41
939501	AE1-179 C O1	3.1398	Adder	3.69
939502	AE1-179 E O1	2.2158	Adder	2.61
939821	AE1-218 C O1	0.0801	Adder	0.09
939822	AE1-218 E O1	0.1201	Adder	0.14
939931	AE1-229 C O1	8.6740	Adder	10.2
939932	AE1-229 E O1	5.8769	Adder	6.91
940001	AE1-240 C O1	2.6016	Adder	3.06
940002	AE1-240 E O1	1.8570	Adder	2.18
940361	AE2-020 C	8.5127	Adder	10.01
940362	AE2-020 E	39.8571	Adder	46.89
940371	AE2-021 C	8.5127	Adder	10.01
940372	AE2-021 E	39.8571	Adder	46.89
940381	AE2-022 C	4.9657	Adder	5.84
940382	AE2-022 E	23.2500	Adder	27.35
942101	AE2-222 C	6.9047	Adder	8.12
942102	AE2-222 E	17.6671	Adder	20.78
942381	AE2-251 C	26.9681	Adder	31.73
942382	AE2-251 E	69.0037	Adder	81.18
943071	AE2-334 C	2.6138	Adder	3.08
943072	AE2-334 E	1.7425	Adder	2.05
943732	AF1-041 E	0.1962	Adder	0.23
944951	AF1-160 C	0.9625	Adder	1.13
945431	AF1-208 C O1	2.5706	Adder	3.02
945432	AF1-208 E O1	1.7138	Adder	2.02
945731	AF1-238 C O1	4.5240	Adder	5.32
945732	AF1-238 E O1	6.7860	Adder	7.98
945741	AF1-239 C	1.0645	Adder	1.25
945742	AF1-239 E	1.5967	Adder	1.88
945961	AF1-261	0.1029	Adder	0.12
945971	AF1-262	0.0873	Adder	0.1
945991	AF1-264	0.2114	50/50	0.2114
957221	AF2-016 C	9.8797	Adder	11.62
957222	AF2-016 E	14.8196	Adder	17.43
957251	AF2-019 C	0.6651	Adder	0.78
957252	AF2-019 E	0.9977	Adder	1.17
957261	AF2-020 C	0.7425	Adder	0.87
957262	AF2-020 E	1.1137	Adder	1.31
957291	AF2-023 C	1.7089	Adder	2.01
957292	AF2-023 E	2.5633	Adder	3.02

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957301	AF2-024 C	1.0952	Adder	1.29
957302	AF2-024 E	1.6429	Adder	1.93
957311	AF2-025 C	0.6552	Adder	0.77
957312	AF2-025 E	0.9828	Adder	1.16
957443	AF2-038 BAT	5.7958	50/50	5.7958
958811	**AF2-172 C (Withdrawn : 01/14/2021)**	**0.3461**	**Adder**	**0.41**
958812	**AF2-172 E (Withdrawn : 01/14/2021)**	**0.5647**	**Adder**	**0.66**
958831	AF2-174 C	0.1265	Adder	0.15
958832	AF2-174 E	0.1747	Adder	0.21
961621	AG1-001 C	0.5659	Adder	1.26
961622	AG1-001 E	0.9233	Adder	2.05
962311	AG1-080 C O1	1.7826	50/50	1.7826
962312	AG1-080 E O1	1.5327	50/50	1.5327
962611	AG1-110	1.0203	Adder	2.26
962621	AG1-111	0.5327	Adder	1.18
962801	AG1-129 C O1	1.7293	Adder	3.84
962802	AG1-129 E O1	1.1529	Adder	2.56
962811	AG1-130 C	0.1211	Adder	0.27
962812	AG1-130 E	0.1817	Adder	0.4
963411	AG1-190 C	0.3331	Adder	0.74
963412	AG1-190 E	0.4664	Adder	1.04
964001	AG1-254 C	1.3487	Adder	2.99
964002	AG1-254 E	0.6770	Adder	1.5
964011	AG1-255 C	2.0972	Adder	4.66
964012	AG1-255 E	1.0486	Adder	2.33
964081	AG1-263 C	1.3495	50/50	1.3495
964082	AG1-263 E	2.0243	50/50	2.0243
964371	AG1-299 C	0.0806	Adder	0.18
964372	AG1-299 E	0.0537	Adder	0.12
964381	AG1-300 C	0.1344	Adder	0.3
964382	AG1-300 E	0.0896	Adder	0.2
966061	AG1-475 C	1.2764	50/50	1.2764
966062	AG1-475 E	0.8509	50/50	0.8509
966071	AG1-476	4.6942	50/50	4.6942
966301	AG1-499 C	0.4225	Adder	0.94
966302	AG1-499 E	0.2816	Adder	0.63
G-007A	G-007A	8.7701	Confirmed LTF	8.7701
VFT	VFT	18.6469	Confirmed LTF	18.6469
CALDERWOOD	CALDERWOOD	0.2574	Confirmed LTF	0.2574
PRAIRIE	PRAIRIE	1.3096	Confirmed LTF	1.3096
CHEOAH	CHEOAH	0.2593	Confirmed LTF	0.2593
CBM-N	CBM-N	2.0988	Confirmed LTF	2.0988
COTTONWOOD	COTTONWOOD	1.0773	Confirmed LTF	1.0773
HAMLET	HAMLET	0.3090	Confirmed LTF	0.3090
GIBSON	GIBSON	0.2757	Confirmed LTF	0.2757
BLUEG	BLUEG	0.8767	Confirmed LTF	0.8767
TRIMBLE	TRIMBLE	0.2810	Confirmed LTF	0.2810
CATAWBA	CATAWBA	0.1851	Confirmed LTF	0.1851

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
165314142	214206	RICHRE29	PECO	214274	RICHMOND29	PECO	1	PECO_P2-2_CHI230B1/* $ DELCO $ PECO_P2-2_CHI230B1 $ B	bus	1344.0	118.66	119.04	DC	15.11

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200062	SALEM G3	4.5040	Adder	5.3
218661	EHAMPSOLAR E	0.3346	Adder	0.39
219123	**BCRR_COGEN (Deactivation : 26/04/2020)**	**0.6958**	**Adder**	**0.82**
219124	CAMDEN_STG	3.9521	50/50	3.9521
219126	CAMDEN_CTG	4.8553	50/50	4.8553
219137	**THOSOLAR C (Deactivation : 01/06/2015)**	**0.1932**	**50/50**	**0.1932**
219138	THOSOLAR E	0.3151	50/50	0.3151
219229	EAGLEPT_ST1	2.4284	50/50	2.4284
219230	EAGLEPT_G1	4.8003	50/50	4.8003
219231	EAGLEPT_G2	4.7977	50/50	4.7977
219235	EAGLEPT_ST2	1.7346	50/50	1.7346
219236	SOUTHERNHQ C	0.0178	50/50	0.0178
219237	SOUTHERNHQ E	0.1866	50/50	0.1866
219240	MANTUACREK E	0.7684	50/50	0.7684
219241	PENNAS_GAS	0.2946	50/50	0.2946
219242	PENNAS_SOLA	0.0319	50/50	0.0319
219258	KINSLEYDEP C	0.1530	50/50	0.1530
219259	KINSLEYDEP E	1.1304	50/50	1.1304
219267	GLOU CO RR	0.6849	50/50	0.6849
219273	CLEANLIGHT E	0.3631	Adder	0.43
219286	CAMD CO RR	1.4548	50/50	1.4548
219288	REEVES ST E	1.2671	Adder	1.49
219292	REEVESSO E	0.1156	Adder	0.14
219305	NAMERICA E	0.4897	Adder	0.58
219349	LDSOLAR E	0.5410	Adder	0.64
219608	WPEMNERT E	0.6178	Adder	0.73
219611	FLORENCE E	1.7652	Adder	2.08
219619	MILLCREEK E	0.4294	Adder	0.51
219623	KINSLEYBEA C	0.1304	50/50	0.1304
219624	KINSLEYBEA E	0.8521	50/50	0.8521
219647	COOPERSOLA E	0.1496	50/50	0.1496
219687	LUMSOLAR_N E	0.3903	Adder	0.46
219689	LUMSOLAR_S E	0.3850	Adder	0.45
219726	BAT.STORG E	0.3704	50/50	0.3704
219765	PARADISE E	1.2294	50/50	1.2294
219766	PARADISE C	0.1152	50/50	0.1152

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
219912	PENNSAU2 C	2.0189	50/50	2.0189
219913	PENNSAU2 E	3.3111	50/50	3.3111
219914	CINNAMSOL C	0.2421	50/50	0.2421
219915	CINNAMSOL E	2.5035	50/50	2.5035
227801	ONTC&DCT	6.4787	Adder	7.62
227842	MARINGEN	1.3092	Adder	1.54
227881	GRENWCHG	0.4982	50/50	0.4982
227928	V4-067E	0.2650	Adder	0.31
228102	**BLE#2 ST (Deactivation : 30/04/2019)**	**25.7176**	**Adder**	**30.26**
228251	CARLLS#4	0.9490	Adder	1.12
228261	V4-054E	1.2253	Adder	1.44
228343	**QUINTN#1 (Deactivation : 26/04/2020)**	**0.3592**	**Adder**	**0.42**
228357	V2-046E	2.6357	Adder	3.1
228400	MICK 1CT	2.4021	50/50	2.4021
228471	VALERO1	0.8210	50/50	0.8210
228472	VALERO2	0.4636	50/50	0.4636
228473	VALERO3	0.4636	50/50	0.4636
228484	VALERO4	0.4636	50/50	0.4636
228712	V2-041E	0.4437	Adder	0.52
228721	V2-035E	0.0706	Adder	0.08
230404	Q90 GT1-CC	10.0739	50/50	10.0739
230405	Q90 GT2-CC	10.0739	50/50	10.0739
230406	Q90 ST-CC	16.8915	50/50	16.8915
902082	W1-129E	0.3641	Adder	0.43
902092	W1-130E	1.1259	Adder	1.32
902322	W2-019 E	0.4367	Adder	0.51
902432	W2-030 E	1.0068	Adder	1.18
902692	W2-056 E	1.2628	Adder	1.49
902952	W2-082 E OP1	1.2255	Adder	1.44
905252	W4-025 E	0.5167	Adder	0.61
910862	OWENSCORIN E	0.6210	50/50	0.6210
912102	X4-015 E	0.3631	Adder	0.43
917471	Z2-083	3.7019	50/50	3.7019
924051	AB2-049 C	0.2294	Adder	0.27
924052	AB2-049 E	0.3743	Adder	0.44
924531	AB2-102 C	39.2005	Adder	46.12
924532	AB2-102 E	0.8711	Adder	1.02
924702	**AB2-122 E (Withdrawn : 05/05/2020)**	**0.1988**	**Adder**	**0.23**
925391	AC1-010 C	2.3052	50/50	2.3052
925392	AC1-010 E	1.4600	50/50	1.4600
925452	AC1-017 E	0.4571	Adder	0.54
925561	AC1-030 C	0.0484	50/50	0.0484
925562	AC1-030 E	0.4840	50/50	0.4840
930002	AB1-001 E	0.2221	Adder	0.26
930722	AB1-116 E	0.1620	Adder	0.19
930732	AB1-119 E	0.1441	Adder	0.17
932361	AC2-050 C O1	0.7233	Adder	0.85
932362	AC2-050 E O1	1.1801	Adder	1.39
933962	AD1-019 E	1.2756	Adder	1.5
934661	AD1-097 1	1.3760	Adder	1.62

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
934671	AD1-097 2	1.3760	Adder	1.62
934681	AD1-097 3	1.3774	Adder	1.62
934691	AD1-097 4	0.8154	Adder	0.96
936501	AD2-065 C	0.2114	Adder	0.25
936502	AD2-065 E	0.2916	Adder	0.34
937011	AD2-135 C	0.1170	Adder	0.14
937012	AD2-135 E	0.1989	Adder	0.23
938421	AE1-061 C	0.5432	Adder	0.64
938422	AE1-061 E	0.5432	Adder	0.64
938431	AE1-062 C	1.9502	Adder	2.29
938781	AE1-104 C O1	23.8366	Adder	28.04
938782	AE1-104 E O1	60.9766	Adder	71.74
938871	AE1-115 C	2.1835	Adder	2.57
939301	AE1-161 C	4.1048	Adder	4.83
939302	AE1-161 E	6.1572	Adder	7.24
939501	AE1-179 C O1	6.6393	Adder	7.81
939502	AE1-179 E O1	4.6855	Adder	5.51
939821	AE1-218 C O1	0.1697	Adder	0.2
939822	AE1-218 E O1	0.2545	Adder	0.3
939931	AE1-229 C O1	18.6560	Adder	21.95
939932	AE1-229 E O1	12.6400	Adder	14.87
940001	AE1-240 C O1	5.5034	Adder	6.47
940002	AE1-240 E O1	3.9283	Adder	4.62
940361	AE2-020 C	17.2995	Adder	20.35
940362	AE2-020 E	80.9977	Adder	95.29
940371	AE2-021 C	17.2995	Adder	20.35
940372	AE2-021 E	80.9977	Adder	95.29
940381	AE2-022 C	10.0914	Adder	11.87
940382	AE2-022 E	47.2487	Adder	55.59
942101	AE2-222 C	14.1490	Adder	16.65
942102	AE2-222 E	36.2033	Adder	42.59
942381	AE2-251 C	54.8046	Adder	64.48
942382	AE2-251 E	140.2296	Adder	164.98
943071	AE2-334 C	5.5447	Adder	6.52
943072	AE2-334 E	3.6965	Adder	4.35
943732	AF1-041 E	0.4017	Adder	0.47
944951	AF1-160 C	1.9502	Adder	2.29
945431	AF1-208 C O1	5.5119	Adder	6.48
945432	AF1-208 E O1	3.6746	Adder	4.32
945731	AF1-238 C O1	9.5340	Adder	11.22
945732	AF1-238 E O1	14.3009	Adder	16.82
945741	AF1-239 C	2.2433	Adder	2.64
945742	AF1-239 E	3.3649	Adder	3.96
945961	AF1-261	0.1281	Adder	0.15
945971	AF1-262	0.1868	Adder	0.22
945991	AF1-264	0.4749	50/50	0.4749
957221	AF2-016 C	20.2796	Adder	23.86
957222	AF2-016 E	30.4195	Adder	35.79
957251	AF2-019 C	1.3818	Adder	1.63
957252	AF2-019 E	2.0727	Adder	2.44
957261	AF2-020 C	1.5824	Adder	1.86
957262	AF2-020 E	2.3736	Adder	2.79

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957271	AF2-021 C	0.9705	Adder	1.14
957272	AF2-021 E	1.4557	Adder	1.71
957291	AF2-023 C	3.7129	Adder	4.37
957292	AF2-023 E	5.5694	Adder	6.55
957301	AF2-024 C	2.8504	50/50	2.8504
957302	AF2-024 E	4.2756	50/50	4.2756
957311	AF2-025 C	1.3427	Adder	1.58
957312	AF2-025 E	2.0141	Adder	2.37
957443	AF2-038 BAT	4.2600	Merchant Transmission	4.2600
958811	**AF2-172 C (Withdrawn : 01/14/2021)**	**0.7345**	**Adder**	**0.86**
958812	**AF2-172 E (Withdrawn : 01/14/2021)**	**1.1984**	**Adder**	**1.41**
958831	AF2-174 C	0.2398	Adder	0.28
958832	AF2-174 E	0.3312	Adder	0.39
959631	AF2-254 C	0.4867	Adder	0.57
959632	AF2-254 E	0.6722	Adder	0.79
961621	AG1-001 C	1.1995	Adder	2.66
961622	AG1-001 E	1.9571	Adder	4.34
962311	AG1-080 C O1	3.9350	50/50	3.9350
962312	AG1-080 E O1	3.3834	50/50	3.3834
962611	AG1-110	2.0673	Adder	4.59
962621	AG1-111	1.1572	Adder	2.57
962801	AG1-129 C O1	3.6658	Adder	8.14
962802	AG1-129 E O1	2.4438	Adder	5.42
962811	AG1-130 C	0.1509	Adder	0.33
962812	AG1-130 E	0.2263	Adder	0.5
963411	AG1-190 C	0.4150	Adder	0.92
963412	AG1-190 E	0.5810	Adder	1.29
964001	AG1-254 C	2.9232	Adder	6.49
964002	AG1-254 E	1.4674	Adder	3.26
964011	AG1-255 C	4.5391	Adder	10.08
964012	AG1-255 E	2.2695	Adder	5.04
964081	AG1-263 C	3.0736	50/50	3.0736
964082	AG1-263 E	4.6104	50/50	4.6104
964371	AG1-299 C	0.1688	Adder	0.37
964372	AG1-299 E	0.1126	Adder	0.25
964381	AG1-300 C	0.2814	Adder	0.62
964382	AG1-300 E	0.1876	Adder	0.42
966061	AG1-475 C	2.8534	50/50	2.8534
966062	AG1-475 E	1.9022	50/50	1.9022
966071	AG1-476	10.4940	50/50	10.4940
966301	AG1-499 C	0.9224	Adder	2.05
966302	AG1-499 E	0.6149	Adder	1.36
G-007A	G-007A	11.3018	Confirmed LTF	11.3018
VFT	VFT	19.1758	Confirmed LTF	19.1758
CALDERWOOD	CALDERWOOD	0.5045	Confirmed LTF	0.5045
PRAIRIE	PRAIRIE	2.6295	Confirmed LTF	2.6295
CHEOAH	CHEOAH	0.5080	Confirmed LTF	0.5080
CBM-N	CBM-N	1.5396	Confirmed LTF	1.5396
COTTONWOOD	COTTONWOOD	2.1336	Confirmed LTF	2.1336
HAMLET	HAMLET	0.5833	Confirmed LTF	0.5833
GIBSON	GIBSON	0.5564	Confirmed LTF	0.5564

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
BLUEG	BLUEG	1.7690	Confirmed LTF	1.7690
TRIMBLE	TRIMBLE	0.5671	Confirmed LTF	0.5671
CATAWBA	CATAWBA	0.3542	Confirmed LTF	0.3542

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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
165314120	214277	RICHMOND35	PECO	214012	WANEETA3	PECO	1	PECO_P2-2_CHI230B1/* $ DELCO $ PECO_P2-2_CHI230B1 $ B	bus	1180.0	122.78	123.29	DC	13.92

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
213606	FAIRLESS (Deactivation : 01/06/2020)	8.2926	Adder	9.76
213878	PENNSBRY (Deactivation : 01/06/2020)	0.8363	Adder	0.98
213918	RICHMD91	3.5797	50/50	3.5797
213919	RICHMD92	3.5797	50/50	3.5797
218661	EHAMPSOLAR E	0.3572	Adder	0.42
219117	HARTZZ_E	0.3416	Adder	0.4
219123	BCRR_COGEN (Deactivation : 26/04/2020)	1.0248	Adder	1.21
219124	CAMDEN_STG	3.5160	50/50	3.5160
219126	CAMDEN_CTG	4.3196	50/50	4.3196
219137	THOSOLAR C (Deactivation : 01/06/2015)	0.1733	50/50	0.1733
219138	THOSOLAR E	0.2828	50/50	0.2828
219229	EAGLEPT_ST1	2.1671	50/50	2.1671
219230	EAGLEPT_G1	4.2837	50/50	4.2837
219231	EAGLEPT_G2	4.2816	50/50	4.2816
219235	EAGLEPT_ST2	1.5480	50/50	1.5480
219236	SOUTHERNHQ C	0.0176	50/50	0.0176
219237	SOUTHERNHQ E	0.1847	50/50	0.1847
219240	MANTUACREK E	0.6836	50/50	0.6836
219241	PENNAS_GAS	0.2611	50/50	0.2611
219242	PENNAS_SOLA	0.0282	50/50	0.0282
219258	KINSLEYDEP C	0.1366	50/50	0.1366
219259	KINSLEYDEP E	1.0091	50/50	1.0091
219267	GLOU CO RR	0.6094	50/50	0.6094
219273	CLEANLIGHT E	0.3702	Adder	0.44
219286	CAMD CO RR	1.2943	50/50	1.2943
219288	REEVES ST E	1.3328	Adder	1.57
219292	REEVESSO E	0.1228	Adder	0.14
219305	NAMERICA E	0.7142	Adder	0.84
219349	LDSOLAR E	0.7890	Adder	0.93
219608	WPEMNERT E	0.9011	Adder	1.06
219611	FLORENCE E	2.5745	Adder	3.03
219615	MILLCREEK C	0.0522	50/50	0.0522
219619	MILLCREEK E	0.5982	50/50	0.5982
219623	KINSLEYBEA C	0.1168	50/50	0.1168

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
219624	KINSLEYBEA E	0.7629	50/50	0.7629
219647	COOPERSOLA E	0.1348	50/50	0.1348
219687	LUMSOLAR_N E	0.4105	Adder	0.48
219689	LUMSOLAR_S E	0.4257	Adder	0.5
219726	BAT.STORG E	0.3327	50/50	0.3327
219728	YARDVSOLFA C	0.1898	Adder	0.22
219729	YARDVSOLFA E	0.3096	Adder	0.36
219765	PARADISE E	1.0938	50/50	1.0938
219766	PARADISE C	0.1025	50/50	0.1025
219912	PENNSAU2 C	1.7890	50/50	1.7890
219913	PENNSAU2 E	2.9340	50/50	2.9340
219914	CINNAMSOL C	0.2145	50/50	0.2145
219915	CINNAMSOL E	2.2184	50/50	2.2184
227801	ONTC&DCT	6.1807	Adder	7.27
227842	MARINGEN	1.2490	Adder	1.47
227881	GRENWCHG	0.3850	Adder	0.45
227928	V4-067E	0.2533	Adder	0.3
228102	**BLE#2 ST (Deactivation : 30/04/2019)**	**24.4034**	**Adder**	**28.71**
228251	CARLLS#4	0.8833	Adder	1.04
228261	V4-054E	1.1405	Adder	1.34
228343	**QUINTN#1 (Deactivation : 26/04/2020)**	**0.3314**	**Adder**	**0.39**
228357	V2-046E	2.4279	Adder	2.86
228712	V2-041E	0.4172	Adder	0.49
228721	V2-035E	0.0655	Adder	0.08
230404	Q90 GT1-CC	9.0831	50/50	9.0831
230405	Q90 GT2-CC	9.0831	50/50	9.0831
230406	Q90 ST-CC	15.2303	50/50	15.2303
901982	W1-119 E	0.6665	Adder	0.78
901992	W1-120E	0.6665	Adder	0.78
902082	W1-129E	0.3921	Adder	0.46
902092	W1-130E	1.0539	Adder	1.24
902322	W2-019 E	0.4703	Adder	0.55
902432	W2-030 E	0.9602	Adder	1.13
902692	W2-056 E	1.3579	Adder	1.6
902952	W2-082 E OP1	1.3201	Adder	1.55
905252	W4-025 E	0.5565	Adder	0.65
910862	OWENSCORIN E	0.5581	50/50	0.5581
912102	X4-015 E	0.3911	Adder	0.46
917471	Z2-083	3.3378	50/50	3.3378
917612	Z2-102 E	0.9848	Adder	1.16
924051	AB2-049 C	0.2181	Adder	0.26
924052	AB2-049 E	0.3559	Adder	0.42
924531	AB2-102 C	36.8921	Adder	43.4
924532	AB2-102 E	0.8198	Adder	0.96
924702	**AB2-122 E (Withdrawn : 05/05/2020)**	**0.1900**	**Adder**	**0.22**
925391	AC1-010 C	2.0509	50/50	2.0509
925392	AC1-010 E	1.2989	50/50	1.2989
925451	AC1-017 C	0.0609	50/50	0.0609
925452	AC1-017 E	0.6368	50/50	0.6368
925561	AC1-030 C	0.0478	50/50	0.0478

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
925562	AC1-030 E	0.4782	50/50	0.4782
930002	AB1-001 E	0.2145	Adder	0.25
930722	AB1-116 E	0.1527	Adder	0.18
930732	AB1-119 E	0.1381	Adder	0.16
932361	AC2-050 C O1	0.7390	Adder	0.87
932362	AC2-050 E O1	1.2058	Adder	1.42
933962	AD1-019 E	1.2169	Adder	1.43
934661	AD1-097 1	1.2430	Adder	1.46
934671	AD1-097 2	1.2430	Adder	1.46
934681	AD1-097 3	1.2442	Adder	1.46
934691	AD1-097 4	0.7365	Adder	0.87
936501	AD2-065 C	0.2049	Adder	0.24
936502	AD2-065 E	0.2826	Adder	0.33
937011	AD2-135 C	0.1115	Adder	0.13
937012	AD2-135 E	0.1895	Adder	0.22
938421	AE1-061 C	0.5085	Adder	0.6
938422	AE1-061 E	0.5085	Adder	0.6
938431	AE1-062 C	1.8891	Adder	2.22
938781	AE1-104 C O1	22.6186	Adder	26.61
938782	AE1-104 E O1	57.8607	Adder	68.07
938871	AE1-115 C	2.0062	Adder	2.36
939301	AE1-161 C	3.8267	Adder	4.5
939302	AE1-161 E	5.7401	Adder	6.75
939501	AE1-179 C O1	6.2112	Adder	7.31
939502	AE1-179 E O1	4.3833	Adder	5.16
939821	AE1-218 C O1	0.1589	Adder	0.19
939822	AE1-218 E O1	0.2383	Adder	0.28
939931	AE1-229 C O1	17.2588	Adder	20.3
939932	AE1-229 E O1	11.6933	Adder	13.76
940001	AE1-240 C O1	5.1469	Adder	6.06
940002	AE1-240 E O1	3.6738	Adder	4.32
940361	AE2-020 C	16.5929	Adder	19.52
940362	AE2-020 E	77.6893	Adder	91.4
940371	AE2-021 C	16.5929	Adder	19.52
940372	AE2-021 E	77.6893	Adder	91.4
940381	AE2-022 C	9.6792	Adder	11.39
940382	AE2-022 E	45.3188	Adder	53.32
942101	AE2-222 C	13.4984	Adder	15.88
942102	AE2-222 E	34.5385	Adder	40.63
942381	AE2-251 C	52.5661	Adder	61.84
942382	AE2-251 E	134.5019	Adder	158.24
943071	AE2-334 C	5.1857	Adder	6.1
943072	AE2-334 E	3.4571	Adder	4.07
943732	AF1-041 E	0.3835	Adder	0.45
944951	AF1-160 C	1.8891	Adder	2.22
945431	AF1-208 C O1	5.1089	Adder	6.01
945432	AF1-208 E O1	3.4059	Adder	4.01
945731	AF1-238 C O1	8.9396	Adder	10.52
945732	AF1-238 E O1	13.4095	Adder	15.78
945741	AF1-239 C	2.1034	Adder	2.47
945742	AF1-239 E	3.1552	Adder	3.71
945961	AF1-261	0.1869	Adder	0.22

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945971	AF1-262	0.1734	Adder	0.2
945991	AF1-264	0.4268	50/50	0.4268
957221	AF2-016 C	19.3270	Adder	22.74
957222	AF2-016 E	28.9904	Adder	34.11
957251	AF2-019 C	1.3069	Adder	1.54
957252	AF2-019 E	1.9603	Adder	2.31
957261	AF2-020 C	1.4727	Adder	1.73
957262	AF2-020 E	2.2090	Adder	2.6
957271	AF2-021 C	0.9784	Adder	1.15
957272	AF2-021 E	1.4676	Adder	1.73
957291	AF2-023 C	3.4112	Adder	4.01
957292	AF2-023 E	5.1168	Adder	6.02
957301	AF2-024 C	2.2002	Adder	2.59
957302	AF2-024 E	3.3003	Adder	3.88
957311	AF2-025 C	1.2810	Adder	1.51
957312	AF2-025 E	1.9215	Adder	2.26
957443	AF2-038 BAT	4.6008	Merchant Transmission	4.6008
958811	**AF2-172 C (Withdrawn : 01/14/2021)**	**0.6855**	**Adder**	**0.81**
958812	**AF2-172 E (Withdrawn : 01/14/2021)**	**1.1185**	**Adder**	**1.32**
958831	AF2-174 C	0.2450	Adder	0.29
958832	AF2-174 E	0.3384	Adder	0.4
959631	AF2-254 C	0.5243	Adder	0.62
959632	AF2-254 E	0.7241	Adder	0.85
961621	AG1-001 C	1.1203	Adder	2.49
961622	AG1-001 E	1.8279	Adder	4.06
962311	AG1-080 C O1	3.5863	50/50	3.5863
962312	AG1-080 E O1	3.0836	50/50	3.0836
962611	AG1-110	2.0025	Adder	4.45
962621	AG1-111	1.0633	Adder	2.36
962801	AG1-129 C O1	3.4238	Adder	7.6
962802	AG1-129 E O1	2.2825	Adder	5.07
962811	AG1-130 C	0.2201	Adder	0.49
962812	AG1-130 E	0.3301	Adder	0.73
963411	AG1-190 C	0.6052	Adder	1.34
963412	AG1-190 E	0.8473	Adder	1.88
964001	AG1-254 C	2.6904	Adder	5.97
964002	AG1-254 E	1.3505	Adder	3.0
964011	AG1-255 C	4.1810	Adder	9.28
964012	AG1-255 E	2.0905	Adder	4.64
964081	AG1-263 C	2.7345	50/50	2.7345
964082	AG1-263 E	4.1017	50/50	4.1017
964371	AG1-299 C	0.1589	Adder	0.35
964372	AG1-299 E	0.1059	Adder	0.24
964381	AG1-300 C	0.2648	Adder	0.59
964382	AG1-300 E	0.1766	Adder	0.39
966061	AG1-475 C	2.5727	50/50	2.5727
966062	AG1-475 E	1.7152	50/50	1.7152
966071	AG1-476	9.4620	50/50	9.4620
966301	AG1-499 C	0.8449	Adder	1.88
966302	AG1-499 E	0.5633	Adder	1.25
G-007A	G-007A	13.9918	Confirmed LTF	13.9918

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
VFT	VFT	27.4254	Confirmed LTF	27.4254
CALDERWOOD	CALDERWOOD	0.5984	Confirmed LTF	0.5984
PRAIRIE	PRAIRIE	3.0996	Confirmed LTF	3.0996
CHEOAH	CHEOAH	0.6026	Confirmed LTF	0.6026
CBM-N	CBM-N	2.5260	Confirmed LTF	2.5260
COTTONWOOD	COTTONWOOD	2.5242	Confirmed LTF	2.5242
HAMLET	HAMLET	0.6988	Confirmed LTF	0.6988
GIBSON	GIBSON	0.6547	Confirmed LTF	0.6547
BLUEG	BLUEG	2.0815	Confirmed LTF	2.0815
TRIMBLE	TRIMBLE	0.6672	Confirmed LTF	0.6672
CATAWBA	CATAWBA	0.4228	Confirmed LTF	0.4228

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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
165314430	219125	CAMDEN	PSE&G	214206	RICHRE29	PECO	1	JC-P7-1-JCC-230-13	tower	1344.0	111.59	111.95	DC	14.02

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
218661	EHAMPSOLAR E	0.3255	Adder	0.38
219123	**BCRR_COGEN (Deactivation : 26/04/2020)**	**0.7081**	**Adder**	**0.83**
219124	CAMDEN_STG	3.9082	50/50	3.9082
219126	CAMDEN_CTG	4.8013	50/50	4.8013
219137	**THOSOLAR C (Deactivation : 01/06/2015)**	**0.1815**	**50/50**	**0.1815**
219138	THOSOLAR E	0.2961	50/50	0.2961
219229	EAGLEPT_ST1	2.3582	50/50	2.3582
219230	EAGLEPT_G1	4.6620	50/50	4.6620
219231	EAGLEPT_G2	4.6585	50/50	4.6585
219235	EAGLEPT_ST2	1.6844	50/50	1.6844
219236	SOUTHERNHQ C	0.0178	50/50	0.0178
219237	SOUTHERNHQ E	0.1872	50/50	0.1872
219240	MANTUACREK E	0.7599	50/50	0.7599
219241	PENNAS_GAS	0.2947	50/50	0.2947
219242	PENNAS_SOLA	0.0319	50/50	0.0319
219258	KINSLEYDEP C	0.1483	50/50	0.1483
219259	KINSLEYDEP E	1.0956	50/50	1.0956
219267	GLOU CO RR	0.6773	50/50	0.6773
219273	CLEANLIGHT E	0.3554	Adder	0.42
219286	CAMD CO RR	1.4386	50/50	1.4386
219288	REEVES ST E	1.2310	Adder	1.45
219292	REEVESSO E	0.1123	Adder	0.13
219305	NAMERICA E	0.4972	Adder	0.58
219349	LDSOLAR E	0.5492	Adder	0.65
219608	WPEMNERT E	0.6272	Adder	0.74
219611	FLORENCE E	1.7921	Adder	2.11
219619	MILLCREEK E	0.4329	Adder	0.51
219623	KINSLEYBEA C	0.1285	50/50	0.1285
219624	KINSLEYBEA E	0.8394	50/50	0.8394
219647	COOPERSOLA E	0.1486	50/50	0.1486
219687	LUMSOLAR_N E	0.3792	Adder	0.45
219689	LUMSOLAR_S E	0.3773	Adder	0.44
219726	BAT.STORG E	0.3669	50/50	0.3669
219765	PARADISE E	1.2158	50/50	1.2158
219766	PARADISE C	0.1139	50/50	0.1139
219912	PENNSAU2 C	2.0197	50/50	2.0197
219913	PENNSAU2 E	3.3123	50/50	3.3123
219914	CINNAMSOL C	0.2422	50/50	0.2422

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
219915	CINNAMSOL E	2.5044	50/50	2.5044
227801	ONTC&DCT	6.6476	Adder	7.82
227842	MARINGEN	1.3434	Adder	1.58
227881	GRENWCHG	0.4566	50/50	0.4566
227928	V4-067E	0.2734	Adder	0.32
228102	BLE#2 ST (Deactivation : 30/04/2019)	25.7035	Adder	30.24
228251	CARLLS#4	0.8937	Adder	1.05
228261	V4-054E	1.1540	Adder	1.36
228343	QUINTN#1 (Deactivation : 26/04/2020)	0.3340	Adder	0.39
228357	V2-046E	2.4433	Adder	2.87
228400	MICK 1CT	2.1994	50/50	2.1994
228471	VALERO1	0.7522	50/50	0.7522
228472	VALERO2	0.4247	50/50	0.4247
228473	VALERO3	0.4247	50/50	0.4247
228484	VALERO4	0.4247	50/50	0.4247
228712	V2-041E	0.4255	Adder	0.5
228721	V2-035E	0.0663	Adder	0.08
230404	Q90 GT1-CC	9.1762	50/50	9.1762
230405	Q90 GT2-CC	9.1762	50/50	9.1762
230406	Q90 ST-CC	15.3864	50/50	15.3864
901982	W1-119 E	0.5702	Adder	0.67
901992	W1-120E	0.5702	Adder	0.67
902082	W1-129E	0.3375	Adder	0.4
902092	W1-130E	1.0809	Adder	1.27
902322	W2-019 E	0.4051	Adder	0.48
902432	W2-030 E	1.0302	Adder	1.21
902692	W2-056 E	1.2310	Adder	1.45
902952	W2-082 E OP1	1.1350	Adder	1.34
905252	W4-025 E	0.4790	Adder	0.56
910862	OWENSCORIN E	0.6142	50/50	0.6142
912102	X4-015 E	0.3365	Adder	0.4
917471	Z2-083	3.3720	50/50	3.3720
917612	Z2-102 E	0.8425	Adder	0.99
924051	AB2-049 C	0.2158	Adder	0.25
924052	AB2-049 E	0.3520	Adder	0.41
924531	AB2-102 C	37.5481	Adder	44.17
924532	AB2-102 E	0.8344	Adder	0.98
924702	AB2-122 E (Withdrawn : 05/05/2020)	0.2050	Adder	0.24
925391	AC1-010 C	2.2796	50/50	2.2796
925392	AC1-010 E	1.4437	50/50	1.4437
925452	AC1-017 E	0.4608	Adder	0.54
925561	AC1-030 C	0.0485	50/50	0.0485
925562	AC1-030 E	0.4854	50/50	0.4854
930002	AB1-001 E	0.2445	Adder	0.29
930722	AB1-116 E	0.1518	Adder	0.18
930732	AB1-119 E	0.1359	Adder	0.16
932361	AC2-050 C O1	0.6947	Adder	0.82
932362	AC2-050 E O1	1.1335	Adder	1.33
933962	AD1-019 E	1.3089	Adder	1.54
936501	AD2-065 C	0.2001	Adder	0.24

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
936502	AD2-065 E	0.2760	Adder	0.32
937011	AD2-135 C	0.1102	Adder	0.13
937012	AD2-135 E	0.1874	Adder	0.22
938421	AE1-061 C	0.5215	Adder	0.61
938422	AE1-061 E	0.5215	Adder	0.61
938431	AE1-062 C	1.8467	Adder	2.17
938781	AE1-104 C O1	23.8236	Adder	28.03
938782	AE1-104 E O1	60.9433	Adder	71.7
938871	AE1-115 C	2.0179	Adder	2.37
939301	AE1-161 C	3.8848	Adder	4.57
939302	AE1-161 E	5.8273	Adder	6.86
939501	AE1-179 C O1	6.2993	Adder	7.41
939502	AE1-179 E O1	4.4455	Adder	5.23
939821	AE1-218 C O1	0.1585	Adder	0.19
939822	AE1-218 E O1	0.2378	Adder	0.28
939931	AE1-229 C O1	17.4199	Adder	20.49
939932	AE1-229 E O1	11.8025	Adder	13.89
940001	AE1-240 C O1	5.2209	Adder	6.14
940002	AE1-240 E O1	3.7266	Adder	4.38
940161	AE2-000 C O1	37.8506	Adder	44.53
940162	AE2-000 E O1	96.8466	Adder	113.94
940361	AE2-020 C	18.0595	Adder	21.25
940362	AE2-020 E	84.5560	Adder	99.48
940371	AE2-021 C	18.0595	Adder	21.25
940372	AE2-021 E	84.5560	Adder	99.48
940381	AE2-022 C	10.5347	Adder	12.39
940382	AE2-022 E	49.3243	Adder	58.03
942101	AE2-222 C	14.5195	Adder	17.08
942102	AE2-222 E	37.1512	Adder	43.71
942381	AE2-251 C	57.2122	Adder	67.31
942382	AE2-251 E	146.3900	Adder	172.22
943071	AE2-334 C	5.1839	Adder	6.1
943072	AE2-334 E	3.4559	Adder	4.07
943732	AF1-041 E	0.4132	Adder	0.49
944331	AF1-101 C O1	37.1077	Adder	43.66
944332	AF1-101 E O1	94.9483	Adder	111.7
944951	AF1-160 C	1.8467	Adder	2.17
945431	AF1-208 C O1	5.1592	Adder	6.07
945432	AF1-208 E O1	3.4394	Adder	4.05
945731	AF1-238 C O1	9.0710	Adder	10.67
945732	AF1-238 E O1	13.6065	Adder	16.01
945741	AF1-239 C	2.1344	Adder	2.51
945742	AF1-239 E	3.2015	Adder	3.77
945961	AF1-261	0.1301	Adder	0.15
945971	AF1-262	0.1755	Adder	0.21
945991	AF1-264	0.4697	50/50	0.4697
957221	AF2-016 C	20.7060	Adder	24.36
957222	AF2-016 E	31.0590	Adder	36.54
957251	AF2-019 C	1.3586	Adder	1.6
957252	AF2-019 E	2.0380	Adder	2.4
957261	AF2-020 C	1.4901	Adder	1.75
957262	AF2-020 E	2.2351	Adder	2.63

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957271	AF2-021 C	1.3357	Adder	1.57
957272	AF2-021 E	2.0035	Adder	2.36
957291	AF2-023 C	3.4312	Adder	4.04
957292	AF2-023 E	5.1467	Adder	6.05
957301	AF2-024 C	2.6098	50/50	2.6098
957302	AF2-024 E	3.9146	50/50	3.9146
957311	AF2-025 C	1.3777	Adder	1.62
957312	AF2-025 E	2.0665	Adder	2.43
958811	AF2-172 C (Withdrawn : 01/14/2021)	0.6945	Adder	0.82
958812	AF2-172 E (Withdrawn : 01/14/2021)	1.1332	Adder	1.33
958831	AF2-174 C	0.2304	Adder	0.27
958832	AF2-174 E	0.3181	Adder	0.37
959631	AF2-254 C	0.4503	Adder	0.53
959632	AF2-254 E	0.6218	Adder	0.73
961621	AG1-001 C	1.1354	Adder	2.52
961622	AG1-001 E	1.8525	Adder	4.11
962311	AG1-080 C O1	3.9164	50/50	3.9164
962312	AG1-080 E O1	3.3674	50/50	3.3674
962611	AG1-110	1.9575	Adder	4.35
962621	AG1-111	1.0695	Adder	2.37
962801	AG1-129 C O1	3.4698	Adder	7.7
962802	AG1-129 E O1	2.3132	Adder	5.13
962811	AG1-130 C	0.1532	Adder	0.34
962812	AG1-130 E	0.2298	Adder	0.51
963391	AG1-188 C	0.5234	Adder	1.16
963392	AG1-188 E	0.7221	Adder	1.6
963401	AG1-189 C	0.3659	Adder	0.81
963402	AG1-189 E	0.4950	Adder	1.1
963411	AG1-190 C	0.4213	Adder	0.94
963412	AG1-190 E	0.5898	Adder	1.31
964001	AG1-254 C	2.7071	Adder	6.01
964002	AG1-254 E	1.3589	Adder	3.02
964011	AG1-255 C	4.2102	Adder	9.35
964012	AG1-255 E	2.1051	Adder	4.67
964081	AG1-263 C	3.0394	50/50	3.0394
964082	AG1-263 E	4.5592	50/50	4.5592
964371	AG1-299 C	0.1623	Adder	0.36
964372	AG1-299 E	0.1082	Adder	0.24
964381	AG1-300 C	0.2705	Adder	0.6
964382	AG1-300 E	0.1803	Adder	0.4
966061	AG1-475 C	2.5991	50/50	2.5991
966062	AG1-475 E	1.7327	50/50	1.7327
966071	AG1-476	9.5589	50/50	9.5589
966301	AG1-499 C	0.8509	Adder	1.89
966302	AG1-499 E	0.5672	Adder	1.26
G-007A	G-007A	10.7408	Confirmed LTF	10.7408
VFT	VFT	20.7045	Confirmed LTF	20.7045
CALDERWOOD	CALDERWOOD	0.4200	Confirmed LTF	0.4200
PRAIRIE	PRAIRIE	2.1749	Confirmed LTF	2.1749
CHEOAH	CHEOAH	0.4229	Confirmed LTF	0.4229
CBM-N	CBM-N	1.9956	Confirmed LTF	1.9956

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
COTTONWOOD	COTTONWOOD	1.7724	Confirmed LTF	1.7724
HAMLET	HAMLET	0.4903	Confirmed LTF	0.4903
GIBSON	GIBSON	0.4592	Confirmed LTF	0.4592
BLUEG	BLUEG	1.4600	Confirmed LTF	1.4600
TRIMBLE	TRIMBLE	0.4680	Confirmed LTF	0.4680
CATAWBA	CATAWBA	0.2968	Confirmed LTF	0.2968

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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
166740491	228218	LAUREL	AE	228360	WOODTWN2	AE	1	AE_P7-1 AE2TOWER	tower	107.0	103.49	104.91	DC	3.38

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
228102	BLE#2 ST (Deactivation : 30/04/2019)	6.7627	Adder	7.96
228200	CARL#1CT	1.6082	50/50	1.6082
228201	CARL#2CT	1.7023	50/50	1.7023
228251	CARLLS#4	1.6105	50/50	1.6105
228260	V4-054C	0.1988	50/50	0.1988
228261	V4-054E	2.0561	50/50	2.0561
228343	QUINTN#1 (Deactivation : 26/04/2020)	0.1719	Adder	0.2
228702	WEST CT	0.5687	50/50	0.5687
228712	V2-041E	0.2658	Adder	0.31
228717	S121	1.0763	50/50	1.0763
228727	W2-039G	1.2202	50/50	1.2202
924531	AB2-102 C	18.2414	Adder	21.46
924532	AB2-102 E	0.4054	Adder	0.48
938781	AE1-104 C O1	6.2681	Adder	7.37
938782	AE1-104 E O1	16.0345	Adder	18.86
939501	AE1-179 C O1	7.5919	50/50	7.5919
939502	AE1-179 E O1	5.3577	50/50	5.3577
940001	AE1-240 C O1	6.5401	50/50	6.5401
940002	AE1-240 E O1	4.6683	50/50	4.6683
945431	AF1-208 C O1	7.4782	50/50	7.4782
945432	AF1-208 E O1	4.9855	50/50	4.9855
945731	AF1-238 C O1	8.2834	50/50	8.2834
945732	AF1-238 E O1	12.4251	50/50	12.4251
945741	AF1-239 C	1.9490	50/50	1.9490
945742	AF1-239 E	2.9236	50/50	2.9236
957251	AF2-019 C	0.4882	Adder	0.57
957252	AF2-019 E	0.7323	Adder	0.86
957261	AF2-020 C	2.6942	50/50	2.6942
957262	AF2-020 E	4.0414	50/50	4.0414
958811	AF2-172 C (Withdrawn : 01/14/2021)	1.0219	50/50	1.0219
958812	AF2-172 E (Withdrawn : 01/14/2021)	1.6673	50/50	1.6673
961621	AG1-001 C	2.9681	50/50	2.9681
961622	AG1-001 E	4.8427	50/50	4.8427
962801	AG1-129 C O1	9.0706	50/50	9.0706
962802	AG1-129 E O1	6.0470	50/50	6.0470
964003	AG1-254 BAT	1.1128	Merchant Transmission	1.1128
964011	AG1-255 C	1.0163	Adder	2.26
964012	AG1-255 E	0.5082	Adder	1.13

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
964371	AG1-299 C	0.0859	Adder	0.19
964372	AG1-299 E	0.0573	Adder	0.13
964381	AG1-300 C	0.1432	Adder	0.32
964382	AG1-300 E	0.0955	Adder	0.21
G-007A	G-007A	0.1534	Confirmed LTF	0.1534
VFT	VFT	0.0129	Confirmed LTF	0.0129
CALDERWOOD	CALDERWOOD	0.0194	Confirmed LTF	0.0194
NY	NY	0.0072	Confirmed LTF	0.0072
PRAIRIE	PRAIRIE	0.1007	Confirmed LTF	0.1007
CHEOAH	CHEOAH	0.0195	Confirmed LTF	0.0195
COTTONWOOD	COTTONWOOD	0.0819	Confirmed LTF	0.0819
HAMLET	HAMLET	0.0225	Confirmed LTF	0.0225
GIBSON	GIBSON	0.0213	Confirmed LTF	0.0213
BLUEG	BLUEG	0.0677	Confirmed LTF	0.0677
TRIMBLE	TRIMBLE	0.0217	Confirmed LTF	0.0217
CATAWBA	CATAWBA	0.0137	Confirmed LTF	0.0137

11.6.7 Index 7

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
167903792	228228	SO MVLLE	AE	228215	BALFSTNT	AE	1	AE_P1-2 BUT-LINC	single	88.0	100.27	102.57	DC	2.02

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
228200	CARL#1CT	0.5628	80/20	0.5628
228201	CARL#2CT	0.5957	80/20	0.5957
228251	CARLLS#4	0.5597	80/20	0.5597
228260	V4-054C	0.1698	80/20	0.1698
228343	**QUINTN#1 (Deactivation : 26/04/2020)**	**0.1202**	**80/20**	**0.1202**
228727	W2-039G	5.7883	80/20	5.7883
939501	AE1-179 C O1	24.9151	80/20	24.9151
945431	AF1-208 C O1	3.2918	80/20	3.2918
957261	AF2-020 C	0.9428	80/20	0.9428
958811	**AF2-172 C (Withdrawn : 01/14/2021)**	**1.9666**	**80/20**	**1.9666**
961621	AG1-001 C	6.8429	80/20	6.8429
962801	AG1-129 C O1	20.9120	80/20	20.9120
964011	AG1-255 C	2.0184	80/20	2.0184
CALDERWOOD	CALDERWOOD	0.0134	Confirmed LTF	0.0134
NY	NY	0.0166	Confirmed LTF	0.0166
PRAIRIE	PRAIRIE	0.0697	Confirmed LTF	0.0697
SIGE	SIGE	0.0006	Confirmed LTF	0.0006
CHEOAH	CHEOAH	0.0135	Confirmed LTF	0.0135
COTTONWOOD	COTTONWOOD	0.0567	Confirmed LTF	0.0567
HAMLET	HAMLET	0.0156	Confirmed LTF	0.0156
GIBSON	GIBSON	0.0147	Confirmed LTF	0.0147
BLUEG	BLUEG	0.0469	Confirmed LTF	0.0469
TRIMBLE	TRIMBLE	0.0150	Confirmed LTF	0.0150
CATAWBA	CATAWBA	0.0094	Confirmed LTF	0.0094

11.6.8 Index 8

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
167903771	228233	WHTN A T	AE	228225	2ND ST#1	AE	1	AE_P1-2 BUT-LINC	single	83.0	106.31	108.75	DC	2.02

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
228200	CARL#1CT	0.5628	80/20	0.5628
228201	CARL#2CT	0.5957	80/20	0.5957
228251	CARLLS#4	0.5597	80/20	0.5597
228260	V4-054C	0.1698	80/20	0.1698
228343	**QUINTN#1 (Deactivation : 26/04/2020)**	**0.1202**	**80/20**	**0.1202**
228727	W2-039G	5.7883	80/20	5.7883
939501	AE1-179 C O1	24.9151	80/20	24.9151
945431	AF1-208 C O1	3.2918	80/20	3.2918
957261	AF2-020 C	0.9428	80/20	0.9428
958811	**AF2-172 C (Withdrawn : 01/14/2021)**	**1.9666**	**80/20**	**1.9666**
961621	AG1-001 C	6.8429	80/20	6.8429
962801	AG1-129 C O1	20.9120	80/20	20.9120
964011	AG1-255 C	2.0184	80/20	2.0184
CALDERWOOD	CALDERWOOD	0.0134	Confirmed LTF	0.0134
NY	NY	0.0166	Confirmed LTF	0.0166
PRAIRIE	PRAIRIE	0.0697	Confirmed LTF	0.0697
SIGE	SIGE	0.0006	Confirmed LTF	0.0006
CHEOAH	CHEOAH	0.0135	Confirmed LTF	0.0135
COTTONWOOD	COTTONWOOD	0.0567	Confirmed LTF	0.0567
HAMLET	HAMLET	0.0156	Confirmed LTF	0.0156
GIBSON	GIBSON	0.0147	Confirmed LTF	0.0147
BLUEG	BLUEG	0.0469	Confirmed LTF	0.0469
TRIMBLE	TRIMBLE	0.0150	Confirmed LTF	0.0150
CATAWBA	CATAWBA	0.0094	Confirmed LTF	0.0094

11.6.9 Index 9

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
165314394	228313	BRIDGPRT	AE	228401	MCKLTON	AE	1	JC-P7-1-JCC-230-13	tower	804.0	124.46	126.49	DC	17.35

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
219137	THOSOLAR C (Deactivation : 01/06/2015)	-0.0338	Adder	-0.04
227801	ONTC&DCT	3.9041	Adder	4.59
227842	MARINGEN	0.7884	Adder	0.93
227928	V4-067E	0.1604	Adder	0.19
228102	BLE#2 ST (Deactivation : 30/04/2019)	17.4847	Adder	20.57
228200	CARL#1CT	0.9069	50/50	0.9069
228201	CARL#2CT	0.9599	50/50	0.9599
228251	CARLLS#4	0.9103	50/50	0.9103
228260	V4-054C	0.1132	50/50	0.1132
228261	V4-054E	1.1705	50/50	1.1705
228304	LOGAN	24.5820	50/50	24.5820
228306	PCLP STM	6.0471	50/50	6.0471
228307	PCLP GT	6.0471	50/50	6.0471
228309	CCLP NUG	17.9285	50/50	17.9285
228343	QUINTN#1 (Deactivation : 26/04/2020)	0.4598	50/50	0.4598
228351	V2-046C	0.2768	50/50	0.2768
228357	V2-046E	2.7218	50/50	2.7218
228712	V2-041E	0.3407	Adder	0.4
228720	V2-035C	0.0241	50/50	0.0241
228721	V2-035E	0.0684	50/50	0.0684
902092	W1-130E	0.5445	Adder	0.64
902432	W2-030 E	0.6188	Adder	0.73
924531	AB2-102 C	32.8797	Adder	38.68
924532	AB2-102 E	0.7307	Adder	0.86
924702	AB2-122 E (Withdrawn : 05/05/2020)	0.1203	Adder	0.14
930002	AB1-001 E	0.1407	Adder	0.17
933962	AD1-019 E	0.7687	Adder	0.9
938421	AE1-061 C	0.2627	Adder	0.31
938422	AE1-061 E	0.2627	Adder	0.31
938781	AE1-104 C O1	16.2059	Adder	19.07
938782	AE1-104 E O1	41.4564	Adder	48.77
938871	AE1-115 C	3.1707	50/50	3.1707
939301	AE1-161 C	1.8765	Adder	2.21
939302	AE1-161 E	2.8147	Adder	3.31
939501	AE1-179 C O1	4.8710	Adder	5.73
939502	AE1-179 E O1	3.4375	Adder	4.04
939931	AE1-229 C O1	25.4513	50/50	25.4513

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939932	AE1-229 E O1	17.2440	50/50	17.2440
940001	AE1-240 C O1	4.1148	Adder	4.84
940002	AE1-240 E O1	2.9371	Adder	3.46
940161	AE2-000 C O1	20.8724	Adder	24.56
940162	AE2-000 E O1	53.4052	Adder	62.83
940361	AE2-020 C	10.2181	Adder	12.02
940362	AE2-020 E	47.8421	Adder	56.28
940371	AE2-021 C	10.2181	Adder	12.02
940372	AE2-021 E	47.8421	Adder	56.28
940381	AE2-022 C	5.9606	Adder	7.01
940382	AE2-022 E	27.9079	Adder	32.83
942101	AE2-222 C	8.5219	Adder	10.03
942102	AE2-222 E	21.8052	Adder	25.65
942381	AE2-251 C	32.3709	Adder	38.08
942382	AE2-251 E	82.8279	Adder	97.44
943732	AF1-041 E	0.2406	Adder	0.28
944331	AF1-101 C O1	20.4628	Adder	24.07
944332	AF1-101 E O1	52.3584	Adder	61.6
945431	AF1-208 C O1	6.0305	50/50	6.0305
945432	AF1-208 E O1	4.0203	50/50	4.0203
945731	AF1-238 C O1	6.4539	Adder	7.59
945732	AF1-238 E O1	9.6809	Adder	11.39
945741	AF1-239 C	1.5186	Adder	1.79
945742	AF1-239 E	2.2779	Adder	2.68
945971	AF1-262	0.1811	50/50	0.1811
957221	AF2-016 C	12.2206	Adder	14.38
957222	AF2-016 E	18.3309	Adder	21.57
957251	AF2-019 C	1.0154	Adder	1.19
957252	AF2-019 E	1.5231	Adder	1.79
957261	AF2-020 C	1.5193	50/50	1.5193
957262	AF2-020 E	2.2789	50/50	2.2789
957271	AF2-021 C	0.7455	Adder	0.88
957272	AF2-021 E	1.1182	Adder	1.32
957291	AF2-023 C	5.4082	50/50	5.4082
957292	AF2-023 E	8.1123	50/50	8.1123
957311	AF2-025 C	0.8093	Adder	0.95
957312	AF2-025 E	1.2139	Adder	1.43
958811	**AF2-172 C (Withdrawn : 01/14/2021)**	**0.6653**	**50/50**	**0.6653**
958812	**AF2-172 E (Withdrawn : 01/14/2021)**	**1.0856**	**50/50**	**1.0856**
961621	AG1-001 C	0.9095	Adder	2.02
961622	AG1-001 E	1.4840	Adder	3.29
962621	AG1-111	3.1707	50/50	3.1707
962801	AG1-129 C O1	2.7796	Adder	6.17
962802	AG1-129 E O1	1.8531	Adder	4.11
963401	AG1-189 C	0.1631	Adder	0.36
963402	AG1-189 E	0.2207	Adder	0.49
964001	AG1-254 C	6.4609	50/50	6.4609
964002	AG1-254 E	3.2432	50/50	3.2432
964011	AG1-255 C	11.5644	50/50	11.5644
964012	AG1-255 E	5.7822	50/50	5.7822
964371	AG1-299 C	0.1323	Adder	0.29

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
964372	AG1-299 E	0.0882	Adder	0.2
964381	AG1-300 C	0.2205	Adder	0.49
964382	AG1-300 E	0.1470	Adder	0.33
966301	AG1-499 C	0.5071	Adder	1.13
966302	AG1-499 E	0.3381	Adder	0.75
CALDERWOOD	CALDERWOOD	0.0910	Confirmed LTF	0.0910
NY	NY	0.1880	Confirmed LTF	0.1880
PRAIRIE	PRAIRIE	0.4804	Confirmed LTF	0.4804
O-066	O-066	2.6314	Confirmed LTF	2.6314
SIGE	SIGE	0.0214	Confirmed LTF	0.0214
CHEOAH	CHEOAH	0.0916	Confirmed LTF	0.0916
COTTONWOOD	COTTONWOOD	0.3885	Confirmed LTF	0.3885
G-007	G-007	0.3255	Confirmed LTF	0.3255
HAMLET	HAMLET	0.1028	Confirmed LTF	0.1028
GIBSON	GIBSON	0.1021	Confirmed LTF	0.1021
BLUEG	BLUEG	0.3246	Confirmed LTF	0.3246
TRIMBLE	TRIMBLE	0.1041	Confirmed LTF	0.1041
CATAWBA	CATAWBA	0.0630	Confirmed LTF	0.0630

11.6.10 Index 10

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
166740438	228714	CNTRLN	AE	228504	SHLDLYT	AE	1	AE_P7-1 AE7TOWER	tower	143.0	122.56	123.53	DC	3.08

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
228102	BLE#2 ST (Deactivation : 30/04/2019)	13.9039	Adder	16.36
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
228343	QUINTN#1 (Deactivation : 26/04/2020)	0.1005	Adder	0.12
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
958811	AF2-172 C (Withdrawn : 01/14/2021)	0.7180	50/50	0.7180
958812	AF2-172 E (Withdrawn : 01/14/2021)	1.1715	50/50	1.1715
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

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

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
AC1-010	Gloucester 26kV	Engineering and Procurement
AC1-017	Levittown 13 kV	In Service
AC1-030	Cinnaminson 13kV	In Service
AC2-050	Tabernacle 12kV	Active
AD1-019	Ontario 23 kV	Active
AD1-097	Linwood 230 kV II	Engineering and Procurement
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
AE2-000	N/A	N/A
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
AF1-101	Oyster Creek 230 kV III	Active
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
AF1-264	Runnemede 13 kV	Engineering and Procurement

Queue Number	Project Name	Status
AF2-016	Lewis 138 kV	Active
AF2-019	Middle 69 kV	Active
AF2-020	Carll's Corner 69 kV	Active
AF2-021	Cedar 69 kV	Active
AF2-023	Churchtown 69 kV	Active
AF2-024	Mickleton 69 kV	Active
AF2-025	Missouri Ave 69 kV	Active
AF2-038	Printz 230 kV	Active
AF2-172	Newport 12 kV	Withdrawn
AF2-174	Tabernacle 12 kV	Active
AF2-254	Cookstown-New Lisbon 34.5 kV	Active
AG1-001	US Silica-Unimin 69 kV	Active
AG1-080	Delair-Locust Street 69 kV	Active
AG1-110	Silver Lake 69 kV	Active
AG1-111	Churchtown 69 kV	Active
AG1-129	US Silica 69 kV	Active
AG1-130	Burlington 26 kV	Active
AG1-188	Manitou-Oyster Creek 34.5 kV	Active
AG1-189	Oyster Creek-Bamber Lake 34.5	Active
AG1-190	Burlington 26 kV	Active
AG1-254	Salem-Woodstown 69 kV	Active
AG1-255	Churchtown-Orchard 230 kV	Active
AG1-263	Gloucester 230 kV	Active
AG1-299	U.S. Silica 12.47 kV	Active
AG1-300	U.S Silica II 12.47 kV	Active
AG1-475	Mickelton 230 kV	Active
AG1-476	Mickelton 230 kV II	Active
AG1-499	Henry Harris 69 kV	Active
V2-035	Pittsgrove	In Service
V2-041	Clayville 12kV	In Service
V2-046	Pilesgrove Township 12kV	In Service
V4-054	Fairfield Township 12kV	In Service
V4-067	Cates Road Egg Harbor Township 12kV	In Service
W1-119	Pemberton Township 1 34.5 kV	In Service
W1-120	Pemberton Township 2 34.5 kV	In Service
W1-129	Cookstown 34.5kV	In Service
W1-130	Vine Road 12kV	In Service
W2-019	Wrightstown 34.5kV	In Service
W2-030	Egg Harbor Township	In Service
W2-039	Clayville 69kV	In Service
W2-056	Lumberton 13kV	In Service
W2-082	Fort Dix-McGuire 34.5kV	In Service
W4-025	Cookstown-Fort Dix 34.5kV	In Service
X4-015	Cookstown-Fort Dix 34kV	In Service
Z2-083	Mickleton 230kV	In Service
Z2-102	Argonne-New Lisbon 34.5kV	In Service

11.8 Contingency Descriptions

Contingency Name	Contingency Definition
AE_P1-2 WOOD-LAUR	CONTINGENCY 'AE_P1-2 WOOD-LAUR' OPEN LINE FROM BUS 228218 TO BUS 228360 CIRCUIT 1 / END
PS_P1-2_U-2299_LT	CONTINGENCY 'PS_P1-2_U-2299_LT' DISCONNECT BUS 219754 /* CUTHBERT BS 2 CLOSE LINE FROM BUS 219176 TO BUS 219179 CKT Z /* CUTHBERT T30/40 MOVE 8 MW LOAD FROM BUS 219179 TO BUS 219724 MOVE 8 MW LOAD FROM BUS 219179 TO BUS 219640 MOVE 8 MW LOAD FROM BUS 219179 TO BUS 219640 END
JC-P7-1-JCC-230-13	CONTINGENCY 'JC-P7-1-JCC-230-13' /* MANITOU-OYSTER CREEK 230 LINES & OYSTER GEN DISCONNECT BRANCH FROM BUS 206297 TO BUS 206302 CKT 1 DISCONNECT BRANCH FROM BUS 206297 TO BUS 206302 CKT 2 END
AE_P7-1 AE7TOWER	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
AE_P1-2 ORCH-CUMB	CONTINGENCY 'AE_P1-2 ORCH-CUMB' OPEN LINE FROM BUS 228002 TO BUS 228207 CIRCUIT 1 / END
CARLL-240 TAP-SHERM-A	CONTINGENCY 'CARLL-240 TAP-SHERM-A' OPEN LINE FROM BUS 228252 TO BUS 940000 CIRCUIT 1 / END
PS_P1-2_D-2282	CONTINGENCY 'PS_P1-2_D-2282' DISCONNECT BUS 219755 /* CUTHBERT BS 4 CLOSE LINE FROM BUS 219177 TO BUS 219178 CKT Z /* CUTHBERT T10/20 END
AE_P7-1 AE18TOWER	CONTINGENCY 'AE_P7-1 AE18TOWER' DISCONNECT BUS 227903 /* #1 MILL TO LEWIS 138 KV DISCONNECT BUS 227904 /* #2 MILL TO LEWIS 138 KV END

Contingency Name	Contingency Definition
PS_P1-2_Z-2305_LT	CONTINGENCY 'PS_P1-2_Z-2305_LT' DISCONNECT BUS 219108 /* CUTHBERT BS 1 CLOSE LINE FROM BUS 219176 TO BUS 219179 CKT Z /* CUTHBERT T30/40 MOVE 8 MW LOAD FROM BUS 219176 TO BUS 219640 MOVE 8 MW LOAD FROM BUS 219176 TO BUS 219678 MOVE 8 MW LOAD FROM BUS 219176 TO BUS 219629 MOVE 8 MW LOAD FROM BUS 219176 TO BUS 219170 END
CARLL-240 TAP-SHERM-B	CONTINGENCY 'CARLL-240 TAP-SHERM-B' OPEN LINE FROM BUS 940000 TO BUS 228226 CIRCUIT 1 / END
AE_P7-1 AE2TOWER	CONTINGENCY 'AE_P7-1 AE2TOWER' / PJM FIXED DISCONNECT BRANCH FROM BUS 228262 TO BUS 228253 CKT 1 /* SHERMAN TO CUMBERLAND 138 KV DISCONNECT BRANCH FROM BUS 228207 TO BUS 228002 CKT 1 /* ORCHARD TO CUMBERLAND 230 KV END
PECO_P2-2_CHI230B1/* $ DELCO $ PECO_P2-2_CHI230B1 $ B	CONTINGENCY 'PECO_P2-2_CHI230B1/* $ DELCO $ PECO_P2-2_CHI230B1 $ B' DISCONNECT BUS 213489 /* CHICHST1 230.00 $ DELCO $ PECO_P2-2_CHI230B1 $ B END
JC-P1-2-JCC-500-003	CONTINGENCY 'JC-P1-2-JCC-500-003' /* NEWFRDM - WINDSOR 500.00 LINE DISCONNECT BRANCH FROM BUS 200012 TO BUS 200028 CKT 1 /* NEWFRDM - WINDSOR 500.00 LINE END
AE_P1-2 CHCH-QUINT-A	CONTINGENCY 'AE_P1-2 CHCH-QUINT-A' OPEN LINE FROM BUS 228319 TO BUS 964010 CIRCUIT 1 / END
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
Base Case	

Contingency Name	Contingency Definition
PS_P1-2_C-2308	CONTINGENCY 'PS_P1-2_C-2308' DISCONNECT BUS 219753 /* CUTHBERT BS 3 CLOSE LINE FROM BUS 219177 TO BUS 219178 CKT Z /* CUTHBERT T10/20 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