



Generation Interconnection

Feasibility Study Report

For

Queue Project AF2-208

COLORA 230 KV

40.32 MW Capacity / 100.8 MW Energy

July 2020

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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 DPL.

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.

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 Storage generating facility located in Cecil County, Maryland. The installed facilities will have a total capability of 100.8 MW with 40.32 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is October 15, 2022. This study does not imply a TO commitment to this in-service date.

Queue Number	AF2-208
Project Name	COLORA 230 KV
State	Maryland
County	Cecil
Transmission Owner	DPL
MFO	100.8
MWE	100.8
MWC	40.32
Fuel	Storage
Basecase Study Year	2023

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 Primary Point of Interconnection

AF2-208 will interconnect with the DPL transmission system at the Colora 230 kV substation by installing an additional terminal position at the substation.

5 Cost Summary

The AF2-208 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$2,250,000
Total System Network Upgrade Costs	\$5,191,000
Total Costs	\$7,441,000

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 88-129. 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.

5.1 DPL Costs

Cost estimates will further be refined as a part of the Impact Study and Facilities Study for this project. The Interconnection Customer will be responsible for all costs incurred by DPL in connection with the AF2-208 project. DPL reserves the right to reassess issues presented in this document and, upon appropriate justification, submit additional costs related to the AF2-208 project.

6 Transmission Owner Scope of Work

Add a new 230 kV bus position to the existing Colora 230 kV substation

Major Equipment:

- One (1) 3000A 230 kV circuit breaker
- Two (2) 3000A 230 kV breaker disconnect switches
- One (1) 3000A 230 kV line disconnect switches
- Two (2) new relay panels
- Associated Bus work and relaying

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

Description	Total Cost
New bus position at Colora 230 kV	\$2,250,000
Total Physical Interconnection Costs	\$2,250,000

Estimate Assumptions:

- Any additional land required will be provided by IC and is not included in the cost estimate
- Site prep to be performed by IC if additional land required

7 Schedule

DPL would take approximately 20-24 months to complete the TO scope of work.

8 Transmission Owner Analysis

None

9 Interconnection Customer Requirements

9.1 Required Relaying and Communications

New protection relays are required for the new terminals.

Front line and back-up line protection will be required. A relay panel at the generator terminal will be required for front line and back-up protection.

New protection relays are required for the new line terminals. Frontline and Backup line protection will be required. A relay panel will be required for each transmission line (2 total).

A breaker control relay on a breaker control panel will be required for the control and operation of each new 230 kV circuit breaker.

9.2 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 DPL'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.

9.3 DPL Interconnection Customer Scope of Direct Connection Work Requirements

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

9.4 Special Operating Requirements

1. DPL 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 DPL.
2. DPL 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 DPL.

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 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 230 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 the DPL's specifications. The secondary wiring connections at the instrument transformers will be completed by the Interconnection Customer and inspected by DPL, while the connections at the metering enclosure will be completed by the DPL. The metering control cable and meter cabinets will be supplied by the DPL 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. The DPL 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. DPL 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 DPL within approximately three feet of the DPL metering position to facilitate remote interrogation and data collection. It is the Interconnection Customer's responsibility to send the data that PJM and DPL require directly to PJM. The Interconnection Customer will grant permission for PJM to send DPL the following telemetry that the Interconnection Customer sends to PJM: real time MW, MVAR, volts, amperes, generator status, and interval MWH and MVARH.

DPL'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 - Primary POI

The Queue Project AF2-208 was evaluated as a 100.8 MW (Capacity 40.32 MW) injection at the Colora 230 kV substation in the DPL area. Project AF2-208 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-208 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)

None

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 PROJE CT LOADIN G %	POST PROJE CT LOADIN G %	AC D C	MW IMPAC T
100095560	214035	WHITPA N1	230.0	PECO	213906	PLYMT G 1	230.0	PECO	1	PECO_P2-2_WHI230B2/* \$ MONTCO \$ WHI230B2 \$ B	bus	519.0	100.01	100.88	DC	8.53
100095847	214035	WHITPA N1	230.0	PECO	213906	PLYMT G 1	230.0	PECO	1	PECO_P4_WHITP165/* \$ MONTCO \$ WHITP165 \$ STBK	breaker	519.0	100.01	100.88	DC	8.53
101787135	231124	GLASGO W	138.0	DP&L	231130	CECIL138	138.0	DP&L	1	PECO_P4_PEACH215/* \$ CHESCO \$ PEACH215 \$ STBK	breaker	378.0	114.58	120.16	DC	21.09
101787136	231124	GLASGO W	138.0	DP&L	231130	CECIL138	138.0	DP&L	1	PECO_P4_PEACH205/* \$ CHESCO \$ PEACH205 \$ STBK	breaker	378.0	112.57	118.14	DC	21.08

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 PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPAC T
101787581	231124	GLASGO W	138.0	DP&L	231130	CECIL138	138.0	DP&L	1	PECO_P1 - 2_5014/ * \$ CHESCO \$ 5014 \$ L	operatio n	378.0	112.55	118.12	DC	21.09

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
101787135,101787136	2	GLASGOW 138.0 kV - CECIL138 138.0 kV Ckt 1	<p><u>DP&L</u> dt13810r0001 (1031) : To mitigate the (DPL) Glasgow to Cecil 138 kV line 13810 (from bus 231124 to bus 231130 ckt 1) overload, it will require increasing the emergency rating of the Glasgow to Cecil 138 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 Glasgow. Project Type : FAC Cost : \$5,000,000 Time Estimate : 36-60 Months</p> <p><u>DP&L</u> ds13810r0001 (1058) : To mitigate the (DPL) Glasgow - Cecil 138 kV line (from bus 231130 to 231124) overload it will require increasing the emergency rating of the line by upgrading terminal equipment at Glsagow Project Type : FAC Cost : \$100,000 Time Estimate : 9-12 Months</p>	\$5,100,000
100095560,100095847	1	WHITPAN1 230.0 kV - PLYMTG 1 230.0 kV Ckt 1	<p><u>PECO</u> pe030 (1692) : Replace 2 pieces of station cable on Whitpain- Plymouth 220-13 line Project Type : FAC Cost : \$91,000 Time Estimate : 36.0 Months</p>	\$91,000
			TOTAL COST	\$5,191,000

11.6 Flow Gate Details - Primary POI

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	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPACT
100095847	214035	WHITPAN1	PECO	213906	PLYMTG1	PECO	1	PECO_P4_WHITP165/ * \$ MONTCO \$ WHITP165 \$ STBK	breaker	519.0	100.01	100.88	DC	8.53

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
214225	Y1-057 BAT	0.3791	50/50	0.3791
292070	V1-026 (Withdrawn : 07/07/2020)	-0.9245	Adder	-1.09
902401	W2-028 (Withdrawn : 07/07/2020)	-0.2311	Adder	-0.27
919901	AB1-000 1	-0.3897	Adder	-0.46
919911	AB1-000 2	-0.3897	Adder	-0.46
919921	AB1-000 3	-0.3897	Adder	-0.46
936911	AD2-115 C O1	0.6229	Adder	0.73
936912	AD2-115 E O1	0.3354	Adder	0.39
937561	AD2-077 C O1	24.0840	50/50	24.0840
937562	AD2-077 E O1	24.0840	50/50	24.0840
940271	AE2-010	-0.2244	Adder	-0.26
946701	AF1-334 C O1	0.5127	Adder	0.6
946702	AF1-334 E O1	0.3418	Adder	0.4
946721	AF1-336 C O1	0.5127	Adder	0.6
946722	AF1-336 E O1	0.3418	Adder	0.4
957361	AF2-030 C	0.1978	Adder	0.44
957362	AF2-030 E	0.2966	Adder	0.66
957443	AF2-038 BAT	0.9065	Merchant Transmission	0.9065
959173	AF2-208 BAT	4.5202	Merchant Transmission	4.5202
959812	AF2-272 E	0.0676	Adder	0.15
959862	AF2-277 E	0.0588	Adder	0.13
959902	AF2-281 E	0.0742	Adder	0.16
961372	AF2-428 E	0.0768	Adder	0.17
961382	AF2-429 E	0.0883	Adder	0.2
961392	AF2-430 E	0.0739	Adder	0.16
961402	AF2-431 E	0.0298	Adder	0.07
WEC	WEC	0.1068	Confirmed LTF	0.1068
LGEE	LGEE	0.1900	Confirmed LTF	0.1900
CPL	CPL	0.1488	Confirmed LTF	0.1488
VFT	VFT	3.2121	Confirmed LTF	3.2121
CBM-W2	CBM-W2	2.5962	Confirmed LTF	2.5962
CBM-W1	CBM-W1	4.3285	Confirmed LTF	4.3285
TVA	TVA	0.4228	Confirmed LTF	0.4228
CBM-S2	CBM-S2	1.4392	Confirmed LTF	1.4392
CBM-S1	CBM-S1	2.6242	Confirmed LTF	2.6242
G-007	G-007	0.0728	Confirmed LTF	0.0728
MEC	MEC	0.5260	Confirmed LTF	0.5260

11.6.2 Index 2

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 IMPACT
101787135	231124	GLASGO W	DP&L	231130	CECIL138	DP&L	1	PECO_P4_PEACH215/ * \$ CHESCO \$ PEACH215 \$ STBK	breaker	378.0	114.58	120.16	DC	21.09

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200062	SALEM G3	1.9750	Adder	2.32
231708	CHRIST3	0.9517	Adder	1.12
231902	DC CT7	1.0848	50/50	1.0848
231903	GEN4	1.0316	Adder	1.21
231904	DC1 NUG	3.1444	50/50	3.1444
231905	DC2 NUG	3.1444	50/50	3.1444
231906	DC3 NUG	1.3702	50/50	1.3702
231907	DC10	0.3388	50/50	0.3388
231915	DC CT6	1.0467	50/50	1.0467
232405	W1-003 E	0.3638	Adder	0.43
232407	W1-004 E	0.3638	Adder	0.43
232409	W1-005 E	0.3638	Adder	0.43
232411	W1-006 E	0.3638	Adder	0.43
232412	X1-032 E	0.3240	Adder	0.38
232416	X2-083	0.0546	50/50	0.0546
232418	X3-008 E	1.0574	Adder	1.24
232422	X3-066 FULL	0.0483	50/50	0.0483
232423	X3-066 E	0.4572	50/50	0.4572
232424	Y1-079 C	0.0757	50/50	0.0757
232425	Y1-079 E	0.7163	50/50	0.7163
232427	Y1-080 E	0.1755	Adder	0.21
232429	Y3-058 E	0.7590	Adder	0.89
232433	Z2-076 E	0.1606	Adder	0.19
232435	Z2-077 E	0.1606	Adder	0.19
232436	AB1-176 C	0.1856	50/50	0.1856
232922	MR3 (Deactivation : 01/06/2021)	7.5646	Adder	8.9
917082	Z2-012 E	1.0019	Adder	1.18
919831	AA2-069 (Suspended)	33.4473	Adder	39.35
923282	AB1-137 C	0.3347	Adder	0.39
923283	AB1-137 E	0.1434	Adder	0.17
923322	AB1-141 C OP	1.6670	50/50	1.6670
923323	AB1-141 E OP	0.7779	50/50	0.7779
923332	AB1-142 C OP	1.6670	50/50	1.6670
923603	AB1-176 E	0.3060	50/50	0.3060
923921	AB2-032 C	1.6793	50/50	1.6793
923922	AB2-032 E	0.7903	50/50	0.7903
923951	AB2-036 C	3.9842	50/50	3.9842
923952	AB2-036 E	6.5185	50/50	6.5185
923961	AB2-037 C	6.3826	Adder	7.51
923962	AB2-037 E	10.4268	Adder	12.27
924681	AB2-120 C OP	3.0698	Adder	3.61

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
924682	AB2-120 E OP	5.0086	Adder	5.89
924781	AB2-130 C OP	2.6140	Adder	3.08
924782	AB2-130 E OP	4.2649	Adder	5.02
924801	AB2-133 C OP	3.2088	50/50	3.2088
924802	AB2-133 E OP	4.0697	50/50	4.0697
924821	AB2-135 C	3.6915	50/50	3.6915
924822	AB2-135 E	4.2100	50/50	4.2100
924831	AB2-136 C	2.0852	Adder	2.45
924832	AB2-136 E	2.2114	Adder	2.6
924971	AB2-153 C	0.9384	50/50	0.9384
924972	AB2-153 E	1.5312	50/50	1.5312
925151	AB2-172 C OP	1.6202	Adder	1.91
925152	AB2-172 E OP	2.6434	Adder	3.11
925251	AB2-179 C OP	6.1901	50/50	6.1901
925252	AB2-179 E OP	2.0414	50/50	2.0414
925261	AB2-180 C	1.1425	Adder	1.34
925262	AB2-180 E	0.4897	Adder	0.58
925271	AB2-185 C OP	1.6174	50/50	1.6174
925272	AB2-185 E OP	0.6932	50/50	0.6932
926131	AC1-091 C	0.5588	Adder	0.66
926132	AC1-091 E	0.9165	Adder	1.08
926141	AC1-092 C	0.5588	Adder	0.66
926142	AC1-092 E	0.9165	Adder	1.08
926151	AC1-093 C	0.5290	Adder	0.62
926152	AC1-093 E	0.8718	Adder	1.03
926161	AC1-094 C	0.4471	Adder	0.53
926162	AC1-094 E	0.7377	Adder	0.87
927031	AC1-190 C	2.9774	Adder	3.5
927032	AC1-190 E	1.2760	Adder	1.5
927191	AC1-213 C	0.2598	Adder	0.31
927192	AC1-213 E	0.1705	Adder	0.2
930201	AB1-056 C	5.1165	Adder	6.02
930202	AB1-056 E	14.5710	Adder	17.14
930881	AB1-137 C	0.3347	Adder	0.39
930882	AB1-137 E	0.1434	Adder	0.17
930932	AB1-142 E OP	0.7779	50/50	0.7779
932082	AC2-018 E1	1.6551	Adder	1.95
932092	AC2-018 E2	1.6551	Adder	1.95
932161	AC2-023 C	2.1703	Adder	2.55
932162	AC2-023 E	1.5806	Adder	1.86
933631	AC2-185 C	1.1326	Adder	1.33
933632	AC2-185 E	1.8479	Adder	2.17
933641	AC2-186 C	1.5533	Adder	1.83
933642	AC2-186 E	2.5343	Adder	2.98
936451	AD2-059 C	0.0324	50/50	0.0324
936452	AD2-059 E	0.1015	50/50	0.1015
936611	AD2-076 C O1	2.3355	50/50	2.3355
936612	AD2-076 E O1	3.8106	50/50	3.8106
938651	AE1-087 C	1.3644	Adder	1.61
938652	AE1-087 E	0.3411	Adder	0.4
938811	AE1-107 C	4.9535	50/50	4.9535
938812	AE1-107 E	3.5314	50/50	3.5314

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
938891	AE1-117 C O1	3.3070	Adder	3.89
938892	AE1-117 E O1	8.8055	Adder	10.36
938901	AE1-118 C O1 (Withdrawn : 07/10/2020)	3.3074	Adder	3.89
938902	AE1-118 E O1 (Withdrawn : 07/10/2020)	8.8064	Adder	10.36
939151	AE1-145	1.6157	Adder	1.9
939621	AE1-192 C O1	3.7976	Adder	4.47
939622	AE1-192 E O1	1.8584	Adder	2.19
941021	AE2-093 C	1.7664	Adder	2.08
941022	AE2-093 E	2.8066	Adder	3.3
941181	AE2-112 C	0.8103	50/50	0.8103
941182	AE2-112 E	1.3220	50/50	1.3220
942441	AE2-257 C	2.6286	Adder	3.09
942442	AE2-257 E	6.9299	Adder	8.15
943361	AF1-007 C	0.1510	Adder	0.18
943362	AF1-007 E	0.4290	Adder	0.5
943441	AF1-015 C	0.5649	Adder	0.66
943442	AF1-015 E	0.7801	Adder	0.92
943651	AF1-036 C	1.0536	50/50	1.0536
943652	AF1-036 E	1.4550	50/50	1.4550
944921	AF1-157 C O1	1.2056	Adder	1.42
944922	AF1-157 E O1	0.8038	Adder	0.95
945661	AF1-231 C	0.6141	Adder	0.72
945662	AF1-231 E	0.9211	Adder	1.08
945781	AF1-243	0.4040	Adder	0.48
945791	AF1-244	0.6483	Adder	0.76
945931	AF1-258	0.2611	Adder	0.31
945941	AF1-259	0.0983	50/50	0.0983
946041	AF1-269 (Withdrawn : 05/12/2020)	0.9195	Adder	1.08
957611	AF2-055 C	1.4989	Adder	3.33
957612	AF2-055 E	0.6424	Adder	1.43
957661	AF2-060	0.3853	Adder	0.86
957671	AF2-061 O1	1.7126	Adder	3.8
958151	AF2-109 C	1.3044	50/50	1.3044
958152	AF2-109 E	1.3044	50/50	1.3044
959021	AF2-193 C O1	5.0109	Adder	11.12
959022	AF2-193 E O1	13.5167	Adder	30.0
959031	AF2-194 C O1	5.0109	Adder	11.12
959032	AF2-194 E O1	13.5167	Adder	30.0
959051	AF2-196 C	0.3799	Adder	0.84
959052	AF2-196 E	0.8865	Adder	1.97
959161	AF2-207 C O1	0.8668	Adder	1.92
959162	AF2-207 E O1	1.3002	Adder	2.89
959173	AF2-208 BAT	21.0864	50/50	21.0864
959571	AF2-248 C	0.1462	Adder	0.32
959572	AF2-248 E	0.1635	Adder	0.36
959581	AF2-249 C	0.0258	Adder	0.06
959582	AF2-249 E	0.1032	Adder	0.23
959591	AF2-250 C	0.0473	Adder	0.1

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959592	AF2-250 E	0.0366	Adder	0.08
960221	AF2-313 C	1.5608	50/50	1.5608
960222	AF2-313 E	0.8849	50/50	0.8849
960341	AF2-325 C	0.1881	Adder	0.42
960342	AF2-325 E	0.2598	Adder	0.58
960671	AF2-358 C O1	2.6522	Adder	5.89
960672	AF2-358 E O1	1.7681	Adder	3.92
960871	AF2-378 C	0.0496	Adder	0.11
960872	AF2-378 E	0.0688	Adder	0.15
960881	AF2-379 C	0.0705	Adder	0.16
960882	AF2-379 E	0.0972	Adder	0.22
960941	AF2-385 C O1	2.0638	Adder	4.58
960942	AF2-385 E O1	1.1609	Adder	2.58
960961	AF2-387 C O1	3.2920	Adder	7.31
960962	AF2-387 E O1	1.6509	Adder	3.66
961181	AF2-409 O1	4.3635	Adder	9.69
NEWTON	NEWTON	0.7006	Confirmed LTF	0.7006
FARMERCITY	FARMERCITY	0.0367	Confirmed LTF	0.0367
G-007A	G-007A	4.2124	Confirmed LTF	4.2124
VFT	VFT	9.6686	Confirmed LTF	9.6686
CALDERWOOD	CALDERWOOD	0.3390	Confirmed LTF	0.3390
PRAIRIE	PRAIRIE	1.6970	Confirmed LTF	1.6970
CHEOAH	CHEOAH	0.3418	Confirmed LTF	0.3418
EDWARDS	EDWARDS	0.2268	Confirmed LTF	0.2268
TILTON	TILTON	0.4082	Confirmed LTF	0.4082
GIBSON	GIBSON	0.3554	Confirmed LTF	0.3554
BLUEG	BLUEG	1.1301	Confirmed LTF	1.1301
TRIMBLE	TRIMBLE	0.3623	Confirmed LTF	0.3623
CATAWBA	CATAWBA	0.2478	Confirmed LTF	0.2478

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
AA2-069	Cartanza 230kV	Suspended
AB1-000	N/A	N/A
AB1-056	Indian River 230kV I	Engineering and Procurement
AB1-137	Frankford 25kV	Engineering and Procurement
AB1-141	Church-Wye Mills 138 kV I	Engineering and Procurement
AB1-142	Church-Wye Mills 138 kV II	Engineering and Procurement
AB1-176	Price 25kV II	Active
AB2-032	Church-Wye Mills 138 kV	Engineering and Procurement
AB2-036	Church-Steele 138kV	Active
AB2-037	Keeney-Steele 230kV	Active
AB2-120	Piney Grove-New Church 138kV	Active
AB2-130	Laurel 69kV	Active
AB2-133	Chestertown-Church 69kV	Active
AB2-135	Church-Kent 69kV	Active
AB2-136	West Cambridge-Vienna 69kV	Active
AB2-153	Church-Wye Mills 138 kV	Engineering and Procurement
AB2-172	Todd 69kV	Active
AB2-179	Townsend 138kV	Engineering and Procurement
AB2-180	Rockawalkin 69kV	Active
AB2-185	Wye Mills 25kV	Active
AC1-091	Cedar Creek 138kV I	Active
AC1-092	Cedar Creek 138kV II	Active
AC1-093	Cedar Creek 138kV III	Active
AC1-094	Cedar Creek 138kV IV	Active
AC1-190	East New Market 69kV	Active
AC1-213	North Salisbury 25kV	Active
AC2-018	Rock Springs 500kV	In Service
AC2-023	Hebron 69kV	Active
AC2-185	Cedar Creek 138kV II	Active
AC2-186	Harrington 25kV	Active
AD2-059	Chapel Street 138 kV	Active
AD2-076	Centreville 69 kV	Active
AD2-077	Buxmont 69 kV	Active
AD2-115	Lyons-Moselem 69kV	Active
AE1-087	Todd 69 kV	Active
AE1-107	Mt. Pleasant-Lums Pond 138 kV	Active
AE1-117	Bethany 138 kV	Active
AE1-118	Bethany-138th Street 138 kV	Withdrawn
AE1-145	Wallops Island 69 kV	Active

Queue Number	Project Name	Status
AE1-192	Belle Haven-Tasley 69 kV	Active
AE2-010	Paper Tap 69 kV	Engineering and Procurement
AE2-093	Easton-Steele 138 kV	Active
AE2-112	Carville 138 kV	Active
AE2-257	Cedar Neck 69 kV	Active
AF1-007	Indian River 230 kV I	Active
AF1-015	Easton-Steele 138 kV	Active
AF1-036	Carville 138 kV	Active
AF1-157	Laurel-Sussex 69 kV	Active
AF1-231	New Church 138 kV	Active
AF1-243	Tasley 25 kV	Active
AF1-244	Kingston 25 kV	Active
AF1-258	Rockawalkin 69 kV	Active
AF1-259	Price 25 kV	Active
AF1-269	Airey-Golden Hill 69 kV	Withdrawn
AF1-334	Northkill 69 kV	Active
AF1-336	Northkill 69 kV	Active
AF2-030	Ontelaunee 230 kV	Active
AF2-038	Printz 230 kV	Active
AF2-055	Plantation 69 kV	Active
AF2-060	Wattsville 12 kV	Active
AF2-061	Wattsville 69kV	Active
AF2-109	Church 69 kV	Active
AF2-193	Indian River 230 kV I	Active
AF2-194	Indian River 230 kV II	Active
AF2-196	Cedar Neck 69 kV II	Active
AF2-207	Nelson 69 kV	Active
AF2-208	Colora 230 kV	Active
AF2-248	Edgewood 12 kV I	Active
AF2-249	Edgewood 12 kV II	Active
AF2-250	Edgewood 12 kV III	Active
AF2-272	Bernville 13.2 kV	Engineering and Procurement
AF2-277	Richland 12.47 kV	Active
AF2-281	Lynnville 13.2 kV	Engineering and Procurement
AF2-313	Price 69 kV	Active
AF2-325	Jacktown 12 kV	Active
AF2-358	Airey-Vienna 69 kV	Active
AF2-378	Cambridge 12 kV	Active
AF2-379	Princess Anne 25 kV	Active
AF2-385	Nelson 69 kV	Active
AF2-387	Hillsboro 138 kV	Active
AF2-409	Vienna 138 kV	Active
AF2-428	West Boyertown 13.2 kV	Engineering and Procurement
AF2-429	South Hamburg 34.5 kV	Active
AF2-430	Moselem 13.2 kV	Engineering and Procurement
AF2-431	Baldy 13.2 kV	Active
V1-026	Limerick	Withdrawn
W1-003	Oak Hall	In Service
W1-004	Oak Hall	In Service
W1-005	Oak Hall	In Service
W1-006	Oak Hall	In Service
W2-028	Limerick #1	Withdrawn

Queue Number	Project Name	Status
X1-032	Costen 25kV	In Service
X2-083	Newark 12kV	In Service
X3-008	Todd 69kV	Under Construction
X3-066	Church Hill 69kV	In Service
Y1-057	Barbadoes 34kV	Deactivated
Y1-079	Wye Mills 69kV	In Service
Y1-080	Dorchester 12kV	In Service
Y3-058	Rockawalkin 69kV	In Service
Z2-012	Weirwood-Eastville 69kV	In Service
Z2-076	Worcester South 25kV	In Service
Z2-077	Worcester North 25kV	In Service

11.8 Contingency Descriptions - Primary POI

Contingency Name	Contingency Definition
PECO_P4_PEACH215/* \$ CHESCO \$ PEACH215 \$ STBK	CONTINGENCY 'PECO_P4_PEACH215/* \$ CHESCO \$ PEACH215 \$ STBK' TRIP BRANCH FROM BUS 200065 TO BUS 200051 CKT 1 /* PCHBTM2S 500.00 ROCKSPGS 500.00 \$ CHESCO \$ PEACH215 \$ STBK REMOVE MACHINE 1 FROM BUS 200034 /* PCHBTM 2 22.00 \$ CHESCO \$ PEACH215 \$ STBK END
PECO_P2-2_WHI230B2/* \$ MONTCO \$ WHI230B2 \$ B	CONTINGENCY 'PECO_P2-2_WHI230B2/* \$ MONTCO \$ WHI230B2 \$ B' DISCONNECT BUS 214036 /* WHITPAN2 230.00 \$ MONTCO \$ WHI230B2 \$ B END
PECO_P1-2_5014/* \$ CHESCO \$ 5014 \$ L	CONTINGENCY 'PECO_P1-2_5014/* \$ CHESCO \$ 5014 \$ L' TRIP BRANCH FROM BUS 200065 TO BUS 200051 CKT 1 /* PCHBTM2S 500.00 ROCKSPGS 500.00 \$ CHESCO \$ 5014 \$ L END
PECO_P4_PEACH205/* \$ CHESCO \$ PEACH205 \$ STBK	CONTINGENCY 'PECO_P4_PEACH205/* \$ CHESCO \$ PEACH205 \$ STBK' TRIP BRANCH FROM BUS 200065 TO BUS 200066 CKT 1 /* PCHBTM2S 500.00 PCHBTM1N 500.00 \$ CHESCO \$ PEACH205 \$ STBK TRIP BRANCH FROM BUS 200064 TO BUS 200065 CKT Z1 /* PCHBTM1S 500.00 PCHBTM2S 500.00 \$ CHESCO \$ PEACH205 \$ STBK TRIP BRANCH FROM BUS 200013 TO BUS 200066 CKT Z1 /* PCHBTM2N 500.00 PCHBTM1N 500.00 \$ CHESCO \$ PEACH205 \$ STBK TRIP BRANCH FROM BUS 200065 TO BUS 200051 CKT 1 /* PCHBTM2S 500.00 ROCKSPGS 500.00 \$ CHESCO \$ PEACH205 \$ STBK END
PECO_P4_WHITP165/* \$ MONTCO \$ WHITP165 \$ STBK	CONTINGENCY 'PECO_P4_WHITP165/* \$ MONTCO \$ WHITP165 \$ STBK' DISCONNECT BUS 214036 /* WHITPAN2 230.00 \$ MONTCO \$ WHITP165 \$ STBK DISCONNECT BUS 213828 /* N WALES9 230.00 \$ MONTCO \$ WHITP165 \$ STBK END

12 Short Circuit Analysis - Primary POI

Short circuit will be studied in the System Impact Study phase.

13 Secondary Point of Interconnection

AF2-208 will interconnect with the DPL transmission system by tapping the Colora – Crest 230 kV line.

14 Summer Peak - Load Flow Analysis - Secondary POI

The Queue Project AF2-208 was evaluated as a 100.9 MW (Capacity 40.32 MW) injection tapping the Colora to Crest 230 kV line in the DPL area. Project AF2-208 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-208 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

14.1 Generation Deliverability

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

None

14.2 Multiple Facility Contingency

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

None

14.3 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 PROJE CT LOADIN G %	POST PROJE CT LOADIN G %	AC/D C	MW IMPAC T
100095560	214035	WHITPA N1	230.0	PECO	213906	PLYMT G 1	230.0	PECO	1	PECO_P2-2_WHI230B2/* \$ MONTCO \$ WHI230B2 \$ B	bus	519.0	100.01	100.87	DC	8.5
100095847	214035	WHITPA N1	230.0	PECO	213906	PLYMT G 1	230.0	PECO	1	PECO_P4_WHITP165/* \$ MONTCO \$ WHITP165 \$ STBK	breaker	519.0	100.01	100.87	DC	8.5
101787135	231124	GLASGO W	138.0	DP& L	231130	CECIL1 38	138.0	DP& L	1	PECO_P4_PEACH215/* \$ CHESCO \$ PEACH215 \$ STBK	breaker	378.0	114.48	120.2	DC	21.62
101787136	231124	GLASGO W	138.0	DP& L	231130	CECIL1 38	138.0	DP& L	1	PECO_P4_PEACH205/* \$ CHESCO \$ PEACH205 \$ STBK	breaker	378.0	112.47	118.19	DC	21.62

14.4 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 LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPACT
101787581	231124	GLASGOW	138.0	DP&L	231130	CECIL138	138.0	DP&L	1	PECO_P1 - 2_5014/* \$ CHESCO \$ 5014 \$ L	operation	378.0	112.45	118.16	DC	21.62

14.5 Flow Gate Details - Secondary POI

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".

14.5.1 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 IMPACT
100095847	214035	WHITPAN1	PECO	213906	PLYMTG1	PECO	1	PECO_P4_WHITP165/ * \$ MONTCO \$ WHITP165 \$ STBK	breaker	519.0	100.01	100.87	DC	8.5

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
214225	Y1-057 BAT	0.3791	50/50	0.3791
292070	V1-026 (Withdrawn : 07/07/2020)	-0.9245	Adder	-1.09
902401	W2-028 (Withdrawn : 07/07/2020)	-0.2311	Adder	-0.27
919901	AB1-000 1	-0.3897	Adder	-0.46
919911	AB1-000 2	-0.3897	Adder	-0.46
919921	AB1-000 3	-0.3897	Adder	-0.46
936911	AD2-115 C O1	0.6229	Adder	0.73
936912	AD2-115 E O1	0.3354	Adder	0.39
937561	AD2-077 C O1	24.0840	50/50	24.0840
937562	AD2-077 E O1	24.0840	50/50	24.0840
940271	AE2-010	-0.2244	Adder	-0.26
946701	AF1-334 C O1	0.5127	Adder	0.6
946702	AF1-334 E O1	0.3418	Adder	0.4
946721	AF1-336 C O1	0.5127	Adder	0.6
946722	AF1-336 E O1	0.3418	Adder	0.4
957361	AF2-030 C	0.1978	Adder	0.44
957362	AF2-030 E	0.2966	Adder	0.66
957443	AF2-038 BAT	0.9065	Merchant Transmission	0.9065
959173	AF2-208 BAT	4.5031	Merchant Transmission	4.5031
959812	AF2-272 E	0.0676	Adder	0.15
959862	AF2-277 E	0.0588	Adder	0.13
959902	AF2-281 E	0.0742	Adder	0.16
961372	AF2-428 E	0.0768	Adder	0.17
961382	AF2-429 E	0.0883	Adder	0.2
961392	AF2-430 E	0.0739	Adder	0.16
961402	AF2-431 E	0.0298	Adder	0.07
WEC	WEC	0.1068	Confirmed LTF	0.1068
LGEE	LGEE	0.1900	Confirmed LTF	0.1900
CPLE	CPLE	0.1488	Confirmed LTF	0.1488
VFT	VFT	3.2121	Confirmed LTF	3.2121
CBM-W2	CBM-W2	2.5962	Confirmed LTF	2.5962
CBM-W1	CBM-W1	4.3285	Confirmed LTF	4.3285
TVA	TVA	0.4228	Confirmed LTF	0.4228
CBM-S2	CBM-S2	1.4392	Confirmed LTF	1.4392
CBM-S1	CBM-S1	2.6242	Confirmed LTF	2.6242
G-007	G-007	0.0728	Confirmed LTF	0.0728
MEC	MEC	0.5260	Confirmed LTF	0.5260

14.5.2 Index 2

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 IMPACT
101787135	231124	GLASGO W	DP&L	231130	CECIL138	DP&L	1	PECO_P4_PEACH215/ * \$ CHESCO \$ PEACH215 \$ STBK	breaker	378.0	114.48	120.2	DC	21.62

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200062	SALEM G3	1.9750	Adder	2.32
231708	CHRIST3	0.9517	Adder	1.12
231902	DC CT7	1.0848	50/50	1.0848
231903	GEN4	1.0316	Adder	1.21
231904	DC1 NUG	3.1444	50/50	3.1444
231905	DC2 NUG	3.1444	50/50	3.1444
231906	DC3 NUG	1.3702	50/50	1.3702
231907	DC10	0.3388	50/50	0.3388
231915	DC CT6	1.0467	50/50	1.0467
232405	W1-003 E	0.3638	Adder	0.43
232407	W1-004 E	0.3638	Adder	0.43
232409	W1-005 E	0.3638	Adder	0.43
232411	W1-006 E	0.3638	Adder	0.43
232412	X1-032 E	0.3240	Adder	0.38
232416	X2-083	0.0546	50/50	0.0546
232418	X3-008 E	1.0574	Adder	1.24
232422	X3-066 FULL	0.0483	50/50	0.0483
232423	X3-066 E	0.4572	50/50	0.4572
232424	Y1-079 C	0.0757	50/50	0.0757
232425	Y1-079 E	0.7163	50/50	0.7163
232427	Y1-080 E	0.1755	Adder	0.21
232429	Y3-058 E	0.7590	Adder	0.89
232433	Z2-076 E	0.1606	Adder	0.19
232435	Z2-077 E	0.1606	Adder	0.19
232436	AB1-176 C	0.1856	50/50	0.1856
232922	MR3 (Deactivation : 01/06/2021)	7.5646	Adder	8.9
917082	Z2-012 E	1.0019	Adder	1.18
919831	AA2-069 (Suspended)	33.4473	Adder	39.35
923282	AB1-137 C	0.3347	Adder	0.39
923283	AB1-137 E	0.1434	Adder	0.17
923322	AB1-141 C OP	1.6670	50/50	1.6670
923323	AB1-141 E OP	0.7779	50/50	0.7779
923332	AB1-142 C OP	1.6670	50/50	1.6670
923603	AB1-176 E	0.3060	50/50	0.3060
923921	AB2-032 C	1.6793	50/50	1.6793
923922	AB2-032 E	0.7903	50/50	0.7903
923951	AB2-036 C	3.9842	50/50	3.9842
923952	AB2-036 E	6.5185	50/50	6.5185
923961	AB2-037 C	6.3826	Adder	7.51
923962	AB2-037 E	10.4268	Adder	12.27
924681	AB2-120 C OP	3.0698	Adder	3.61

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
924682	AB2-120 E OP	5.0086	Adder	5.89
924781	AB2-130 C OP	2.6140	Adder	3.08
924782	AB2-130 E OP	4.2649	Adder	5.02
924801	AB2-133 C OP	3.2088	50/50	3.2088
924802	AB2-133 E OP	4.0697	50/50	4.0697
924821	AB2-135 C	3.6915	50/50	3.6915
924822	AB2-135 E	4.2100	50/50	4.2100
924831	AB2-136 C	2.0852	Adder	2.45
924832	AB2-136 E	2.2114	Adder	2.6
924971	AB2-153 C	0.9384	50/50	0.9384
924972	AB2-153 E	1.5312	50/50	1.5312
925151	AB2-172 C OP	1.6202	Adder	1.91
925152	AB2-172 E OP	2.6434	Adder	3.11
925251	AB2-179 C OP	6.1901	50/50	6.1901
925252	AB2-179 E OP	2.0414	50/50	2.0414
925261	AB2-180 C	1.1425	Adder	1.34
925262	AB2-180 E	0.4897	Adder	0.58
925271	AB2-185 C OP	1.6174	50/50	1.6174
925272	AB2-185 E OP	0.6932	50/50	0.6932
926131	AC1-091 C	0.5588	Adder	0.66
926132	AC1-091 E	0.9165	Adder	1.08
926141	AC1-092 C	0.5588	Adder	0.66
926142	AC1-092 E	0.9165	Adder	1.08
926151	AC1-093 C	0.5290	Adder	0.62
926152	AC1-093 E	0.8718	Adder	1.03
926161	AC1-094 C	0.4471	Adder	0.53
926162	AC1-094 E	0.7377	Adder	0.87
927031	AC1-190 C	2.9774	Adder	3.5
927032	AC1-190 E	1.2760	Adder	1.5
927191	AC1-213 C	0.2598	Adder	0.31
927192	AC1-213 E	0.1705	Adder	0.2
930201	AB1-056 C	5.1165	Adder	6.02
930202	AB1-056 E	14.5710	Adder	17.14
930881	AB1-137 C	0.3347	Adder	0.39
930882	AB1-137 E	0.1434	Adder	0.17
930932	AB1-142 E OP	0.7779	50/50	0.7779
932082	AC2-018 E1	1.6551	Adder	1.95
932092	AC2-018 E2	1.6551	Adder	1.95
932161	AC2-023 C	2.1703	Adder	2.55
932162	AC2-023 E	1.5806	Adder	1.86
933631	AC2-185 C	1.1326	Adder	1.33
933632	AC2-185 E	1.8479	Adder	2.17
933641	AC2-186 C	1.5533	Adder	1.83
933642	AC2-186 E	2.5343	Adder	2.98
936451	AD2-059 C	0.0324	50/50	0.0324
936452	AD2-059 E	0.1015	50/50	0.1015
936611	AD2-076 C O1	2.3355	50/50	2.3355
936612	AD2-076 E O1	3.8106	50/50	3.8106
938651	AE1-087 C	1.3644	Adder	1.61
938652	AE1-087 E	0.3411	Adder	0.4
938811	AE1-107 C	4.9535	50/50	4.9535
938812	AE1-107 E	3.5314	50/50	3.5314

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
938891	AE1-117 C O1	3.3070	Adder	3.89
938892	AE1-117 E O1	8.8055	Adder	10.36
938901	AE1-118 C O1 (Withdrawn : 07/10/2020)	3.3074	Adder	3.89
938902	AE1-118 E O1 (Withdrawn : 07/10/2020)	8.8064	Adder	10.36
939151	AE1-145	1.6157	Adder	1.9
939621	AE1-192 C O1	3.7976	Adder	4.47
939622	AE1-192 E O1	1.8584	Adder	2.19
941021	AE2-093 C	1.7664	Adder	2.08
941022	AE2-093 E	2.8066	Adder	3.3
941181	AE2-112 C	0.8103	50/50	0.8103
941182	AE2-112 E	1.3220	50/50	1.3220
942441	AE2-257 C	2.6286	Adder	3.09
942442	AE2-257 E	6.9299	Adder	8.15
943361	AF1-007 C	0.1510	Adder	0.18
943362	AF1-007 E	0.4290	Adder	0.5
943441	AF1-015 C	0.5649	Adder	0.66
943442	AF1-015 E	0.7801	Adder	0.92
943651	AF1-036 C	1.0536	50/50	1.0536
943652	AF1-036 E	1.4550	50/50	1.4550
944921	AF1-157 C O1	1.2056	Adder	1.42
944922	AF1-157 E O1	0.8038	Adder	0.95
945661	AF1-231 C	0.6141	Adder	0.72
945662	AF1-231 E	0.9211	Adder	1.08
945781	AF1-243	0.4040	Adder	0.48
945791	AF1-244	0.6483	Adder	0.76
945931	AF1-258	0.2611	Adder	0.31
945941	AF1-259	0.0983	50/50	0.0983
946041	AF1-269 (Withdrawn : 05/12/2020)	0.9195	Adder	1.08
957611	AF2-055 C	1.4989	Adder	3.33
957612	AF2-055 E	0.6424	Adder	1.43
957661	AF2-060	0.3853	Adder	0.86
957671	AF2-061 O2	1.7123	Adder	3.8
958151	AF2-109 C	1.3044	50/50	1.3044
958152	AF2-109 E	1.3044	50/50	1.3044
959021	AF2-193 C O2	4.9600	Adder	11.01
959022	AF2-193 E O2	13.3794	Adder	29.7
959031	AF2-194 C O2	4.9600	Adder	11.01
959032	AF2-194 E O2	13.3794	Adder	29.7
959051	AF2-196 C	0.3799	Adder	0.84
959052	AF2-196 E	0.8865	Adder	1.97
959161	AF2-207 C O2	0.8681	Adder	1.93
959162	AF2-207 E O2	1.3021	Adder	2.89
959173	AF2-208 BAT	21.6196	50/50	21.6196
959571	AF2-248 C	0.1462	Adder	0.32
959572	AF2-248 E	0.1635	Adder	0.36
959581	AF2-249 C	0.0258	Adder	0.06
959582	AF2-249 E	0.1032	Adder	0.23
959591	AF2-250 C	0.0473	Adder	0.1

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959592	AF2-250 E	0.0366	Adder	0.08
960221	AF2-313 C	1.5608	50/50	1.5608
960222	AF2-313 E	0.8849	50/50	0.8849
960341	AF2-325 C	0.1881	Adder	0.42
960342	AF2-325 E	0.2598	Adder	0.58
960671	AF2-358 C O2	2.6962	Adder	5.98
960672	AF2-358 E O2	1.7975	Adder	3.99
960871	AF2-378 C	0.0496	Adder	0.11
960872	AF2-378 E	0.0688	Adder	0.15
960881	AF2-379 C	0.0705	Adder	0.16
960882	AF2-379 E	0.0972	Adder	0.22
960941	AF2-385 C O2	2.0552	Adder	4.56
960942	AF2-385 E O2	1.1695	Adder	2.6
960961	AF2-387 C O2	3.2680	Adder	7.25
960962	AF2-387 E O2	1.6389	Adder	3.64
961181	AF2-409 O2	4.4059	Adder	9.78
NEWTON	NEWTON	0.7006	Confirmed LTF	0.7006
FARMERCITY	FARMERCITY	0.0367	Confirmed LTF	0.0367
G-007A	G-007A	4.2124	Confirmed LTF	4.2124
VFT	VFT	9.6686	Confirmed LTF	9.6686
CALDERWOOD	CALDERWOOD	0.3390	Confirmed LTF	0.3390
PRAIRIE	PRAIRIE	1.6970	Confirmed LTF	1.6970
CHEOAH	CHEOAH	0.3418	Confirmed LTF	0.3418
EDWARDS	EDWARDS	0.2268	Confirmed LTF	0.2268
TILTON	TILTON	0.4082	Confirmed LTF	0.4082
GIBSON	GIBSON	0.3554	Confirmed LTF	0.3554
BLUEG	BLUEG	1.1301	Confirmed LTF	1.1301
TRIMBLE	TRIMBLE	0.3623	Confirmed LTF	0.3623
CATAWBA	CATAWBA	0.2478	Confirmed LTF	0.2478

14.6 Contingency Descriptions - Secondary POI

Contingency Name	Contingency Definition
PECO_P4_PEACH215/* \$ CHESCO \$ PEACH215 \$ STBK	CONTINGENCY 'PECO_P4_PEACH215/* \$ CHESCO \$ PEACH215 \$ STBK' TRIP BRANCH FROM BUS 200065 TO BUS 200051 CKT 1 /* PCHBTM2S 500.00 ROCKSPGS 500.00 \$ CHESCO \$ PEACH215 \$ STBK REMOVE MACHINE 1 FROM BUS 200034 /* PCHBTM 2 22.00 \$ CHESCO \$ PEACH215 \$ STBK END
PECO_P2-2_WHI230B2/* \$ MONTCO \$ WHI230B2 \$ B	CONTINGENCY 'PECO_P2-2_WHI230B2/* \$ MONTCO \$ WHI230B2 \$ B' DISCONNECT BUS 214036 /* WHITPAN2 230.00 \$ MONTCO \$ WHI230B2 \$ B END
PECO_P1-2_5014/* \$ CHESCO \$ 5014 \$ L	CONTINGENCY 'PECO_P1-2_5014/* \$ CHESCO \$ 5014 \$ L' TRIP BRANCH FROM BUS 200065 TO BUS 200051 CKT 1 /* PCHBTM2S 500.00 ROCKSPGS 500.00 \$ CHESCO \$ 5014 \$ L END
PECO_P4_PEACH205/* \$ CHESCO \$ PEACH205 \$ STBK	CONTINGENCY 'PECO_P4_PEACH205/* \$ CHESCO \$ PEACH205 \$ STBK' TRIP BRANCH FROM BUS 200065 TO BUS 200066 CKT 1 /* PCHBTM2S 500.00 PCHBTM1N 500.00 \$ CHESCO \$ PEACH205 \$ STBK TRIP BRANCH FROM BUS 200064 TO BUS 200065 CKT Z1 /* PCHBTM1S 500.00 PCHBTM2S 500.00 \$ CHESCO \$ PEACH205 \$ STBK TRIP BRANCH FROM BUS 200013 TO BUS 200066 CKT Z1 /* PCHBTM2N 500.00 PCHBTM1N 500.00 \$ CHESCO \$ PEACH205 \$ STBK TRIP BRANCH FROM BUS 200065 TO BUS 200051 CKT 1 /* PCHBTM2S 500.00 ROCKSPGS 500.00 \$ CHESCO \$ PEACH205 \$ STBK END
PECO_P4_WHITP165/* \$ MONTCO \$ WHITP165 \$ STBK	CONTINGENCY 'PECO_P4_WHITP165/* \$ MONTCO \$ WHITP165 \$ STBK' DISCONNECT BUS 214036 /* WHITPAN2 230.00 \$ MONTCO \$ WHITP165 \$ STBK DISCONNECT BUS 213828 /* N WALES9 230.00 \$ MONTCO \$ WHITP165 \$ STBK END

15 Affected Systems

None