Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-060

ELDRED 69 KV

25.7 MW Capacity / 174.8 MW Energy

May 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 PPL.

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.

The conduct of light load analysis as required under the PJM planning process is not performed during the Generation Interconnection Feasibility Study phase of the PJM study process. Additional reinforcement requirements for this Interconnection Request may be defined during the conduct of the light load analysis which shall be performed following execution of the System Impact Study agreement.

3 General

The Interconnection Customer (IC) has proposed a Wind generating facility located in Schuylkill County, Pennsylvania. The installed facilities will have a total capability of 174.8 MW with 25.7 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is May 31, 2022. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-060
Project Name	ELDRED 69 KV
State	Pennsylvania
County	Schuylkill
Transmission Owner	PPL
MFO	174.8
MWE	174.8
MWC	25.7
Fuel	Wind
Basecase Study Year	2024

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

4 Point of Interconnection

AG1-060 will interconnect with the PPL Transmission system at the Eldred 69 kV. The project will interconnect with the PPL EU transmission system via a new ~7.5 mile PPL EU express 69 kV line from the Eldred 69 kV substation to the customer site. The Point of Interconnection (POI) will be at the PPL EU owned dead-end structure where the Interconnection Customer's transmission line terminates (with insulators).

5 Cost Summary

The AG1-060 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$ 13,654,460
Total System Network Upgrade Costs	$ 242,700,000
Total Costs	$ 256,354,460

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

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

Description	Total Cost
Attachment Facilities	$ 893,364
Direct Connection Network Upgrade	$ 0
Non-Direct Connection Network Upgrades	$ 12,761,096
Total Costs	$ 13,654,460

PPL EU can accommodate this interconnection by constructing a new ~7.5 mile transmission line from the Eldred 69 kV substation Bay 3 to the customer site. PPL EU will use the existing Eldred – Pine Grove 69 kV line right-of-way corridor for the new circuit. PPL EU will rebuild the Eldred-Pine Grove 69 kV line as double circuit to accommodate the express feeder.

Risks and Assumptions

- No major environmental, real estate, or permitting issues.
- IC is responsible for acquisition of easements, permits, and right of way for any Direct Connection Network Upgrades and Attachment Facilities per PPL EU standards and requirements.
- PPL EU will perform all grading, site preparation, and establish access roads for the PPL EU owned Attachment Facilities per PPL EU standards and requirements.
- The existing 36F OPGW must remain in service during construction as it carries DTT from another IPP, EU-Net and AMI traffic.
- Metering will be owned by the IC and located in the IC substation.
- Outage coordination will be assessed during the Facilities Study Phase.
- PPL EU will require permanent access to the motor operated switch.

6.1 Attachment Facilities

69 kV Transmission Line Tap

PPL EU will tap the new 69 kV line at or near GPS Coordinates: 40.641821, -76.437340. PPL EU will extend the tap towards the IC substation. PPL EU will install a motor operated switch and POI structure. The IC must build the remainder of the Attachment Facilities from the POI termination structure to the IC substation. The IC is responsible for procuring 100 ft. ROW for these facilities. For the purposes of this Feasibility Study Report cost estimate, PPL EU is assuming all engineering and construction responsibility for land development activities, including grading, site preparation, and new access road. During the Facilities Study phase, PPL EU and the IC will review land development activities, and the IC may choose to perform some, or all, of these activities. The cost estimate will be updated accordingly and included in the Facilities Study Report.

PPL EU work will consist of installing the following:

- Install one (1) new direct-embed, steel, motor operated switch structure one span before the POI with a rating of 2000A (not 1200A).
- Install one (1) new direct-embed, steel, dead-end tension structure (POI structure).

The total preliminary cost estimate for the Attachment work is given in the table below.

Description	Total Cost
69 kV Tap line, Motor Operated Switch, structures, and foundations	$ 868,964
IC substation facility acceptance, testing, commissioning, & telemetry coordination	$ 24,400
Total Attachment Facility Costs	$ 893,364

6.2 Direct Connection Cost Estimate

None.

6.3 Non-Direct Connection Cost Estimate

The 69 kV Eldred substation will require an expansion to support this project's interconnection, resulting in a (2) bus and (1) circuit breaker arrangement.

Eldred 69 kV Substation Expansion – Physical Electrical Work

- Construct one (1) new 69 kV bay as a double bus and single breaker arrangement at the Eldred 230/69 kV substation by utilizing the existing Bay 3. The IC line will terminate in Bay 3 populated with 69 kV equipment.
- Include all required grounding, cabling, raceway and bus work. Also add in the control cubicle with protection, control and SCADA equipment, yard lighting.

Rebuild Eldred – Pine Grove 69 kV Line as double circuit from the Eldred 69 kV Substation to the POI

- Rebuild ~7.5 miles of the Eldred – Pine Grove 69 kV line from Eldred 69 kV substation to the POI from single circuit to double circuit. This will be a pole for pole replacement with the addition of a second circuit.
- Install 556.5 kcmil conductor on existing circuit (Eldred – Pine Grove 69 kV).
- Install 1590 kcmil 45/7 conductor on new circuit (Eldred to POI).
- The new circuit feeding the IC will be connected to Bay 3 at the Eldred 69 kV substation.
- Install 48-ct OPGW along the new circuit from the Eldred substation to the POI, including splice boxes where necessary.

The total preliminary cost estimate for the Non-Direct Connection work is given in the table below.

Description	Total Cost
Eldred 69 kV Substation Expansion	$ 1,604,060
Rebuild Eldred – Pine Grove 69 kV Line from Eldred 69 kV Substation to the Project POI	$ 11,157,036
Total Non-Direct Connection Facility Costs	$ 12,761,096

7 Schedule

The estimated time to complete the scope of work is 20-24 months after the PJM three-party Interconnection Service Agreement (ISA) and Interconnection Construction Service Agreement (ICSA) are signed and PPL EU receives Notice to Proceed from the IC.

8 Transmission Owner Analysis

The Transmission Owner identified the violations on the facilities below. The violations will be evaluated further in the System Impact Study. Please refer to the System Reinforcement section of this report for mitigation measures.

FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type
208072	SIEG	138	PPL	211161	SIEG	230	PPL	4	PL:20:P42:102406 PL:20:P42:102399 PL:20:P42:001097	Breaker
208109	SUNB	500	PPL	200021	SUNBURY	230	PPL	24/25	PL:08:P42:000925 PL:08:P42:001375 PL:08:P42:000921 PL:08:P42:000924 PL:08:P42:101477	Breaker

9 Interconnection Customer Requirements

PPL EU applicable technical standards that address requirements for interconnection of generation, transmission, and end user facilities can be found at the following link:
https://pjm.com/planning/design-engineering/to-tech-standards/private-ppl.aspx

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

- Wind speed (meters/second) - (Required)
- Wind direction (decimal degrees from true north) - (Required)
- Ambient air temperature (Fahrenheit) - (Required)
- Air Pressure (Hectopascals) - (Required)
- Humidity (Percent) (Accepted, not required)

10.3 Interconnected Transmission Owner Requirements

Installation of revenue grade Bi-directional Metering Equipment will be required in the vicinity of the POI to measure kWh and kVARh. PPL EU will design and supply the required metering equipment; all installation costs would be borne by the IC including CTs/PTs. All metering equipment must meet applicable PPL EU tariff requirements as well as being compliant with all applicable requirements of the PJM agreements. The equipment must provide bidirectional revenue metering (kWh and kVARh) and real-time data (kW, kVAR, circuit breaker status, and generator bus voltages) for the IC's generating resource. The metering equipment should be housed in a control cabinet or similar enclosure and must be accessible to PPL EU metering personnel.

11 Summer Peak - Load Flow Analysis

The Queue Project AG1-060 was evaluated as a 174.8 MW (Capacity 25.7 MW) injection at the Eldred 69 kV in the PPL area. Project AG1-060 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-060 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 PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
164851535	207915	GLBR	230.0	PPL	208120	SU10	230.0	PPL	1	PL:48:P71:102649	tower	801.0	140.64	142.29	DC	30.01
164851614	207973	FRAC	230.0	PPL	938390	AE1-058_TAP	230.0	PPL	1	PL:48:P71:102415	tower	628.0	109.09	115.75	DC	41.83
164851615	207973	FRAC	230.0	PPL	938390	AE1-058_TAP	230.0	PPL	1	PL:08:P71:101751	tower	628.0	105.88	113.41	DC	47.26
164851718	208025	MACR	230.0	PPL	206263	28MO PARK	230.0	JCP&L	1	JC-P7-1-JCN-230-17T	tower	1431.0	100.12	100.52	DC	14.52
164851598	208120	SU10	230.0	PPL	208113	SUSQ	230.0	PPL	1	PL:48:P71:102649	tower	801.0	116.57	117.8	DC	22.27
164851562	938390	AE1-058_TAP	230.0	PPL	208072	SIEG	230.0	PPL	1	PL:48:P71:102415	tower	628.0	137.23	140.23	DC	41.83
164851563	938390	AE1-058_TAP	230.0	PPL	208072	SIEG	230.0	PPL	1	PL:08:P71:101751	tower	628.0	136.87	140.26	DC	47.26
169543819	938390	AE1-058_TAP	230.0	PPL	208072	SIEG	230.0	PPL	1	PL:18:P12:000083	single	628.0	126.39	127.51	DC	7.02
169543820	938390	AE1-058_TAP	230.0	PPL	208072	SIEG	230.0	PPL	1	Base Case	single	513.0	124.86	126.05	DC	6.1

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
167567275	200021	SUNBURY	500.0	PPL	200009	JUNIATA	500.0	PPL	1	PL:28:P12:000080	operation	3112.0	106.25	107.43	DC	82.25
167567295	200022	SUSQUEHANNA	500.0	PPL	200023	WESCOSVILLE	500.0	PPL	1	PL:18:P12:000083	operation	3112.0	107.6	107.86	DC	56.11
167567238	200023	WESCOSVILLE	500.0	PPL	200075	BREINIGSVILL	500.0	PPL	1	PL:18:P12:000083	operation	3112.0	112.53	113.14	DC	68.52
167567144	207915	GLBR	230.0	PPL	208120	SU10	230.0	PPL	1	PL:48:P12:101741	operation	801.0	119.77	121.43	DC	30.2
167567158	207915	GLBR	230.0	PPL	208113	SUSQ	230.0	PPL	1	PL:08:P12:101740	operation	801.0	117.37	119.0	DC	29.64
167567106	207964	ELDR	230.0	PPL	208109	SUNB	230.0	PPL	1	208072 SIEG 230 938390 AE1-058_TAP 230 1	operation	456.0	108.1	132.14	DC	109.63
167567309	207964	ELDR	230.0	PPL	207975	FRAC TR3	230.0	PPL	1	PL:08:P12:000218	operation	456.0	93.63	106.71	DC	59.63
167567252	207973	FRAC	230.0	PPL	938390	AE1-058_TAP	230.0	PPL	1	PL:18:P12:000083	operation	628.0	101.48	109.08	DC	47.76
167567253	207973	FRAC	230.0	PPL	938390	AE1-058_TAP	230.0	PPL	1	Base Case	operation	513.0	100.17	108.25	DC	41.47
167567337	208040	MONT	230.0	PPL	207915	GLBR	230.0	PPL	1	PL:08:P12:101739	operation	801.0	100.54	101.8	DC	23.97
167567344	208040	MONT	230.0	PPL	207915	GLBR	230.0	PPL	2	PL:08:P12:101738	operation	801.0	100.24	101.49	DC	23.9
167567203	208109	SUNB	230.0	PPL	200021	SUNBURY	500.0	PPL	24	PL:08:P13:101349	operation	1097.0	111.53	115.92	DC	73.03
167567204	208109	SUNB	230.0	PPL	200021	SUNBURY	500.0	PPL	24	Base Case	operation	771.0	96.66	100.46	DC	44.49
167567249	208109	SUNB	230.0	PPL	200021	SUNBURY	500.0	PPL	25	PL:08:P13:100456	operation	1165.0	105.06	109.2	DC	73.06
169543817	938390	AE1-058_TAP	230.0	PPL	208072	SIEG	230.0	PPL	1	Base Case	operation	513.0	135.69	139.34	DC	41.47
169543818	938390	AE1-058_TAP	230.0	PPL	208072	SIEG	230.0	PPL	1	PL:18:P12:000083	operation	628.0	132.65	136.08	DC	47.76

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Index	Facility	Upgrade Description	Cost
169543819, 164851563, 164851562, 169543820	5	AE1-058 TAP 230.0 kV - SIEG 230.0 kV Ckt 1	R-PL-0003C (2418) : Rebuild 35.5 miles of the SIEG-FRAC 230kV line from AE1-058 switchyard cut-in to Siegfried substation as 230kV single circuit (ACSS). Project Type : FAC Cost : $78,200,000 Time Estimate : 72.0 Months	$78,200,000
164851535	1	BETA 230.0 kV - SU10 230.0 kV Ckt 1	R-PL-0014 (2424) : Construct a new (4 miles) 230kV single circuit line from GLBR to SU10 yard. Re-terminate GLBR-SUSQ 230kV line into SU10 yard and rebuild the GLBR-SUSQ line (2.7 miles) from the new termination in T10 yard to Susquehanna 230kV yard. Project Type : CON Cost : $22,400,000 Time Estimate : 36.0 Months	$22,400,000
164851718	3	MACR 230.0 kV - 28MO PARK 230.0 kV Ckt 1	R-PL-0020 (2430) : Break the SUSQ-WESC 500kV line at Siegfried substation. Build a new 500kV yard with one 500/230kV Transformer at Siegfried substation. Project Type : CON Cost : $40,300,000 Time Estimate : 48.0 Months	$40,300,000
164851615, 164851614	2	FRAC 230.0 kV - AE1-058 TAP 230.0 kV Ckt 1	R-PL-0003B (2417) : Rebuild FRAC-AE1-058 yard 230kV line. Project Type : FAC Cost : $12,200,000 Time Estimate : 30.0 Months	$12,200,000
164851598	4	SU10 230.0 kV - SUSQ 230.0 kV Ckt 1	R-PL-0018 (2428) : Rebuild SUSQ-SU10 230kV line. Project Type : FAC Cost : $22,300,000 Time Estimate : 36.0 Months	$22,300,000
N/A	N/A	208072 SIEG 230.0 kV - 211161 SIEG 138.0 kV Ckt Id 4 208072 SIEG 230.0 kV - 211161 SIEG 138.0 kV Ckt Id 5 208025 MACR 230.0 kV - 206263 28MO PARK 230.0 kV Ckt Id 1 208091 SFLD 230.0 kV - 204686 27HOSNSACK 230.0 kV Ckt Id	R-PL-0020: Break the SUSQ-WESC 500kV line at Siegfried substation. Build a new 500kV yard with one 500/230kV Transformer at Siegfried substation. Project Type : CON Cost : $40,300,000 Time Estimate : 48.0 Months	$40,300,000

ID	Index	Facility	Upgrade Description	Cost
N/A	N/A	**208109 SUNB 230.0 kV - 200021 SUNBURY 500.0 kV Ckt Id 24** **208109 SUNB 230.0 kV - 200021 SUNBURY 500.0 kV Ckt Id 25**	**R-PL-0026: Re-terminate the SUNB 500/230 kV Transformers at Sunbury into double breaker double bus arrangement in the 500kV yard. In the SUNB 230kV yard, re-terminate T24 into a breaker and half position with the SUNB-ELIM line and make the T25 bay double breaker double bus arrangement.** **Project Type : CON** **Cost : $27,000,000** **Time Estimate : 36.0 Months**	$27,000,000
			TOTAL COST	**$242,700,000**

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
164851535	207915	GLBR	PPL	208120	SU10	PPL	1	PL:48:P71:102649	tower	801.0	140.64	142.29	DC	30.01

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
208911	MONT G1	41.5535	50/50	41.5535
208912	**MONT G2 (Deactivation : 18/02/2019)**	**41.5207**	**50/50**	**41.5207**
208945	LOHA CT	0.5863	50/50	0.5863
208948	WILL CT	1.2207	50/50	1.2207
209013	SCEN IPP	2.4754	50/50	2.4754
209022	**WHFR IPP (Deactivation : 03/03/2020 WD - 01/03/2020)**	**6.6682**	**Adder**	**7.84**
211375	BEAC	-2.0879	Adder	-2.46
212005	ALWD	0.1426	50/50	0.1426
212369	PATRIOT 1	18.9247	50/50	18.9247
212370	PATRIOT 2	18.9247	50/50	18.9247
212435	SMIL	0.0768	50/50	0.0768
923674	AB1-182 BAT	2.5706	Merchant Transmission	2.5706
938392	AE1-058_GEN1	34.4442	Adder	40.52
938393	AE1-058_GEN2	34.4442	Adder	40.52
939891	AE1-225 C O1	1.2561	Adder	1.48
939892	AE1-225 E O1	1.3897	Adder	1.63
940561	AE2-042 C	11.3850	50/50	11.3850
940562	AE2-042 E	5.6439	50/50	5.6439
940593	AE2-046 BAT	3.6846	Merchant Transmission	3.6846
940721	AE2-059 C	2.0435	50/50	2.0435
940722	AE2-059 E	2.8219	50/50	2.8219
940941	AE2-084 C	2.0435	50/50	2.0435
940942	AE2-084 E	2.8219	50/50	2.8219
941161	AE2-110 C	2.5161	50/50	2.5161
941162	AE2-110 E	3.4747	50/50	3.4747
941171	AE2-111 C	1.1225	Adder	1.32
941172	AE2-111 E	1.5501	Adder	1.82
941371	AE2-133 C	1.1225	Adder	1.32
941372	AE2-133 E	1.5501	Adder	1.82
942281	AE2-241 C	2.5161	50/50	2.5161
942282	AE2-241 E	3.4747	50/50	3.4747
942561	AE2-271 C	21.1678	50/50	21.1678
942562	AE2-271 E	14.1118	50/50	14.1118
942771	AE2-295 C	3.7506	Adder	4.41
942772	AE2-295 E	21.7591	Adder	25.6
943721	AF1-040 C	0.1336	Adder	0.16
943722	AF1-040 E	2.5389	Adder	2.99
945511	AF1-216 C1O1	11.7954	50/50	11.7954
945512	AF1-216 E1O1	7.8544	50/50	7.8544
945521	AF1-216 C2O1	11.7949	50/50	11.7949
945522	AF1-216 E2O1	7.8541	50/50	7.8541

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945611	AF1-226 C	4.4032	50/50	4.4032
945612	AF1-226 E	6.0807	50/50	6.0807
946471	AF1-311 C O1	19.7927	50/50	19.7927
946472	AF1-311 E O1	32.2933	50/50	32.2933
946691	AF1-333 C O1	2.3514	50/50	2.3514
946692	AF1-333 E O1	1.5676	50/50	1.5676
946731	AF1-337 C	2.3514	50/50	2.3514
946732	AF1-337 E	1.5676	50/50	1.5676
946741	AF1-338 C	2.3514	50/50	2.3514
946742	AF1-338 E	1.5676	50/50	1.5676
946751	AF1-339 C O1	2.3514	50/50	2.3514
946752	AF1-339 E O1	1.5676	50/50	1.5676
946761	AF1-271AC	1.3630	Adder	1.6
946762	AF1-271AE	0.9087	Adder	1.07
957621	AF2-056 C	5.1174	Adder	6.02
957622	AF2-056 E	2.6363	Adder	3.1
957881	AF2-082 C	4.4097	Adder	5.19
957882	AF2-082 E	2.9398	Adder	3.46
957921	AF2-086 C	3.5945	50/50	3.5945
957922	AF2-086 E	2.3963	50/50	2.3963
958461	AF2-140	9.4080	50/50	9.4080
958511	AF2-145 C1	4.2018	50/50	4.2018
958512	AF2-145 E1	2.8012	50/50	2.8012
958521	AF2-145 C2	4.2017	50/50	4.2017
958522	AF2-145 E2	2.8011	50/50	2.8011
959121	AF2-203 C	3.5945	50/50	3.5945
959122	AF2-203 E	2.3963	50/50	2.3963
959411	AF2-232 C	7.1890	50/50	7.1890
959412	AF2-232 E	4.7926	50/50	4.7926
959421	AF2-233 C	1.6035	Adder	1.89
959422	AF2-233 E	1.0690	Adder	1.26
959431	AF2-234 C	3.2071	Adder	3.77
959432	AF2-234 E	2.1381	Adder	2.52
959932	AF2-284 E	0.6154	50/50	0.6154
959982	AF2-289 E	0.9231	50/50	0.9231
959992	AF2-290 E	0.4865	50/50	0.4865
960401	AF2-331 C	10.4172	50/50	10.4172
960402	AF2-331 E	6.9448	50/50	6.9448
960411	AF2-332 C	10.4172	50/50	10.4172
960412	AF2-332 E	6.9448	50/50	6.9448
960421	AF2-333 C	4.1669	50/50	4.1669
960422	AF2-333 E	2.7779	50/50	2.7779
960431	AF2-334 C	4.1669	50/50	4.1669
960432	AF2-334 E	2.7779	50/50	2.7779
961271	AF2-418 C	3.5945	50/50	3.5945
961272	AF2-418 E	2.3963	50/50	2.3963
961331	AF2-424 C	1.7512	Adder	2.06
961332	AF2-424 E	1.1675	Adder	1.37
961341	AF2-425 C	1.7512	Adder	2.06
961342	AF2-425 E	1.1675	Adder	1.37
961362	AF2-427 E	0.9231	50/50	0.9231
961412	AF2-432 E	0.5991	50/50	0.5991

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
961421	AF2-433 C O1	3.5945	50/50	3.5945
961422	AF2-433 E O1	2.3963	50/50	2.3963
961431	AF2-434 C O1	3.5945	50/50	3.5945
961432	AF2-434 E O1	2.3963	50/50	2.3963
961531	AF2-444 C	1.7221	Adder	2.03
961532	AF2-444 E	1.1675	Adder	1.37
961541	AF2-445AC	1.8299	Adder	2.15
961542	AF2-445AE	1.2406	Adder	1.46
962061	AG1-050	4.8654	50/50	4.8654
962151	AG1-060 C	1.9878	Adder	4.41
962152	AG1-060 E	11.5323	Adder	25.6
963551	AG1-204 C	4.4321	50/50	4.4321
963552	AG1-204 E	2.3865	50/50	2.3865
963751	AG1-227 C	0.9863	Adder	2.19
963752	AG1-227 E	0.6575	Adder	1.46
963761	AG1-228 C	0.9863	Adder	2.19
963762	AG1-228 E	0.6575	Adder	1.46
963911	AG1-244 C	0.4604	Adder	1.02
963912	AG1-244 E	0.2479	Adder	0.55
964051	AG1-259 C	0.5878	Adder	1.3
964052	AG1-259 E	0.8215	Adder	1.82
964061	AG1-260 C	0.5878	Adder	1.3
964062	AG1-260 E	0.8215	Adder	1.82
964163	AG1-277 BAT	1.3019	Merchant Transmission	1.3019
964173	AG1-278 BAT	0.2226	Merchant Transmission	0.2226
964183	AG1-279 BAT	0.2226	Merchant Transmission	0.2226
964671	AG1-330 C	0.3187	Adder	0.71
964672	AG1-330 E	0.0354	Adder	0.08
964731	AG1-336 C	0.2762	Adder	0.61
964732	AG1-336 E	0.0779	Adder	0.17
964741	AG1-337 C	0.2691	Adder	0.6
964742	AG1-337 E	0.0850	Adder	0.19
965311	AG1-396 C	0.2833	Adder	0.63
965312	AG1-396 E	0.2479	Adder	0.55
966351	AG1-504 C O1	28.0244	50/50	28.0244
966352	AG1-504 E O1	18.3420	50/50	18.3420
CALDERWOOD	CALDERWOOD	0.0477	Confirmed LTF	0.0477
NY	NY	1.3007	Confirmed LTF	1.3007
PRAIRIE	PRAIRIE	0.2299	Confirmed LTF	0.2299
O-066	O-066	12.7870	Confirmed LTF	12.7870
SIGE	SIGE	0.1904	Confirmed LTF	0.1904
CHEOAH	CHEOAH	0.0480	Confirmed LTF	0.0480
COTTONWOOD	COTTONWOOD	0.1953	Confirmed LTF	0.1953
G-007	G-007	1.7241	Confirmed LTF	1.7241
HAMLET	HAMLET	0.0635	Confirmed LTF	0.0635
GIBSON	GIBSON	0.0470	Confirmed LTF	0.0470
BLUEG	BLUEG	0.1493	Confirmed LTF	0.1493
TRIMBLE	TRIMBLE	0.0473	Confirmed LTF	0.0473
CATAWBA	CATAWBA	0.0367	Confirmed LTF	0.0367

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
164851614	207973	FRAC	PPL	938390	AE1-058_TAP	PPL	1	PL:48:P71:102415	tower	628.0	109.09	115.75	DC	41.83

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
208941	FISH CT	1.3735	50/50	1.3735
208981	FOWH IPP	1.6123	50/50	1.6123
208982	GLBT IPP	4.0225	50/50	4.0225
209013	SCEN IPP	4.2187	50/50	4.2187
209021	WEST IPP	1.2272	50/50	1.2272
209022	**WHFR IPP (Deactivation : 03/03/2020 WD - 01/03/2020)**	**13.3700**	**50/50**	**13.3700**
209027	LOR2_Q27	0.5592	50/50	0.5592
211375	BEAC	-2.8062	Adder	-3.3
212099	COLA IPP	0.3021	50/50	0.3021
212174	INGE	0.2303	50/50	0.2303
212266	LOR1	0.1717	50/50	0.1717
935083	**AD1-143 BAT1 (Suspended)**	**0.7480**	**50/50**	**0.7480**
935103	**AD1-143 BAT2 (Suspended)**	**0.7480**	**50/50**	**0.7480**
939891	AE1-225 C O1	0.7426	Adder	0.87
939892	AE1-225 E O1	0.8216	Adder	0.97
940561	AE2-042 C	4.1204	Adder	4.85
940562	AE2-042 E	2.0426	Adder	2.4
940593	AE2-046 BAT	4.9521	50/50	4.9521
940721	AE2-059 C	0.7396	Adder	0.87
940722	AE2-059 E	1.0213	Adder	1.2
940941	AE2-084 C	0.7396	Adder	0.87
940942	AE2-084 E	1.0213	Adder	1.2
941161	AE2-110 C	1.4528	50/50	1.4528
941162	AE2-110 E	2.0062	50/50	2.0062
941171	AE2-111 C	0.6636	Adder	0.78
941172	AE2-111 E	0.9164	Adder	1.08
941371	AE2-133 C	0.6636	Adder	0.78
941372	AE2-133 E	0.9164	Adder	1.08
942281	AE2-241 C	1.4528	50/50	1.4528
942282	AE2-241 E	2.0062	50/50	2.0062
942561	AE2-271 C	6.0335	Adder	7.1
942562	AE2-271 E	4.0223	Adder	4.73
942771	AE2-295 C	6.1508	50/50	6.1508
942772	AE2-295 E	35.6841	50/50	35.6841
943721	AF1-040 C	0.0790	Adder	0.09
943722	AF1-040 E	1.5010	Adder	1.77
945511	AF1-216 C1O1	3.9231	Adder	4.62
945512	AF1-216 E1O1	2.6124	Adder	3.07
945521	AF1-216 C2O1	3.9231	Adder	4.62

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945522	AF1-216 E2O1	2.6124	Adder	3.07
945611	AF1-226 C	2.5424	50/50	2.5424
945612	AF1-226 E	3.5109	50/50	3.5109
946471	AF1-311 C O1	5.6415	Adder	6.64
946472	AF1-311 E O1	9.2046	Adder	10.83
946691	AF1-333 C O1	0.9968	Adder	1.17
946692	AF1-333 E O1	0.6646	Adder	0.78
946731	AF1-337 C	0.9968	Adder	1.17
946732	AF1-337 E	0.6646	Adder	0.78
946741	AF1-338 C	0.9968	Adder	1.17
946742	AF1-338 E	0.6646	Adder	0.78
946751	AF1-339 C O1	0.9968	Adder	1.17
946752	AF1-339 E O1	0.6646	Adder	0.78
946761	AF1-271AC	0.8058	Adder	0.95
946762	AF1-271AE	0.5372	Adder	0.63
957621	AF2-056 C	10.2607	50/50	10.2607
957622	AF2-056 E	5.2858	50/50	5.2858
957881	AF2-082 C	2.6070	Adder	3.07
957882	AF2-082 E	1.7380	Adder	2.04
957921	AF2-086 C	2.0754	50/50	2.0754
957922	AF2-086 E	1.3836	50/50	1.3836
958461	AF2-140	2.8631	Adder	3.37
958511	AF2-145 C1	1.3975	Adder	1.64
958512	AF2-145 E1	0.9317	Adder	1.1
958521	AF2-145 C2	1.3975	Adder	1.64
958522	AF2-145 E2	0.9317	Adder	1.1
959121	AF2-203 C	2.0754	50/50	2.0754
959122	AF2-203 E	1.3836	50/50	1.3836
959411	AF2-232 C	4.1508	50/50	4.1508
959412	AF2-232 E	2.7672	50/50	2.7672
959421	AF2-233 C	0.9480	Adder	1.12
959422	AF2-233 E	0.6320	Adder	0.74
959431	AF2-234 C	1.8960	Adder	2.23
959432	AF2-234 E	1.2640	Adder	1.49
959932	AF2-284 E	0.1896	Adder	0.22
959982	AF2-289 E	0.2845	Adder	0.33
959992	AF2-290 E	0.1761	Adder	0.21
960401	AF2-331 C	2.9692	Adder	3.49
960402	AF2-331 E	1.9795	Adder	2.33
960411	AF2-332 C	2.9692	Adder	3.49
960412	AF2-332 E	1.9795	Adder	2.33
960421	AF2-333 C	1.1877	Adder	1.4
960422	AF2-333 E	0.7918	Adder	0.93
960431	AF2-334 C	1.1877	Adder	1.4
960432	AF2-334 E	0.7918	Adder	0.93
961271	AF2-418 C	2.0754	50/50	2.0754
961272	AF2-418 E	1.3836	50/50	1.3836
961331	AF2-424 C	2.8720	50/50	2.8720
961332	AF2-424 E	1.9146	50/50	1.9146
961341	AF2-425 C	2.8720	50/50	2.8720
961342	AF2-425 E	1.9146	50/50	1.9146
961362	AF2-427 E	0.2845	Adder	0.33

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
961412	AF2-432 E	0.3459	50/50	0.3459
961421	AF2-433 C O1	2.0754	50/50	2.0754
961422	AF2-433 E O1	1.3836	50/50	1.3836
961431	AF2-434 C O1	2.0754	50/50	2.0754
961432	AF2-434 E O1	1.3836	50/50	1.3836
961531	AF2-444 C	2.8241	50/50	2.8241
961532	AF2-444 E	1.9146	50/50	1.9146
961541	AF2-445AC	3.6690	50/50	3.6690
961542	AF2-445AE	2.4874	50/50	2.4874
962061	AG1-050	0.9333	Adder	2.07
962151	AG1-060 C	6.1508	50/50	6.1508
962152	AG1-060 E	35.6841	50/50	35.6841
963751	AG1-227 C	3.7312	50/50	3.7312
963752	AG1-227 E	2.4874	50/50	2.4874
963761	AG1-228 C	3.7312	50/50	3.7312
963762	AG1-228 E	2.4874	50/50	2.4874
963911	AG1-244 C	0.2722	Adder	0.6
963912	AG1-244 E	0.1465	Adder	0.33
964051	AG1-259 C	0.3475	Adder	0.77
964052	AG1-259 E	0.4857	Adder	1.08
964061	AG1-260 C	0.3475	Adder	0.77
964062	AG1-260 E	0.4857	Adder	1.08
964073	AG1-262 BAT	4.3296	Merchant Transmission	4.3296
964093	AG1-267 BAT	0.9868	Merchant Transmission	0.9868
964163	AG1-277 BAT	3.3014	50/50	3.3014
964173	AG1-278 BAT	0.5645	50/50	0.5645
964183	AG1-279 BAT	0.5645	50/50	0.5645
964671	AG1-330 C	0.1884	Adder	0.42
964672	AG1-330 E	0.0209	Adder	0.05
964731	AG1-336 C	0.1633	Adder	0.36
964732	AG1-336 E	0.0461	Adder	0.1
964741	AG1-337 C	0.1591	Adder	0.35
964742	AG1-337 E	0.0502	Adder	0.11
965311	AG1-396 C	0.1675	Adder	0.37
965312	AG1-396 E	0.1465	Adder	0.33
WEC	WEC	0.0621	Confirmed LTF	0.0621
LGEE	LGEE	0.1200	Confirmed LTF	0.1200
CPLE	CPLE	0.0648	Confirmed LTF	0.0648
CBM-W2	CBM-W2	1.5859	Confirmed LTF	1.5859
NY	NY	0.3307	Confirmed LTF	0.3307
TVA	TVA	0.2296	Confirmed LTF	0.2296
O-066	O-066	15.6742	Confirmed LTF	15.6742
SIGE	SIGE	0.2645	Confirmed LTF	0.2645
CBM-S2	CBM-S2	1.2215	Confirmed LTF	1.2215
CBM-S1	CBM-S1	0.0642	Confirmed LTF	0.0642
G-007	G-007	2.0527	Confirmed LTF	2.0527
MEC	MEC	0.3019	Confirmed LTF	0.3019
LAGN	LAGN	0.2923	Confirmed LTF	0.2923
CBM-W1	CBM-W1	2.8461	Confirmed LTF	2.8461

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
164851718	208025	MACR	PPL	206263	28MO PARK	JCP&L	1	JC-P7-1-JCN-230-17T	tower	1431.0	100.12	100.52	DC	14.52

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
204661	27PORT 5CT	5.3081	50/50	5.3081
206338	28KITTGEN2	4.5640	50/50	4.5640
206339	28KITTGEN3	4.5640	50/50	4.5640
206617	28EXXON	-0.9691	Adder	-1.14
206638	28PEAPACK	-0.4003	Adder	-0.47
206679	28M&M S721	-0.9570	Adder	-1.13
207403	AA2-082 BAT	5.1558	50/50	5.1558
208905	LMBE CT1	9.6419	50/50	9.6419
208906	LMBE CT2	9.6419	50/50	9.6419
208908	LMBE ST1	11.5607	50/50	11.5607
208909	MACR G3	40.9781	50/50	40.9781
208910	MACR G4	40.9781	50/50	40.9781
208943	HARW CT	2.4433	Adder	2.87
208946	MACR CT	2.9751	50/50	2.9751
209006	**NEPC IPP (Deactivation : 24/10/2018)**	**2.1559**	**Adder**	**2.54**
209022	**WHFR IPP (Deactivation : 03/03/2020 WD - 01/03/2020)**	**3.5983**	**Adder**	**4.23**
209028	**N31 IPP (Deactivation : 31/08/2019)**	**0.8186**	**Adder**	**0.96**
211369	W1-111 BAT	0.0090	Adder	0.01
211375	BEAC	1.7966	Adder	2.11
905542	W4-064 E	0.1293	Adder	0.15
921662	**AA2-017 C (Suspended)**	**1.9076**	**Adder**	**2.24**
921663	**AA2-017 E (Suspended)**	**12.8124**	**Adder**	**15.07**
933323	**AC2-144 BAT (Suspended)**	**0.0331**	**Merchant Transmission**	**0.0331**
935071	**AD1-143 C1 (Suspended)**	**0.9827**	**Adder**	**1.16**
935072	**AD1-143 E1 (Suspended)**	**5.8894**	**Adder**	**6.93**
935081	**AD1-143 C2 (Suspended)**	**0.0344**	**Adder**	**0.04**
935082	**AD1-143 E2 (Suspended)**	**0.8246**	**Adder**	**0.97**
935091	**AD1-143 C3 (Suspended)**	**0.9827**	**Adder**	**1.16**
935092	**AD1-143 E3 (Suspended)**	**5.8894**	**Adder**	**6.93**
935101	**AD1-143 C4 (Suspended)**	**0.0344**	**Adder**	**0.04**
935102	**AD1-143 E4 (Suspended)**	**0.8246**	**Adder**	**0.97**
937523	AD2-213 BAT	1.6696	Merchant Transmission	1.6696
937563	AD2-077 BAT	16.4420	Merchant Transmission	16.4420
938392	AE1-058_GEN1	24.7486	Adder	29.12
938393	AE1-058_GEN2	24.7486	Adder	29.12
938412	AE1-060 E	1.9827	Adder	2.33
939521	AE1-181 C	2.4254	Adder	2.85
939522	AE1-181 E	1.6169	Adder	1.9
940013	AE1-243 BAT	4.9550	50/50	4.9550

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
940592	AE2-046 E	2.3355	Adder	2.75
941161	AE2-110 C	0.5397	Adder	0.63
941162	AE2-110 E	0.7453	Adder	0.88
941751	AE2-175 C	7.8250	Adder	9.21
941752	AE2-175 E	5.2167	Adder	6.14
942281	AE2-241 C	0.5397	Adder	0.63
942282	AE2-241 E	0.7453	Adder	0.88
942771	AE2-295 C	1.8144	Adder	2.13
942772	AE2-295 E	10.5266	Adder	12.38
944402	AF1-105 BAT	4.1982	50/50	4.1982
944432	AF1-108 BAT	1.5562	Merchant Transmission	1.5562
945611	AF1-226 C	0.9445	Adder	1.11
945612	AF1-226 E	1.3043	Adder	1.53
946623	**AF1-326 BAT (Withdrawn : 12/03/2020)**	**2.6210**	**Merchant Transmission**	**2.6210**
946633	**AF1-327 BAT (Withdrawn : 12/03/2020)**	**2.5768**	**Merchant Transmission**	**2.5768**
946643	AF1-328 BAT	2.5194	Merchant Transmission	2.5194
946781	AF1-186	0.2575	50/50	0.2575
957363	AF2-030 BAT	1.6426	Merchant Transmission	1.6426
957621	AF2-056 C	2.7615	Adder	3.25
957622	AF2-056 E	1.4226	Adder	1.67
957921	AF2-086 C	0.7710	Adder	0.91
957922	AF2-086 E	0.5140	Adder	0.6
959121	AF2-203 C	0.7710	Adder	0.91
959122	AF2-203 E	0.5140	Adder	0.6
959361	AF2-227 C	9.9473	50/50	9.9473
959362	AF2-227 E	6.6315	50/50	6.6315
959411	AF2-232 C	1.5420	Adder	1.81
959412	AF2-232 E	1.0280	Adder	1.21
959602	AF2-251 E	3.1743	Adder	3.73
959863	AF2-277 BAT	0.2447	Merchant Transmission	0.2447
959903	AF2-281 BAT	0.1209	Merchant Transmission	0.1209
959942	AF2-285 E	0.1631	Adder	0.19
961261	AF2-417 C	0.9787	Adder	1.15
961262	AF2-417 E	0.6525	Adder	0.77
961271	AF2-418 C	0.7710	Adder	0.91
961272	AF2-418 E	0.5140	Adder	0.6
961301	AF2-421 C	1.0779	Adder	1.27
961302	AF2-421 E	0.7186	Adder	0.85
961331	AF2-424 C	0.8472	Adder	1.0
961332	AF2-424 E	0.5648	Adder	0.66
961341	AF2-425 C	0.8472	Adder	1.0
961342	AF2-425 E	0.5648	Adder	0.66
961373	AF2-428 BAT	0.1277	Merchant Transmission	0.1277
961383	AF2-429 BAT	0.1164	Merchant Transmission	0.1164
961393	AF2-430 BAT	0.1209	Merchant Transmission	0.1209
961403	AF2-431 BAT	0.0971	Merchant Transmission	0.0971
961412	AF2-432 E	0.1285	Adder	0.15
961421	AF2-433 C O1	0.7710	Adder	0.91
961422	AF2-433 E O1	0.5140	Adder	0.6
961431	AF2-434 C O1	0.7710	Adder	0.91
961432	AF2-434 E O1	0.5140	Adder	0.6

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
961531	AF2-444 C	0.8331	Adder	0.98
961532	AF2-444 E	0.5648	Adder	0.66
961541	AF2-445AC	0.9875	Adder	1.16
961542	AF2-445AE	0.6695	Adder	0.79
962151	AG1-060 C	0.9617	Adder	2.13
962152	AG1-060 E	5.5791	Adder	12.38
962662	AG1-115 BAT	4.3571	Merchant Transmission	4.3571
963071	AG1-156 C	1.4234	Adder	3.16
963072	AG1-156 E	0.7387	Adder	1.64
963082	AG1-157 E	0.4233	Adder	0.94
963151	AG1-164 C	0.5713	Adder	1.27
963152	AG1-164 E	0.3809	Adder	0.85
963161	AG1-165 C	0.5713	Adder	1.27
963162	AG1-165 E	0.3809	Adder	0.85
963751	AG1-227 C	0.5322	Adder	1.18
963752	AG1-227 E	0.3548	Adder	0.79
963761	AG1-228 C	0.5322	Adder	1.18
963762	AG1-228 E	0.3548	Adder	0.79
964071	AG1-262 C	12.2228	50/50	12.2228
964072	AG1-262 E	18.3342	50/50	18.3342
964091	AG1-267 C	2.0953	50/50	2.0953
964092	AG1-267 E	3.1429	50/50	3.1429
964161	AG1-277 C	1.5235	Adder	3.38
964162	AG1-277 E	0.3809	Adder	0.85
964171	AG1-278 C	0.7332	Adder	1.63
964172	AG1-278 E	0.2190	Adder	0.49
964181	AG1-279 C	0.7332	Adder	1.63
964182	AG1-279 E	0.2190	Adder	0.49
964221	AG1-283 C O1	1.4839	Adder	3.29
964222	AG1-283 E O1	0.9892	Adder	2.2
966111	AG1-480 C	1.6695	Adder	3.71
966112	AG1-480 E	0.0717	Adder	0.16
966182	AG1-487 BAT	6.9610	50/50	6.9610
966291	AG1-498 C	0.9559	50/50	0.9559
966292	AG1-498 E	1.3176	50/50	1.3176
966411	AG1-510 C O1	1.0073	Adder	2.24
966412	AG1-510 E O1	0.6715	Adder	1.49
966421	AG1-511 C O1	2.7926	Adder	6.2
966422	AG1-511 E O1	1.8617	Adder	4.13
CALDERWOOD	CALDERWOOD	0.2087	Confirmed LTF	0.2087
NY	NY	0.1902	Confirmed LTF	0.1902
PRAIRIE	PRAIRIE	0.9815	Confirmed LTF	0.9815
O-066	O-066	21.1053	Confirmed LTF	21.1053
SIGE	SIGE	0.2902	Confirmed LTF	0.2902
CHEOAH	CHEOAH	0.2112	Confirmed LTF	0.2112
COTTONWOOD	COTTONWOOD	0.8463	Confirmed LTF	0.8463
G-007	G-007	2.6754	Confirmed LTF	2.6754
HAMLET	HAMLET	0.2795	Confirmed LTF	0.2795
GIBSON	GIBSON	0.2015	Confirmed LTF	0.2015
BLUEG	BLUEG	0.6406	Confirmed LTF	0.6406
TRIMBLE	TRIMBLE	0.2053	Confirmed LTF	0.2053
CATAWBA	CATAWBA	0.1620	Confirmed LTF	0.1620

11.6.4 Index 4

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
164851598	208120	SU10	PPL	208113	SUSQ	PPL	1	PL:48:P71:102649	tower	801.0	116.57	117.8	DC	22.27

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
208911	MONT G1	33.7153	50/50	33.7153
208912	**MONT G2 (Deactivation : 18/02/2019)**	**33.6886**	**50/50**	**33.6886**
208945	LOHA CT	0.4645	50/50	0.4645
208948	WILL CT	0.9730	50/50	0.9730
209013	SCEN IPP	1.8500	50/50	1.8500
209022	**WHFR IPP (Deactivation : 03/03/2020 WD - 01/03/2020)**	**4.9836**	**Adder**	**5.86**
211375	BEAC	-3.0374	Adder	-3.57
212005	ALWD	0.1136	50/50	0.1136
212369	PATRIOT 1	15.2285	50/50	15.2285
212370	PATRIOT 2	15.2285	50/50	15.2285
212435	SMIL	0.0602	50/50	0.0602
234311	HUN GEN5	1.3591	50/50	1.3591
234312	HUN GEN6	1.3507	50/50	1.3507
938392	AE1-058_GEN1	24.8707	Adder	29.26
938393	AE1-058_GEN2	24.8707	Adder	29.26
939891	AE1-225 C O1	0.9245	Adder	1.09
939892	AE1-225 E O1	1.0229	Adder	1.2
940561	AE2-042 C	8.9346	50/50	8.9346
940562	AE2-042 E	4.4291	50/50	4.4291
940593	AE2-046 BAT	5.3601	50/50	5.3601
940721	AE2-059 C	1.6036	50/50	1.6036
940722	AE2-059 E	2.2146	50/50	2.2146
940941	AE2-084 C	1.6036	50/50	1.6036
940942	AE2-084 E	2.2146	50/50	2.2146
941161	AE2-110 C	2.0131	50/50	2.0131
941162	AE2-110 E	2.7801	50/50	2.7801
941171	AE2-111 C	0.8262	Adder	0.97
941172	AE2-111 E	1.1409	Adder	1.34
941371	AE2-133 C	0.8262	Adder	0.97
941372	AE2-133 E	1.1409	Adder	1.34
942281	AE2-241 C	2.0131	50/50	2.0131
942282	AE2-241 E	2.7801	50/50	2.7801
942561	AE2-271 C	17.1749	50/50	17.1749
942562	AE2-271 E	11.4499	50/50	11.4499
942771	AE2-295 C	2.7833	Adder	3.27
942772	AE2-295 E	16.1473	Adder	19.0
943721	AF1-040 C	0.0984	Adder	0.12
943722	AF1-040 E	1.8687	Adder	2.2
945511	AF1-216 C1O1	9.3764	50/50	9.3764
945512	AF1-216 E1O1	6.2437	50/50	6.2437
945521	AF1-216 C2O1	9.3760	50/50	9.3760

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945522	AF1-216 E2O1	6.2434	50/50	6.2434
945611	AF1-226 C	3.5230	50/50	3.5230
945612	AF1-226 E	4.8651	50/50	4.8651
946471	AF1-311 C O1	16.0592	50/50	16.0592
946472	AF1-311 E O1	26.2018	50/50	26.2018
946691	AF1-333 C O1	1.7947	50/50	1.7947
946692	AF1-333 E O1	1.1965	50/50	1.1965
946731	AF1-337 C	1.7947	50/50	1.7947
946732	AF1-337 E	1.1965	50/50	1.1965
946741	AF1-338 C	1.7947	50/50	1.7947
946742	AF1-338 E	1.1965	50/50	1.1965
946751	AF1-339 C O1	1.7947	50/50	1.7947
946752	AF1-339 E O1	1.1965	50/50	1.1965
946761	AF1-271AC	1.0032	Adder	1.18
946762	AF1-271AE	0.6688	Adder	0.79
957621	AF2-056 C	3.8246	Adder	4.5
957622	AF2-056 E	1.9703	Adder	2.32
957881	AF2-082 C	3.2457	Adder	3.82
957882	AF2-082 E	2.1638	Adder	2.55
957921	AF2-086 C	2.8759	50/50	2.8759
957922	AF2-086 E	1.9173	50/50	1.9173
958461	AF2-140	7.5705	50/50	7.5705
958511	AF2-145 C1	3.3401	50/50	3.3401
958512	AF2-145 E1	2.2268	50/50	2.2268
958521	AF2-145 C2	3.3400	50/50	3.3400
958522	AF2-145 E2	2.2267	50/50	2.2267
959121	AF2-203 C	2.8759	50/50	2.8759
959122	AF2-203 E	1.9173	50/50	1.9173
959411	AF2-232 C	5.7518	50/50	5.7518
959412	AF2-232 E	3.8346	50/50	3.8346
959421	AF2-233 C	1.1802	Adder	1.39
959422	AF2-233 E	0.7868	Adder	0.93
959431	AF2-234 C	2.3605	Adder	2.78
959432	AF2-234 E	1.5737	Adder	1.85
959932	AF2-284 E	0.4944	50/50	0.4944
959982	AF2-289 E	0.7415	50/50	0.7415
959992	AF2-290 E	0.3818	50/50	0.3818
960401	AF2-331 C	8.4522	50/50	8.4522
960402	AF2-331 E	5.6348	50/50	5.6348
960411	AF2-332 C	8.4522	50/50	8.4522
960412	AF2-332 E	5.6348	50/50	5.6348
960421	AF2-333 C	3.3809	50/50	3.3809
960422	AF2-333 E	2.2539	50/50	2.2539
960431	AF2-334 C	3.3809	50/50	3.3809
960432	AF2-334 E	2.2539	50/50	2.2539
961271	AF2-418 C	2.8759	50/50	2.8759
961272	AF2-418 E	1.9173	50/50	1.9173
961331	AF2-424 C	1.2996	Adder	1.53
961332	AF2-424 E	0.8664	Adder	1.02
961341	AF2-425 C	1.2996	Adder	1.53
961342	AF2-425 E	0.8664	Adder	1.02
961362	AF2-427 E	0.7415	50/50	0.7415

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
961412	AF2-432 E	0.4793	50/50	0.4793
961421	AF2-433 C O1	2.8759	50/50	2.8759
961422	AF2-433 E O1	1.9173	50/50	1.9173
961431	AF2-434 C O1	2.8759	50/50	2.8759
961432	AF2-434 E O1	1.9173	50/50	1.9173
961531	AF2-444 C	1.2779	Adder	1.5
961532	AF2-444 E	0.8664	Adder	1.02
961541	AF2-445AC	1.3676	Adder	1.61
961542	AF2-445AE	0.9272	Adder	1.09
962061	AG1-050	3.8182	50/50	3.8182
962151	AG1-060 C	1.4751	Adder	3.27
962152	AG1-060 E	8.5581	Adder	19.0
963551	AG1-204 C	3.7355	50/50	3.7355
963552	AG1-204 E	2.0114	50/50	2.0114
963751	AG1-227 C	0.7371	Adder	1.64
963752	AG1-227 E	0.4914	Adder	1.09
963761	AG1-228 C	0.7371	Adder	1.64
963762	AG1-228 E	0.4914	Adder	1.09
963911	AG1-244 C	0.3388	Adder	0.75
963912	AG1-244 E	0.1824	Adder	0.4
964051	AG1-259 C	0.4327	Adder	0.96
964052	AG1-259 E	0.6047	Adder	1.34
964061	AG1-260 C	0.4327	Adder	0.96
964062	AG1-260 E	0.6047	Adder	1.34
964163	AG1-277 BAT	3.5734	50/50	3.5734
964173	AG1-278 BAT	0.6111	50/50	0.6111
964183	AG1-279 BAT	0.6111	50/50	0.6111
964671	AG1-330 C	0.2346	Adder	0.52
964672	AG1-330 E	0.0261	Adder	0.06
964731	AG1-336 C	0.2033	Adder	0.45
964732	AG1-336 E	0.0573	Adder	0.13
964741	AG1-337 C	0.1981	Adder	0.44
964742	AG1-337 E	0.0626	Adder	0.14
965311	AG1-396 C	0.2085	Adder	0.46
965312	AG1-396 E	0.1824	Adder	0.4
966351	AG1-504 C O1	23.6202	50/50	23.6202
966352	AG1-504 E O1	15.4594	50/50	15.4594
CALDERWOOD	CALDERWOOD	0.0507	Confirmed LTF	0.0507
NY	NY	0.4623	Confirmed LTF	0.4623
PRAIRIE	PRAIRIE	0.2092	Confirmed LTF	0.2092
O-066	O-066	10.8689	Confirmed LTF	10.8689
SIGE	SIGE	0.1616	Confirmed LTF	0.1616
CHEOAH	CHEOAH	0.0516	Confirmed LTF	0.0516
COTTONWOOD	COTTONWOOD	0.1953	Confirmed LTF	0.1953
G-007	G-007	1.5550	Confirmed LTF	1.5550
HAMLET	HAMLET	0.0785	Confirmed LTF	0.0785
GIBSON	GIBSON	0.0409	Confirmed LTF	0.0409
BLUEG	BLUEG	0.1302	Confirmed LTF	0.1302
TRIMBLE	TRIMBLE	0.0417	Confirmed LTF	0.0417
CATAWBA	CATAWBA	0.0437	Confirmed LTF	0.0437

11.6.5 Index 5

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
164851563	938390	AE1-058_TAP	PPL	208072	SIEG	PPL	1	PL:08:P71:101751	tower	628.0	136.87	140.26	DC	47.26

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
208941	FISH CT	1.5435	50/50	1.5435
208981	FOWH IPP	1.8216	50/50	1.8216
208982	GLBT IPP	4.5202	50/50	4.5202
209013	SCEN IPP	4.7407	50/50	4.7407
209022	**WHFR IPP (Deactivation : 03/03/2020 WD - 01/03/2020)**	**15.0242**	**50/50**	**15.0242**
209027	LOR2_Q27	0.6284	50/50	0.6284
212266	LOR1	0.1929	50/50	0.1929
935083	**AD1-143 BAT1 (Suspended)**	**0.5352**	**Merchant Transmission**	**0.5352**
935103	**AD1-143 BAT2 (Suspended)**	**0.5352**	**Merchant Transmission**	**0.5352**
938392	AE1-058_GEN1	109.6648	50/50	109.6648
938393	AE1-058_GEN2	109.6648	50/50	109.6648
939891	AE1-225 C O1	0.8792	Adder	1.03
939892	AE1-225 E O1	0.9728	Adder	1.14
940561	AE2-042 C	5.3743	Adder	6.32
940562	AE2-042 E	2.6642	Adder	3.13
940721	AE2-059 C	0.9646	Adder	1.13
940722	AE2-059 E	1.3321	Adder	1.57
940941	AE2-084 C	0.9646	Adder	1.13
940942	AE2-084 E	1.3321	Adder	1.57
941161	AE2-110 C	1.5628	Adder	1.84
941162	AE2-110 E	2.1582	Adder	2.54
941171	AE2-111 C	0.7857	Adder	0.92
941172	AE2-111 E	1.0850	Adder	1.28
941371	AE2-133 C	0.7857	Adder	0.92
941372	AE2-133 E	1.0850	Adder	1.28
942281	AE2-241 C	1.5628	Adder	1.84
942282	AE2-241 E	2.1582	Adder	2.54
942561	AE2-271 C	8.5693	Adder	10.08
942562	AE2-271 E	5.7129	Adder	6.72
942771	AE2-295 C	5.9067	Adder	6.95
942772	AE2-295 E	34.2679	Adder	40.32
943721	AF1-040 C	0.0935	Adder	0.11
943722	AF1-040 E	1.7771	Adder	2.09
945511	AF1-216 C1O1	5.2658	Adder	6.2
945512	AF1-216 E1O1	3.5065	Adder	4.13
945521	AF1-216 C2O1	5.2655	Adder	6.19
945522	AF1-216 E2O1	3.5062	Adder	4.12
945611	AF1-226 C	2.7349	Adder	3.22
945612	AF1-226 E	3.7768	Adder	4.44

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
946471	AF1-311 C O1	8.0127	Adder	9.43
946472	AF1-311 E O1	13.0733	Adder	15.38
946691	AF1-333 C O1	1.2375	Adder	1.46
946692	AF1-333 E O1	0.8250	Adder	0.97
946731	AF1-337 C	1.2375	Adder	1.46
946732	AF1-337 E	0.8250	Adder	0.97
946741	AF1-338 C	1.2375	Adder	1.46
946742	AF1-338 E	0.8250	Adder	0.97
946751	AF1-339 C O1	1.2375	Adder	1.46
946752	AF1-339 E O1	0.8250	Adder	0.97
946761	AF1-271AC	0.9540	Adder	1.12
946762	AF1-271AE	0.6360	Adder	0.75
957621	AF2-056 C	11.5302	50/50	11.5302
957622	AF2-056 E	5.9398	50/50	5.9398
957881	AF2-082 C	3.0866	Adder	3.63
957882	AF2-082 E	2.0577	Adder	2.42
957921	AF2-086 C	2.2326	Adder	2.63
957922	AF2-086 E	1.4884	Adder	1.75
958461	AF2-140	3.9675	Adder	4.67
958511	AF2-145 C1	1.8758	Adder	2.21
958512	AF2-145 E1	1.2506	Adder	1.47
958521	AF2-145 C2	1.8757	Adder	2.21
958522	AF2-145 E2	1.2505	Adder	1.47
959121	AF2-203 C	2.2326	Adder	2.63
959122	AF2-203 E	1.4884	Adder	1.75
959411	AF2-232 C	4.4652	Adder	5.25
959412	AF2-232 E	2.9768	Adder	3.5
959421	AF2-233 C	1.1224	Adder	1.32
959422	AF2-233 E	0.7483	Adder	0.88
959431	AF2-234 C	2.2448	Adder	2.64
959432	AF2-234 E	1.4965	Adder	1.76
959932	AF2-284 E	0.2616	Adder	0.31
959982	AF2-289 E	0.3923	Adder	0.46
959992	AF2-290 E	0.2297	Adder	0.27
960401	AF2-331 C	4.2172	Adder	4.96
960402	AF2-331 E	2.8115	Adder	3.31
960411	AF2-332 C	4.2172	Adder	4.96
960412	AF2-332 E	2.8115	Adder	3.31
960421	AF2-333 C	1.6869	Adder	1.98
960422	AF2-333 E	1.1246	Adder	1.32
960431	AF2-334 C	1.6869	Adder	1.98
960432	AF2-334 E	1.1246	Adder	1.32
961271	AF2-418 C	2.2326	Adder	2.63
961272	AF2-418 E	1.4884	Adder	1.75
961331	AF2-424 C	2.7580	Adder	3.24
961332	AF2-424 E	1.8387	Adder	2.16
961341	AF2-425 C	2.7580	Adder	3.24
961342	AF2-425 E	1.8387	Adder	2.16
961362	AF2-427 E	0.3923	Adder	0.46
961412	AF2-432 E	0.3721	Adder	0.44
961421	AF2-433 C O1	2.2326	Adder	2.63
961422	AF2-433 E O1	1.4884	Adder	1.75

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
961431	AF2-434 C O1	2.2326	Adder	2.63
961432	AF2-434 E O1	1.4884	Adder	1.75
961531	AF2-444 C	2.7120	Adder	3.19
961532	AF2-444 E	1.8387	Adder	2.16
961541	AF2-445AC	4.1229	50/50	4.1229
961542	AF2-445AE	2.7952	50/50	2.7952
962061	AG1-050	1.2173	Adder	2.7
962151	AG1-060 C	3.1305	Adder	6.95
962152	AG1-060 E	18.1620	Adder	40.32
963751	AG1-227 C	4.1928	50/50	4.1928
963752	AG1-227 E	2.7952	50/50	2.7952
963761	AG1-228 C	4.1928	50/50	4.1928
963762	AG1-228 E	2.7952	50/50	2.7952
963911	AG1-244 C	0.3222	Adder	0.72
963912	AG1-244 E	0.1735	Adder	0.39
964051	AG1-259 C	0.4115	Adder	0.91
964052	AG1-259 E	0.5750	Adder	1.28
964061	AG1-260 C	0.4115	Adder	0.91
964062	AG1-260 E	0.5750	Adder	1.28
964671	AG1-330 C	0.2231	Adder	0.5
964672	AG1-330 E	0.0248	Adder	0.06
964731	AG1-336 C	0.1933	Adder	0.43
964732	AG1-336 E	0.0545	Adder	0.12
964741	AG1-337 C	0.1884	Adder	0.42
964742	AG1-337 E	0.0595	Adder	0.13
965311	AG1-396 C	0.1983	Adder	0.44
965312	AG1-396 E	0.1735	Adder	0.39
WEC	WEC	0.0441	Confirmed LTF	0.0441
LGEE	LGEE	0.0854	Confirmed LTF	0.0854
CPLE	CPLE	0.0430	Confirmed LTF	0.0430
CBM-W2	CBM-W2	1.1200	Confirmed LTF	1.1200
NY	NY	0.5923	Confirmed LTF	0.5923
TVA	TVA	0.1624	Confirmed LTF	0.1624
O-066	O-066	14.1667	Confirmed LTF	14.1667
SIGE	SIGE	0.2352	Confirmed LTF	0.2352
CBM-S2	CBM-S2	0.8248	Confirmed LTF	0.8248
CBM-S1	CBM-S1	0.0456	Confirmed LTF	0.0456
G-007	G-007	1.8669	Confirmed LTF	1.8669
MEC	MEC	0.2145	Confirmed LTF	0.2145
LAGN	LAGN	0.2047	Confirmed LTF	0.2047
CBM-W1	CBM-W1	2.0189	Confirmed LTF	2.0189

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
AA2-017	East Palmerton-Acahela 69kV	Suspended
AA2-082	Alpha 34.5kV	In Service
AB1-182	Bear Creek	Engineering and Procurement
AC2-144	Newburgh 12.47kV	Suspended
AD1-143	Hauto-Siegfried 69 kV	Suspended
AD2-077	Buxmont 69 kV	Active
AD2-213	East Flemington-Lebanon 34.5 kV	Active
AE1-058	Frackville-Siegfried 230 kV	Active
AE1-060	Kittatinny-Newton 34.5 kV	Active
AE1-181	St. Johns-Freeland 69 kV	Active
AE1-225	Columbia-Sunbury 69 kV	Active
AE1-243	Warren Glen Storage 34.5 kV	Active
AE2-042	Milton 69 kV	Active
AE2-046	Harwood-East Hazelton 69 kV	Active
AE2-059	Derry Tap-Derry Bus 69 kV	Active
AE2-084	Derry Tap-Derry Bus 69 kV	Active
AE2-110	Columbia-West Bloomsburg 69 kV	Active
AE2-111	Beavertown Tap-Beavertown Weaving Tap 69kV	Active
AE2-133	Penns Tap-Richfield Tie 69 kV	Active
AE2-175	Jackson-Long Pond 69 kV	Active
AE2-241	Bloomsburg-Columbia 69 kV	Active
AE2-271	Montour 230 kV	Active
AE2-295	Eldred 230 kV	Active
AF1-040	Gratz Tap 69 kV	Active
AF1-105	Glen Gardner 34.5 kV	Active
AF1-108	East Flemington 34.5 kV	Active
AF1-186	Portland 5 230 kV	Partially in Service - Under Construction
AF1-216	Lycoming-Lock Haven 69 kV	Active
AF1-226	Bowmans Mill-Scott 69 kV	Active
AF1-271A	Gratz 69 kV	Active
AF1-311	Montour 230 kV	Active
AF1-326	Pohatcong-Newburgh 34.5 kV	Withdrawn
AF1-327	Pohatcong-Newburgh 34.5 kV	Withdrawn
AF1-328	Hackettstown-Pohatcong 34.5 kV	Active
AF1-333	Laurelton-Mifflinburg 69 kV	Active
AF1-337	Laurelton-Mifflinburg 69 kV	Active
AF1-338	Laurelton-Mifflinburg 69 kV	Active
AF1-339	Laurelton-Mifflinburg 69 kV	Active
AF2-030	Ontelaunee 230 kV	Active
AF2-056	Shenandoah Tap 1– Mahanoy Tap 2 69 kV	Active

Queue Number	Project Name	Status
AF2-082	Dauphin PG Tie–Dauphin Juniata Tie 69 k	Active
AF2-086	Scott Tap-Bowmans Mill Tap 69 kV	Active
AF2-140	Saegers 230 kV	Active
AF2-145	Lycoming-Lock Haven 69 kV	Active
AF2-203	Rohrsburg 12.5 kV	Active
AF2-227	Martins Creek–Cherry Hill 69 kV	Active
AF2-232	Bowmanns Mill Tap-Scott 69 kV	Active
AF2-233	Penns-Richfield Tie #1 69 kV	Active
AF2-234	Sunbury Yard #1-Richfield Tie #2 69 kV	Active
AF2-251	Susquehanna unit 1 230 kV	Active
AF2-277	Richland 12.47 kV	Engineering and Procurement
AF2-281	Lynnville 13.2 kV	Engineering and Procurement
AF2-284	Watson 12.47 kV	Engineering and Procurement
AF2-285	W. Damascus 12.47 kV	Engineering and Procurement
AF2-289	Watson 12.47 kV	Engineering and Procurement
AF2-290	Derry 12.47 kV	Engineering and Procurement
AF2-331	Montour 230 kV	Active
AF2-332	Montour 230 kV	Active
AF2-333	Montour 230 kV	Active
AF2-334	Montour 230 kV	Active
AF2-417	West Damascus Tap-West Damascus 69 kV	Active
AF2-418	Millville Tap 69 kV	Active
AF2-421	East Hazelton-Weatherly Tap 69	Active
AF2-424	Reed-Reed Tap #1 69 kV	Active
AF2-425	Sunbury-Eldred #2 69 kV	Active
AF2-427	Watson 12.47 kV	Engineering and Procurement
AF2-428	West Boyertown 13.2 kV	Engineering and Procurement
AF2-429	South Hamburg 34.5 kV	Engineering and Procurement
AF2-430	Moselem 13.2 kV	Engineering and Procurement
AF2-431	Baldy 13.2 kV	Engineering and Procurement
AF2-432	University 12.47 kV	Engineering and Procurement
AF2-433	Columbia-Geisinger Tap #1 69 kV	Active
AF2-434	Columbia-Geisinger Tap #1 69 kV	Active
AF2-444	Reed-Fairview Tap #2 69 kV	Active
AF2-445A	Fishbach-Port Carbon 69 kV	Active
AG1-050	Milton 69 kV	Active
AG1-060	Eldred 69 kV	Active
AG1-115	Buxmont 69 kV	Active
AG1-156	Jack Frost-Lake Harmony 69 kV	Active
AG1-157	Macungie-Emmaus Tie 69 kV	Active
AG1-164	East Hazelton-Weatherly Tap 69 kV	Active
AG1-165	East Hazelton-Weatherly Tap 69 kV	Active
AG1-204	West Berwick 12.47 kV	Active
AG1-227	Altamont-Tuscarora 69 kV	Active
AG1-228	Alta Haute-Tuscarora 69 kV	Active
AG1-244	Middleburg 12.47 kV	Active
AG1-259	Sunbury-Dalmatia 69 kV	Active
AG1-260	Sunbury-Dalmatia 69 kV	Active
AG1-262	Lower Mount Bethel 230 kV	Active
AG1-267	Martins Creek 69 kV	Active
AG1-277	Salem-Beacon Power 69 kV	Active
AG1-278	Salem-Beacon Power 69 kV	Active

Queue Number	Project Name	Status
AG1-279	Salem-Beacon Power 69 kV	Active
AG1-283	Effort Mountain-Gilbert 138 kV	Active
AG1-330	Beavertown 12.47 kV	Active
AG1-336	Hunter 12.47 kV	Active
AG1-337	Elizabethville 12.47 kV	Active
AG1-396	Duphin-Pine Grove 69 kV	Active
AG1-480	Shawnee 34.5 kV	Active
AG1-487	Gilbert 230 kV	Active
AG1-498	Mount Bethel 12.47 kV	Active
AG1-504	Glenbrook-Salem 69 kV	Active
AG1-510	Kittatinny-Blairstown 34.5 kV	Active
AG1-511	Kittatinny 230 kV	Active
W1-111	Harwood-Berwick 69kV	In Service
W4-064	N. Newton 12kV	In Service

11.8 Contingency Descriptions

Contingency Name	Contingency Definition
PL:08:P12:000218	CONTINGENCY 'PL:08:P12:000218' /* MONT-COLU 230 KV LINE DISCONNECT BUS 207943 /* COLU TR2 (MONT-COLU & COLU TR2) END
PL:08:P12:101739	CONTINGENCY 'PL:08:P12:101739' /* MONT-BETA 2 230KV LINE DISCONNECT BRANCH FROM BUS 207915 TO BUS 208040 CKT 2 /* BETA-MONT END
PL:08:P12:101738	CONTINGENCY 'PL:08:P12:101738' /* MONT-BETA 1 230KV LINE DISCONNECT BRANCH FROM BUS 207915 TO BUS 208040 CKT 1 /* BETA-MONT END
PL:48:P71:102649	CONTINGENCY 'PL:48:P71:102649' /* SUSQ-GEN1 230KV & BETA-SUSQ 230KV DISCONNECT BRANCH FROM BUS 207915 TO BUS 208113 CKT 1 /* BETA-SUSQ DISCONNECT BUS 208114 /* SUSQ G1 END
PL:28:P12:000080	CONTINGENCY 'PL:28:P12:000080' /* SUSQ-WESC 500KV LINE DISCONNECT BRANCH FROM BUS 200022 TO BUS 200023 CKT 1 /* SUSQHANA-WESCOVLE 500 END
PL:08:P13:100456	CONTINGENCY 'PL:08:P13:100456' /* SUNB TR24 500-230KV DISCONNECT BRANCH FROM BUS 200021 TO BUS 208109 CKT 24 /* SUNBURY-SUNB END
JC-P7-1-JCN-230-17T	CONTINGENCY 'JC-P7-1-JCN-230-17T' /* PORTLAND-GREYSTONE & KITTATINNY-POHATCONG 230 KV S1007 L2012 DISCONNECT BRANCH FROM BUS 204510 TO BUS 206241 CKT 1 /* 27PORTLAND 230 28GRYSTN Q 230 REMOVE LOAD 3 FROM BUS 206241 /* 28GRYSTN Q 230 DISCONNECT BRANCH FROM BUS 206242 TO BUS 206247 CKT 1 /* 28KITATINY 230 28POHATCNG 230 DISCONNECT BRANCH FROM BUS 206247 TO BUS 206219 CKT 1 /* 28POHATCNG 230 28POHATCNG 35 END
PL:08:P71:101751	CONTINGENCY 'PL:08:P71:101751' /* MONT-BETA 1 & 2 230KV DISCONNECT BRANCH FROM BUS 207915 TO BUS 208040 CKT 1 /* MONT-BETA 1 DISCONNECT BRANCH FROM BUS 207915 TO BUS 208040 CKT 2 /* MONT-BETA 2 END

Contingency Name	Contingency Definition
PL:48:P71:102415	CONTINGENCY 'PL:48:P71:102415' /* SUSQ-HARW 1&2 230KV DISCONNECT BRANCH FROM BUS 207977 TO BUS 208113 CKT 2 /* HARW-SUSQ 2 DISCONNECT BRANCH FROM BUS 207977 TO BUS 208113 CKT 1 /* HARW-SUSQ END
208072 SIEG 230 938390 AE1-058_TAP 230 1	CONTINGENCY '208072 SIEG 230 938390 AE1-058_TAP 230 1' OPEN BRANCH FROM BUS 208072 TO BUS 938390 CKT 1 END
Base Case	
PL:08:P13:101349	CONTINGENCY 'PL:08:P13:101349' /* SUNB TR25 500-230KV DISCONNECT BRANCH FROM BUS 200021 TO BUS 208109 CKT 25 /* SUNBURY-SUNB END
PL:08:P12:101740	CONTINGENCY 'PL:08:P12:101740' /* BETA-SU10 230KV LINE DISCONNECT BRANCH FROM BUS 207915 TO BUS 208120 CKT 1 /* BETA-SU10 END
PL:48:P12:101741	CONTINGENCY 'PL:48:P12:101741' /* BETA-SUSQ 230KV LINE DISCONNECT BRANCH FROM BUS 207915 TO BUS 208113 CKT 1 /* BETA-SUSQ END
PL:18:P12:000083	CONTINGENCY 'PL:18:P12:000083' /* JUNI-SUNB 500KV LINE DISCONNECT BRANCH FROM BUS 200009 TO BUS 200021 CKT 1 /* JUNIATA-SUNBURY END
PL:20:P42:102406	CONTINGENCY 'PL:20:P42:102406' /* MACR-SIEG 1 230KV; MACR1_N CB @ SIEG 230KV DISCONNECT BRANCH FROM BUS 208072 TO BUS 211161 CKT 5 /* SIEG 230/138KV T5 DISCONNECT BRANCH FROM BUS 208025 TO BUS 208072 CKT 1 /* MACR-SIEG 230 END
PL:20:P42:102399	CONTINGENCY 'PL:20:P42:102399' /* MACR-SIEG 2 230KV; MACR2_N CB @ SIEG 230KV DISCONNECT BRANCH FROM BUS 208025 TO BUS 208072 CKT 2 /* MACR-SIEG 230 DISCONNECT BRANCH FROM BUS 208072 TO BUS 211161 CKT 5 /* SIEG TR5-SIEG 230-138 END
PL:20:P42:001097	CONTINGENCY 'PL:20:P42:001097' /* MACR-SIEG 2 230KV; MACR2_S CB @ SIEG 230KV DISCONNECT BRANCH FROM BUS 208072 TO BUS 211161 CKT 4 /* SIEG 230/138KV T4 DISCONNECT BRANCH FROM BUS 208025 TO BUS 208072 CKT 2 /* MACR-SIEG 230 END
PL:08:P42:000925	CONTINGENCY 'PL:08:P42:000925' /* SUNB-HUST 500KV; HUST_S CB @ SUNB 500KV DISCONNECT BRANCH FROM BUS 200021 TO BUS 208109 CKT 25 /* SUNB TR25 DISCONNECT BUS 200080 /* HUST (SUNB-HUST & GEN10/11/12/13) END

Contingency Name	Contingency Definition
PL:08:P42:001375	CONTINGENCY 'PL:08:P42:001375' /* SUNB-SUSQ 1 230KV; SUSQ1 CB @ SUNB 230KV DISCONNECT BRANCH FROM BUS 200021 TO BUS 208109 CKT 25 /* SUNB TR25 DISCONNECT BRANCH FROM BUS 208109 TO BUS 208113 CKT 1 /* SUNB-SUSQ DISCONNECT BRANCH FROM BUS 208109 TO BUS 212441 CKT 23 /* SUNB TR23 END
PL:08:P42:000921	CONTINGENCY 'PL:08:P42:000921' /* SUNB-SUSQ 2 500KV; SUSQ2_S CB @SUNB 500KV DISCONNECT BRANCH FROM BUS 200021 TO BUS 208109 CKT 25 /* SUNB TR25 DISCONNECT BRANCH FROM BUS 200021 TO BUS 200022 CKT 2 /* SUNBURY-SUSQHANA END
PL:08:P42:000924	CONTINGENCY 'PL:08:P42:000924' /* SUNB-HUST 500KV; HUST_N CB @ SUNB 500KV DISCONNECT BRANCH FROM BUS 200021 TO BUS 208109 CKT 24 /* SUNB TR24 DISCONNECT BUS 200080 /* HUST (SUNB-HUST & GEN10/11/12/13) END
PL:08:P42:101477	CONTINGENCY 'PL:08:P42:101477' /* SUNB-SUSQ 2 500KV; SUSQ2_N CB @ SUNB 500KV DISCONNECT BRANCH FROM BUS 200021 TO BUS 208109 CKT 24 /* SUNB TR24 DISCONNECT BRANCH FROM BUS 200021 TO BUS 200022 CKT 2 /* SUNB-SUSQ END

12 Short Circuit Analysis

The following Breakers are overdutied:

None

12.1 System Reinforcements - Short Circuit

None

13 Affected Systems

13.1 NYISO

NYISO Impacts to be determined during later study phases (as applicable).