Generation Interconnection

Feasibility Study Report

for

Queue Project AF2-221

SCALP LEVEL 22.9 KV

6.3 MW Capacity / 15 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 Mid-Atlantic Interstate Transmission, Inc. (MAIT, PENELEC Zone).

2 Preface

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

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

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

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

3 General

The Interconnection Customer (IC), has proposed a Solar generating facility located in Somerset County, Pennsylvania. The installed facilities will have a total capability of 15 MW with 6.3 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is March 15, 2023. This study does not imply a TO commitment to this in-service date.

Queue Number	AF2-221
Project Name	SCALP LEVEL 22.9 KV
State	Pennsylvania
County	Somerset
Transmission Owner	MAIT (PENELEC Zone)
MFO	15
MWE	15
MWC	6.3
Fuel	Solar
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 Point of Interconnection

4.1 Primary Point of Interconnection

AF2-221 will interconnect with the PENELEC distribution system at Point of Interconnection (POI) pole J-168111, which is located on the 22.86kV Windber ckt#00932-11 @ Scalp Level substation.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AF2-221 generation project to connect to the Penelec distribution system. IC will be responsible for constructing all of the facilities on its side of the POI, including the attachment facilities which connect the generator to the Penelec distribution system's direct connection facilities.

4.2 Secondary Point of Interconnection

Customer requested a secondary point of interconnection as a direct connect to the 22.86kV Scalp Level substation bus via a dedicated, customer owned circuit. No physical interconnection costs are provided for the secondary POI, only analysis results are provided. If the customer choses the secondary POI for the System Impact phase, then the costs will be provided at that time.

The analysis results for the primary and secondary POI are the same as the project was studied at the same electrical point in the model for each location.

5 Cost Summary

The AF2-221 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$ 139,600
Total Local System Upgrade Costs	$ 103,000
Total System Network Upgrade Costs	$ 87,858,180
Total Costs	$ 88,100,780

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.

6 Transmission Owner Scope of Work

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

Description	Total Cost
Tap the existing 22.86kV Windber ckt#00931-11 @ Scalp Level at POI pole J-168111 and install a SCADA controlled 22.86kV recloser to interconnect queue project AF2-221. Install 22.86kV metering in customer's facilities. The customer is responsible to build their own line from their site to Penelec' s existing facilities	$100,000
NPs & Cust Dwg Review @ AF2-221	$ 25,200
Scalp Level 22.86kV SS. Adjust Remote Relay and Metering Settings.	$ 14,400
Total Physical Interconnection Costs	$ 139,600

7 Schedule

Based on the scope of work for the Attachment Facilities and the Direct and/or Non-Direct Connection facilities, it is expected to take a minimum of 15 months after the signing of an Interconnection Construction Service Agreement to complete the installation. This includes the requirement for the IC to make a preliminary payment that compensates FE for the engineering design work that is related to the construction. This assumes that there will be no environmental issues with any of the new properties associated with this project, that there will be no delays in acquiring the necessary permits for implementing the defined direct connection and network upgrades, and that all transmission system outages will be allowed when requested.

The schedule for the required Network Impact Reinforcements will be more clearly identified in future study phases.

8 Transmission Owner Analysis

Penelec performed an analysis of its distribution system. The AF2-221 project did contribute overloads on the distribution system requiring the reconductoring of approximately 0.42 miles of three-phase mainline conductor.

Description	Total Cost
Re-conductor multiple spans of undersized three-phase main-line conductor for a total distance of 2,171 feet.	$ 103,000
Total Local System Upgrades	$ 103,000

9 Interconnection Customer Requirements

9.1 System Protection

An analysis was conducted to assess the impact of the Scalp Level 22.9kV (AF2-221) Project on the system protection requirements in the area. The results of this review show that the following relay additions will be required:

Proposed single line diagrams showthe IC constructing a generation facility they call “Scalp Level 22.9kV” that will connect to Penelec’s 22.86kV Scalp Level substation ckt#00932-11 via a customer owned tap to pole J-168111.

The 22.86kV interconnection proposal will require Developer to meet applicable "Technical Requirements" as outlined in First Energy's document titled “Technical Requirements for the Interconnection of Customer-Owned Generation to the FirstEnergy Distribution System".

Protection requirements are included in the "Technical Requirements" document.

9.2 General Concerns

It is to be understood, for abnormal operation of the Penelec system, which could cause Developer’s generation facility to be electrically isolated from the Penelec system synchronous source via the tripping of a interconnecting primary voltage line or device, Developer will, via Penelec’s direction, be required to disconnect the generation from Penelec’s system and remain disconnected (units are required to be OFF LINE), until the Penelec system normal circuitry is restored. These abnormal conditions will be reviewed by Penelec system operators as to the need for the generation facility to be disconnected.

9.3 Requirements for Owner's/Developer's generation IPP Facility

The proposed interconnection Owner's/Developer's facilities must be designed in accordance with the document titled FirstEnergy Distribution Engineering Practices Interconnection of Customer-Owned Generation to the FirstEnergy Distribution System dated 11/17/14 located at the following link:

http://www.pjm.com/planning/design-engineering/to-tech-standards/private-firstenergy.aspx

The document is referred to as engineering practice EP(# 02-280) with section 4 part C specifically referencing the "interconnection technical requirements". Certain protection requirements are shown.

Additionally, Owner/Developer is responsible to provide adequate protection (for their equipment) under any distribution system operating condition' - which includes 'Separation from supply' (i.e. tripping of F.E. circuit breakers) and 'Re-synchronizing the generation after electric restoration of the supply' (i.e. reclosing of F.E. circuit breakers).

Owner's/Developer's protection must be designed to coordinate with the reclosing practices of FirstEnergy line protective devices. The generator must cease to energize the FirstEnergy circuit to which it is connected prior to reclosing of any (FE) automatic reclosing devices.

Owners/Developer's electrical protection and control schematics shall be provided to FE for consideration. FE may request modifications, if required, to meet the technical requirements.

9.4 Power Factor

IC will be responsible for meeting a power factor between 0.95 lagging (producing MVARs) to 0.95 leading (absorbing MVARs) and assure that voltage deviation will be less than 1.0 volt as measured at the POI under all Solar Gen operating conditions due to the inherent dynamic reactive power capability of this solar/storage facility.

Generators with no inherent VAR (reactive power) control capability, or those that have a restricted VAR capability less than the defined requirements, must provide dynamic supplementary reactive support located at the generation facility with electrical characteristics equivalent to that provided by a similar sized synchronous generator. A Dynamic Reactive Compensation (either Static VAR Compensator (SVC) or STATCOM) or other method be applied in order to maintain the required specifications at the POI. IC is responsible for the installation of equipment on its side of the POI in order to adhere to the criteria stated above by FirstEnergy.

10 Revenue Metering and SCADA Requirements

10.1 PJM Requirements

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

10.2 Meteorological Data Reporting Requirements

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

- Back panel temperature (Fahrenheit)
- Irradiance (Watts/meter^2)
- Ambient air temperature (Fahrenheit) - (Accepted, not required)
- Wind speed (meters/second) – (Accepted, not required)
- Wind direction (decimal degrees from true north) – (Accepted, not required)

10.3 Interconnected Transmission Owner Requirements

IC will be required to comply with all FE Revenue Metering Requirements for Generation Interconnection Customers. These FE requirements are the following:

The FE operating company (Penelec) shall provide, own, operate, test, and maintain the revenue metering equipment at the Interconnection Customer's (IC) expense. The revenue metering equipment includes, but is not limited to, current transformers, voltage transformers, secondary wires, meter socket, bidirectional revenue meter, and associated devices. The IC shall mount the instrument transformers unless otherwise agreed to by Penelec. The instrument transformers and meter socket shall be installed in a location that is readily accessible to authorized Penelec representatives. Penelec will provide the IC access to bidirectional kWh and kVARh pulses from the Penelec meter at the IC's expense if requested. The IC shall, at its expense, install, own, operate, test, and maintain any metering and telemetry equipment that may be required to provide real-time meter data to FE or PJM.

11 Summer Peak - Load Flow Analysis

The Queue Project AF2-221 was evaluated as a 15.0 MW (Capacity 6.3 MW) injection at the Scalp 23 kV substation in the PENELEC area. Project AF2-221 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-221 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

11.1 Generation Deliverability

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

None

11.2 Multiple Facility Contingency

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
101179104	200741	26SEWARD	115.0	PENELEC	200766	26FLORENCE	115.0	PENELEC	1	PN-P2-3-PN-230-9H-A	breaker	282.0	99.54	100.17	DC	1.78
101179109	200766	26FLORENCE	115.0	PENELEC	200740	26BLRSVL E	115.0	PENELEC	1	PN-P2-3-PN-230-9H-A	breaker	282.0	99.43	100.06	DC	1.78

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
101180009	200734	26SCALP L.	115.0	PENELEC	200749	26RACHEL H	115.0	PENELEC	1	PN-P7-1-PN-230-001	tower	190.0	100.75	106.15	DC	10.28
101179994	200746	26ROCKWOOD	115.0	PENELEC	202650	26HIGHPOINT	115.0	PENELEC	1	PN-P7-1-PN-230-001	tower	179.0	132.04	133.37	DC	2.38
101179989	202650	26HIGHPOINT	115.0	PENELEC	200747	26PENN-MAR	115.0	PENELEC	1	PN-P7-1-PN-230-001	tower	174.0	147.0	148.36	DC	2.38

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
101179311	200742	26TOWER 51	115.0	PENELEC	200741	26SEWARD	115.0	PENELEC	1	AP-P1-3-PN-115-010	operation	185.0	115.09	117.03	DC	3.58
101179264	200743	26HOOVER SV	115.0	PENELEC	200742	26TOWER 51	115.0	PENELEC	1	AP-P1-3-PN-115-010	operation	172.0	137.34	139.43	DC	3.59
101179269	200743	26HOOVER SV	115.0	PENELEC	200742	26TOWER 51	115.0	PENELEC	1	Base Case	operation	137.0	116.13	118.44	DC	3.16

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
101179994	4	26ROCKWOOD 115.0 kV - 26HIGHPOINT 115.0 kV Ckt 1	PENELEC PN-AF2-F-0037 (1782) : Rebuild 10.1 miles of transmission line Project Type : FAC Cost : $30,875,700 Time Estimate : 36.0 Months	$30,875,700
101179104	1	26SEWARD 115.0 kV - 26FLORENCE 115.0 kV Ckt 1	PENELEC PN-AF2-F-0029A (1768) : Replace bus conductor at Seward. Project Type : FAC Cost : $122,280 Time Estimate : 12.0 Months PN-AF2-F-0029B (1769) : Reconductor 4.15 miles of transmission line Project Type : FAC Cost : $12,686,550 Time Estimate : 30.0 Months	$12,808,830
101179109	2	26FLORENCE 115.0 kV - 26BLRSVL E 115.0 kV Ckt 1	PENELEC PN-AF2-F-0028A (1765) : Reconductor 9.5 miles of transmission line. Replace line drops at Blairsville East. Project Type : FAC Cost : $29,041,500 Time Estimate : 36.0 Months	$29,041,500
101180009	3	26SCALP L. 115.0 kV - 26RACHEL H 115.0 kV Ckt 1	PENELEC s2046_s2046.1_s2046.2 (1900) : Hooversville115 kV Substation Replace line relaying and line trap (s2046.1) Scalp Level 115 kV Substation Replace substation conductor (s2046.2) Rachel Hill 115 kV Substation Replace line relaying, line trap, and substation conductor (s2046.3) Project Type : FAC Cost : $0	$0
101179989	5	26HIGHPOINT 115.0 kV - 26PENN-MAR 115.0 kV Ckt 1	PENELEC PN-AF2-F-0039A (1786) : Replace circuit breaker at Penn Mar Project Type : FAC Cost : $733,680 Time Estimate : 12.0 Months PN-AF2-F-0039B (1787) : Rebuild 4.67 miles of transmission line Project Type : FAC Cost : $14,276,190 Time Estimate : 36.0 Months PN-AF2-F-0039C (1788) : Replace bus conductor at Penn Mar. Project Type : FAC Cost : $122,280 Time Estimate : 12.0 Months	$15,132,150
			TOTAL COST	$87,858,180

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
101179104	200741	26SEWARD	PENELEC	200766	26FLORENCE	PENELEC	1	PN-P2-3-PN-230-9H-A	breaker	282.0	99.54	100.17	DC	1.78

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200503	26C.SLOPE (Deactivation : 07/06/2019)	11.5022	50/50	11.5022
200794	26CONEMAGH	0.3083	50/50	0.3083
200834	26SW_E13_K22	0.0324	50/50	0.0324
200846	26FORWARD	0.1160	50/50	0.1160
200864	K-013 E	2.6898	50/50	2.6898
200883	Q-053 E	4.8830	50/50	4.8830
200888	26HIGHLAND	0.2622	50/50	0.2622
200889	26STNY CRK	0.1945	50/50	0.1945
200915	26CHSTN_FL	0.1334	50/50	0.1334
200925	26R32	0.3025	50/50	0.3025
202225	26SCI_S29B	0.0503	50/50	0.0503
290086	Q-036 E	2.4262	Adder	2.85
292350	K-023	2.4461	Adder	2.88
292542	L-013 1	2.3792	Adder	2.8
293301	N-039 E	4.4048	Adder	5.18
293393	V3-030E	1.8610	Adder	2.19
293432	R-040 E	0.1338	Adder	0.16
293603	O-018 E	6.0793	50/50	6.0793
293902	O-048 E	2.1413	Adder	2.52
294515	O38_P22	3.8542	Adder	4.53
294903	P-060 E	4.5112	50/50	4.5112
296332	R-032 E	7.0146	50/50	7.0146
913142	Y1-033 E OP1	1.9259	Adder	2.27
917672	Z2-108 E	1.3383	Adder	1.57
936991	AD2-133 C	1.0918	Adder	1.28
936992	AD2-133 E	4.9938	Adder	5.88
938351	AE1-053	0.7435	Adder	0.87
938881	AE1-116	0.4691	50/50	0.4691
938991	AE1-128 C	8.0201	50/50	8.0201
938992	AE1-128 E	5.3467	50/50	5.3467
941231	AE2-117 C	0.5472	Adder	0.64
941232	AE2-117 E	0.3648	Adder	0.43
941241	AE2-118 C	0.5472	Adder	0.64
941242	AE2-118 E	0.3648	Adder	0.43
941331	AE2-129 C	0.5907	Adder	0.69
941332	AE2-129 E	0.3938	Adder	0.46
941351	AE2-131 C	0.5907	Adder	0.69
941352	AE2-131 E	0.3938	Adder	0.46
942121	AE2-224 C	4.6094	Adder	5.42
942122	AE2-224 E	3.0729	Adder	3.62

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942511	AE2-264 C	2.6157	Adder	3.08
942512	AE2-264 E	1.7438	Adder	2.05
943711	AF1-039 C O1	0.5095	Adder	0.6
943712	AF1-039 E O1	0.3397	Adder	0.4
944751	AF1-140 C	1.0799	50/50	1.0799
944752	AF1-140 E	0.7199	50/50	0.7199
944781	AF1-143 C	4.4610	Adder	5.25
944782	AF1-143 E	2.3792	Adder	2.8
945671	AF1-232 C O2	11.0552	50/50	11.0552
945672	AF1-232 E O2	5.9528	50/50	5.9528
946081	AF1-273 C O1	5.4392	50/50	5.4392
946082	AF1-273 E O1	3.6261	50/50	3.6261
946431	AF1-307 C	6.2719	50/50	6.2719
946432	AF1-307 E	4.1813	50/50	4.1813
946571	AF1-321 C O1	1.4050	50/50	1.4050
946572	AF1-321 E O1	0.9366	50/50	0.9366
957001	AF2-001 C O1	1.4050	50/50	1.4050
957002	AF2-001 E O1	0.9366	50/50	0.9366
957011	AF2-002 C O1	0.7025	50/50	0.7025
957012	AF2-002 E O1	0.4683	50/50	0.4683
957512	AF2-045 E	2.1427	50/50	2.1427
957561	AF2-050 C	1.2215	Adder	2.71
957562	AF2-050 E	0.8143	Adder	1.81
957931	AF2-087 C	0.1170	Adder	0.26
957932	AF2-087 E	0.1611	Adder	0.36
957981	AF2-092 C	0.8004	50/50	0.8004
957982	AF2-092 E	0.5336	50/50	0.5336
958101	AF2-104 C	0.2502	50/50	0.2502
958102	AF2-104 E	0.1668	50/50	0.1668
958271	AF2-121 C	0.3131	Adder	0.7
958272	AF2-121 E	0.2087	Adder	0.46
958411	AF2-135 C	0.1182	Adder	0.26
958412	AF2-135 E	0.0788	Adder	0.17
958471	AF2-141	0.3152	Adder	0.7
959301	AF2-221 C	0.7489	50/50	0.7489
959302	AF2-221 E	1.0342	50/50	1.0342
959401	AF2-231 C	0.0725	Adder	0.16
959402	AF2-231 E	0.0483	Adder	0.11
959792	AF2-270 E	0.4145	50/50	0.4145
959802	AF2-271 E	0.1060	Adder	0.24
960211	AF2-312 C	0.3863	Adder	0.86
960212	AF2-312 E	0.2575	Adder	0.57
960391	AF2-330 C	5.2932	50/50	5.2932
960392	AF2-330 E	2.3151	50/50	2.3151
960451	AF2-336 C O1	1.3340	50/50	1.3340
960452	AF2-336 E O1	0.8894	50/50	0.8894
960461	AF2-337 C O1	1.3340	50/50	1.3340
960462	AF2-337 E O1	0.8894	50/50	0.8894
960471	AF2-338 C O1	1.3340	50/50	1.3340
960472	AF2-338 E O1	0.8894	50/50	0.8894
960481	AF2-339 C O1	1.3340	50/50	1.3340
960482	AF2-339 E O1	0.8894	50/50	0.8894

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960901	AF2-381 C	9.3767	50/50	9.3767
960902	AF2-381 E	4.9345	50/50	4.9345
NEWTON	NEWTON	0.5319	Confirmed LTF	0.5319
FARMERCITY	FARMERCITY	0.0274	Confirmed LTF	0.0274
G-007A	G-007A	1.4529	Confirmed LTF	1.4529
VFT	VFT	4.0054	Confirmed LTF	4.0054
CALDERWOOD	CALDERWOOD	0.2271	Confirmed LTF	0.2271
PRAIRIE	PRAIRIE	1.2605	Confirmed LTF	1.2605
CHEOAH	CHEOAH	0.2277	Confirmed LTF	0.2277
EDWARDS	EDWARDS	0.1740	Confirmed LTF	0.1740
TILTON	TILTON	0.3144	Confirmed LTF	0.3144
MADISON	MADISON	0.0403	Confirmed LTF	0.0403
GIBSON	GIBSON	0.2725	Confirmed LTF	0.2725
BLUEG	BLUEG	0.8715	Confirmed LTF	0.8715
TRIMBLE	TRIMBLE	0.2794	Confirmed LTF	0.2794
CATAWBA	CATAWBA	0.1452	Confirmed LTF	0.1452

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
101179109	200766	26FLORENCE	PENELEC	200740	26BLRSVLE	PENELEC	1	PN-P2-3-PN-230-9H-A	breaker	282.0	99.43	100.06	DC	1.78

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200503	26C.SLOPE (Deactivation : 07/06/2019)	11.5022	50/50	11.5022
200794	26CONEMAGH	0.3083	50/50	0.3083
200834	26SW_E13_K22	0.0324	50/50	0.0324
200846	26FORWARD	0.1160	50/50	0.1160
200864	K-013 E	2.6898	50/50	2.6898
200883	Q-053 E	4.8830	50/50	4.8830
200888	26HIGHLAND	0.2622	50/50	0.2622
200889	26STNY CRK	0.1945	50/50	0.1945
200915	26CHSTN_FL	0.1334	50/50	0.1334
200925	26R32	0.3025	50/50	0.3025
202225	26SCI_S29B	0.0503	50/50	0.0503
290086	Q-036 E	2.4262	Adder	2.85
292350	K-023	2.4461	Adder	2.88
292542	L-013 1	2.3792	Adder	2.8
293301	N-039 E	4.4048	Adder	5.18
293393	V3-030E	1.8610	Adder	2.19
293432	R-040 E	0.1338	Adder	0.16
293603	O-018 E	6.0793	50/50	6.0793
293902	O-048 E	2.1413	Adder	2.52
294515	O38_P22	3.8542	Adder	4.53
294903	P-060 E	4.5112	50/50	4.5112
296332	R-032 E	7.0146	50/50	7.0146
913142	Y1-033 E OP1	1.9259	Adder	2.27
917672	Z2-108 E	1.3383	Adder	1.57
936991	AD2-133 C	1.0918	Adder	1.28
936992	AD2-133 E	4.9938	Adder	5.88
938351	AE1-053	0.7435	Adder	0.87
938881	AE1-116	0.4691	50/50	0.4691
938991	AE1-128 C	8.0201	50/50	8.0201
938992	AE1-128 E	5.3467	50/50	5.3467
941231	AE2-117 C	0.5472	Adder	0.64
941232	AE2-117 E	0.3648	Adder	0.43
941241	AE2-118 C	0.5472	Adder	0.64
941242	AE2-118 E	0.3648	Adder	0.43
941331	AE2-129 C	0.5907	Adder	0.69
941332	AE2-129 E	0.3938	Adder	0.46
941351	AE2-131 C	0.5907	Adder	0.69
941352	AE2-131 E	0.3938	Adder	0.46
942121	AE2-224 C	4.6094	Adder	5.42
942122	AE2-224 E	3.0729	Adder	3.62

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942511	AE2-264 C	2.6157	Adder	3.08
942512	AE2-264 E	1.7438	Adder	2.05
943711	AF1-039 C O1	0.5095	Adder	0.6
943712	AF1-039 E O1	0.3397	Adder	0.4
944751	AF1-140 C	1.0799	50/50	1.0799
944752	AF1-140 E	0.7199	50/50	0.7199
944781	AF1-143 C	4.4610	Adder	5.25
944782	AF1-143 E	2.3792	Adder	2.8
945671	AF1-232 C O2	11.0552	50/50	11.0552
945672	AF1-232 E O2	5.9528	50/50	5.9528
946081	AF1-273 C O1	5.4392	50/50	5.4392
946082	AF1-273 E O1	3.6261	50/50	3.6261
946431	AF1-307 C	6.2719	50/50	6.2719
946432	AF1-307 E	4.1813	50/50	4.1813
946571	AF1-321 C O1	1.4050	50/50	1.4050
946572	AF1-321 E O1	0.9366	50/50	0.9366
957001	AF2-001 C O1	1.4050	50/50	1.4050
957002	AF2-001 E O1	0.9366	50/50	0.9366
957011	AF2-002 C O1	0.7025	50/50	0.7025
957012	AF2-002 E O1	0.4683	50/50	0.4683
957512	AF2-045 E	2.1427	50/50	2.1427
957561	AF2-050 C	1.2215	Adder	2.71
957562	AF2-050 E	0.8143	Adder	1.81
957931	AF2-087 C	0.1170	Adder	0.26
957932	AF2-087 E	0.1611	Adder	0.36
957981	AF2-092 C	0.8004	50/50	0.8004
957982	AF2-092 E	0.5336	50/50	0.5336
958101	AF2-104 C	0.2502	50/50	0.2502
958102	AF2-104 E	0.1668	50/50	0.1668
958271	AF2-121 C	0.3131	Adder	0.7
958272	AF2-121 E	0.2087	Adder	0.46
958411	AF2-135 C	0.1182	Adder	0.26
958412	AF2-135 E	0.0788	Adder	0.17
958471	AF2-141	0.3152	Adder	0.7
959301	AF2-221 C	0.7489	50/50	0.7489
959302	AF2-221 E	1.0342	50/50	1.0342
959401	AF2-231 C	0.0725	Adder	0.16
959402	AF2-231 E	0.0483	Adder	0.11
959792	AF2-270 E	0.4145	50/50	0.4145
959802	AF2-271 E	0.1060	Adder	0.24
960211	AF2-312 C	0.3863	Adder	0.86
960212	AF2-312 E	0.2575	Adder	0.57
960391	AF2-330 C	5.2932	50/50	5.2932
960392	AF2-330 E	2.3151	50/50	2.3151
960451	AF2-336 C O1	1.3340	50/50	1.3340
960452	AF2-336 E O1	0.8894	50/50	0.8894
960461	AF2-337 C O1	1.3340	50/50	1.3340
960462	AF2-337 E O1	0.8894	50/50	0.8894
960471	AF2-338 C O1	1.3340	50/50	1.3340
960472	AF2-338 E O1	0.8894	50/50	0.8894
960481	AF2-339 C O1	1.3340	50/50	1.3340
960482	AF2-339 E O1	0.8894	50/50	0.8894

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960901	AF2-381 C	9.3767	50/50	9.3767
960902	AF2-381 E	4.9345	50/50	4.9345
NEWTON	NEWTON	0.5319	Confirmed LTF	0.5319
FARMERCITY	FARMERCITY	0.0274	Confirmed LTF	0.0274
G-007A	G-007A	1.4529	Confirmed LTF	1.4529
VFT	VFT	4.0054	Confirmed LTF	4.0054
CALDERWOOD	CALDERWOOD	0.2271	Confirmed LTF	0.2271
PRAIRIE	PRAIRIE	1.2605	Confirmed LTF	1.2605
CHEOAH	CHEOAH	0.2277	Confirmed LTF	0.2277
EDWARDS	EDWARDS	0.1740	Confirmed LTF	0.1740
TILTON	TILTON	0.3144	Confirmed LTF	0.3144
MADISON	MADISON	0.0403	Confirmed LTF	0.0403
GIBSON	GIBSON	0.2725	Confirmed LTF	0.2725
BLUEG	BLUEG	0.8715	Confirmed LTF	0.8715
TRIMBLE	TRIMBLE	0.2794	Confirmed LTF	0.2794
CATAWBA	CATAWBA	0.1452	Confirmed LTF	0.1452

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
101180009	200734	26SCALP L.	PENELEC	200749	26RACHEL H	PENELEC	1	PN-P7-1-PN-230-001	tower	190.0	100.75	106.15	DC	10.28

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.2537	50/50	0.2537
200834	26SW_E13_K22	0.1303	50/50	0.1303
200835	26DSGENWIN	0.6414	50/50	0.6414
200840	26DEEPCRK1	0.2343	50/50	0.2343
200841	26DEEPCRK2	0.2343	50/50	0.2343
200846	26FORWARD	0.4573	50/50	0.4573
200864	K-013 E	10.6047	50/50	10.6047
200889	26STNY CRK	0.6356	50/50	0.6356
200890	26BF_G21_K23	0.3146	50/50	0.3146
200891	26CSLMN_L13	0.4934	50/50	0.4934
200892	26LOOKOUT	0.4687	50/50	0.4687
202225	26SCI_S29B	0.2027	50/50	0.2027
202652	26RGH_Y1-033	0.2408	50/50	0.2408
292350	K-023	11.7637	50/50	11.7637
292542	L-013 1	11.4419	50/50	11.4419
293432	R-040 E	0.6436	50/50	0.6436
293902	O-048 E	10.2977	50/50	10.2977
294903	P-060 E	14.7386	50/50	14.7386
913142	Y1-033 E OP1	9.5361	50/50	9.5361
917672	Z2-108 E	6.4361	50/50	6.4361
930262	**AB1-065 E (Suspended)**	**0.4692**	**Adder**	**0.55**
938351	AE1-053	3.5756	50/50	3.5756
938881	AE1-116	1.8885	50/50	1.8885
938991	AE1-128 C	19.0411	50/50	19.0411
938992	AE1-128 E	12.6941	50/50	12.6941
943301	AF1-001 C	0.4485	Adder	0.53
943302	AF1-001 E	0.5002	Adder	0.59
943711	AF1-039 C O1	2.5228	50/50	2.5228
943712	AF1-039 E O1	1.6819	50/50	1.6819
944781	AF1-143 C	21.4536	50/50	21.4536
944782	AF1-143 E	11.4419	50/50	11.4419
945671	AF1-232 C O2	39.0010	50/50	39.0010
945672	AF1-232 E O2	21.0006	50/50	21.0006
946081	AF1-273 C O1	18.7389	50/50	18.7389
946082	AF1-273 E O1	12.4926	50/50	12.4926
946571	AF1-321 C O1	6.0611	50/50	6.0611
946572	AF1-321 E O1	4.0407	50/50	4.0407
957001	AF2-001 C O1	6.0611	50/50	6.0611
957002	AF2-001 E O1	4.0407	50/50	4.0407
957011	AF2-002 C O1	3.0305	50/50	3.0305
957012	AF2-002 E O1	2.0204	50/50	2.0204

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957981	AF2-092 C	1.5727	50/50	1.5727
957982	AF2-092 E	1.0485	50/50	1.0485
958101	AF2-104 C	1.0072	50/50	1.0072
958102	AF2-104 E	0.6715	50/50	0.6715
958411	AF2-135 C	1.0727	50/50	1.0727
958412	AF2-135 E	0.7151	50/50	0.7151
958471	AF2-141	2.8605	50/50	2.8605
959301	AF2-221 C	4.3160	50/50	4.3160
959302	AF2-221 E	5.9602	50/50	5.9602
959792	AF2-270 E	0.9841	50/50	0.9841
960451	AF2-336 C O1	2.6212	50/50	2.6212
960452	AF2-336 E O1	1.7474	50/50	1.7474
960461	AF2-337 C O1	2.6212	50/50	2.6212
960462	AF2-337 E O1	1.7474	50/50	1.7474
960471	AF2-338 C O1	2.6212	50/50	2.6212
960472	AF2-338 E O1	1.7474	50/50	1.7474
960481	AF2-339 C O1	2.6212	50/50	2.6212
960482	AF2-339 E O1	1.7474	50/50	1.7474
960901	AF2-381 C	32.3898	50/50	32.3898
960902	AF2-381 E	17.0452	50/50	17.0452
WEC	WEC	0.0410	Confirmed LTF	0.0410
LGEE	LGEE	0.0787	Confirmed LTF	0.0787
CPLE	CPLE	0.1131	Confirmed LTF	0.1131
CBM-W2	CBM-W2	1.1630	Confirmed LTF	1.1630
NY	NY	0.2300	Confirmed LTF	0.2300
CBM-W1	CBM-W1	1.4887	Confirmed LTF	1.4887
TVA	TVA	0.2086	Confirmed LTF	0.2086
O-066	O-066	1.5994	Confirmed LTF	1.5994
CBM-S2	CBM-S2	0.9595	Confirmed LTF	0.9595
CBM-S1	CBM-S1	1.2524	Confirmed LTF	1.2524
G-007	G-007	0.2392	Confirmed LTF	0.2392
MEC	MEC	0.2129	Confirmed LTF	0.2129

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
101179994	200746	26ROCKWOOD	PENELEC	202650	26HIGHPOINT	PENELEC	1	PN-P7-1-PN-230-001	tower	179.0	132.04	133.37	DC	2.38

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200834	26SW_E13_K22	0.0866	50/50	0.0866
200835	26DSGENWIN	0.6918	50/50	0.6918
200846	26FORWARD	0.2029	50/50	0.2029
200864	K-013 E	4.7045	50/50	4.7045
200883	Q-053 E	3.2917	Adder	3.87
200888	26HIGHLAND	0.2565	50/50	0.2565
200889	26STNY CRK	0.4216	50/50	0.4216
200890	26BF_G21_K23	0.3393	50/50	0.3393
200891	26CSLMN_L13	0.5322	50/50	0.5322
200892	26LOOKOUT	0.5056	50/50	0.5056
200925	26R32	0.2960	50/50	0.2960
202225	26SCI_S29B	0.1348	50/50	0.1348
292350	K-023	12.6879	50/50	12.6879
292542	L-013 1	12.3408	50/50	12.3408
293432	R-040 E	0.6942	50/50	0.6942
293603	O-018 E	5.9483	50/50	5.9483
293902	O-048 E	11.1067	50/50	11.1067
294903	P-060 E	9.7768	50/50	9.7768
296332	R-032 E	6.8634	50/50	6.8634
917672	Z2-108 E	6.9417	50/50	6.9417
938351	AE1-053	3.8565	50/50	3.8565
938881	AE1-116	1.2556	50/50	1.2556
938991	AE1-128 C	12.5719	50/50	12.5719
938992	AE1-128 E	8.3813	50/50	8.3813
944751	AF1-140 C	1.1220	50/50	1.1220
944752	AF1-140 E	0.7480	50/50	0.7480
944781	AF1-143 C	23.1390	50/50	23.1390
944782	AF1-143 E	12.3408	50/50	12.3408
945671	AF1-232 C O2	25.8939	50/50	25.8939
945672	AF1-232 E O2	13.9429	50/50	13.9429
946081	AF1-273 C O1	12.4379	50/50	12.4379
946082	AF1-273 E O1	8.2919	50/50	8.2919
946571	AF1-321 C O1	2.5176	50/50	2.5176
946572	AF1-321 E O1	1.6784	50/50	1.6784
957001	AF2-001 C O1	2.5176	50/50	2.5176
957002	AF2-001 E O1	1.6784	50/50	1.6784
957011	AF2-002 C O1	1.2588	50/50	1.2588
957012	AF2-002 E O1	0.8392	50/50	0.8392
957512	AF2-045 E	0.5650	Adder	1.25
957981	AF2-092 C	1.1613	50/50	1.1613

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957982	AF2-092 E	0.7742	50/50	0.7742
958101	AF2-104 C	0.6697	50/50	0.6697
958102	AF2-104 E	0.4464	50/50	0.4464
958411	AF2-135 C	1.1570	50/50	1.1570
958412	AF2-135 E	0.7713	50/50	0.7713
958471	AF2-141	3.0852	50/50	3.0852
959301	AF2-221 C	0.9989	50/50	0.9989
959302	AF2-221 E	1.3795	50/50	1.3795
959792	AF2-270 E	0.6497	50/50	0.6497
960391	AF2-330 C	1.9956	Adder	4.43
960392	AF2-330 E	0.8728	Adder	1.94
960451	AF2-336 C O1	1.9355	50/50	1.9355
960452	AF2-336 E O1	1.2903	50/50	1.2903
960461	AF2-337 C O1	1.9355	50/50	1.9355
960462	AF2-337 E O1	1.2903	50/50	1.2903
960471	AF2-338 C O1	1.9355	50/50	1.9355
960472	AF2-338 E O1	1.2903	50/50	1.2903
960481	AF2-339 C O1	1.9355	50/50	1.9355
960482	AF2-339 E O1	1.2903	50/50	1.2903
960901	AF2-381 C	15.8698	50/50	15.8698
960902	AF2-381 E	8.3515	50/50	8.3515
NEWTON	NEWTON	0.3084	Confirmed LTF	0.3084
FARMERCITY	FARMERCITY	0.0161	Confirmed LTF	0.0161
G-007A	G-007A	1.0141	Confirmed LTF	1.0141
VFT	VFT	2.7993	Confirmed LTF	2.7993
CALDERWOOD	CALDERWOOD	0.1580	Confirmed LTF	0.1580
PRAIRIE	PRAIRIE	0.7517	Confirmed LTF	0.7517
CHEOAH	CHEOAH	0.1597	Confirmed LTF	0.1597
EDWARDS	EDWARDS	0.0973	Confirmed LTF	0.0973
TILTON	TILTON	0.1770	Confirmed LTF	0.1770
GIBSON	GIBSON	0.1567	Confirmed LTF	0.1567
BLUEG	BLUEG	0.5034	Confirmed LTF	0.5034
TRIMBLE	TRIMBLE	0.1614	Confirmed LTF	0.1614
CATAWBA	CATAWBA	0.1169	Confirmed LTF	0.1169

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
101179989	202650	26HIGHPOINT	PENELEC	200747	26PENN-MAR	PENELEC	1	PN-P7-1-PN-230-001	tower	174.0	147.0	148.36	DC	2.38

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200834	26SW_E13_K22	0.0866	50/50	0.0866
200835	26DSGENWIN	0.6918	50/50	0.6918
200846	26FORWARD	0.2029	50/50	0.2029
200864	K-013 E	4.7040	50/50	4.7040
200883	Q-053 E	3.2909	Adder	3.87
200888	26HIGHLAND	0.2564	50/50	0.2564
200889	26STNY CRK	0.4216	50/50	0.4216
200890	26BF_G21_K23	0.3392	50/50	0.3392
200891	26CSLMN_L13	0.5321	50/50	0.5321
200892	26LOOKOUT	0.5055	50/50	0.5055
200925	26R32	0.2959	50/50	0.2959
202225	26SCI_S29B	0.1348	50/50	0.1348
202652	26RGH_Y1-033	0.4452	50/50	0.4452
292350	K-023	12.6872	50/50	12.6872
292542	L-013 1	12.3402	50/50	12.3402
293432	R-040 E	0.6941	50/50	0.6941
293603	O-018 E	5.9467	50/50	5.9467
293902	O-048 E	11.1061	50/50	11.1061
294903	P-060 E	9.7755	50/50	9.7755
296332	R-032 E	6.8616	50/50	6.8616
913142	Y1-033 E OP1	17.6302	50/50	17.6302
917672	Z2-108 E	6.9413	50/50	6.9413
938351	AE1-053	3.8563	50/50	3.8563
938881	AE1-116	1.2555	50/50	1.2555
938991	AE1-128 C	12.5698	50/50	12.5698
938992	AE1-128 E	8.3798	50/50	8.3798
943711	AF1-039 C O1	4.6641	50/50	4.6641
943712	AF1-039 E O1	3.1094	50/50	3.1094
944751	AF1-140 C	1.1217	50/50	1.1217
944752	AF1-140 E	0.7478	50/50	0.7478
944781	AF1-143 C	23.1378	50/50	23.1378
944782	AF1-143 E	12.3402	50/50	12.3402
945671	AF1-232 C O2	25.8908	50/50	25.8908
945672	AF1-232 E O2	13.9412	50/50	13.9412
946081	AF1-273 C O1	12.4369	50/50	12.4369
946082	AF1-273 E O1	8.2912	50/50	8.2912
946571	AF1-321 C O1	2.5172	50/50	2.5172
946572	AF1-321 E O1	1.6782	50/50	1.6782
957001	AF2-001 C O1	2.5172	50/50	2.5172
957002	AF2-001 E O1	1.6782	50/50	1.6782
957011	AF2-002 C O1	1.2586	50/50	1.2586

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957012	AF2-002 E O1	0.8391	50/50	0.8391
957512	AF2-045 E	0.5648	Adder	1.25
957981	AF2-092 C	1.1611	50/50	1.1611
957982	AF2-092 E	0.7740	50/50	0.7740
958101	AF2-104 C	0.6696	50/50	0.6696
958102	AF2-104 E	0.4464	50/50	0.4464
958411	AF2-135 C	1.1569	50/50	1.1569
958412	AF2-135 E	0.7713	50/50	0.7713
958471	AF2-141	3.0850	50/50	3.0850
959301	AF2-221 C	0.9988	50/50	0.9988
959302	AF2-221 E	1.3793	50/50	1.3793
959792	AF2-270 E	0.6496	50/50	0.6496
960391	AF2-330 C	1.9949	Adder	4.43
960392	AF2-330 E	0.8725	Adder	1.94
960451	AF2-336 C O1	1.9351	50/50	1.9351
960452	AF2-336 E O1	1.2901	50/50	1.2901
960461	AF2-337 C O1	1.9351	50/50	1.9351
960462	AF2-337 E O1	1.2901	50/50	1.2901
960471	AF2-338 C O1	1.9351	50/50	1.9351
960472	AF2-338 E O1	1.2901	50/50	1.2901
960481	AF2-339 C O1	1.9351	50/50	1.9351
960482	AF2-339 E O1	1.2901	50/50	1.2901
960901	AF2-381 C	15.8673	50/50	15.8673
960902	AF2-381 E	8.3502	50/50	8.3502
NEWTON	NEWTON	0.3105	Confirmed LTF	0.3105
FARMERCITY	FARMERCITY	0.0162	Confirmed LTF	0.0162
G-007A	G-007A	1.0093	Confirmed LTF	1.0093
VFT	VFT	2.7864	Confirmed LTF	2.7864
CALDERWOOD	CALDERWOOD	0.1590	Confirmed LTF	0.1590
PRAIRIE	PRAIRIE	0.7568	Confirmed LTF	0.7568
CHEOAH	CHEOAH	0.1607	Confirmed LTF	0.1607
EDWARDS	EDWARDS	0.0980	Confirmed LTF	0.0980
TILTON	TILTON	0.1783	Confirmed LTF	0.1783
GIBSON	GIBSON	0.1578	Confirmed LTF	0.1578
BLUEG	BLUEG	0.5069	Confirmed LTF	0.5069
TRIMBLE	TRIMBLE	0.1625	Confirmed LTF	0.1625
CATAWBA	CATAWBA	0.1176	Confirmed LTF	0.1176

11.7 Queue Dependencies

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

Queue Number	Project Name	Status
AB1-065	Jennings-Hoyes 34.5kV	Suspended
AD2-133	Eagle Valley 115kV	Active
AE1-053	Meyersdale North	Active
AE1-116	Somerset Windpower 23 kV	Active
AE1-128	Bedford North-Wills Mounain 115 kV	Active
AE2-117	ABW Tap-Alexandria 46 kV	Active
AE2-118	ABW Tap-Williamsburg 46 kV	Active
AE2-129	Philipsburg-Clarence 34.5 kV	Active
AE2-131	Philipsburg-Karthaus 34.5	Active
AE2-224	Bearrock-Johnstown 230 kV	Active
AE2-264	Altoona-Raystown 230 kV	Active
AF1-001	Thayerville 34.5 kV	Engineering and Procurement
AF1-039	Listonburg-Highpoint 24.9 kV	Active
AF1-140	Claysburg 23 kV	Engineering and Procurement
AF1-143	Lick Run 115 kV	Active
AF1-232	Allegheny-Somerset 115 kV	Active
AF1-273	Allegheny 115 kV	Active
AF1-307	Seward-Jackson Rd 115 kV	Active
AF1-321	Hooversville 115 kV I	Active
AF2-001	Hooversville 115 kV II	Active
AF2-002	Hooversville 115 kV III	Active
AF2-045	Cambria Nug 115 kV	Active
AF2-050	Bearrock-Johnstown 230 kV	Active
AF2-087	East Altoona-Pinecroft 12.47 kV	Active
AF2-092	Snake Spring-Bedford Area 23 kV	Active
AF2-104	Somerset 23 kV	Active
AF2-121	Philipsburg-Shawville 34.5 kV	Active
AF2-135	Rockwood-Confluence 23 kV	Active
AF2-141	Lick Run 115 kV	Active
AF2-221	Scalp Level 22.9 kV	Active
AF2-231	Belleville 12.47 kV	Active
AF2-270	Bedford South RCB-Bedford Area 23 kV	Active
AF2-271	Pemberton-Sinking Valley 12.47 kV	Active
AF2-312	Carrolltown-Patton 46 kV	Active
AF2-330	Claysburg-Summit 115 kV	Active
AF2-336	Snake Spring 115 kV I	Active
AF2-337	Snake Spring 115 kV II	Active
AF2-338	Snake Spring 115 kV III	Active
AF2-339	Snake Spring 115 kV IV	Active

Queue Number	Project Name	Status
AF2-381	Bedford North-Central City West 115 kV	Active
V3-030	St. Benedict-Patton 46kV	In Service
Y1-033	Penn Mar-Rock Wood 115kV	In Service
Z2-108	Meyersdale North 115kV	In Service

11.8 Contingency Descriptions

Contingency Name	Contingency Definition
Base Case	
PN-P7-1-PN-230-001	CONTINGENCY 'PN-P7-1-PN-230-001' /* HOMER CITY - HOOVERSVILLE 230KV & SEWARD - TOWER 51 115KV DISCONNECT BRANCH FROM BUS 200767 TO BUS 200768 CKT 1 /* 26HOMER CT 230 26QUEMAHON 230 DISCONNECT BRANCH FROM BUS 200768 TO BUS 200796 CKT 1 /* 26QUEMAHON 230 26HOOVRSVL 230 DISCONNECT BRANCH FROM BUS 200796 TO BUS 200743 CKT 3 /* 26HOOVRSVL 230 26HOOVERSV 115 DISCONNECT BRANCH FROM BUS 200741 TO BUS 200742 CKT 1 /* 26SEWARD 115 26TOWER 51 115 END
PN-P2-3-PN-230-9H-A	CONTINGENCY 'PN-P2-3-PN-230-9H-A' /* HOMER CITY 230 KV STUCK BREAKER 209 (SHELOCTA/SOUTH BUS) DISCONNECT BRANCH FROM BUS 200767 TO BUS 200769 TO BUS 202641 CKT S/* 26HOMER CT 230 26HOMER CY 345 26HOMERCITYS 23.00 DISCONNECT BRANCH FROM BUS 200767 TO BUS 200795 CKT 1 /* 26HOMER CT 230 26SHELOCTA 230 END
AP-P1-3-PN-115-010	CONTINGENCY 'AP-P1-3-PN-115-010' /* GARRETT 138/115KV XFMR FAULT OPEN BRANCH FROM BUS 235469 TO BUS 235470 CKT 1 /* 01GARRET 138.00 01GARRET 115.00 END

12 Short Circuit Analysis

Short circuit analysis will be provided in the System Impact Study report.

13 Affected Systems

13.1 NYISO

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

14 Attachment 1: One Line Diagram