Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-203

REELS CORNER 23 KV

6.5 MW Capacity / 10 MW Energy

January 2021

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1 Introduction

This Feasibility Study has been prepared in accordance with the PJM Open Access Transmission Tariff, 36.2, as well as the Feasibility Study Agreement between the Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is Mid-Atlantic Interstate Transmission, LLC (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 10 MW with 6.5 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is December 31, 2022. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-203
Project Name	REELS CORNER 23 KV
State	Pennsylvania
County	Somerset
Transmission Owner	MAIT (PENELEC)
MFO	10
MWE	10
MWC	6.5
Fuel	Solar
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

AG1-203 will interconnect with the PENELEC system via a tap on the 23 kV Reels Corner circuit at pole # 15029-S12. The IC's proposed generating unit site is approximately 2.8 miles southeast of Shanksville, PA., near Huckleberry Hwy. and Sulfer Run Road.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AG1-203 generation project to connect to the Penelec distribution system.

5 Cost Summary

The AG1-203 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$170,200
Total System Network Upgrade Costs	$130,400,000[1]
Total Costs	$130,570,200

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.

[1] This project currently causes and/or contributes to overloads of the Transmission System (see Summer Peak Load Flow Analysis section below) and therefore has potential to have cost allocation for the system reinforcements listed in the report. This will be re-evaluated in the System Impact phase. The results may vary with queue customers withdrawing from the queue and other generators deactivating over time. If a customer is the first to cause the need for a project (causes loading to exceed 100% of rating), then the customer is responsible. If a customer contributes to a facility that is already overloaded by a prior queue, then they may receive cost allocation.

6 Transmission Owner Scope of Work

The AG1-203 will interconnect with the Penelec distribution system via a tap on the 23 kV Reels Corner circuit at pole # 15029-S12. The IC will be responsible for acquiring all easements, properties, and permits that may be required to construct the new interconnection station and the associated facilities.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AG1-203 generation project to connect to the Penelec distribution system. The 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 FE distribution system's direct connection facilities.

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

Description	**Total Cost**
Proposed tap point at 15029-S12 on existing pole or interspersed pole on existing Sidone Road 23kV distribution circuit, add new SCADA switch, add new primary metering. The customer is responsible to build their own line from their site to Penelec's existing facilities.	$ 137,000
Relay settings at sub for AG1-203 tap MW injection. @ Allegheny	$ 33,200
Total Physical Interconnection Costs	$170,200

7 Schedule

Based on the scope of work for the interconnection facilities, it is expected to take a minimum of **14 months** after the signing of an Interconnection Construction Service Agreement and construction kickoff call to complete the installation. 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 work and that any system outages will be allowed when requested.

8 Transmission Owner Analysis

Penelec performed an analysis of its distribution system. The AG1-203 project did not contribute to any overloads on the distribution system.

9 Interconnection Customer Requirements

9.1 System Protection

An analysis was conducted to assess the impact of the Reels Corner 23 kV (AG1-203) 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 show the IC constructing a generation facility tapping Penelec's Allegheny – 23 kV Reels Corner circuit at pole 15029-S12.

The 23kV 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". Anti-islanding system shall meet IEEE 1547 and UL 1741 therefore no Direct Transfer Trip (DTT) will be required.

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 Compliance Issues

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

10.3 Interconnected Transmission Owner Requirements

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

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

11 Summer Peak - Load Flow Analysis

The Queue Project AG1-203 was evaluated as a 10.0 MW (Capacity 6.5 MW) injection at the Allegheny 23 kV substation in the PENELEC area. Project AG1-203 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-203 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
165934562	200744	26SOMERST	115.0	PENELEC	965880	AG1-457 TAP	115.0	PENELEC	1	PN-P2-3-PN-230-0183-208	breaker	179.0	99.48	100.53	DC	1.89
165934485	965880	AG1-457 TAP	115.0	PENELEC	200746	26ROCKWOOD	115.0	PENELEC	1	PN-P2-3-PN-230-0183-208	breaker	179.0	99.42	100.48	DC	1.89

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
165934502	200501	26BDFORDN	115.0	PENELEC	200523	26SNAKE SP	115.0	PENELEC	1	PN-P2-3-PN-115-11F	breaker	152.0	108.19	109.23	DC	1.58
166579636	200505	26CLYSBURG	115.0	PENELEC	200525	26SUMMIT	115.0	PENELEC	1	PN-P7-1-PN-230-001	tower	252.0	100.27	101.4	DC	2.85
166579666	200743	26HOOVER SV	115.0	PENELEC	964910	AG1-355 TAP	115.0	PENELEC	1	PN-P7-1-PN-230-001	tower	245.0	100.8	102.28	DC	3.62
166579656	200744	26SOMERST	115.0	PENELEC	965880	AG1-457 TAP	115.0	PENELEC	1	PN-P7-1-PN-230-001	tower	179.0	104.31	105.68	DC	2.46
165934359	200745	26ALLEGHEN	115.0	PENELEC	200884	26NEW BALT	115.0	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	128.76	132.71	DC	6.33
165934312	200884	26NEW BALT	115.0	PENELEC	200501	26BDFORD N	115.0	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	151.51	155.46	DC	6.33

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
165934347	202637	26PRIDE	115.0	PENELEC	200744	26SOMERST	115.0	PENELEC	1	PN-P2-3-PN-115-11A	breaker	160.0	147.18	151.72	DC	7.27
165934369	945670	AF1-232 TAP	115.0	PENELEC	964920	AG1-356 TAP	115.0	PENELEC	1	PN-P2-3-PN-115-11A	breaker	160.0	149.93	154.47	DC	7.27
166579628	964910	AG1-355 TAP	115.0	PENELEC	200734	26SCALP L.	115.0	PENELEC	1	PN-P7-1-PN-230-001	tower	245.0	100.8	102.28	DC	3.62
165934337	964920	AG1-356 TAP	115.0	PENELEC	202637	26PRIDE	115.0	PENELEC	1	PN-P2-3-PN-115-11A	breaker	160.0	149.93	154.47	DC	7.27
166579623	965880	AG1-457 TAP	115.0	PENELEC	200746	26ROCKWOOD	115.0	PENELEC	1	PN-P7-1-PN-230-001	tower	179.0	104.31	105.68	DC	2.46

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
166178188	200501	26BDFORDN	115.0	PENELEC	960900	AF2-381 TAP	115.0	PENELEC	1	PN-P1-2-PN-115-074-A	operation	149.0	97.61	100.57	DC	4.41
166178225	200523	26SNAKESP	115.0	PENELEC	200521	26SAXTON	115.0	PENELEC	1	PN-P1-2-PN-115-080	operation	160.0	102.2	103.22	DC	1.63
166178036	200742	26TOWER51	115.0	PENELEC	200741	26SEWARD	115.0	PENELEC	1	AP-P1-3-PE-115-010	operation	185.0	134.99	136.6	DC	2.97

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
166178040	200742	26TOWER 51	115.0	PENELEC	200741	26SEWARD	115.0	PENELEC	1	Base Case	operation	147.0	114.62	116.27	DC	2.43
166177993	200743	26HOOVER SV	115.0	PENELEC	200742	26TOWER 51	115.0	PENELEC	1	AP-P1-3-PE-115-010	operation	172.0	159.87	161.62	DC	3.01
166177997	200743	26HOOVER SV	115.0	PENELEC	200742	26TOWER 51	115.0	PENELEC	1	Base Case	operation	137.0	139.33	141.12	DC	2.46
166178120	200744	26SOMERST	115.0	PENELEC	200743	26HOOVERSV	115.0	PENELEC	1	AP-P1-3-PE-115-010	operation	190.0	109.26	110.99	DC	3.29
166178216	200744	26SOMERST	115.0	PENELEC	965880	AG1-457 TAP	115.0	PENELEC	1	Base Case	operation	148.0	104.8	105.88	DC	1.6
166178126	200745	26ALLEGHEN	115.0	PENELEC	200884	26NEW BALT	115.0	PENELEC	1	PN-P1-2-PN-115-074-A	operation	160.0	100.75	107.0	DC	10.0
166178127	200745	26ALLEGHEN	115.0	PENELEC	200884	26NEW BALT	115.0	PENELEC	1	PN-P1-3-PN-115-025-A	operation	160.0	100.75	107.0	DC	10.0
166177985	200747	26PENN-MAR	115.0	PENELEC	200762	26GARRETT	115.0	PENELEC	1	Base Case	operation	148.0	157.8	158.89	DC	1.6
166178047	200884	26NEW BALT	115.0	PENELEC	200501	26BDFORDN	115.0	PENELEC	1	PN-P1-2-PN-115-074-A	operation	160.0	132.19	138.44	DC	10.0
166178048	200884	26NEW BALT	115.0	PENELEC	200501	26BDFORDN	115.0	PENELEC	1	PN-P1-3-PN-115-025-A	operation	160.0	132.19	138.44	DC	10.0
166178051	200884	26NEW BALT	115.0	PENELEC	200501	26BDFORDN	115.0	PENELEC	1	Base Case	operation	133.0	101.32	104.09	DC	3.67
166178054	202637	26PRIDE	115.0	PENELEC	200744	26SOMERST	115.0	PENELEC	1	Base Case	operation	133.0	133.38	138.13	DC	6.32
166178055	202637	26PRIDE	115.0	PENELEC	200744	26SOMERST	115.0	PENELEC	1	PN-P1-2-PN-115-076	operation	160.0	129.5	135.75	DC	10.0
166178072	945670	AF1-232 TAP	115.0	PENELEC	964920	AG1-356 TAP	115.0	PENELEC	1	Base Case	operation	133.0	138.34	143.09	DC	6.32
166178073	945670	AF1-232 TAP	115.0	PENELEC	964920	AG1-356 TAP	115.0	PENELEC	1	PN-P1-2-PN-115-076	operation	160.0	132.19	138.44	DC	10.0
166178016	960900	AF2-381 TAP	115.0	PENELEC	200799	26CEN.CTY	115.0	PENELEC	1	PN-P1-2-PN-115-074-A	operation	149.0	156.36	159.32	DC	4.41
166178041	964920	AG1-356 TAP	115.0	PENELEC	202637	26PRIDE	115.0	PENELEC	1	Base Case	operation	133.0	136.61	141.36	DC	6.32

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
166178042	964920	AG1-356 TAP	115.0	PENELEC	202637	26PRIDE	115.0	PENELEC	1	PN-P1-2-PN-115-076	operation	160.0	132.19	138.44	DC	10.0
166178166	965880	AG1-457 TAP	115.0	PENELEC	200746	26ROCKWOOD	115.0	PENELEC	1	Base Case	operation	148.0	104.73	105.81	DC	1.6

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
165934337	11	AG1-356 TAP 115.0 kV - 26PRIDE 115.0 kV Ckt 1	PENELEC PN-AG1-F-0036X : Reconductor 2.1 miles of line Project Type : Cost : $5,100,000 Time Estimate : 30 Months	$5,100,000
165934312	7	26NEW BALT 115.0 kV - 26BDFORD N 115.0 kV Ckt 1	PENELEC PN-AG1-F-0032 (1485) : Reconductor 11.1 miles of line. Project Type : FAC Cost : $27,200,000 Time Estimate : 50.0 Months	$27,200,000
166579636	4	26CLYSBURG 115.0 kV - 26SUMMIT 115.0 kV Ckt 1	PENELEC PN-AG1-F-0006A (1377) : Rebuild approximately 11.85 miles of line. Project Type : FAC Cost : $29,000,000 Time Estimate : 50.0 Months	$29,000,000
165934502	3	26BDFORD N 115.0 kV - 26SNAKE SP 115.0 kV Ckt 1	PENELEC PN-AF2-F-0008 (1495) : Reconductor 7.1 miles of line. Project Type : FAC Cost : $17,400,000 Time Estimate : 30.0 Months	$17,400,000
165934562,166579656	1	26SOMERST 115.0 kV - AG1-457 TAP 115.0 kV Ckt 1	PENELEC PN-AG1-F-0008 (1388) : Reconductor approximately 8.1 miles of line. Replace line drops at Somerset Substation. Project Type : FAC Cost : $20,000,000 Time Estimate : 42.0 Months	$20,000,000
166579666	5	26HOOVERSV 115.0 kV - AG1-355 TAP 115.0 kV Ckt 1	PENELEC PN-AG1-F-0034 (1499) : Reconductor 5.4 miles of line. Project Type : FAC Cost : $13,300,000 Time Estimate : 37.0 Months	$13,300,000
166579628	10	AG1-355 TAP 115.0 kV - 26SCALP L. 115.0 kV Ckt 1		
166579623,165934485	2	AG1-457 TAP 115.0 kV - 26ROCKWOOD 115.0 kV Ckt 1	PENELEC PN-AG1-F-0033A (1489) : Rebuild 3 miles of line. Project Type : FAC Cost : $7,400,000 Time Estimate : 32.0 Months	$7,400,000

ID	Idx	Facility	Upgrade Description	Cost
165934359	6	26ALLEGHEN 115.0 kV - 26NEW BALT 115.0 kV Ckt 1	PENELEC PN-AF2-F-0031A (1502) : Reconductor 3.52 miles of line. Project Type : FAC Cost : $10,800,000 Time Estimate : 30.0 Months PN-AF2-F-0031B (1503) : Replace bus conductor at Allegheny. Project Type : FAC Cost : $200,000 Time Estimate : 12.0 Months	$11,000,000
165934369	9	AF1-232 TAP 115.0 kV - AG1-356 TAP 115.0 kV Ckt 1	PENELEC No violation, incorrect contingency. Note: It should be noted that some of the contingencies taken in the analysis may not be valid due to system condition changes that were not captured in the model. This will be re-evaluated for validity in the System Impact phase.	$0
165934347	8	26PRIDE 115.0 kV - 26SOMERST 115.0 kV Ckt 1		
			TOTAL COST	$130,400,000[1]

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
166579656	200744	26SOMERST	PENELEC	965880	AG1-457 TAP	PENELEC	1	PN-P7-1-PN-230-001	tower	179.0	104.31	105.68	DC	2.46

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200834	26SW_E13_K22	0.0404	50/50	0.0404
200835	26ARN_Z1-066	-4.1106	Adder	-4.84
200846	26FORWARD	0.1044	50/50	0.1044
200864	K-013 E	4.7966	50/50	4.7966
200888	26HIGHLAND	0.1443	50/50	0.1443
200889	26STNY CRK	0.3137	50/50	0.3137
200925	26R32	0.2262	50/50	0.2262
202225	26SCI_S29B	0.0808	50/50	0.0808
293603	O-018 E	5.8708	50/50	5.8708
294903	P-060 E	9.8259	50/50	9.8259
296332	R-032 E	6.7740	50/50	6.7740
917673	Z2-108 BAT	10.8810	50/50	10.8810
938352	AE1-053 BAT	6.0450	50/50	6.0450
938881	AE1-116	1.2798	50/50	1.2798
938993	AE1-128 C	12.5712	50/50	12.5712
938994	AE1-128 E	8.3808	50/50	8.3808
942361	AE2-249 C	1.4143	50/50	1.4143
942362	AE2-249 E	0.9428	50/50	0.9428
943301	AF1-001 C	-0.8054	Adder	-0.95
944751	AF1-140 C	1.1050	50/50	1.1050
944752	AF1-140 E	0.7367	50/50	0.7367
945671	**AF1-232 C (Withdrawn : 01/19/2021)**	**26.1706**	**50/50**	**26.1706**
945672	**AF1-232 E (Withdrawn : 01/19/2021)**	**14.0918**	**50/50**	**14.0918**
946571	AF1-321 C O1	2.5591	50/50	2.5591
946572	AF1-321 E O1	1.7061	50/50	1.7061
957001	AF2-001 C O1	2.5591	50/50	2.5591
957002	AF2-001 E O1	1.7061	50/50	1.7061
957011	AF2-002 C O1	1.2796	50/50	1.2796
957012	AF2-002 E O1	0.8530	50/50	0.8530
957981	AF2-092 C	1.1585	50/50	1.1585
957982	AF2-092 E	0.7723	50/50	0.7723
958101	**AF2-104 C (Withdrawn : 12/08/2020)**	**0.6826**	**50/50**	**0.6826**
958102	**AF2-104 E (Withdrawn : 12/08/2020)**	**0.4551**	**50/50**	**0.4551**
958472	AF2-141 BAT	12.0900	50/50	12.0900
959792	AF2-270 E	0.6497	50/50	0.6497
960451	AF2-336 C	1.9308	50/50	1.9308
960452	AF2-336 E	1.2872	50/50	1.2872

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960461	AF2-337 C	1.9308	50/50	1.9308
960462	AF2-337 E	1.2872	50/50	1.2872
960471	AF2-338 C	1.9308	50/50	1.9308
960472	AF2-338 E	1.2872	50/50	1.2872
960481	AF2-339 C	1.9308	50/50	1.9308
960482	AF2-339 E	1.2872	50/50	1.2872
960901	AF2-381 C	16.1695	50/50	16.1695
960902	AF2-381 E	8.5092	50/50	8.5092
961911	AG1-033 C	0.5102	50/50	0.5102
961912	AG1-033 E	0.2870	50/50	0.2870
961981	AG1-041 C	1.0866	50/50	1.0866
961982	AG1-041 E	0.7244	50/50	0.7244
962292	AG1-077 E	0.9841	50/50	0.9841
962641	AG1-113	1.0239	50/50	1.0239
962652	AG1-114 BAT	6.0450	50/50	6.0450
963541	AG1-203 C	1.5991	50/50	1.5991
963542	AG1-203 E	0.8611	50/50	0.8611
963881	AG1-241 C	1.0364	50/50	1.0364
963882	AG1-241 E	0.5581	50/50	0.5581
964191	AG1-280 C	0.4902	Adder	1.09
964192	AG1-280 E	0.3268	Adder	0.73
964201	AG1-281 C	0.4872	Adder	1.08
964202	AG1-281 E	0.3248	Adder	0.72
964751	AG1-338 C	0.5317	50/50	0.5317
964752	AG1-338 E	0.0725	50/50	0.0725
964761	AG1-339 C	0.5559	50/50	0.5559
964762	AG1-339 E	0.0483	50/50	0.0483
964771	AG1-340 C	0.5317	50/50	0.5317
964772	AG1-340 E	0.0725	50/50	0.0725
964911	AG1-355 C	6.5111	50/50	6.5111
964912	AG1-355 E	4.3407	50/50	4.3407
964921	AG1-356 C	5.5797	50/50	5.5797
964922	AG1-356 E	3.7198	50/50	3.7198
966512	AG1-520 E	0.8530	50/50	0.8530
G-007A	G-007A	1.0909	Confirmed LTF	1.0909
VFT	VFT	2.9993	Confirmed LTF	2.9993
CALDERWOOD	CALDERWOOD	0.1605	Confirmed LTF	0.1605
PRAIRIE	PRAIRIE	0.7594	Confirmed LTF	0.7594
CHEOAH	CHEOAH	0.1617	Confirmed LTF	0.1617
CBM-N	CBM-N	0.5844	Confirmed LTF	0.5844
COTTONWOOD	COTTONWOOD	0.6489	Confirmed LTF	0.6489
HAMLET	HAMLET	0.1981	Confirmed LTF	0.1981
GIBSON	GIBSON	0.1583	Confirmed LTF	0.1583
BLUEG	BLUEG	0.5086	Confirmed LTF	0.5086
TRIMBLE	TRIMBLE	0.1631	Confirmed LTF	0.1631
CATAWBA	CATAWBA	0.1186	Confirmed LTF	0.1186

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
166579623	965880	AG1-457 TAP	PENELEC	200746	26ROCKWOOD	PENELEC	1	PN-P7-1-PN-230-001	tower	179.0	104.31	105.68	DC	2.46

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200834	26SW_E13_K22	0.0404	50/50	0.0404
200835	26ARN_Z1-066	-4.1106	Adder	-4.84
200846	26FORWARD	0.1044	50/50	0.1044
200864	K-013 E	4.7966	50/50	4.7966
200888	26HIGHLAND	0.1443	50/50	0.1443
200889	26STNY CRK	0.3137	50/50	0.3137
200925	26R32	0.2262	50/50	0.2262
202225	26SCI_S29B	0.0808	50/50	0.0808
293603	O-018 E	5.8708	50/50	5.8708
294903	P-060 E	9.8259	50/50	9.8259
296332	R-032 E	6.7740	50/50	6.7740
917673	Z2-108 BAT	10.8810	50/50	10.8810
938352	AE1-053 BAT	6.0450	50/50	6.0450
938881	AE1-116	1.2798	50/50	1.2798
938993	AE1-128 C	12.5712	50/50	12.5712
938994	AE1-128 E	8.3808	50/50	8.3808
942361	AE2-249 C	1.4143	50/50	1.4143
942362	AE2-249 E	0.9428	50/50	0.9428
943301	AF1-001 C	-0.8054	Adder	-0.95
944751	AF1-140 C	1.1050	50/50	1.1050
944752	AF1-140 E	0.7367	50/50	0.7367
945671	**AF1-232 C (Withdrawn : 01/19/2021)**	**26.1706**	**50/50**	**26.1706**
945672	**AF1-232 E (Withdrawn : 01/19/2021)**	**14.0918**	**50/50**	**14.0918**
946571	AF1-321 C O1	2.5591	50/50	2.5591
946572	AF1-321 E O1	1.7061	50/50	1.7061
957001	AF2-001 C O1	2.5591	50/50	2.5591
957002	AF2-001 E O1	1.7061	50/50	1.7061
957011	AF2-002 C O1	1.2796	50/50	1.2796
957012	AF2-002 E O1	0.8530	50/50	0.8530
957981	AF2-092 C	1.1585	50/50	1.1585
957982	AF2-092 E	0.7723	50/50	0.7723
958101	**AF2-104 C (Withdrawn : 12/08/2020)**	**0.6826**	**50/50**	**0.6826**
958102	**AF2-104 E (Withdrawn : 12/08/2020)**	**0.4551**	**50/50**	**0.4551**
958472	AF2-141 BAT	12.0900	50/50	12.0900
959792	AF2-270 E	0.6497	50/50	0.6497
960451	AF2-336 C	1.9308	50/50	1.9308
960452	AF2-336 E	1.2872	50/50	1.2872

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960461	AF2-337 C	1.9308	50/50	1.9308
960462	AF2-337 E	1.2872	50/50	1.2872
960471	AF2-338 C	1.9308	50/50	1.9308
960472	AF2-338 E	1.2872	50/50	1.2872
960481	AF2-339 C	1.9308	50/50	1.9308
960482	AF2-339 E	1.2872	50/50	1.2872
960901	AF2-381 C	16.1695	50/50	16.1695
960902	AF2-381 E	8.5092	50/50	8.5092
961911	AG1-033 C	0.5102	50/50	0.5102
961912	AG1-033 E	0.2870	50/50	0.2870
961981	AG1-041 C	1.0866	50/50	1.0866
961982	AG1-041 E	0.7244	50/50	0.7244
962292	AG1-077 E	0.9841	50/50	0.9841
962641	AG1-113	1.0239	50/50	1.0239
962652	AG1-114 BAT	6.0450	50/50	6.0450
963541	AG1-203 C	1.5991	50/50	1.5991
963542	AG1-203 E	0.8611	50/50	0.8611
963881	AG1-241 C	1.0364	50/50	1.0364
963882	AG1-241 E	0.5581	50/50	0.5581
964191	AG1-280 C	0.4902	Adder	1.09
964192	AG1-280 E	0.3268	Adder	0.73
964201	AG1-281 C	0.4872	Adder	1.08
964202	AG1-281 E	0.3248	Adder	0.72
964751	AG1-338 C	0.5317	50/50	0.5317
964752	AG1-338 E	0.0725	50/50	0.0725
964761	AG1-339 C	0.5559	50/50	0.5559
964762	AG1-339 E	0.0483	50/50	0.0483
964771	AG1-340 C	0.5317	50/50	0.5317
964772	AG1-340 E	0.0725	50/50	0.0725
964911	AG1-355 C	6.5111	50/50	6.5111
964912	AG1-355 E	4.3407	50/50	4.3407
964921	AG1-356 C	5.5797	50/50	5.5797
964922	AG1-356 E	3.7198	50/50	3.7198
965881	AG1-457 C	11.5746	50/50	11.5746
965882	AG1-457 E	7.7164	50/50	7.7164
966512	AG1-520 E	0.8530	50/50	0.8530
G-007A	G-007A	1.0909	Confirmed LTF	1.0909
VFT	VFT	2.9993	Confirmed LTF	2.9993
CALDERWOOD	CALDERWOOD	0.1605	Confirmed LTF	0.1605
PRAIRIE	PRAIRIE	0.7594	Confirmed LTF	0.7594
CHEOAH	CHEOAH	0.1617	Confirmed LTF	0.1617
CBM-N	CBM-N	0.5844	Confirmed LTF	0.5844
COTTONWOOD	COTTONWOOD	0.6489	Confirmed LTF	0.6489
HAMLET	HAMLET	0.1981	Confirmed LTF	0.1981
GIBSON	GIBSON	0.1583	Confirmed LTF	0.1583
BLUEG	BLUEG	0.5086	Confirmed LTF	0.5086
TRIMBLE	TRIMBLE	0.1631	Confirmed LTF	0.1631
CATAWBA	CATAWBA	0.1186	Confirmed LTF	0.1186

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
165934502	200501	26BDFORDN	PENELEC	200523	26SNAKESP	PENELEC	1	PN-P2-3-PN-115-11F	breaker	152.0	108.19	109.23	DC	1.58

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200835	26ARN_Z1-066	0.5329	Adder	0.63
200846	26FORWARD	0.0509	50/50	0.0509
200864	K-013 E	2.3397	50/50	2.3397
200889	26STNY CRK	0.2401	50/50	0.2401
203915	26BF_Z2-108	1.1991	Adder	1.41
292350	K-023	2.1916	Adder	2.58
292542	L-013 1	2.1317	Adder	2.51
293432	R-040 E	0.1199	Adder	0.14
293902	O-048 E	1.9185	Adder	2.26
294903	P-060 E	7.5193	50/50	7.5193
913142	Y1-033 E OP1	1.7506	Adder	2.06
938351	AE1-053	0.6661	Adder	0.78
938881	AE1-116	0.3546	Adder	0.42
938993	AE1-128 C	20.1996	50/50	20.1996
938994	AE1-128 E	13.4664	50/50	13.4664
942361	AE2-249 C	2.2725	50/50	2.2725
942362	AE2-249 E	1.5150	50/50	1.5150
943711	AF1-039 C O1	0.4631	Adder	0.54
943712	AF1-039 E O1	0.3088	Adder	0.36
944751	AF1-140 C	-1.8816	Adder	-2.21
944781	AF1-143 C	3.9969	Adder	4.7
944782	AF1-143 E	2.1317	Adder	2.51
945671	AF1-232 C (Withdrawn : 01/19/2021)	15.4710	50/50	15.4710
945672	AF1-232 E (Withdrawn : 01/19/2021)	8.3306	50/50	8.3306
946571	AF1-321 C O1	0.6571	Adder	0.77
946572	AF1-321 E O1	0.4381	Adder	0.52
957001	AF2-001 C O1	0.6571	Adder	0.77
957002	AF2-001 E O1	0.4381	Adder	0.52
957011	AF2-002 C O1	0.3285	Adder	0.39
957012	AF2-002 E O1	0.2190	Adder	0.26
957513	AF2-045 BAT	1.3162	Merchant Transmission	1.3162
957931	AF2-087 C (Suspended)	-0.2042	Adder	-0.24
958101	AF2-104 C (Withdrawn : 12/08/2020)	0.1891	Adder	0.22
958102	AF2-104 E (Withdrawn : 12/08/2020)	0.1261	Adder	0.15
958471	AF2-141	0.5329	Adder	0.63
959792	AF2-270 E	1.0439	50/50	1.0439
960901	AF2-381 C	12.5266	50/50	12.5266

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960902	AF2-381 E	6.5921	50/50	6.5921
962292	AG1-077 E	0.6335	50/50	0.6335
962641	AG1-113	0.1504	Adder	0.33
962651	AG1-114	0.3531	Adder	0.78
963541	AG1-203 C	1.0294	50/50	1.0294
963542	AG1-203 E	0.5543	50/50	0.5543
963561	AG1-205 C	0.2295	Adder	0.51
963562	AG1-205 E	0.1236	Adder	0.27
964753	AG1-338 BAT	1.3018	50/50	1.3018
964763	AG1-339 BAT	1.3018	50/50	1.3018
964773	AG1-340 BAT	1.3018	50/50	1.3018
964911	AG1-355 C	0.8613	Adder	1.91
964912	AG1-355 E	0.5742	Adder	1.27
964921	AG1-356 C	2.9668	50/50	2.9668
964922	AG1-356 E	1.9778	50/50	1.9778
965881	AG1-457 C	1.2160	Adder	2.7
965882	AG1-457 E	0.8107	Adder	1.8
966512	AG1-520 E	0.1161	Adder	0.26
WEC	WEC	0.0243	Confirmed LTF	0.0243
LGEE	LGEE	0.0490	Confirmed LTF	0.0490
CPLE	CPLE	0.0471	Confirmed LTF	0.0471
CBM-W2	CBM-W2	0.6899	Confirmed LTF	0.6899
NY	NY	0.0979	Confirmed LTF	0.0979
TVA	TVA	0.1064	Confirmed LTF	0.1064
O-066	O-066	0.9826	Confirmed LTF	0.9826
SIGE	SIGE	0.0235	Confirmed LTF	0.0235
CBM-S2	CBM-S2	0.7517	Confirmed LTF	0.7517
CBM-S1	CBM-S1	0.0293	Confirmed LTF	0.0293
G-007	G-007	0.1491	Confirmed LTF	0.1491
MEC	MEC	0.1224	Confirmed LTF	0.1224
LAGN	LAGN	0.1330	Confirmed LTF	0.1330
CBM-W1	CBM-W1	1.0515	Confirmed LTF	1.0515

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
166579636	200505	26CLYSBURG	PENELEC	200525	26SUMMIT	PENELEC	1	PN-P7-1-PN-230-001	tower	252.0	100.27	101.4	DC	2.85

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.1264	50/50	0.1264
200834	26SW_E13_K22	0.0336	50/50	0.0336
200835	26ARN_Z1-066	1.5990	50/50	1.5990
200846	26FORWARD	0.1318	50/50	0.1318
200864	K-013 E	6.0566	50/50	6.0566
200888	26HIGHLAND	0.3683	50/50	0.3683
200889	26STNY CRK	0.4031	50/50	0.4031
200890	26BF_G21_K23	0.1608	50/50	0.1608
200891	26CSLMN_L13	0.1860	50/50	0.1860
200892	26LOOKOUT	0.1987	50/50	0.1987
200925	26R32	0.5775	50/50	0.5775
202225	26SCI_S29B	0.0672	50/50	0.0672
202652	26RGH_Y1-033	0.1217	50/50	0.1217
203915	26BF_Z2-108	3.5977	50/50	3.5977
292350	K-023	6.5757	50/50	6.5757
292542	L-013 1	6.3958	50/50	6.3958
293432	R-040 E	0.3598	50/50	0.3598
293603	O-018 E	14.9880	50/50	14.9880
293902	O-048 E	5.7563	50/50	5.7563
294903	P-060 E	12.6252	50/50	12.6252
296332	R-032 E	17.2938	50/50	17.2938
913142	Y1-033 E OP1	5.2483	50/50	5.2483
938351	AE1-053	1.9987	50/50	1.9987
938881	AE1-116	1.0644	50/50	1.0644
938993	AE1-128 C	27.0670	50/50	27.0670
938994	AE1-128 E	18.0446	50/50	18.0446
941351	**AE2-131 C (Suspended)**	**-0.9094**	**Adder**	**-1.07**
942361	AE2-249 C	3.0450	50/50	3.0450
942362	AE2-249 E	2.0300	50/50	2.0300
943711	AF1-039 C O1	1.3884	50/50	1.3884
943712	AF1-039 E O1	0.9256	50/50	0.9256
944751	AF1-140 C	4.9027	50/50	4.9027
944752	AF1-140 E	3.2685	50/50	3.2685
944781	AF1-143 C	11.9922	50/50	11.9922
944782	AF1-143 E	6.3958	50/50	6.3958
945671	**AF1-232 C (Withdrawn : 01/19/2021)**	**28.9266**	**50/50**	**28.9266**
945672	**AF1-232 E (Withdrawn : 01/19/2021)**	**15.5758**	**50/50**	**15.5758**
946571	AF1-321 C O1	2.8532	50/50	2.8532
946572	AF1-321 E O1	1.9022	50/50	1.9022

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957001	AF2-001 C O1	2.8532	50/50	2.8532
957002	AF2-001 E O1	1.9022	50/50	1.9022
957011	AF2-002 C O1	1.4266	50/50	1.4266
957012	AF2-002 E O1	0.9511	50/50	0.9511
957513	AF2-045 BAT	2.6190	50/50	2.6190
957931	**AF2-087 C (Suspended)**	**-0.2402**	**Adder**	**-0.28**
957981	AF2-092 C	2.9074	50/50	2.9074
957982	AF2-092 E	1.9383	50/50	1.9383
958101	**AF2-104 C (Withdrawn : 12/08/2020)**	**0.5677**	**50/50**	**0.5677**
958102	**AF2-104 E (Withdrawn : 12/08/2020)**	**0.3785**	**50/50**	**0.3785**
958471	AF2-141	1.5990	50/50	1.5990
959792	AF2-270 E	1.3988	50/50	1.3988
959803	AF2-271 BAT	0.1233	Merchant Transmission	0.1233
960451	AF2-336 C	4.8457	50/50	4.8457
960452	AF2-336 E	3.2305	50/50	3.2305
960461	AF2-337 C	4.8457	50/50	4.8457
960462	AF2-337 E	3.2305	50/50	3.2305
960471	AF2-338 C	4.8457	50/50	4.8457
960472	AF2-338 E	3.2305	50/50	3.2305
960481	AF2-339 C	4.8457	50/50	4.8457
960482	AF2-339 E	3.2305	50/50	3.2305
960901	AF2-381 C	24.1081	50/50	24.1081
960902	AF2-381 E	12.6869	50/50	12.6869
961911	AG1-033 C	0.6497	50/50	0.6497
961912	AG1-033 E	0.3655	50/50	0.3655
961981	AG1-041 C	3.0536	50/50	3.0536
961982	AG1-041 E	2.0357	50/50	2.0357
962292	AG1-077 E	1.1411	50/50	1.1411
962641	AG1-113	0.8515	50/50	0.8515
962651	AG1-114	1.9987	50/50	1.9987
963541	AG1-203 C	1.8543	50/50	1.8543
963542	AG1-203 E	0.9984	50/50	0.9984
963561	AG1-205 C	1.2992	50/50	1.2992
963562	AG1-205 E	0.6995	50/50	0.6995
963881	AG1-241 C	1.3198	50/50	1.3198
963882	AG1-241 E	0.7106	50/50	0.7106
964191	AG1-280 C	3.5288	50/50	3.5288
964192	AG1-280 E	2.3526	50/50	2.3526
964201	AG1-281 C	3.4664	50/50	3.4664
964202	AG1-281 E	2.3110	50/50	2.3110
964751	AG1-338 C	2.1353	50/50	2.1353
964752	AG1-338 E	0.2912	50/50	0.2912
964761	AG1-339 C	2.2323	50/50	2.2323
964762	AG1-339 E	0.1941	50/50	0.1941
964771	AG1-340 C	2.1353	50/50	2.1353
964772	AG1-340 E	0.2912	50/50	0.2912
964911	AG1-355 C	7.4465	50/50	7.4465
964912	AG1-355 E	4.9643	50/50	4.9643
964921	AG1-356 C	5.8249	50/50	5.8249
964922	AG1-356 E	3.8832	50/50	3.8832
965303	AG1-395 BAT	0.4050	Merchant Transmission	0.4050

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
965881	AG1-457 C	6.8850	50/50	6.8850
965882	AG1-457 E	4.5900	50/50	4.5900
966512	AG1-520 E	0.9511	50/50	0.9511
WEC	WEC	0.0378	Confirmed LTF	0.0378
LGEE	LGEE	0.0785	Confirmed LTF	0.0785
CPLE	CPLE	0.0935	Confirmed LTF	0.0935
CBM-W2	CBM-W2	1.1290	Confirmed LTF	1.1290
NY	NY	0.2101	Confirmed LTF	0.2101
TVA	TVA	0.1820	Confirmed LTF	0.1820
O-066	O-066	1.4537	Confirmed LTF	1.4537
SIGE	SIGE	0.0357	Confirmed LTF	0.0357
CBM-S2	CBM-S2	1.4198	Confirmed LTF	1.4198
CBM-S1	CBM-S1	0.0490	Confirmed LTF	0.0490
G-007	G-007	0.2195	Confirmed LTF	0.2195
MEC	MEC	0.1939	Confirmed LTF	0.1939
LAGN	LAGN	0.2240	Confirmed LTF	0.2240
CBM-W1	CBM-W1	1.5843	Confirmed LTF	1.5843

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
166579666	200743	26HOOVERSV	PENELEC	964910	AG1-355 TAP	PENELEC	1	PN-P7-1-PN-230-001	tower	245.0	100.8	102.28	DC	3.62

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.2241	50/50	0.2241
200834	26SW_E13_K22	0.0596	50/50	0.0596
200835	26ARN_Z1-066	2.8383	50/50	2.8383
200840	26DEEPCRK1	0.1927	50/50	0.1927
200841	26DEEPCRK2	0.1946	50/50	0.1946
200846	26FORWARD	0.2364	50/50	0.2364
200864	K-013 E	10.8611	50/50	10.8611
200889	26STNY CRK	0.4605	50/50	0.4605
200890	26BF_G21_K23	0.2855	50/50	0.2855
200891	26CSLMN_L13	0.3303	50/50	0.3303
200892	26LOOKOUT	0.3526	50/50	0.3526
202225	26SCI_S29B	0.1193	50/50	0.1193
202652	26RGH_Y1-033	0.2159	50/50	0.2159
203915	26BF_Z2-108	6.3862	50/50	6.3862
292350	K-023	11.6726	50/50	11.6726
292542	L-013 1	11.3533	50/50	11.3533
293432	R-040 E	0.6386	50/50	0.6386
293902	O-048 E	10.2180	50/50	10.2180
294903	P-060 E	14.4211	50/50	14.4211
913142	Y1-033 E OP1	9.3096	50/50	9.3096
938351	AE1-053	3.5479	50/50	3.5479
938881	AE1-116	1.8901	50/50	1.8901
938993	AE1-128 C	18.2297	50/50	18.2297
938994	AE1-128 E	12.1531	50/50	12.1531
942361	AE2-249 C	2.0508	50/50	2.0508
942362	AE2-249 E	1.3672	50/50	1.3672
943301	AF1-001 C	0.4718	Adder	0.56
943302	AF1-001 E	0.5262	Adder	0.62
943711	AF1-039 C O1	2.4628	50/50	2.4628
943712	AF1-039 E O1	1.6419	50/50	1.6419
944781	AF1-143 C	21.2874	50/50	21.2874
944782	AF1-143 E	11.3533	50/50	11.3533
945671	**AF1-232 C (Withdrawn : 01/19/2021)**	**38.5050**	**50/50**	**38.5050**
945672	**AF1-232 E (Withdrawn : 01/19/2021)**	**20.7334**	**50/50**	**20.7334**
946571	AF1-321 C O1	6.1408	50/50	6.1408
946572	AF1-321 E O1	4.0938	50/50	4.0938
957001	AF2-001 C O1	6.1408	50/50	6.1408
957002	AF2-001 E O1	4.0938	50/50	4.0938
957011	AF2-002 C O1	3.0704	50/50	3.0704

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957012	AF2-002 E O1	2.0469	50/50	2.0469
957981	AF2-092 C	1.5036	50/50	1.5036
957982	AF2-092 E	1.0024	50/50	1.0024
958101	**AF2-104 C (Withdrawn : 12/08/2020)**	**1.0081**	**50/50**	**1.0081**
958102	**AF2-104 E (Withdrawn : 12/08/2020)**	**0.6720**	**50/50**	**0.6720**
958471	AF2-141	2.8383	50/50	2.8383
959792	AF2-270 E	0.9421	50/50	0.9421
960451	AF2-336 C	2.5061	50/50	2.5061
960452	AF2-336 E	1.6707	50/50	1.6707
960461	AF2-337 C	2.5061	50/50	2.5061
960462	AF2-337 E	1.6707	50/50	1.6707
960471	AF2-338 C	2.5061	50/50	2.5061
960472	AF2-338 E	1.6707	50/50	1.6707
960481	AF2-339 C	2.5061	50/50	2.5061
960482	AF2-339 E	1.6707	50/50	1.6707
960901	AF2-381 C	33.2367	50/50	33.2367
960902	AF2-381 E	17.4908	50/50	17.4908
961981	AG1-041 C	1.2712	50/50	1.2712
961982	AG1-041 E	0.8475	50/50	0.8475
962292	AG1-077 E	1.4468	50/50	1.4468
962641	AG1-113	1.5121	50/50	1.5121
962651	AG1-114	3.5479	50/50	3.5479
963541	AG1-203 C	2.3511	50/50	2.3511
963542	AG1-203 E	1.2660	50/50	1.2660
963561	AG1-205 C	2.3061	50/50	2.3061
963562	AG1-205 E	1.2418	50/50	1.2418
964921	AG1-356 C	8.2162	50/50	8.2162
964922	AG1-356 E	5.4775	50/50	5.4775
965881	AG1-457 C	12.2232	50/50	12.2232
965882	AG1-457 E	8.1488	50/50	8.1488
966512	AG1-520 E	2.0469	50/50	2.0469
WEC	WEC	0.0447	Confirmed LTF	0.0447
LGEE	LGEE	0.0949	Confirmed LTF	0.0949
CPLE	CPLE	0.1276	Confirmed LTF	0.1276
CBM-W2	CBM-W2	1.3888	Confirmed LTF	1.3888
NY	NY	0.2411	Confirmed LTF	0.2411
TVA	TVA	0.2282	Confirmed LTF	0.2282
O-066	O-066	1.6287	Confirmed LTF	1.6287
SIGE	SIGE	0.0412	Confirmed LTF	0.0412
CBM-S2	CBM-S2	1.9001	Confirmed LTF	1.9001
CBM-S1	CBM-S1	0.0612	Confirmed LTF	0.0612
G-007	G-007	0.2467	Confirmed LTF	0.2467
MEC	MEC	0.2336	Confirmed LTF	0.2336
LAGN	LAGN	0.2818	Confirmed LTF	0.2818
CBM-W1	CBM-W1	1.8366	Confirmed LTF	1.8366

11.6.6 Index 6

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
165934359	200745	26ALLEGHEN	PENELEC	200884	26NEW BALT	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	128.76	132.71	DC	6.33

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.2780	50/50	0.2780
200834	26SW_E13_K22	0.0740	50/50	0.0740
200835	26ARN_Z1-066	3.5201	50/50	3.5201
200840	26DEEPCRK1	0.2393	50/50	0.2393
200841	26DEEPCRK2	0.2417	50/50	0.2417
200890	26BF_G21_K23	0.3540	50/50	0.3540
200891	26CSLMN_L13	0.4096	50/50	0.4096
200892	26LOOKOUT	0.4373	50/50	0.4373
202225	26SCI_S29B	0.1479	50/50	0.1479
202652	26RGH_Y1-033	0.2678	50/50	0.2678
203915	26BF_Z2-108	7.9202	50/50	7.9202
292350	K-023	14.4763	50/50	14.4763
292542	L-013 1	14.0803	50/50	14.0803
293432	R-040 E	0.7920	50/50	0.7920
293902	O-048 E	12.6723	50/50	12.6723
913142	Y1-033 E OP1	11.5481	50/50	11.5481
938351	AE1-053	4.4001	50/50	4.4001
938881	AE1-116	2.3439	50/50	2.3439
943301	AF1-001 C	0.6898	50/50	0.6898
943302	AF1-001 E	0.7694	50/50	0.7694
943711	AF1-039 C O1	3.0551	50/50	3.0551
943712	AF1-039 E O1	2.0367	50/50	2.0367
944751	AF1-140 C	-0.6928	Adder	-0.82
944781	AF1-143 C	26.4006	50/50	26.4006
944782	AF1-143 E	14.0803	50/50	14.0803
945671	**AF1-232 C (Withdrawn : 01/19/2021)**	**64.1139**	**50/50**	**64.1139**
945672	**AF1-232 E (Withdrawn : 01/19/2021)**	**34.5229**	**50/50**	**34.5229**
958101	**AF2-104 C (Withdrawn : 12/08/2020)**	**1.2501**	**50/50**	**1.2501**
958102	**AF2-104 E (Withdrawn : 12/08/2020)**	**0.8334**	**50/50**	**0.8334**
958471	AF2-141	3.5201	50/50	3.5201
959793	AF2-270 BAT	0.2381	50/50	0.2381
962292	AG1-077 E	2.5315	50/50	2.5315
962641	AG1-113	1.8751	50/50	1.8751
962651	AG1-114	4.4001	50/50	4.4001
963541	AG1-203 C	4.1137	50/50	4.1137
963542	AG1-203 E	2.2150	50/50	2.2150
963561	AG1-205 C	2.8601	50/50	2.8601

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
963562	AG1-205 E	1.5400	50/50	1.5400
964753	AG1-338 BAT	0.2217	Merchant Transmission	0.2217
964763	AG1-339 BAT	0.2217	Merchant Transmission	0.2217
964773	AG1-340 BAT	0.2217	Merchant Transmission	0.2217
964921	AG1-356 C	12.8954	50/50	12.8954
964922	AG1-356 E	8.5969	50/50	8.5969
965881	AG1-457 C	15.1587	50/50	15.1587
965882	AG1-457 E	10.1058	50/50	10.1058
WEC	WEC	0.0630	Confirmed LTF	0.0630
LGEE	LGEE	0.1326	Confirmed LTF	0.1326
CPLE	CPLE	0.1720	Confirmed LTF	0.1720
CBM-W2	CBM-W2	1.9354	Confirmed LTF	1.9354
NY	NY	0.3368	Confirmed LTF	0.3368
TVA	TVA	0.3150	Confirmed LTF	0.3150
O-066	O-066	2.2545	Confirmed LTF	2.2545
SIGE	SIGE	0.0571	Confirmed LTF	0.0571
CBM-S2	CBM-S2	2.5682	Confirmed LTF	2.5682
CBM-S1	CBM-S1	0.0844	Confirmed LTF	0.0844
G-007	G-007	0.3402	Confirmed LTF	0.3402
MEC	MEC	0.3273	Confirmed LTF	0.3273
LAGN	LAGN	0.3885	Confirmed LTF	0.3885
CBM-W1	CBM-W1	2.6077	Confirmed LTF	2.6077

11.6.7 Index 7

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
165934312	200884	26NEW BALT	PENELEC	200501	26BDFORD N	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	151.51	155.46	DC	6.33

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.2779	50/50	0.2779
200834	26SW_E13_K22	0.0740	50/50	0.0740
200835	26ARN_Z1-066	3.5198	50/50	3.5198
200840	26DEEPCRK1	0.2392	50/50	0.2392
200841	26DEEPCRK2	0.2416	50/50	0.2416
200889	26STNY CRK	0.8959	50/50	0.8959
200890	26BF_G21_K23	0.3540	50/50	0.3540
200891	26CSLMN_L13	0.4095	50/50	0.4095
200892	26LOOKOUT	0.4373	50/50	0.4373
202225	26SCI_S29B	0.1479	50/50	0.1479
202652	26RGH_Y1-033	0.2677	50/50	0.2677
203915	26BF_Z2-108	7.9195	50/50	7.9195
292350	K-023	14.4750	50/50	14.4750
292542	L-013 1	14.0790	50/50	14.0790
293432	R-040 E	0.7919	50/50	0.7919
293902	O-048 E	12.6711	50/50	12.6711
294903	P-060 E	28.0585	50/50	28.0585
913142	Y1-033 E OP1	11.5467	50/50	11.5467
938351	AE1-053	4.3997	50/50	4.3997
938881	AE1-116	2.3437	50/50	2.3437
943301	AF1-001 C	0.6895	50/50	0.6895
943302	AF1-001 E	0.7691	50/50	0.7691
943711	AF1-039 C O1	3.0547	50/50	3.0547
943712	AF1-039 E O1	2.0365	50/50	2.0365
944781	AF1-143 C	26.3982	50/50	26.3982
944782	AF1-143 E	14.0790	50/50	14.0790
945671	AF1-232 C (Withdrawn : 01/19/2021)	64.1087	50/50	64.1087
945672	AF1-232 E (Withdrawn : 01/19/2021)	34.5201	50/50	34.5201
958101	AF2-104 C (Withdrawn : 12/08/2020)	1.2500	50/50	1.2500
958102	AF2-104 E (Withdrawn : 12/08/2020)	0.8333	50/50	0.8333
958471	AF2-141	3.5198	50/50	3.5198
959793	AF2-270 BAT	0.2382	50/50	0.2382
962292	AG1-077 E	2.5313	50/50	2.5313
962641	AG1-113	1.8750	50/50	1.8750
962651	AG1-114	4.3997	50/50	4.3997
963541	AG1-203 C	4.1134	50/50	4.1134
963542	AG1-203 E	2.2149	50/50	2.2149

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
963561	AG1-205 C	2.8598	50/50	2.8598
963562	AG1-205 E	1.5399	50/50	1.5399
964753	AG1-338 BAT	0.2218	Merchant Transmission	0.2218
964763	AG1-339 BAT	0.2218	Merchant Transmission	0.2218
964773	AG1-340 BAT	0.2218	Merchant Transmission	0.2218
964921	AG1-356 C	12.8943	50/50	12.8943
964922	AG1-356 E	8.5962	50/50	8.5962
965881	AG1-457 C	15.1574	50/50	15.1574
965882	AG1-457 E	10.1049	50/50	10.1049
WEC	WEC	0.0617	Confirmed LTF	0.0617
LGEE	LGEE	0.1301	Confirmed LTF	0.1301
CPLE	CPLE	0.1693	Confirmed LTF	0.1693
CBM-W2	CBM-W2	1.8995	Confirmed LTF	1.8995
NY	NY	0.3390	Confirmed LTF	0.3390
TVA	TVA	0.3094	Confirmed LTF	0.3094
O-066	O-066	2.2815	Confirmed LTF	2.2815
SIGE	SIGE	0.0571	Confirmed LTF	0.0571
CBM-S2	CBM-S2	2.5265	Confirmed LTF	2.5265
CBM-S1	CBM-S1	0.0828	Confirmed LTF	0.0828
G-007	G-007	0.3444	Confirmed LTF	0.3444
MEC	MEC	0.3210	Confirmed LTF	0.3210
LAGN	LAGN	0.3815	Confirmed LTF	0.3815
CBM-W1	CBM-W1	2.5516	Confirmed LTF	2.5516

11.6.8 Index 8

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
165934347	202637	26PRIDE	PENELEC	200744	26SOMERST	PENELEC	1	PN-P2-3-PN-115-11A	breaker	160.0	147.18	151.72	DC	7.27

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200835	26ARN_Z1-066	-0.5118	Adder	-0.6
200864	K-013 E	1.4859	Adder	1.75
200889	26STNY CRK	0.8974	50/50	0.8974
294903	P-060 E	28.1064	50/50	28.1064
917673	Z2-108 BAT	1.3547	Merchant Transmission	1.3547
938352	AE1-053 BAT	0.7526	Merchant Transmission	0.7526
938993	AE1-128 C	27.7142	50/50	27.7142
938994	AE1-128 E	18.4762	50/50	18.4762
942361	AE2-249 C	3.1179	50/50	3.1179
942362	AE2-249 E	2.0786	50/50	2.0786
945671	**AF1-232 C (Withdrawn : 01/19/2021)**	**78.4108**	**50/50**	**78.4108**
945672	**AF1-232 E (Withdrawn : 01/19/2021)**	**42.2212**	**50/50**	**42.2212**
957981	AF2-092 C	2.7714	50/50	2.7714
957982	AF2-092 E	1.8476	50/50	1.8476
958472	AF2-141 BAT	1.5052	Merchant Transmission	1.5052
959792	AF2-270 E	1.4323	50/50	1.4323
960451	AF2-336 C	4.6190	50/50	4.6190
960452	AF2-336 E	3.0794	50/50	3.0794
960461	AF2-337 C	4.6190	50/50	4.6190
960462	AF2-337 E	3.0794	50/50	3.0794
960471	AF2-338 C	4.6190	50/50	4.6190
960472	AF2-338 E	3.0794	50/50	3.0794
960481	AF2-339 C	4.6190	50/50	4.6190
960482	AF2-339 E	3.0794	50/50	3.0794
960901	AF2-381 C	13.5225	50/50	13.5225
960902	AF2-381 E	7.1162	50/50	7.1162
962292	AG1-077 E	2.9082	50/50	2.9082
962642	AG1-113 BAT	0.4249	Merchant Transmission	0.4249
962652	AG1-114 BAT	0.3989	Merchant Transmission	0.3989
963541	AG1-203 C	4.7258	50/50	4.7258
963542	AG1-203 E	2.5446	50/50	2.5446
964751	AG1-338 C	1.6936	50/50	1.6936
964752	AG1-338 E	0.2310	50/50	0.2310
964761	AG1-339 C	1.7706	50/50	1.7706
964762	AG1-339 E	0.1540	50/50	0.1540
964771	AG1-340 C	1.6936	50/50	1.6936
964772	AG1-340 E	0.2310	50/50	0.2310
964921	AG1-356 C	16.9759	50/50	16.9759
964922	AG1-356 E	11.3172	50/50	11.3172

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
G-007A	G-007A	0.1151	Confirmed LTF	0.1151
VFT	VFT	0.3161	Confirmed LTF	0.3161
CALDERWOOD	CALDERWOOD	0.0204	Confirmed LTF	0.0204
PRAIRIE	PRAIRIE	0.0956	Confirmed LTF	0.0956
CHEOAH	CHEOAH	0.0205	Confirmed LTF	0.0205
CBM-N	CBM-N	0.0624	Confirmed LTF	0.0624
COTTONWOOD	COTTONWOOD	0.0819	Confirmed LTF	0.0819
HAMLET	HAMLET	0.0254	Confirmed LTF	0.0254
GIBSON	GIBSON	0.0202	Confirmed LTF	0.0202
BLUEG	BLUEG	0.0642	Confirmed LTF	0.0642
TRIMBLE	TRIMBLE	0.0206	Confirmed LTF	0.0206
CATAWBA	CATAWBA	0.0154	Confirmed LTF	0.0154

11.6.9 Index 9

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
165934369	945670	AF1-232 TAP	PENELEC	964920	AG1-356 TAP	PENELEC	1	PN-P2-3-PN-115-11A	breaker	160.0	149.93	154.47	DC	7.27

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200835	26ARN_Z1-066	-0.5118	Adder	-0.6
200864	K-013 E	1.4859	Adder	1.75
200889	26STNY CRK	0.8974	50/50	0.8974
294903	P-060 E	28.1064	50/50	28.1064
917673	Z2-108 BAT	1.3547	Merchant Transmission	1.3547
938352	AE1-053 BAT	0.7526	Merchant Transmission	0.7526
938993	AE1-128 C	27.7142	50/50	27.7142
938994	AE1-128 E	18.4762	50/50	18.4762
942361	AE2-249 C	3.1179	50/50	3.1179
942362	AE2-249 E	2.0786	50/50	2.0786
945671	**AF1-232 C (Withdrawn : 01/19/2021)**	**78.4108**	**50/50**	**78.4108**
945672	**AF1-232 E (Withdrawn : 01/19/2021)**	**42.2212**	**50/50**	**42.2212**
957981	AF2-092 C	2.7714	50/50	2.7714
957982	AF2-092 E	1.8476	50/50	1.8476
958472	AF2-141 BAT	1.5052	Merchant Transmission	1.5052
959792	AF2-270 E	1.4323	50/50	1.4323
960451	AF2-336 C	4.6190	50/50	4.6190
960452	AF2-336 E	3.0794	50/50	3.0794
960461	AF2-337 C	4.6190	50/50	4.6190
960462	AF2-337 E	3.0794	50/50	3.0794
960471	AF2-338 C	4.6190	50/50	4.6190
960472	AF2-338 E	3.0794	50/50	3.0794
960481	AF2-339 C	4.6190	50/50	4.6190
960482	AF2-339 E	3.0794	50/50	3.0794
960901	AF2-381 C	13.5225	50/50	13.5225
960902	AF2-381 E	7.1162	50/50	7.1162
962292	AG1-077 E	2.9082	50/50	2.9082
962642	AG1-113 BAT	0.4249	Merchant Transmission	0.4249
962652	AG1-114 BAT	0.3989	Merchant Transmission	0.3989
963541	AG1-203 C	4.7258	50/50	4.7258
963542	AG1-203 E	2.5446	50/50	2.5446
964751	AG1-338 C	1.6936	50/50	1.6936
964752	AG1-338 E	0.2310	50/50	0.2310
964761	AG1-339 C	1.7706	50/50	1.7706
964762	AG1-339 E	0.1540	50/50	0.1540
964771	AG1-340 C	1.6936	50/50	1.6936
964772	AG1-340 E	0.2310	50/50	0.2310
G-007A	G-007A	0.1151	Confirmed LTF	0.1151
VFT	VFT	0.3161	Confirmed LTF	0.3161
CALDERWOOD	CALDERWOOD	0.0204	Confirmed LTF	0.0204

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
PRAIRIE	PRAIRIE	0.0956	Confirmed LTF	0.0956
CHEOAH	CHEOAH	0.0205	Confirmed LTF	0.0205
CBM-N	CBM-N	0.0624	Confirmed LTF	0.0624
COTTONWOOD	COTTONWOOD	0.0819	Confirmed LTF	0.0819
HAMLET	HAMLET	0.0254	Confirmed LTF	0.0254
GIBSON	GIBSON	0.0202	Confirmed LTF	0.0202
BLUEG	BLUEG	0.0642	Confirmed LTF	0.0642
TRIMBLE	TRIMBLE	0.0206	Confirmed LTF	0.0206
CATAWBA	CATAWBA	0.0154	Confirmed LTF	0.0154

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
166579628	964910	AG1-355 TAP	PENELEC	200734	26SCALP L.	PENELEC	1	PN-P7-1-PN-230-001	tower	245.0	100.8	102.28	DC	3.62

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.2241	50/50	0.2241
200834	26SW_E13_K22	0.0596	50/50	0.0596
200835	26ARN_Z1-066	2.8383	50/50	2.8383
200840	26DEEPCRK1	0.1927	50/50	0.1927
200841	26DEEPCRK2	0.1946	50/50	0.1946
200846	26FORWARD	0.2364	50/50	0.2364
200864	K-013 E	10.8611	50/50	10.8611
200889	26STNY CRK	0.4605	50/50	0.4605
200890	26BF_G21_K23	0.2855	50/50	0.2855
200891	26CSLMN_L13	0.3303	50/50	0.3303
200892	26LOOKOUT	0.3526	50/50	0.3526
202225	26SCI_S29B	0.1193	50/50	0.1193
202652	26RGH_Y1-033	0.2159	50/50	0.2159
203915	26BF_Z2-108	6.3862	50/50	6.3862
292350	K-023	11.6726	50/50	11.6726
292542	L-013 1	11.3533	50/50	11.3533
293432	R-040 E	0.6386	50/50	0.6386
293902	O-048 E	10.2180	50/50	10.2180
294903	P-060 E	14.4211	50/50	14.4211
913142	Y1-033 E OP1	9.3096	50/50	9.3096
938351	AE1-053	3.5479	50/50	3.5479
938881	AE1-116	1.8901	50/50	1.8901
938993	AE1-128 C	18.2297	50/50	18.2297
938994	AE1-128 E	12.1531	50/50	12.1531
942361	AE2-249 C	2.0508	50/50	2.0508
942362	AE2-249 E	1.3672	50/50	1.3672
943301	AF1-001 C	0.4718	Adder	0.56
943302	AF1-001 E	0.5262	Adder	0.62
943711	AF1-039 C O1	2.4628	50/50	2.4628
943712	AF1-039 E O1	1.6419	50/50	1.6419
944781	AF1-143 C	21.2874	50/50	21.2874
944782	AF1-143 E	11.3533	50/50	11.3533
945671	**AF1-232 C (Withdrawn : 01/19/2021)**	**38.5050**	**50/50**	**38.5050**
945672	**AF1-232 E (Withdrawn : 01/19/2021)**	**20.7334**	**50/50**	**20.7334**
946571	AF1-321 C O1	6.1408	50/50	6.1408
946572	AF1-321 E O1	4.0938	50/50	4.0938
957001	AF2-001 C O1	6.1408	50/50	6.1408
957002	AF2-001 E O1	4.0938	50/50	4.0938
957011	AF2-002 C O1	3.0704	50/50	3.0704
957012	AF2-002 E O1	2.0469	50/50	2.0469

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957981	AF2-092 C	1.5036	50/50	1.5036
957982	AF2-092 E	1.0024	50/50	1.0024
958101	AF2-104 C (Withdrawn : 12/08/2020)	1.0081	50/50	1.0081
958102	AF2-104 E (Withdrawn : 12/08/2020)	0.6720	50/50	0.6720
958471	AF2-141	2.8383	50/50	2.8383
959792	AF2-270 E	0.9421	50/50	0.9421
960451	AF2-336 C	2.5061	50/50	2.5061
960452	AF2-336 E	1.6707	50/50	1.6707
960461	AF2-337 C	2.5061	50/50	2.5061
960462	AF2-337 E	1.6707	50/50	1.6707
960471	AF2-338 C	2.5061	50/50	2.5061
960472	AF2-338 E	1.6707	50/50	1.6707
960481	AF2-339 C	2.5061	50/50	2.5061
960482	AF2-339 E	1.6707	50/50	1.6707
960901	AF2-381 C	33.2367	50/50	33.2367
960902	AF2-381 E	17.4908	50/50	17.4908
961981	AG1-041 C	1.2712	50/50	1.2712
961982	AG1-041 E	0.8475	50/50	0.8475
962292	AG1-077 E	1.4468	50/50	1.4468
962641	AG1-113	1.5121	50/50	1.5121
962651	AG1-114	3.5479	50/50	3.5479
963541	AG1-203 C	2.3511	50/50	2.3511
963542	AG1-203 E	1.2660	50/50	1.2660
963561	AG1-205 C	2.3061	50/50	2.3061
963562	AG1-205 E	1.2418	50/50	1.2418
964911	AG1-355 C	17.9013	50/50	17.9013
964912	AG1-355 E	11.9342	50/50	11.9342
964921	AG1-356 C	8.2162	50/50	8.2162
964922	AG1-356 E	5.4775	50/50	5.4775
965881	AG1-457 C	12.2232	50/50	12.2232
965882	AG1-457 E	8.1488	50/50	8.1488
966512	AG1-520 E	2.0469	50/50	2.0469
WEC	WEC	0.0447	Confirmed LTF	0.0447
LGEE	LGEE	0.0949	Confirmed LTF	0.0949
CPLE	CPLE	0.1276	Confirmed LTF	0.1276
CBM-W2	CBM-W2	1.3888	Confirmed LTF	1.3888
NY	NY	0.2411	Confirmed LTF	0.2411
TVA	TVA	0.2282	Confirmed LTF	0.2282
O-066	O-066	1.6287	Confirmed LTF	1.6287
SIGE	SIGE	0.0412	Confirmed LTF	0.0412
CBM-S2	CBM-S2	1.9001	Confirmed LTF	1.9001
CBM-S1	CBM-S1	0.0612	Confirmed LTF	0.0612
G-007	G-007	0.2467	Confirmed LTF	0.2467
MEC	MEC	0.2336	Confirmed LTF	0.2336
LAGN	LAGN	0.2818	Confirmed LTF	0.2818
CBM-W1	CBM-W1	1.8366	Confirmed LTF	1.8366

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ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
165934337	964920	AG1-356 TAP	PENELEC	202637	26PRIDE	PENELEC	1	PN-P2-3-PN-115-11A	breaker	160.0	149.93	154.47	DC	7.27

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200835	26ARN_Z1-066	-0.5118	Adder	-0.6
200864	K-013 E	1.4859	Adder	1.75
200889	26STNY CRK	0.8974	50/50	0.8974
294903	P-060 E	28.1064	50/50	28.1064
917673	Z2-108 BAT	1.3547	Merchant Transmission	1.3547
938352	AE1-053 BAT	0.7526	Merchant Transmission	0.7526
938993	AE1-128 C	27.7142	50/50	27.7142
938994	AE1-128 E	18.4762	50/50	18.4762
942361	AE2-249 C	3.1179	50/50	3.1179
942362	AE2-249 E	2.0786	50/50	2.0786
945671	**AF1-232 C (Withdrawn : 01/19/2021)**	**78.4108**	**50/50**	**78.4108**
945672	**AF1-232 E (Withdrawn : 01/19/2021)**	**42.2212**	**50/50**	**42.2212**
957981	AF2-092 C	2.7714	50/50	2.7714
957982	AF2-092 E	1.8476	50/50	1.8476
958472	AF2-141 BAT	1.5052	Merchant Transmission	1.5052
959792	AF2-270 E	1.4323	50/50	1.4323
960451	AF2-336 C	4.6190	50/50	4.6190
960452	AF2-336 E	3.0794	50/50	3.0794
960461	AF2-337 C	4.6190	50/50	4.6190
960462	AF2-337 E	3.0794	50/50	3.0794
960471	AF2-338 C	4.6190	50/50	4.6190
960472	AF2-338 E	3.0794	50/50	3.0794
960481	AF2-339 C	4.6190	50/50	4.6190
960482	AF2-339 E	3.0794	50/50	3.0794
960901	AF2-381 C	13.5225	50/50	13.5225
960902	AF2-381 E	7.1162	50/50	7.1162
962292	AG1-077 E	2.9082	50/50	2.9082
962642	AG1-113 BAT	0.4249	Merchant Transmission	0.4249
962652	AG1-114 BAT	0.3989	Merchant Transmission	0.3989
963541	AG1-203 C	4.7258	50/50	4.7258
963542	AG1-203 E	2.5446	50/50	2.5446
964751	AG1-338 C	1.6936	50/50	1.6936
964752	AG1-338 E	0.2310	50/50	0.2310
964761	AG1-339 C	1.7706	50/50	1.7706
964762	AG1-339 E	0.1540	50/50	0.1540
964771	AG1-340 C	1.6936	50/50	1.6936
964772	AG1-340 E	0.2310	50/50	0.2310
964921	AG1-356 C	16.9759	50/50	16.9759
964922	AG1-356 E	11.3172	50/50	11.3172

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
G-007A	G-007A	0.1151	Confirmed LTF	0.1151
VFT	VFT	0.3161	Confirmed LTF	0.3161
CALDERWOOD	CALDERWOOD	0.0204	Confirmed LTF	0.0204
PRAIRIE	PRAIRIE	0.0956	Confirmed LTF	0.0956
CHEOAH	CHEOAH	0.0205	Confirmed LTF	0.0205
CBM-N	CBM-N	0.0624	Confirmed LTF	0.0624
COTTONWOOD	COTTONWOOD	0.0819	Confirmed LTF	0.0819
HAMLET	HAMLET	0.0254	Confirmed LTF	0.0254
GIBSON	GIBSON	0.0202	Confirmed LTF	0.0202
BLUEG	BLUEG	0.0642	Confirmed LTF	0.0642
TRIMBLE	TRIMBLE	0.0206	Confirmed LTF	0.0206
CATAWBA	CATAWBA	0.0154	Confirmed LTF	0.0154

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
AE1-053	Meyersdale North	Active
AE1-116	Somerset Windpower 23 kV	Active
AE1-128	Bedford North-Wills Mounain 115 kV	Active
AE2-131	Philipsburg-Karthaus 34.5	Suspended
AE2-249	Bedford North-Pennsylvania Hollow 23 kV	Engineering and Procurement
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	Withdrawn
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	Engineering and Procurement
AF2-087	East Altoona-Pinecroft 12.47 kV	Suspended
AF2-092	Snake Spring-Bedford Area 23 kV	Active
AF2-104	Somerset 23 kV	Withdrawn
AF2-141	Lick Run 115 kV	Active
AF2-270	Bedford South RCB-Bedford Area 23 kV	Engineering and Procurement
AF2-271	Pemberton-Sinking Valley 12.47 kV	Engineering and Procurement
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
AF2-381	Bedford North-Central City West 115 kV	Active
AG1-033	Scalp Level 23 kV	Active
AG1-041	Osterburg-Bedford North 23 kV	Active
AG1-077	Allegheny Tunnel 23 kV	Active
AG1-113	Somerset Windpower 22.86 kV	Active
AG1-114	Meyersdale North 115 kV	Active
AG1-203	Reels Corner 23 kV	Active
AG1-205	Rockwood 23 kV	Active
AG1-241	Scalp Level 23 kV	Active
AG1-280	Claysburg-Puzzletown 46 kV	Active
AG1-281	Claysburg-HCR Tap 46 kV	Active
AG1-338	Curryville-RKB-Yellow Creek 23 kV I	Active
AG1-339	Curryville-RKB-Yellow Creek 23 kV II	Active
AG1-340	Curryville 23 kV	Active
AG1-355	Scalp Level-Hooversville 115 kV	Active
AG1-356	Somerset-Allegheny 115 kV	Active
AG1-395	Philipsburg-Karthaus 34.5 kV 2	Active
AG1-457	Somerset-Rockwood 115 kV	Active
AG1-520	Hooversville-Rockingham 23 kV	Active

Queue Number	Project Name	Status
Y1-033	Penn Mar-Rock Wood 115kV	In Service
Z1-066	Arnold 34.5kV	In Service
Z2-108	Meyersdale North 115kV	In Service

11.8 Contingency Descriptions

Contingency Name	Contingency Definition
PN-P1-2-PN-115-076	CONTINGENCY 'PN-P1-2-PN-115-076' /* BEDFORD NORTH - NEW BALTIMORE 115KV DISCONNECT BRANCH FROM BUS 200501 TO BUS 200884 CKT 1 /* 26BDFORD N 115 26NEW BALT 115 END
PN-P1-2-PN-115-074-A	CONTINGENCY 'PN-P1-2-PN-115-074-A' /* ALLEGHENY - SOMERSET 115KV DISCONNECT BRANCH FROM BUS 200744 TO BUS 202637 CKT 1 /* 26SOMERST 115 26PRIDE 115 DISCONNECT BRANCH FROM BUS 202637 TO BUS 964920 CKT 1 /* 26PRIDE 115 AG1-356 TAP 115 END
PN-P2-3-PN-115-11A	CONTINGENCY 'PN-P2-3-PN-115-11A' /* CLAYSBURG 115KV SB DISCONNECT BRANCH FROM BUS 200505 TO BUS 200525 CKT 1 /* 26CLYSBURG 115 26SUMMIT 115 DISCONNECT BRANCH FROM BUS 200505 TO BUS 200878 CKT 1 /* 26CLYSBURG 115 26KRAYN 115 DISCONNECT BRANCH FROM BUS 200505 TO BUS 200516 CKT 1 /* 26CLYSBURG 115 26OSTRBURG 115 DISCONNECT BRANCH FROM BUS 200516 TO BUS 200564 CKT 1 /* 26OSTRBURG 115 26OSTRE SB 23 DISCONNECT BRANCH FROM BUS 200501 TO BUS 200516 CKT 1 /* 26BDFORD N 115 26OSTRBURG 115 DISCONNECT BRANCH FROM BUS 200505 TO BUS 200506 CKT 1 /* 26CLYSBURG 115 26CURYVILE 115 DISCONNECT BRANCH FROM BUS 200506 TO BUS 200521 CKT 1 /* 26CURYVILE 115 26SAXTON 115 DISCONNECT BRANCH FROM BUS 200506 TO BUS 200552 CKT 1 /* 26CURYVILE 115 26CURY SUB 23 DISCONNECT BRANCH FROM BUS 200505 TO BUS 200541 CKT 2 /* 26CLYSBURG 115 26CLAYSBRG 46 DISCONNECT BRANCH FROM BUS 200505 TO BUS 200551 CKT 1 /* 26CLYSBURG 115 26CLAY SUB 23 END
PN-P1-2-PN-115-080	CONTINGENCY 'PN-P1-2-PN-115-080' /* BEDFORD NORTH - CLAYSBURG 115KV DISCONNECT BRANCH FROM BUS 200505 TO BUS 200516 CKT 1 /* 26CLYSBURG 115 26OSTRBURG 115 DISCONNECT BRANCH FROM BUS 200516 TO BUS 200501 CKT 1 /* 26OSTRBURG 115 26BDFORD N 115 DISCONNECT BRANCH FROM BUS 200516 TO BUS 200564 CKT 1 /* 26OSTRBURG 115 26OSTRE SB 23 DISCONNECT BUS 200516 /* 26OSTRBURG 115 END

Contingency Name	Contingency Definition
PN-P2-3-PN-115-35E	CONTINGENCY 'PN-P2-3-PN-115-35E' /* #14 STUCK TIE BREAKER BETWEEN BUSES 1 AND 2 DISCONNECT BRANCH FROM BUS 964910 TO BUS 200743 CKT 1 /* AG1-355 TAP 115 26HOOVERSV 115 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200802 CKT 1 /* 26HOOVERSV 115 26RALPHTON 115 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200776 CKT 1 /* 26HOOVERSV 115 26HOOVER#1 23 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200744 CKT 1 /* 26HOOVERSV 115 26SOMERST 115 DISCONNECT BRANCH FROM BUS 200742 TO BUS 200743 CKT 1 /* 26TOWER 51 115 26HOOVERSV 115 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200789 CKT 2 /* 26HOOVERSV 115 26HOOVER#2 23 END
PN-P2-3-PN-115-11F	CONTINGENCY 'PN-P2-3-PN-115-11F' /* FUTURE CLAYSBURG 115KV SB (BEDFORD NORTH/KRAYN) DISCONNECT BUS 200516 /* 26OSTRBURG 115 DISCONNECT BUS 200564 /* 26OSTRE SB 23 DISCONNECT BRANCH FROM BUS 200505 TO BUS 200878 CKT 1 /* 26CLYSBURG 115 26KRAYN 115 END
AP-P1-3-PE-115-010	CONTINGENCY 'AP-P1-3-PE-115-010' /* GARRETT 138/115KV XFMR FAULT OPEN BRANCH FROM BUS 235469 TO BUS 235470 CKT 1 /* 01GARRET 138.00 01GARRET 115.00 END
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

Contingency Name	Contingency Definition
PN-P1-3-PN-115-025-A	CONTINGENCY 'PN-P1-3-PN-115-025-A' /* SOMERSET #1 XFMR FAULT DISCONNECT BRANCH FROM BUS 200744 TO BUS 200774 CKT 1 /* 26SOMERST 115 26SOMRSET1 23 DISCONNECT BRANCH FROM BUS 200744 TO BUS 965880 CKT 1 /* 26SOMERST 115 AG1-457 TAP 115 DISCONNECT BRANCH FROM BUS 200744 TO BUS 202637 CKT 1 /* 26SOMERST 115 26PRIDE 115 DISCONNECT BRANCH FROM BUS 202637 TO BUS 964920 CKT 1 /* 26PRIDE 115 AF1-232 TAP 115 DISCONNECT BRANCH FROM BUS 200744 TO BUS 200743 CKT 1 /* 26SOMERST 115 26HOOVERSV 115 END
PN-P2-3-PN-230-0183-208	CONTINGENCY 'PN-P2-3-PN-230-0183-208' /* HOMER CITY 230 KV STUCK BREAKER 208 (HOOVERSVILLE/SHELOCTA) 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 OPEN BRANCH FROM BUS 200767 TO BUS 200795 CKT 1 /* 26HOMER CT 230.00 26SHELOCTA 230.00 END

12 Short Circuit Analysis

The following Breakers are overdutied:

None

13 Affected Systems

13.1 NYISO

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

13.2 MISO

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

14 Attachment 1: One Line Diagram