



**Generation Interconnection
Feasibility Study Report
for
Queue Project AF2-330
CLAYSBURG-SUMMIT 115 KV
48.7 MW Capacity / 70 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, 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 Cambria County, Pennsylvania. The installed facilities will have a total capability of 70 MW with 48.7 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	AF2-330
Project Name	CLAYSBURG-SUMMIT 115 KV
State	Pennsylvania
County	Cambria
Transmission Owner	PENELEC (MAIT)
MFO	70
MWE	70
MWC	48.7
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

The interconnection of the project at the Primary POI will be accomplished by constructing a new 115 kV three (3) breaker ring bus substation and looping the Claysburg - Summit 115 kV line into the new station. The new substation will be located approximately 1.5 miles from Summit Substation. The IC will be responsible for acquiring all easements, properties, and permits that may be required to construct both the new interconnection switching station and the associated facilities. The IC will also be responsible for the rough grade of the property and an access road to the proposed three-breaker ring bus site. The project will also require Non-Direct Connection upgrades at Claysburg Substation and Summit Substation.

5 Cost Summary

The AF2-330 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$10,200,000
Total System Network Upgrade Costs	\$330,220,460 ¹
Total Costs	\$340,420,460

This cost excludes a Federal Income Tax Gross Up charges. This tax may or may not be charged based on whether this project meets the eligibility requirements of IRS Notice 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.

¹ This project currently causes and 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's MW contribution to a facility that is already overloaded by a prior queue is less than 5 MW, then they will not receive cost allocation.

6 Transmission Owner Scope of Work

The interconnection of the project at the Primary POI will be accomplished by constructing a new 115 kV three (3) breaker ring bus substation and looping the Claysburg - Summit 115 kV line into the new station. The new substation will be located approximately 1.5 miles from Summit Substation. The total physical interconnection costs is given in the table below:

Description	Total Cost
Install disconnect switch, dead-end structure, and associated facilities for generator lead line exit at interconnection substation.	\$275,000
Construct 115 kV three breaker ring bus interconnection substation.	\$5,185,000
Loop the Claysburg - Summit 115 kV line into the new substation.	\$790,000
Upgrade relaying at Claysburg.	\$430,000
Install ~1.5 miles of OPGW for fiber relaying from Summit to new interconnection ring bus station	\$3,090,000
Upgrade relaying at Summit.	\$430,000
Total Physical Interconnection Costs	\$10,200,000

7 Schedule

Based on the scope of work for the interconnection facilities, it is expected to take a minimum of 24 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 all system outages will be allowed when requested.

The schedule for the required Network Impact Reinforcements will be more clearly identified in future study phases. The estimated time to complete each of the required reinforcements is identified in the “System Reinforcements” section of the report.

8 Transmission Owner Analysis

FE performed an analysis of its underlying transmission <100 kV system. The AF2-330 project did not contribute to any overloads on the <100 kV FE transmission system.

9 Interconnection Customer Requirements

9.1 System Protection

The IC must design its Customer Facilities in accordance with all applicable standards, including the standards in FE’s “Requirements for Transmission Connected Facilities” document located at:

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

Preliminary Protection requirements will be provided as part of the Facilities Study. Detailed Protection Requirements will be provided once the project enters the construction phase.

The IC has requested a non-standard GSU transformer winding configuration. This transformer is in violation of section 14.2.6 of FE’s “Requirements for Transmission Connected Facilities” document and will not be accepted. The GSU transformer must have a grounded wye connection on the high (utility) side and a delta connection on the low (generator) side.

9.2 Compliance Issues and Interconnection Customer Requirements

The proposed Customer Facilities must be designed in accordance with FE’s “Requirements for Transmission Connected Facilities” document located at: <http://www.pjm.com/planning/design-engineering/to-tech-standards/private-firstenergy.aspx>. In particular, the IC is responsible for the following:

1. The purchase and installation of a fully rated 115 kV circuit breaker to protect the AF2-330 generator lead line. A single circuit breaker must be used to protect this line; if the project has several GSU transformers, the individual GSU transformer breakers cannot be used to protect this line.

2. The purchase and installation of the minimum required FE generation interconnection relaying and control facilities. This includes over/under voltage protection, over/under frequency protection, and zero sequence voltage protection relays.
3. The purchase and installation of supervisory control and data acquisition (“SCADA”) equipment to provide information in a compatible format to the FE Transmission System Control Center.
4. Compliance with the FE and PJM generator power factor and voltage control requirements.
5. The execution of a back-up service agreement to serve the customer load supplied from the AF2-330 generation project metering point when the units are out-of-service. This assumes the intent of the IC is to net the generation with the load.

The IC will also be required to meet all PJM, ReliabilityFirst, and NERC reliability criteria and operating procedures for standards compliance. For example, the IC will need to properly locate and report the over and under voltage and over and under frequency system protection elements for its units as well as the submission of the generator model and protection data required to satisfy the PJM and ReliabilityFirst audits. Failure to comply with these requirements may result in a disconnection of service if the violation is found to compromise the reliability of the FE Transmission System.

9.3 Power Factor Requirements

The IC shall design its non-synchronous Customer Facility with the ability to maintain a power factor of at least 0.95 leading (absorbing VARs) to 0.95 lagging (supplying VARs) measured at the high-side of the facility substation transformer(s) connected to the FE Transmission System.

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/meter²)
- 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/>

The IC will be required to comply with all FE revenue metering requirements for generation interconnection customers which can be found in FE's "Requirements for Transmission Connected Facilities" document located at: <http://www.pjm.com/planning/design-engineering/to-tech-standards/private-firstenergy.aspx>.

11 Summer Peak - Load Flow Analysis

The Queue Project AF2-330 was evaluated as a 70.0 MW (Capacity 48.7 MW) injection tapping the Claysburg to Summit 115 kV line in the PENELEC area. Project AF2-330 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-330 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)

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
99596557	999401	KEYSTONE	1.0	PJM	200011	KEYSTONE	500.0	PJM	4	PN-P1-2-PN-345-107T	single	634.0	99.87	100.8	DC	6.1
99596558	999401	KEYSTONE	1.0	PJM	200011	KEYSTONE	500.0	PJM	4	ATSI-P1-2-CEI-345-700T	single	634.0	99.87	100.8	DC	6.1

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
101333957	960390	AF2-330 TAP	115.0	PENELEC	200525	26SUMMIT	115.0	PENELEC	1	PN-P7-1-PN-230-001	tower	237.0	81.88	101.69	DC	46.93

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
99595964	200513	26LEWISTWN	230.0	PENEL EC	208005	JUNI BU2	230.0	PPL	1	PN-P2-3-PN-115-55A	breaker	624.0	161.31	162.76	DC	9.08
99596375	200513	26LEWISTWN	230.0	PENEL EC	208005	JUNI BU2	230.0	PPL	1	Base Case	single	493.0	114.17	115.34	DC	5.73
99596379	200513	26LEWISTWN	230.0	PENEL EC	208005	JUNI BU2	230.0	PPL	1	PN-P1-2-PN-115-094-A	single	624.0	107.0	108.01	DC	6.32
101333033	200741	26SEWARD	115.0	PENEL EC	200766	26FLORENCE	115.0	PENEL EC	1	PN-P2-3-PN-230-9G-A	breaker	282.0	101.69	104.45	DC	7.79
101333034	200741	26SEWARD	115.0	PENEL EC	200766	26FLORENCE	115.0	PENEL EC	1	PN-P2-3-PN-230-9H-A	breaker	282.0	100.63	103.32	DC	7.61
101333924	200746	26ROCKWOD	115.0	PENEL EC	202650	26HIGHPOINT	115.0	PENEL EC	1	PN-P7-1-PN-230-001	tower	179.0	133.73	135.33	DC	6.37
98882012	200763	26BLAIRSVL	138.0	PENEL EC	235253	01SOCIAL	138.0	AP	1	PN-P1-2-PN-230-0103	single	287.0	107.33	109.1	DC	5.07
98882013	200763	26BLAIRSVL	138.0	PENEL EC	235253	01SOCIAL	138.0	AP	1	PJM_P1_APS_B_G692	single	287.0	105.15	106.55	DC	4.02
101333038	200766	26FLORENCE	115.0	PENEL EC	200740	26BLRSVL E	115.0	PENEL EC	1	PN-P2-3-PN-230-9G-A	breaker	282.0	101.58	104.34	DC	7.79
101333039	200766	26FLORENCE	115.0	PENEL EC	200740	26BLRSVL E	115.0	PENEL EC	1	PN-P2-3-PN-230-9H-A	breaker	282.0	100.52	103.22	DC	7.61
99596315	200767	26HOMER CT	230.0	PENEL EC	200795	26SHELOCT A	230.0	PENEL EC	1	ATSI-P1-2-CEI-345-700T	single	917.0	148.44	149.62	DC	10.78
99596316	200767	26HOMER CT	230.0	PENEL EC	200795	26SHELOCT A	230.0	PENEL EC	1	PN-P1-2-PN-345-107T	single	917.0	148.44	149.62	DC	10.78

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC/D C	MW IMPACT
99596318	200767	26HOMER CT	230.0	PENEL EC	200795	26SHELOCT A	230.0	PENEL EC	1	Base Case	single	731.0	126.39	127.68	DC	9.74
99596113	200793	26SEWARD 2	230.0	PENEL EC	200912	26CONEMA GH	230.0	PENEL EC	1	PN-P2_3-PN-230-0252-C	breaker	1147.0	116.45	118.24	DC	21.32
99596114	200793	26SEWARD 2	230.0	PENEL EC	200912	26CONEMA GH	230.0	PENEL EC	1	PN-P2_3-PN-230-0252-B	breaker	1147.0	116.42	118.21	DC	21.32
99596115	200793	26SEWARD 2	230.0	PENEL EC	200912	26CONEMA GH	230.0	PENEL EC	1	PN-P2_3-PN-230-0252-A	breaker	1147.0	116.41	118.2	DC	21.32
99595884	200795	26SHELOCT A	230.0	PENEL EC	200810	26KEYSTON E	230.0	PENEL EC	1	ATSI-P2-3-CEI-345-004D	breaker	917.0	192.9	193.78	DC	17.65
99596330	200795	26SHELOCT A	230.0	PENEL EC	200810	26KEYSTON E	230.0	PENEL EC	1	PN-P1-2-PN-345-107T	single	917.0	143.9	145.19	DC	12.28
99596331	200795	26SHELOCT A	230.0	PENEL EC	200810	26KEYSTON E	230.0	PENEL EC	1	ATSI-P1-2-CEI-345-700T	single	917.0	143.9	145.19	DC	12.28
99596332	200795	26SHELOCT A	230.0	PENEL EC	200810	26KEYSTON E	230.0	PENEL EC	1	PN-P1-2-PN-230-025	single	917.0	118.05	119.77	DC	15.94
99596333	200795	26SHELOCT A	230.0	PENEL EC	200810	26KEYSTON E	230.0	PENEL EC	1	PN-P1-3-PN-230-001T	single	917.0	118.05	119.77	DC	15.94
99596334	200795	26SHELOCT A	230.0	PENEL EC	200810	26KEYSTON E	230.0	PENEL EC	1	Base Case	single	731.0	117.22	118.72	DC	11.19
99596013	200810	26KEYSTON E	230.0	PENEL EC	999401	KEYSTONE	1.0	PJM	4	PJM500_PN_P4-500-001A	breaker	635.0	145.25	146.11	DC	11.92
99596014	200810	26KEYSTON E	230.0	PENEL EC	999401	KEYSTONE	1.0	PJM	4	PJM500_PN_P4-500-001D	breaker	635.0	145.25	146.11	DC	11.92
99596063	200912	26CONEMA GH	230.0	PENEL EC	200005	CONEM-GH	500.0	PJM	3	PN-P2_3-PN-230-0252-C	breaker	1066.0	125.3	127.23	DC	21.32
99596064	200912	26CONEMA GH	230.0	PENEL EC	200005	CONEM-GH	500.0	PJM	3	PN-P2_3-PN-230-0252-B	breaker	1066.0	125.26	127.19	DC	21.32
99596065	200912	26CONEMA GH	230.0	PENEL EC	200005	CONEM-GH	500.0	PJM	3	PN-P2_3-PN-230-0252-A	breaker	1066.0	125.25	127.18	DC	21.32
101333919	202650	26HIGHPOINT	115.0	PENEL EC	200747	26PENNMAR	115.0	PENEL EC	1	PN-P7-1-PN-230-001	tower	174.0	148.74	150.39	DC	6.37
99596018	999401	KEYSTONE	1.0	PJM	200011	KEYSTONE	500.0	PJM	4	PJM500_PN_P4-500-001A	breaker	634.0	144.74	145.6	DC	11.92
99596019	999401	KEYSTONE	1.0	PJM	200011	KEYSTONE	500.0	PJM	4	PJM500_PN_P4-500-001D	breaker	634.0	144.74	145.6	DC	11.92

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	CK T ID	CON T NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC/D C	MW IMPACT
99596370	200513	26LEWISTWN	230.0	PENELE C	208005	JUNI BU2	230.0	PPL	1	Base Case	operation	493.0	174.97	176.65	DC	8.24

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CON T NAME	Type	Ratin g MVA	PRE PROJEC T LOADIN G %	POST PROJEC T LOADIN G %	AC D C	MW IMPAC T
9959637 1	20051 3	26LEWISTW N	230. 0	PENELE C	20800 5	JUNI BU2	230. 0	PPL	1	PN-P1-2-PN-115-094-A	operatio n	624.0	161.22	162.68	DC	9.08
1013334 18	20074 0	26BLRSVL E	115. 0	PENELE C	20076 3	26BLAIRSVL	138. 0	PENELE C	1	PN-P1_2-PN-230-0103	operatio n	364.0	100.57	102.57	DC	7.28
1013334 08	20074 1	26SEWARD	115. 0	PENELE C	20076 6	26FLORENCE	115. 0	PENELE C	1	PN-P1_2-PN-230-0104	operatio n	282.0	99.48	102.11	DC	7.4
1013332 41	20074 2	26TOWER 51	115. 0	PENELE C	20074 1	26SEWARD	115. 0	PENELE C	1	AP-P1-3-PN-115-010	operatio n	185.0	117.51	118.88	DC	5.62
1013331 94	20074 3	26HOOVERS V	115. 0	PENELE C	20074 2	26TOWER 51	115. 0	PENELE C	1	AP-P1-3-PN-115-010	operatio n	172.0	139.95	141.4	DC	5.54
1013331 99	20074 3	26HOOVERS V	115. 0	PENELE C	20074 2	26TOWER 51	115. 0	PENELE C	1	Base Case	operatio n	137.0	119.0	120.35	DC	4.1
1013332 67	20074 6	26ROCKWO OD	115. 0	PENELE C	20265 0	26HIGHPOIN T	115. 0	PENELE C	1	PN-P1-3-PN-115-029	operatio n	179.0	127.45	128.6	DC	4.57
1013332 68	20074 6	26ROCKWO OD	115. 0	PENELE C	20265 0	26HIGHPOIN T	115. 0	PENELE C	1	Base Case	operatio n	148.0	133.75	135.04	DC	4.21
1013331 84	20074 7	26PENN-MAR	115. 0	PENELE C	20076 2	26GARRETT	115. 0	PENELE C	1	Base Case	operatio n	137.0	160.48	161.86	DC	4.21
9888200 7	20076 3	26BLAIRSVL	138. 0	PENELE C	23525 3	01SOCIAL	138. 0	AP	1	PN-P1_2-PN-230-0103	operatio n	287.0	127.35	129.88	DC	7.28
9888200 8	20076 3	26BLAIRSVL	138. 0	PENELE C	23525 3	01SOCIAL	138. 0	AP	1	Base Case	operatio n	225.0	120.17	121.26	DC	5.47
1013334 11	20076 6	26FLORENCE	115. 0	PENELE C	20074 0	26BLRSVL E	115. 0	PENELE C	1	PN-P1_2-PN-230-0104	operatio n	282.0	99.38	102.0	DC	7.4
9959631 0	20076 7	26HOMER CT	230. 0	PENELE C	20079 5	26SHELOCTA	230. 0	PENELE C	1	PN-P1-2-PN-345-107T	operatio n	917.0	200.53	202.22	DC	15.49
9959631 1	20076 7	26HOMER CT	230. 0	PENELE C	20079 5	26SHELOCTA	230. 0	PENELE C	1	ATSI-P1-2-CEI-345-700T	operatio n	917.0	200.53	202.22	DC	15.49
9959631 2	20076 7	26HOMER CT	230. 0	PENELE C	20079 5	26SHELOCTA	230. 0	PENELE C	1	Base Case	operatio n	731.0	179.37	181.25	DC	14.0
9959668 3	20079 3	26SEWARD 2	230. 0	PENELE C	20091 2	26CONEMA GH	230. 0	PENELE C	1	PN-P1_2-PN-230-0103	operatio n	1147. 0	113.28	115.16	DC	21.3

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CON T NAME	Type	Rating MVA	PRE PROJE C T LOADIN G %	POST PROJE C T LOADIN G %	AC D C	MW IMPAC T
99596325	200795	26SHELOCTA	230.0	PENELE C	200810	26KEYSTONE	230.0	PENELE C	1	PN-P1-2-PN-345-107T	operatio n	917.0	191.96	192.84	DC	17.65
99596326	200795	26SHELOCTA	230.0	PENELE C	200810	26KEYSTONE	230.0	PENELE C	1	ATSI-P1-2-CEI-345-700T	operatio n	917.0	191.96	192.84	DC	17.65
99596329	200795	26SHELOCTA	230.0	PENELE C	200810	26KEYSTONE	230.0	PENELE C	1	Base Case	operatio n	731.0	167.91	168.91	DC	16.08
99596542	200810	26KEYSTONE	230.0	PENELE C	999401	KEYSTONE	1.0	PJM	4	PN-P1-3-PN-500-001A T	operatio n	635.0	138.95	139.81	DC	11.94
99596545	200810	26KEYSTONE	230.0	PENELE C	999401	KEYSTONE	1.0	PJM	4	Base Case	operatio n	494.0	118.97	119.72	DC	7.99
99596640	200912	26CONEMA GH	230.0	PENELE C	200005	CONEM-GH	500.0	PJM	3	PN-P1_2-PN-230-0103	operatio n	1066.0	121.89	123.91	DC	21.3
101333227	202637	26PRIDE	115.0	PENELE C	200744	26SOMERST	115.0	PENELE C	1	Base Case	operatio n	133.0	151.44	152.9	DC	4.32
101333224	202647	26KIMRUN TAP	115.0	PENELE C	202637	26PRIDE	115.0	PENELE C	1	Base Case	operatio n	133.0	153.85	155.31	DC	4.32
101333230	202650	26HIGHPOIN T	115.0	PENELE C	200747	26PENN-MAR	115.0	PENELE C	1	Base Case	operatio n	137.0	156.94	158.32	DC	4.21
100757249	235596	01VASC T	138.0	AP	235173	01EDGEWT	138.0	AP	1	PN-P1_2-PN-230-0103	operatio n	192.0	103.92	104.99	DC	4.56
101333221	945670	AF1-232 TAP	115.0	PENELE C	202647	26KIMRUN TAP	115.0	PENELE C	1	Base Case	operatio n	133.0	153.85	155.31	DC	4.32
101333316	960390	AF2-330 TAP	115.0	PENELE C	200525	26SUMMIT	115.0	PENELE C	1	Base Case	operatio n	175.0	77.98	103.13	DC	44.02
101333317	960390	AF2-330 TAP	115.0	PENELE C	200525	26SUMMIT	115.0	PENELE C	1	PN-P1-2-PN-115-082	operatio n	237.0	80.67	102.14	DC	50.9
99596550	999401	KEYSTONE	1.0	PJM	200011	KEYSTONE	500.0	PJM	4	PN-P1-3-PN-500-001A T	operatio n	634.0	138.44	139.31	DC	11.94
99596555	999401	KEYSTONE	1.0	PJM	200011	KEYSTONE	500.0	PJM	4	Base Case	operatio n	493.0	118.26	119.0	DC	7.99

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
99596014,99596013	11	26KEYSTONE 230.0 kV - STAR592 1.0 kV Ckt 4	PENELEC PN-AF2-F-0005 (1703) : Construct 500 kV yard consisting of three-500 kV breakers configured in a breaker-and-a-half layout (initially a ring bus) Tap the Keystone - Conemaugh 500 kV line and loop into the new Homer City 500 kV yard Install one 500/345 kV transformer Install a new 345 kV breaker-and-a-half string using three new breakers Project Type : FAC Cost : \$85,596,000 Time Estimate : 48.0 Months PJM-AF1-F-0001a (1908) : Replace/ upgrade transformer detail. Reconductor existing section of 1033.5 AAC subconductor circular (SCCIR) Project Type : FAC Cost : \$26,180,000 Time Estimate : 24.0 Months PJM-AF1-F-0001b (1909) : Replace 5.83 Amp BDD relay (thermal) Project Type : FAC Cost : \$357,000 Time Estimate : 12.0 Months	\$112,133,000
99596316,99596315,99596318	8	26HOMER CT 230.0 kV - 26SHELOCTA 230.0 kV Ckt 1		
99596063,99596064,99596065	12	26CONEMAGH 230.0 kV - CONEM-GH 500.0 kV Ckt 3		
99596333,99596330,99596331,99596332,99595884,99596334	10	26SHELOCTA 230.0 kV - 26KEYSTONE 230.0 kV Ckt 1		
99596113,99596114,99596115	9	26SEWARD 2 230.0 kV - 26CONEMAGH 230.0 kV Ckt 1		
99596558,99596019,99596018,99596557	1	STAR592 1.0 kV - KEYSTONE 500.0 kV Ckt 4		
101333957	2	AF2-330 TAP 115.0 kV - 26SUMMIT 115.0 kV Ckt 1	PENELEC PN-AF2-F-0025A (1749) : Replace line trap at Summit Project Type : FAC Cost : \$122,280 Time Estimate : 12.0 Months PN-AF2-F-0025B (1750) : Replace bus conductor at Summit. Project Type : FAC Cost : \$122,280 Time Estimate : 12.0 Months	\$244,560
101333033,101333034	4	26SEWARD 115.0 kV - 26FLORENCE 115.0 kV Ckt 1	PENELEC PN-AF2-F-0029A (1762) : Replace bus conductor at Seward. Project Type : FAC Cost : \$122,280 Time Estimate : 12.0 Months PN-AF2-F-0029B (1763) : Reconductor 4.15 miles of transmission line Project Type : FAC Cost : \$12,686,550 Time Estimate : 30.0 Months	\$12,808,830

ID	Idx	Facility	Upgrade Description	Cost
101333039,101333038	7	26FLORENCE 115.0 kV - 26BLRSVL E 115.0 kV Ckt 1	<u>PENELEC</u> PN-AF2-F-0028A (1759) : 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
101333924	5	26ROCKWOOD 115.0 kV - 26HIGHPOINT 115.0 kV Ckt 1	<u>PENELEC</u> PN-AF2-F-0037 (1776) : Rebuild 10.1 miles of transmission line Project Type : FAC Cost : \$30,875,700 Time Estimate : 36.0 Months	\$30,875,700
98882012,98882013	6	26BLAIRSVL 138.0 kV - 01SOCIAL 138.0 kV Ckt 1	<u>APS</u> WP-AF2-F-0009A (696) : Replace 750 CU bus conductor at Social Hall substation. Project Type : FAC Cost : \$130,252 Time Estimate : 12.0 Months WP-AF2-F-0009B (697) : Replace relaying (CT, MT, RT) at Social Hall substation. Project Type : FAC Cost : \$455,884 Time Estimate : 12.0 Months WP-AF2-F-0009C (698) : Reconductor 372 ft of 636 ACSR from Social Hall substation to structure 42 (1 span). Project Type : FAC Cost : \$325,631 Time Estimate : 12.0 Months <u>PENELEC</u> PN-AF2-F-0033A (1771) : Reconductor 4.83 miles of transmission line Replace line relaying at Blairsville East Project Type : FAC Cost : \$14,765,310 Time Estimate : 30.0 Months	\$15,677,078

ID	Idx	Facility	Upgrade Description	Cost
99595964,99596375,99596379	3	26LEWISTWN 230.0 kV - JUNI BU2 230.0 kV Ckt 1	<u>PENELEC</u> PN-AF2-F-0018B (1735) : Rebuild 24.59 miles of transmission line Project Type : FAC Cost : \$105,240,282 Time Estimate : 48.0 Months PN-AF2-F-0018C (1736) : Adjust/replace the relays, CT, and meters Project Type : FAC Cost : \$1,467,360 Time Estimate : 12.0 Months <u>PPL</u> R-PL-0006 (1929) : Rebuild PPL's ~0.9mi LEWI-JUNI 230kV Line and replace terminal equipment at Juniata 230kV Project Type : FAC Cost : \$7,000,000 Time Estimate : 24.0 Months R-PL-0007 (1930) : Replace two (2) CB's MOD switches Project Type : FAC Cost : \$600,000 Time Estimate : 24.0 Months	\$114,307,642
101333919	13	26HIGHPOINT 115.0 kV - 26PENN-MAR 115.0 kV Ckt 1	<u>PENELEC</u> PN-AF2-F-0039A (1780) : Replace circuit breaker at Penn Mar Project Type : FAC Cost : \$733,680 Time Estimate : 12.0 Months PN-AF2-F-0039B (1781) : Rebuild 4.67 miles of transmission line Project Type : FAC Cost : \$14,276,190 Time Estimate : 36.0 Months PN-AF2-F-0039C (1782) : Replace bus conductor at Penn Mar. Project Type : FAC Cost : \$122,280 Time Estimate : 12.0 Months	\$15,132,150
			TOTAL COST	\$330,220,460 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
99596019	999401	KEYSTONE	PJM	200011	KEYSTONE	PJM	4	PJM500_PN_P4-500-001D	breaker	634.0	144.74	145.6	DC	11.92

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200636	26IUP CO-G	0.5021	50/50	0.5021
200794	26CONEMAGH	0.3401	50/50	0.3401
200805	26COLVER13 (Deactivation : 01/09/2020)	19.4986	50/50	19.4986
200809	26SITHE	1.5787	50/50	1.5787
200833	26SEWRDB34	16.4203	50/50	16.4203
200837	26HOMER C1	27.1889	50/50	27.1889
200838	26HOMER C2	22.7783	50/50	22.7783
200839	26HOMER C3	24.1138	50/50	24.1138
200846	26FORWARD	0.1849	50/50	0.1849
200864	K-013 E	4.2867	50/50	4.2867
200883	Q-053 E	6.7034	Adder	7.89
200888	26HIGHLAND	0.4021	50/50	0.4021
200894	26K02	4.2797	Adder	5.03
200898	26AA1-106	1.6191	Adder	1.9
200906	26KEYSTN#3	0.8346	50/50	0.8346
200925	26R32	0.4640	50/50	0.4640
201477	26Y2-055	2.5158	Adder	2.96
202158	26CON.GEN1	0.0871	50/50	0.0871
202160	26CON.GEN2	0.0608	50/50	0.0608
203910	26Z1-091	1.4616	Adder	1.72
203999	P-047 E	7.6650	Adder	9.02
235003	AC1-025 E	0.1066	Adder	0.13
236828	01GRAYMONT	0.2892	Adder	0.34
290086	Q-036 E	4.7423	Adder	5.58
292350	K-023	3.9316	Adder	4.63
292542	L-013 1	3.8240	Adder	4.5
293301	N-039 E	8.9004	Adder	10.47
293393	V3-030E	4.0991	Adder	4.82
293432	R-040 E	0.2151	Adder	0.25
293603	O-018 E	9.3246	50/50	9.3246
293902	O-048 E	3.4416	Adder	4.05
294515	O38_P22	7.7878	Adder	9.16
294903	P-060 E	6.1011	Adder	7.18
296332	R-032 E	10.7592	50/50	10.7592
913142	Y1-033 E OP1	3.1285	Adder	3.68
916202	Z1-069 E	6.1111	Adder	7.19
917672	Z2-108 E	2.1510	Adder	2.53
918682	AA1-082 E	4.1676	Adder	4.9
919201	AA1-144 OP	11.8571	Adder	13.95
919491	AA2-000	36.9465	Adder	43.47

Bus #	Bus	Gendoliv MW Impact	Type	Full MW Impact
920341	AA2-132 (Suspended)	1.6179	Adder	1.9
922932	AB1-082 OP (Suspended)	2.2235	Adder	2.62
923443	AB1-160 E	1.7460	Adder	2.05
930511	AB1-092	1.3566	Adder	1.6
935191	AD1-154	2.3474	Adder	2.76
936421	AD2-055	2.7929	Adder	3.29
936991	AD2-133 C	2.1340	Adder	2.51
936992	AD2-133 E	9.7609	Adder	11.48
938351	AE1-053	1.1950	Adder	1.41
938881	AE1-116	0.6374	Adder	0.75
938951	AE1-123	1.6446	Adder	1.93
938991	AE1-128 C	12.6893	50/50	12.6893
938992	AE1-128 E	8.4595	50/50	8.4595
939171	AE1-147 C	0.8699	Adder	1.02
939172	AE1-147 E	0.5799	Adder	0.68
939291	AE1-160 C	1.0211	Adder	1.2
939292	AE1-160 E	0.5869	Adder	0.69
940201	AE2-001 C	0.8685	Adder	1.02
940202	AE2-001 E	0.5790	Adder	0.68
940681	AE2-055 C (Suspended)	0.8483	Adder	1.0
940682	AE2-055 E (Suspended)	0.5656	Adder	0.67
940861	AE2-074 C	1.6883	Adder	1.99
940862	AE2-074 E	2.2224	Adder	2.61
941191	AE2-113 C	6.6071	Adder	7.77
941192	AE2-113 E	7.1137	Adder	8.37
941231	AE2-117 C	1.0882	Adder	1.28
941232	AE2-117 E	0.7255	Adder	0.85
941241	AE2-118 C	1.0882	Adder	1.28
941242	AE2-118 E	0.7255	Adder	0.85
941261	AE2-120 C	0.8677	Adder	1.02
941262	AE2-120 E	0.5785	Adder	0.68
941271	AE2-121 C	0.4637	Adder	0.55
941272	AE2-121 E	0.3096	Adder	0.36
941321	AE2-126 C	1.1540	Adder	1.36
941322	AE2-126 E	0.7694	Adder	0.91
941331	AE2-129 C	1.3112	Adder	1.54
941332	AE2-129 E	0.8741	Adder	1.03
941351	AE2-131 C	1.3112	Adder	1.54
941352	AE2-131 E	0.8741	Adder	1.03
941421	AE2-139 C	4.4628	Adder	5.25
941422	AE2-139 E	2.9752	Adder	3.5
942121	AE2-224 C	11.0940	50/50	11.0940
942122	AE2-224 E	7.3960	50/50	7.3960
942351	AE2-248 C	0.6854	Adder	0.81
942352	AE2-248 E	0.4570	Adder	0.54
942491	AE2-262 C	3.9028	Adder	4.59
942492	AE2-262 E	2.6227	Adder	3.09
942501	AE2-263 C	3.6686	Adder	4.32
942502	AE2-263 E	2.4494	Adder	2.88
942511	AE2-264 C	5.1755	Adder	6.09
942512	AE2-264 E	3.4503	Adder	4.06
942811	AE2-299 C	2.1929	Adder	2.58

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942812	AE2-299 E	8.7715	Adder	10.32
942961	AE2-316 C	3.5685	Adder	4.2
942962	AE2-316 E	5.0887	Adder	5.99
943151	AE2-344 C	4.6736	Adder	5.5
943152	AE2-344 E	3.1157	Adder	3.67
943351	AF1-006 C	0.8073	Adder	0.95
943352	AF1-006 E	0.4541	Adder	0.53
943711	AF1-039 C O1	0.8277	Adder	0.97
943712	AF1-039 E O1	0.5518	Adder	0.65
943751	AF1-043	8.3788	Adder	9.86
944001	AF1-068 C O1	0.9112	Adder	1.07
944002	AF1-068 E O1	0.5125	Adder	0.6
944181	AF1-086 C O1	2.7924	Adder	3.29
944182	AF1-086 E O1	12.1484	Adder	14.29
944261	AF1-094 C	0.8554	Adder	1.01
944262	AF1-094 E	0.5702	Adder	0.67
944281	AF1-096 C	0.9648	Adder	1.14
944282	AF1-096 E	0.6432	Adder	0.76
944301	AF1-098 C	3.3713	Adder	3.97
944302	AF1-098 E	2.2475	Adder	2.64
944311	AF1-099 C	5.9244	Adder	6.97
944312	AF1-099 E	3.9496	Adder	4.65
944321	AF1-100 C	12.6059	Adder	14.83
944322	AF1-100 E	8.4040	Adder	9.89
944381	AF1-103 O1	1.7343	Adder	2.04
944411	AF1-106 O1	1.7626	Adder	2.07
944471	AF1-112 C	0.9162	Adder	1.08
944472	AF1-112 E	0.5154	Adder	0.61
944671	AF1-132 C O1	0.8528	Adder	1.0
944672	AF1-132 E O1	0.5685	Adder	0.67
944691	AF1-134 C O1	1.4353	Adder	1.69
944692	AF1-134 E O1	0.9569	Adder	1.13
944751	AF1-140 C	1.4386	Adder	1.69
944752	AF1-140 E	0.9590	Adder	1.13
944771	AF1-142 C	9.4791	Adder	11.15
944772	AF1-142 E	6.3194	Adder	7.43
944781	AF1-143 C	7.1701	Adder	8.44
944782	AF1-143 E	3.8240	Adder	4.5
944841	AF1-149 C	0.8677	Adder	1.02
944842	AF1-149 E	0.5785	Adder	0.68
944881	AF1-153 C O1	1.0338	Adder	1.22
944882	AF1-153 E O1	0.6892	Adder	0.81
944901	AF1-155 C	1.0336	Adder	1.22
944902	AF1-155 E	0.6890	Adder	0.81
945021	AF1-167 C	0.6395	Adder	0.75
945022	AF1-167 E	0.4272	Adder	0.5
945051	AF1-170 C	2.9067	Adder	3.42
945052	AF1-170 E	1.9378	Adder	2.28
945121	AF1-177	0.4336	Adder	0.51
945161	AF1-181	0.0677	Adder	0.08
945171	AF1-182	0.3383	Adder	0.4
945181	AF1-183	0.0910	Adder	0.11

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945331	AF1-198	0.2365	Adder	0.28
945451	AF1-210 C	0.6992	Adder	0.82
945452	AF1-210 E	0.4662	Adder	0.55
945491	AF1-214 C	0.8678	Adder	1.02
945492	AF1-214 E	0.5785	Adder	0.68
945551	AF1-220 C	8.6431	Adder	10.17
945552	AF1-220 E	5.7652	Adder	6.78
945671	AF1-232 C O2	14.9758	Adder	17.62
945672	AF1-232 E O2	8.0639	Adder	9.49
945751	AF1-240 C O1	1.4084	Adder	1.66
945752	AF1-240 E O1	0.9389	Adder	1.1
946071	AF1-272 C O1	15.7799	50/50	15.7799
946072	AF1-272 E O1	10.5200	50/50	10.5200
946081	AF1-273 C O1	7.3643	Adder	8.66
946082	AF1-273 E O1	4.9095	Adder	5.78
946111	AF1-276 C	7.5744	Adder	8.91
946112	AF1-276 E	3.7307	Adder	4.39
946121	AF1-277 C	7.5744	Adder	8.91
946122	AF1-277 E	3.7307	Adder	4.39
946131	AF1-278 C	6.0369	Adder	7.1
946132	AF1-278 E	3.0026	Adder	3.53
946211	AF1-286 C O1	0.7138	Adder	0.84
946212	AF1-286 E O1	0.4847	Adder	0.57
946221	AF1-287 C	0.8067	Adder	0.95
946222	AF1-287 E	0.5378	Adder	0.63
946381	AF1-302 C	1.5583	Adder	1.83
946382	AF1-302 E	2.0777	Adder	2.44
946401	AF1-304 C	4.9399	Adder	5.81
946402	AF1-304 E	3.2932	Adder	3.87
946421	AF1-306 C	4.3129	Adder	5.07
946422	AF1-306 E	17.2515	Adder	20.3
946431	AF1-307 C	7.1345	50/50	7.1345
946432	AF1-307 E	4.7563	50/50	4.7563
946571	AF1-321 C O1	2.2427	50/50	2.2427
946572	AF1-321 E O1	1.4951	50/50	1.4951
946771	AF1-217 C O2	0.8067	Adder	0.95
946772	AF1-217 E O2	0.5378	Adder	0.63
957001	AF2-001 C O1	2.2427	50/50	2.2427
957002	AF2-001 E O1	1.4951	50/50	1.4951
957011	AF2-002 C O1	1.1213	50/50	1.1213
957012	AF2-002 E O1	0.7476	50/50	0.7476
957161	AF2-010 C	1.7484	Adder	3.88
957162	AF2-010 E	1.1783	Adder	2.62
957451	AF2-039 C	0.4203	Adder	0.93
957452	AF2-039 E	0.2802	Adder	0.62
957512	AF2-045 E	1.4273	Adder	3.17
957561	AF2-050 C	5.5470	50/50	5.5470
957562	AF2-050 E	3.6980	50/50	3.6980
957571	AF2-051 C O1	1.3230	Adder	2.94
957572	AF2-051 E O1	0.6815	Adder	1.51
957581	AF2-052 C	2.2007	Adder	4.89
957582	AF2-052 E	1.0706	Adder	2.38

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957681	AF2-062 C	7.3711	Adder	16.36
957682	AF2-062 E	4.9141	Adder	10.91
957931	AF2-087 C	0.2059	Adder	0.46
957932	AF2-087 E	0.2835	Adder	0.63
957941	AF2-088 C	0.2023	Adder	0.45
957942	AF2-088 E	0.1349	Adder	0.3
957951	AF2-089 C	0.1406	Adder	0.31
957952	AF2-089 E	0.0724	Adder	0.16
957981	AF2-092 C	0.5693	Adder	1.26
957982	AF2-092 E	0.3796	Adder	0.84
958031	AF2-097 C	0.1003	Adder	0.22
958032	AF2-097 E	0.0669	Adder	0.15
958101	AF2-104 C	0.1802	Adder	0.4
958102	AF2-104 E	0.1201	Adder	0.27
958271	AF2-121 C	0.6949	Adder	1.54
958272	AF2-121 E	0.4633	Adder	1.03
958361	AF2-130 C	0.5615	Adder	1.25
958362	AF2-130 E	0.3743	Adder	0.83
958411	AF2-135 C	0.1900	Adder	0.42
958412	AF2-135 E	0.1267	Adder	0.28
958471	AF2-141	0.5067	Adder	1.12
958731	AF2-164 C O1	2.4513	Adder	5.44
958732	AF2-164 E O1	1.6342	Adder	3.63
958741	AF2-165 C	0.5404	Adder	1.2
958742	AF2-165 E	0.3603	Adder	0.8
958751	AF2-166 C	0.5615	Adder	1.25
958752	AF2-166 E	0.3743	Adder	0.83
959061	AF2-197 C O1	1.6039	Adder	3.56
959062	AF2-197 E O1	2.4058	Adder	5.34
959301	AF2-221 C	1.1633	50/50	1.1633
959302	AF2-221 E	1.6065	50/50	1.6065
959401	AF2-231 C	0.1442	Adder	0.32
959402	AF2-231 E	0.0961	Adder	0.21
959441	AF2-235 C	0.2557	Adder	0.57
959442	AF2-235 E	0.1705	Adder	0.38
959461	AF2-237 C	0.2267	Adder	0.5
959462	AF2-237 E	0.1511	Adder	0.34
959471	AF2-238 C	0.5755	Adder	1.28
959472	AF2-238 E	0.3836	Adder	0.85
959481	AF2-239 C	0.4355	Adder	0.97
959482	AF2-239 E	0.3492	Adder	0.78
959491	AF2-240 C	0.5044	Adder	1.12
959492	AF2-240 E	0.4297	Adder	0.95
959501	AF2-241 C	0.5278	Adder	1.17
959502	AF2-241 E	0.4064	Adder	0.9
959521	AF2-243 C	0.4053	Adder	0.9
959522	AF2-243 E	0.2702	Adder	0.6
959741	AF2-265 C	0.4124	Adder	0.92
959742	AF2-265 E	0.3069	Adder	0.68
959792	AF2-270 E	0.6558	50/50	0.6558
959802	AF2-271 E	0.1963	Adder	0.44
959822	AF2-273 E	0.1487	Adder	0.33

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960022	AF2-293 E	0.0448	Adder	0.1
960031	AF2-294 C	0.5171	Adder	1.15
960032	AF2-294 E	0.3447	Adder	0.77
960041	AF2-295 C	0.5478	Adder	1.22
960042	AF2-295 E	0.3652	Adder	0.81
960051	AF2-296 C	0.7607	Adder	1.69
960052	AF2-296 E	0.5072	Adder	1.13
960211	AF2-312 C	0.8320	Adder	1.85
960212	AF2-312 E	0.5547	Adder	1.23
960271	AF2-318 C	0.4709	Adder	1.05
960272	AF2-318 E	0.3139	Adder	0.7
960321	AF2-323 C O1	1.0633	Adder	2.36
960322	AF2-323 E O1	0.7088	Adder	1.57
960391	AF2-330 C	3.7356	Adder	8.29
960392	AF2-330 E	1.6339	Adder	3.63
960451	AF2-336 C O1	0.9489	Adder	2.11
960452	AF2-336 E O1	0.6326	Adder	1.4
960461	AF2-337 C O1	0.9489	Adder	2.11
960462	AF2-337 E O1	0.6326	Adder	1.4
960471	AF2-338 C O1	0.9489	Adder	2.11
960472	AF2-338 E O1	0.6326	Adder	1.4
960481	AF2-339 C O1	0.9489	Adder	2.11
960482	AF2-339 E O1	0.6326	Adder	1.4
960901	AF2-381 C	14.9091	50/50	14.9091
960902	AF2-381 E	7.8459	50/50	7.8459
961141	AF2-405	0.4671	Adder	1.04
961151	AF2-406	3.5031	Adder	7.78
961201	AF2-411 O1	17.8114	Adder	39.54
961211	AF2-412 O1	7.1197	Adder	15.8
961451	AF2-436	0.0528	Adder	0.12
NEWTON	NEWTON	0.5437	Confirmed LTF	0.5437
FARMERCITY	FARMERCITY	0.0283	Confirmed LTF	0.0283
G-007A	G-007A	0.0216	Confirmed LTF	0.0216
VFT	VFT	0.3289	Confirmed LTF	0.3289
CALDERWOOD	CALDERWOOD	0.2863	Confirmed LTF	0.2863
PRAIRIE	PRAIRIE	1.3277	Confirmed LTF	1.3277
CHEOAH	CHEOAH	0.2888	Confirmed LTF	0.2888
EDWARDS	EDWARDS	0.1694	Confirmed LTF	0.1694
TILTON	TILTON	0.3106	Confirmed LTF	0.3106
MADISON	MADISON	0.0302	Confirmed LTF	0.0302
GIBSON	GIBSON	0.2779	Confirmed LTF	0.2779
BLUEG	BLUEG	0.9027	Confirmed LTF	0.9027
TRIMBLE	TRIMBLE	0.2894	Confirmed LTF	0.2894
CATAWBA	CATAWBA	0.2138	Confirmed LTF	0.2138

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
101333957	960390	AF2-330 TAP	PENELEC	200525	26SUMMIT	PENELEC	1	PN-P7-1-PN-230-001	tower	237.0	81.88	101.69	DC	46.93

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.1441	50/50	0.1441
200834	26SW_E13_K22	0.0739	50/50	0.0739
200835	26DSGENWIN	0.3639	50/50	0.3639
200846	26FORWARD	0.2664	50/50	0.2664
200864	K-013 E	6.1772	50/50	6.1772
200888	26HIGHLAND	0.6407	50/50	0.6407
200889	26STNY CRK	0.5348	50/50	0.5348
200890	26BF_G21_K23	0.1785	50/50	0.1785
200891	26CSLMN_L13	0.2800	50/50	0.2800
200892	26LOOKOUT	0.2660	50/50	0.2660
200925	26R32	0.7393	50/50	0.7393
202225	26SCI_S29B	0.1150	50/50	0.1150
202652	26RGH_Y1-033	0.1367	50/50	0.1367
292350	K-023	6.6744	50/50	6.6744
292542	L-013 1	6.4918	50/50	6.4918
293432	R-040 E	0.3652	50/50	0.3652
293603	O-018 E	14.8585	50/50	14.8585
293902	O-048 E	5.8427	50/50	5.8427
294903	P-060 E	12.4022	50/50	12.4022
296332	R-032 E	17.1444	50/50	17.1444
913142	Y1-033 E OP1	5.4139	50/50	5.4139
917672	Z2-108 E	3.6517	50/50	3.6517
938351	AE1-053	2.0287	50/50	2.0287
938881	AE1-116	1.0712	50/50	1.0712
938991	AE1-128 C	26.4449	50/50	26.4449
938992	AE1-128 E	17.6299	50/50	17.6299
943711	AF1-039 C O1	1.4323	50/50	1.4323
943712	AF1-039 E O1	0.9548	50/50	0.9548
944751	AF1-140 C	4.8234	50/50	4.8234
944752	AF1-140 E	3.2156	50/50	3.2156
944781	AF1-143 C	12.1722	50/50	12.1722
944782	AF1-143 E	6.4918	50/50	6.4918
945671	AF1-232 C O2	28.6250	50/50	28.6250
945672	AF1-232 E O2	15.4134	50/50	15.4134
946081	AF1-273 C O1	14.3585	50/50	14.3585
946082	AF1-273 E O1	9.5724	50/50	9.5724
946571	AF1-321 C O1	2.8931	50/50	2.8931
946572	AF1-321 E O1	1.9287	50/50	1.9287
957001	AF2-001 C O1	2.8931	50/50	2.8931
957002	AF2-001 E O1	1.9287	50/50	1.9287
957011	AF2-002 C O1	1.4465	50/50	1.4465

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957012	AF2-002 E O1	0.9644	50/50	0.9644
957513	AF2-045 BAT	2.6820	50/50	2.6820
957981	AF2-092 C	2.8461	50/50	2.8461
957982	AF2-092 E	1.8974	50/50	1.8974
958101	AF2-104 C	0.5713	50/50	0.5713
958102	AF2-104 E	0.3809	50/50	0.3809
958411	AF2-135 C	0.6086	50/50	0.6086
958412	AF2-135 E	0.4057	50/50	0.4057
958471	AF2-141	1.6230	50/50	1.6230
959301	AF2-221 C	1.2907	50/50	1.2907
959302	AF2-221 E	1.7824	50/50	1.7824
959792	AF2-270 E	1.3667	50/50	1.3667
959803	AF2-271 BAT	0.2573	50/50	0.2573
960391	AF2-330 C	32.6533	50/50	32.6533
960392	AF2-330 E	14.2816	50/50	14.2816
960451	AF2-336 C O1	4.7435	50/50	4.7435
960452	AF2-336 E O1	3.1623	50/50	3.1623
960461	AF2-337 C O1	4.7435	50/50	4.7435
960462	AF2-337 E O1	3.1623	50/50	3.1623
960471	AF2-338 C O1	4.7435	50/50	4.7435
960472	AF2-338 E O1	3.1623	50/50	3.1623
960481	AF2-339 C O1	4.7435	50/50	4.7435
960482	AF2-339 E O1	3.1623	50/50	3.1623
960901	AF2-381 C	24.4529	50/50	24.4529
960902	AF2-381 E	12.8684	50/50	12.8684
WEC	WEC	0.0321	Confirmed LTF	0.0321
LGEE	LGEE	0.0616	Confirmed LTF	0.0616
CPL	CPL	0.0820	Confirmed LTF	0.0820
CBM-W2	CBM-W2	0.8927	Confirmed LTF	0.8927
NY	NY	0.2085	Confirmed LTF	0.2085
CBM-W1	CBM-W1	1.1885	Confirmed LTF	1.1885
TVA	TVA	0.1596	Confirmed LTF	0.1596
O-066	O-066	1.2970	Confirmed LTF	1.2970
CBM-S2	CBM-S2	0.7052	Confirmed LTF	0.7052
CBM-S1	CBM-S1	0.9628	Confirmed LTF	0.9628
G-007	G-007	0.1914	Confirmed LTF	0.1914
MEC	MEC	0.1668	Confirmed LTF	0.1668

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
99595964	200513	26LEWISTWN	PENELEC	208005	JUNI BU2	PPL	1	PN-P2-3-PN-115-55A	breaker	624.0	161.31	162.76	DC	9.08

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200649	26PENNTech	1.3440	50/50	1.3440
200665	26SHAWVL 3	7.5857	50/50	7.5857
200666	26SHAWVL 4	7.5605	50/50	7.5605
200715	26SHAWVL 1	5.0273	50/50	5.0273
200722	26SHAWVL 2	5.1561	50/50	5.1561
200812	26ALY HYDR	1.4504	50/50	1.4504
200852	26WARR RDG	0.4144	50/50	0.4144
200883	Q-053 E	6.9533	50/50	6.9533
200886	26ARWF_N39	0.5592	50/50	0.5592
200894	26K02	7.5566	50/50	7.5566
200905	26Q36	0.3212	50/50	0.3212
200913	26SHAW-D	0.2283	50/50	0.2283
200915	26CHSTN_FL	0.1899	50/50	0.1899
201477	26Y2-055	2.7645	Adder	3.25
203034	26NA_O38_P22	0.4893	50/50	0.4893
235003	AC1-025 E	0.5632	50/50	0.5632
236828	01GRAYMONT	1.4477	50/50	1.4477
290086	Q-036 E	7.4480	50/50	7.4480
293301	N-039 E	12.9664	50/50	12.9664
293393	V3-030E	2.8182	Adder	3.32
293603	O-018 E	4.7612	Adder	5.6
294515	O38_P22	11.3456	50/50	11.3456
296332	R-032 E	5.4937	Adder	6.46
919491	AA2-000	93.2852	50/50	93.2852
930511	AB1-092	3.4252	50/50	3.4252
936421	AD2-055	7.0518	50/50	7.0518
936991	AD2-133 C	3.3516	50/50	3.3516
936992	AD2-133 E	15.3298	50/50	15.3298
938381	AE1-071 C	34.6617	50/50	34.6617
938382	AE1-071 E	21.2101	50/50	21.2101
939171	AE1-147 C	4.3175	50/50	4.3175
939172	AE1-147 E	2.8783	50/50	2.8783
940201	AE2-001 C	4.3319	50/50	4.3319
940202	AE2-001 E	2.8879	50/50	2.8879
940681	AE2-055 C (Suspended)	4.5526	50/50	4.5526
940682	AE2-055 E (Suspended)	3.0350	50/50	3.0350
941191	AE2-113 C	9.1621	50/50	9.1621
941192	AE2-113 E	9.8647	50/50	9.8647
941231	AE2-117 C	4.8049	50/50	4.8049
941232	AE2-117 E	3.2033	50/50	3.2033
941241	AE2-118 C	4.8049	50/50	4.8049

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
941242	AE2-118 E	3.2033	50/50	3.2033
941261	AE2-120 C	4.3398	50/50	4.3398
941262	AE2-120 E	2.8932	50/50	2.8932
941271	AE2-121 C	2.2821	50/50	2.2821
941272	AE2-121 E	1.5238	50/50	1.5238
941321	AE2-126 C	2.4082	50/50	2.4082
941322	AE2-126 E	1.6054	50/50	1.6054
941331	AE2-129 C	2.4204	50/50	2.4204
941332	AE2-129 E	1.6136	50/50	1.6136
941351	AE2-131 C	2.4204	50/50	2.4204
941352	AE2-131 E	1.6136	50/50	1.6136
942121	AE2-224 C	7.8468	50/50	7.8468
942122	AE2-224 E	5.2312	50/50	5.2312
942351	AE2-248 C	3.5684	50/50	3.5684
942352	AE2-248 E	2.3789	50/50	2.3789
942491	AE2-262 C	14.9385	50/50	14.9385
942492	AE2-262 E	10.0387	50/50	10.0387
942501	AE2-263 C	14.0422	50/50	14.0422
942502	AE2-263 E	9.3754	50/50	9.3754
942511	AE2-264 C	15.7541	50/50	15.7541
942512	AE2-264 E	10.5027	50/50	10.5027
942961	AE2-316 C	6.0886	50/50	6.0886
942962	AE2-316 E	8.6824	50/50	8.6824
943751	AF1-043	21.1554	50/50	21.1554
944001	AF1-068 C O1	4.7875	50/50	4.7875
944002	AF1-068 E O1	2.6929	50/50	2.6929
944181	AF1-086 C O1	2.7357	50/50	2.7357
944182	AF1-086 E O1	11.9019	50/50	11.9019
944311	AF1-099 C	22.6766	50/50	22.6766
944312	AF1-099 E	15.1178	50/50	15.1178
944321	AF1-100 C	38.2035	50/50	38.2035
944322	AF1-100 E	25.4690	50/50	25.4690
944381	AF1-103 O1	1.9052	Adder	2.24
944471	AF1-112 C	4.7322	50/50	4.7322
944472	AF1-112 E	2.6618	50/50	2.6618
944671	AF1-132 C O1	4.5038	50/50	4.5038
944672	AF1-132 E O1	3.0026	50/50	3.0026
944691	AF1-134 C O1	2.0483	50/50	2.0483
944692	AF1-134 E O1	1.3655	50/50	1.3655
944751	AF1-140 C	1.0127	Adder	1.19
944752	AF1-140 E	0.6751	Adder	0.79
944771	AF1-142 C	36.2826	50/50	36.2826
944772	AF1-142 E	24.1884	50/50	24.1884
944841	AF1-149 C	4.3408	50/50	4.3408
944842	AF1-149 E	2.8938	50/50	2.8938
944881	AF1-153 C O1	2.3069	50/50	2.3069
944882	AF1-153 E O1	1.5379	50/50	1.5379
944901	AF1-155 C	2.2932	50/50	2.2932
944902	AF1-155 E	1.5288	50/50	1.5288
945121	AF1-177	0.4763	Adder	0.56
945161	AF1-181	0.2045	50/50	0.2045
945171	AF1-182	1.0253	50/50	1.0253

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945181	AF1-183	0.2389	50/50	0.2389
945491	AF1-214 C	4.3393	50/50	4.3393
945492	AF1-214 E	2.8929	50/50	2.8929
945551	AF1-220 C	17.0161	50/50	17.0161
945552	AF1-220 E	11.3503	50/50	11.3503
946111	AF1-276 C	6.4074	Adder	7.54
946112	AF1-276 E	3.1559	Adder	3.71
946121	AF1-277 C	6.4074	Adder	7.54
946122	AF1-277 E	3.1559	Adder	3.71
946131	AF1-278 C	5.1068	Adder	6.01
946132	AF1-278 E	2.5400	Adder	2.99
946381	AF1-302 C	2.6588	50/50	2.6588
946382	AF1-302 E	3.5450	50/50	3.5450
946421	AF1-306 C	10.0128	50/50	10.0128
946422	AF1-306 E	40.0513	50/50	40.0513
957451	AF2-039 C	1.7865	50/50	1.7865
957452	AF2-039 E	1.1910	50/50	1.1910
957512	AF2-045 E	0.9316	Adder	2.07
957561	AF2-050 C	3.9234	50/50	3.9234
957562	AF2-050 E	2.6156	50/50	2.6156
957581	AF2-052 C	2.0784	Adder	4.61
957582	AF2-052 E	1.0111	Adder	2.24
957681	AF2-062 C	5.9580	Adder	13.23
957682	AF2-062 E	3.9720	Adder	8.82
957931	AF2-087 C	0.6633	50/50	0.6633
957932	AF2-087 E	0.9135	50/50	0.9135
957941	AF2-088 C	0.8602	50/50	0.8602
957942	AF2-088 E	0.5735	50/50	0.5735
957981	AF2-092 C	0.3509	Adder	0.78
957982	AF2-092 E	0.2339	Adder	0.52
958271	AF2-121 C	2.4204	50/50	2.4204
958272	AF2-121 E	1.6136	50/50	1.6136
958551	AF2-146 C	6.7078	50/50	6.7078
958552	AF2-146 E	4.4718	50/50	4.4718
958561	AF2-147 C	4.4149	50/50	4.4149
958562	AF2-147 E	2.9433	50/50	2.9433
958571	AF2-148 C	4.5277	50/50	4.5277
958572	AF2-148 E	3.0185	50/50	3.0185
959401	AF2-231 C	1.2012	50/50	1.2012
959402	AF2-231 E	0.8008	50/50	0.8008
959802	AF2-271 E	0.5341	50/50	0.5341
960022	AF2-293 E	0.4189	50/50	0.4189
960041	AF2-295 C	2.2932	50/50	2.2932
960042	AF2-295 E	1.5288	50/50	1.5288
960051	AF2-296 C	2.0483	50/50	2.0483
960052	AF2-296 E	1.3655	50/50	1.3655
960211	AF2-312 C	0.5747	Adder	1.28
960212	AF2-312 E	0.3832	Adder	0.85
960391	AF2-330 C	6.3179	50/50	6.3179
960392	AF2-330 E	2.7632	50/50	2.7632
960451	AF2-336 C O1	0.5848	Adder	1.3
960452	AF2-336 E O1	0.3898	Adder	0.87

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960461	AF2-337 C O1	0.5848	Adder	1.3
960462	AF2-337 E O1	0.3898	Adder	0.87
960471	AF2-338 C O1	0.5848	Adder	1.3
960472	AF2-338 E O1	0.3898	Adder	0.87
960481	AF2-339 C O1	0.5848	Adder	1.3
960482	AF2-339 E O1	0.3898	Adder	0.87
WEC	WEC	0.3947	Confirmed LTF	0.3947
LGEE	LGEE	0.6840	Confirmed LTF	0.6840
CPL	CPL	0.3565	Confirmed LTF	0.3565
CBM-W2	CBM-W2	9.0827	Confirmed LTF	9.0827
CBM-W1	CBM-W1	16.5007	Confirmed LTF	16.5007
TVA	TVA	1.4182	Confirmed LTF	1.4182
O-066	O-066	22.6061	Confirmed LTF	22.6061
CBM-S2	CBM-S2	3.9477	Confirmed LTF	3.9477
CBM-S1	CBM-S1	8.9290	Confirmed LTF	8.9290
G-007	G-007	3.5079	Confirmed LTF	3.5079
MEC	MEC	1.9052	Confirmed LTF	1.9052

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
101333033	200741	26SEWARD	PENELEC	200766	26FLORENCE	PENELEC	1	PN-P2-3-PN-230-9G-A	breaker	282.0	101.69	104.45	DC	7.79

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200503	26C.SLOPE (Deactivation : 07/06/2019)	11.5979	50/50	11.5979
200794	26CONEMAGH	0.3084	50/50	0.3084
200834	26SW_E13_K22	0.0357	50/50	0.0357
200846	26FORWARD	0.1279	50/50	0.1279
200864	K-013 E	2.9661	50/50	2.9661
200883	Q-053 E	4.9843	50/50	4.9843
200888	26HIGHLAND	0.2719	50/50	0.2719
200889	26STNY CRK	0.2121	50/50	0.2121
200915	26CHSTN_FL	0.1361	50/50	0.1361
200925	26R32	0.3138	50/50	0.3138
202225	26SCI_S29B	0.0556	50/50	0.0556
290086	Q-036 E	2.4721	Adder	2.91
292350	K-023	2.7056	Adder	3.18
292542	L-013 1	2.6316	Adder	3.1
293301	N-039 E	4.2209	Adder	4.97
293393	V3-030E	1.8828	Adder	2.22
293432	R-040 E	0.1480	Adder	0.17
293603	O-018 E	6.3060	50/50	6.3060
293902	O-048 E	2.3684	Adder	2.79
294515	O38_P22	3.6933	Adder	4.35
294903	P-060 E	4.9178	50/50	4.9178
296332	R-032 E	7.2762	50/50	7.2762
913142	Y1-033 E OP1	2.1364	Adder	2.51
917672	Z2-108 E	1.4803	Adder	1.74
936991	AD2-133 C	1.1125	Adder	1.31
936992	AD2-133 E	5.0883	Adder	5.99
938351	AE1-053	0.8224	Adder	0.97
938881	AE1-116	0.5181	50/50	0.5181
938991	AE1-128 C	8.6076	50/50	8.6076
938992	AE1-128 E	5.7384	50/50	5.7384
941231	AE2-117 C	0.5318	Adder	0.63
941232	AE2-117 E	0.3546	Adder	0.42
941241	AE2-118 C	0.5318	Adder	0.63
941242	AE2-118 E	0.3546	Adder	0.42
941331	AE2-129 C	0.6019	Adder	0.71
941332	AE2-129 E	0.4013	Adder	0.47
941351	AE2-131 C	0.6019	Adder	0.71
941352	AE2-131 E	0.4013	Adder	0.47
942121	AE2-224 C	4.3901	Adder	5.16
942122	AE2-224 E	2.9267	Adder	3.44

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942511	AE2-264 C	2.5365	Adder	2.98
942512	AE2-264 E	1.6910	Adder	1.99
943711	AF1-039 C O1	0.5652	Adder	0.66
943712	AF1-039 E O1	0.3768	Adder	0.44
944751	AF1-140 C	1.1215	50/50	1.1215
944752	AF1-140 E	0.7476	50/50	0.7476
944781	AF1-143 C	4.9343	Adder	5.81
944782	AF1-143 E	2.6316	Adder	3.1
945671	AF1-232 C O2	12.1066	50/50	12.1066
945672	AF1-232 E O2	6.5190	50/50	6.5190
946081	AF1-273 C O1	5.9476	50/50	5.9476
946082	AF1-273 E O1	3.9651	50/50	3.9651
946431	AF1-307 C	6.2779	50/50	6.2779
946432	AF1-307 E	4.1852	50/50	4.1852
946571	AF1-321 C O1	1.5589	50/50	1.5589
946572	AF1-321 E O1	1.0393	50/50	1.0393
957001	AF2-001 C O1	1.5589	50/50	1.5589
957002	AF2-001 E O1	1.0393	50/50	1.0393
957011	AF2-002 C O1	0.7795	50/50	0.7795
957012	AF2-002 E O1	0.5196	50/50	0.5196
957512	AF2-045 E	2.1605	50/50	2.1605
957561	AF2-050 C	1.1634	Adder	2.58
957562	AF2-050 E	0.7756	Adder	1.72
957931	AF2-087 C	0.1172	Adder	0.26
957932	AF2-087 E	0.1615	Adder	0.36
957981	AF2-092 C	0.8530	50/50	0.8530
957982	AF2-092 E	0.5687	50/50	0.5687
958101	AF2-104 C	0.2763	50/50	0.2763
958102	AF2-104 E	0.1842	50/50	0.1842
958271	AF2-121 C	0.3190	Adder	0.71
958272	AF2-121 E	0.2127	Adder	0.47
958411	AF2-135 C	0.1308	Adder	0.29
958412	AF2-135 E	0.0872	Adder	0.19
958471	AF2-141	0.3487	Adder	0.77
959301	AF2-221 C	0.8014	50/50	0.8014
959302	AF2-221 E	1.1066	50/50	1.1066
959401	AF2-231 C	0.0705	Adder	0.16
959402	AF2-231 E	0.0470	Adder	0.1
959792	AF2-270 E	0.4448	50/50	0.4448
959802	AF2-271 E	0.1080	Adder	0.24
960211	AF2-312 C	0.3910	Adder	0.87
960212	AF2-312 E	0.2607	Adder	0.58
960391	AF2-330 C	5.4227	50/50	5.4227
960392	AF2-330 E	2.3718	50/50	2.3718
960451	AF2-336 C O1	1.4216	50/50	1.4216
960452	AF2-336 E O1	0.9478	50/50	0.9478
960461	AF2-337 C O1	1.4216	50/50	1.4216
960462	AF2-337 E O1	0.9478	50/50	0.9478
960471	AF2-338 C O1	1.4216	50/50	1.4216
960472	AF2-338 E O1	0.9478	50/50	0.9478
960481	AF2-339 C O1	1.4216	50/50	1.4216
960482	AF2-339 E O1	0.9478	50/50	0.9478

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960901	AF2-381 C	10.2531	50/50	10.2531
960902	AF2-381 E	5.3957	50/50	5.3957
NEWTON	NEWTON	0.5168	Confirmed LTF	0.5168
FARMERCITY	FARMERCITY	0.0266	Confirmed LTF	0.0266
G-007A	G-007A	1.4121	Confirmed LTF	1.4121
VFT	VFT	3.8958	Confirmed LTF	3.8958
CALDERWOOD	CALDERWOOD	0.2212	Confirmed LTF	0.2212
PRAIRIE	PRAIRIE	1.2269	Confirmed LTF	1.2269
CHEOAH	CHEOAH	0.2222	Confirmed LTF	0.2222
EDWARDS	EDWARDS	0.1690	Confirmed LTF	0.1690
TILTON	TILTON	0.3056	Confirmed LTF	0.3056
MADISON	MADISON	0.0403	Confirmed LTF	0.0403
GIBSON	GIBSON	0.2648	Confirmed LTF	0.2648
BLUEG	BLUEG	0.8472	Confirmed LTF	0.8472
TRIMBLE	TRIMBLE	0.2721	Confirmed LTF	0.2721
CATAWBA	CATAWBA	0.1421	Confirmed LTF	0.1421

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
101333924	200746	26ROCKWOOD	PENELEC	202650	26HIGHPOINT	PENELEC	1	PN-P7-1-PN-230-001	tower	179.0	133.73	135.33	DC	6.37

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
957982	AF2-092 E	0.7742	50/50	0.7742

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
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

11.6.6 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
98882012	200763	26BLAIRSVL	PENELEC	235253	01SOCIAL	AP	1	PN-P1_2-PN-230-0103	single	287.0	107.33	109.1	DC	5.07

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200503	26C.SLOPE (Deactivation : 07/06/2019)	10.7785	80/20	10.7785
200636	26IUP CO-G	0.3876	80/20	0.3876
200715	26SHAWVL 1	1.0991	80/20	1.0991
200722	26SHAWVL 2	1.1268	80/20	1.1268
200794	26CONEMAGH	0.2638	80/20	0.2638
200805	26COLVER13 (Deactivation : 01/09/2020)	13.8149	80/20	13.8149
200809	26SITHE	0.5687	80/20	0.5687
200812	26ALY HYDR	0.2035	80/20	0.2035
200813	26YOUGH	0.0525	80/20	0.0525
200833	26SEWRDB34	8.4976	80/20	8.4976
200834	26SW_E13_K22	0.0299	80/20	0.0299
200835	26DSGENWIN	0.1435	80/20	0.1435
200837	26HOMER C1	9.7941	80/20	9.7941
200838	26HOMER C2	7.9635	80/20	7.9635
200839	26HOMER C3	8.4304	80/20	8.4304
200846	26FORWARD	0.1075	80/20	0.1075
200852	26WARR RDG	0.0581	80/20	0.0581
200886	26ARWF_N39	0.2244	80/20	0.2244
200888	26HIGHLAND	0.2438	80/20	0.2438
200889	26STNY CRK	0.1806	80/20	0.1806
200890	26BF_G21_K23	0.0704	80/20	0.0704
200891	26CSLMN_L13	0.1104	80/20	0.1104
200892	26LOOKOUT	0.1049	80/20	0.1049
200905	26Q36	0.1359	80/20	0.1359
200913	26SHAW-D	0.0612	80/20	0.0612
200915	26CHSTN_FL	0.1300	80/20	0.1300
200925	26R32	0.2813	80/20	0.2813
200945	26CT_V3-030	0.1056	80/20	0.1056
202158	26CON.GEN1	0.0688	80/20	0.0688
202160	26CON.GEN2	0.1286	80/20	0.1286
202225	26SCI_S29B	0.0464	80/20	0.0464
202652	26RGH_Y1-033	0.0514	80/20	0.0514
203034	26NA_O38_P22	0.1964	80/20	0.1964
935191	AD1-154	1.5542	80/20	1.5542
936991	AD2-133 C	1.4184	80/20	1.4184
938351	AE1-053	0.7999	80/20	0.7999
938881	AE1-116	0.4327	80/20	0.4327
938991	AE1-128 C	7.5002	80/20	7.5002

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
941231	AE2-117 C	0.6740	80/20	0.6740
941241	AE2-118 C	0.6740	80/20	0.6740
941321	AE2-126 C	0.6278	80/20	0.6278
941331	AE2-129 C	0.8395	80/20	0.8395
941351	AE2-131 C	0.8395	80/20	0.8395
942121	AE2-224 C	5.4018	80/20	5.4018
942511	AE2-264 C	3.1560	80/20	3.1560
943711	AF1-039 C O1	0.5390	80/20	0.5390
944181	AF1-086 C O1	2.1918	80/20	2.1918
944691	AF1-134 C O1	1.0355	80/20	1.0355
944751	AF1-140 C	1.0220	80/20	1.0220
944781	AF1-143 C	4.7994	80/20	4.7994
945181	AF1-183	0.0522	80/20	0.0522
945671	AF1-232 C O2	10.2398	80/20	10.2398
945751	AF1-240 C O1	0.9325	80/20	0.9325
946071	AF1-272 C O1	12.4245	80/20	12.4245
946081	AF1-273 C O1	5.0419	80/20	5.0419
946431	AF1-307 C	5.4216	80/20	5.4216
946571	AF1-321 C O1	1.2994	80/20	1.2994
957001	AF2-001 C O1	1.2994	80/20	1.2994
957011	AF2-002 C O1	0.6497	80/20	0.6497
957451	AF2-039 C	0.4790	80/20	0.4790
957561	AF2-050 C	2.7009	80/20	2.7009
957931	AF2-087 C	0.2587	80/20	0.2587
957941	AF2-088 C	0.2306	80/20	0.2306
957981	AF2-092 C	0.7506	80/20	0.7506
958101	AF2-104 C	0.2308	80/20	0.2308
958271	AF2-121 C	0.8395	80/20	0.8395
958411	AF2-135 C	0.2400	80/20	0.2400
958471	AF2-141	0.6399	80/20	0.6399
959301	AF2-221 C	0.6913	80/20	0.6913
959401	AF2-231 C	0.1685	80/20	0.1685
960051	AF2-296 C	1.0355	80/20	1.0355
960211	AF2-312 C	1.2310	80/20	1.2310
960391	AF2-330 C	5.0677	80/20	5.0677
960451	AF2-336 C O1	1.2510	80/20	1.2510
960461	AF2-337 C O1	1.2510	80/20	1.2510
960471	AF2-338 C O1	1.2510	80/20	1.2510
960481	AF2-339 C O1	1.2510	80/20	1.2510
960901	AF2-381 C	8.7150	80/20	8.7150
NEWTON	NEWTON	0.7016	Confirmed LTF	0.7016
FARMERCITY	FARMERCITY	0.0361	Confirmed LTF	0.0361
G-007A	G-007A	2.0187	Confirmed LTF	2.0187
VFT	VFT	5.5664	Confirmed LTF	5.5664
CALDERWOOD	CALDERWOOD	0.3027	Confirmed LTF	0.3027
PRAIRIE	PRAIRIE	1.6660	Confirmed LTF	1.6660
CHEOAH	CHEOAH	0.3038	Confirmed LTF	0.3038
EDWARDS	EDWARDS	0.2289	Confirmed LTF	0.2289
TILTON	TILTON	0.4139	Confirmed LTF	0.4139
MADISON	MADISON	0.0524	Confirmed LTF	0.0524
GIBSON	GIBSON	0.3593	Confirmed LTF	0.3593
BLUEG	BLUEG	1.1492	Confirmed LTF	1.1492

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
TRIMBLE	TRIMBLE	0.3690	Confirmed LTF	0.3690
CATAWBA	CATAWBA	0.1953	Confirmed LTF	0.1953

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
101333038	200766	26FLORENCE	PENELEC	200740	26BLRSVL E	PENELEC	1	PN-P2-3-PN-230-9G-A	breaker	282.0	101.58	104.34	DC	7.79

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200503	26C.SLOPE (Deactivation : 07/06/2019)	11.5979	50/50	11.5979
200794	26CONEMAGH	0.3084	50/50	0.3084
200834	26SW_E13_K22	0.0357	50/50	0.0357
200846	26FORWARD	0.1279	50/50	0.1279
200864	K-013 E	2.9661	50/50	2.9661
200883	Q-053 E	4.9843	50/50	4.9843
200888	26HIGHLAND	0.2719	50/50	0.2719
200889	26STNY CRK	0.2121	50/50	0.2121
200915	26CHSTN_FL	0.1361	50/50	0.1361
200925	26R32	0.3138	50/50	0.3138
202225	26SCI_S29B	0.0556	50/50	0.0556
290086	Q-036 E	2.4721	Adder	2.91
292350	K-023	2.7056	Adder	3.18
292542	L-013 1	2.6316	Adder	3.1
293301	N-039 E	4.2209	Adder	4.97
293393	V3-030E	1.8828	Adder	2.22
293432	R-040 E	0.1480	Adder	0.17
293603	O-018 E	6.3060	50/50	6.3060
293902	O-048 E	2.3684	Adder	2.79
294515	O38_P22	3.6933	Adder	4.35
294903	P-060 E	4.9178	50/50	4.9178
296332	R-032 E	7.2762	50/50	7.2762
913142	Y1-033 E OP1	2.1364	Adder	2.51
917672	Z2-108 E	1.4803	Adder	1.74
936991	AD2-133 C	1.1125	Adder	1.31
936992	AD2-133 E	5.0883	Adder	5.99
938351	AE1-053	0.8224	Adder	0.97
938881	AE1-116	0.5181	50/50	0.5181
938991	AE1-128 C	8.6076	50/50	8.6076
938992	AE1-128 E	5.7384	50/50	5.7384
941231	AE2-117 C	0.5318	Adder	0.63
941232	AE2-117 E	0.3546	Adder	0.42
941241	AE2-118 C	0.5318	Adder	0.63
941242	AE2-118 E	0.3546	Adder	0.42
941331	AE2-129 C	0.6019	Adder	0.71
941332	AE2-129 E	0.4013	Adder	0.47
941351	AE2-131 C	0.6019	Adder	0.71
941352	AE2-131 E	0.4013	Adder	0.47
942121	AE2-224 C	4.3901	Adder	5.16
942122	AE2-224 E	2.9267	Adder	3.44

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942511	AE2-264 C	2.5365	Adder	2.98
942512	AE2-264 E	1.6910	Adder	1.99
943711	AF1-039 C O1	0.5652	Adder	0.66
943712	AF1-039 E O1	0.3768	Adder	0.44
944751	AF1-140 C	1.1215	50/50	1.1215
944752	AF1-140 E	0.7476	50/50	0.7476
944781	AF1-143 C	4.9343	Adder	5.81
944782	AF1-143 E	2.6316	Adder	3.1
945671	AF1-232 C O2	12.1066	50/50	12.1066
945672	AF1-232 E O2	6.5190	50/50	6.5190
946081	AF1-273 C O1	5.9476	50/50	5.9476
946082	AF1-273 E O1	3.9651	50/50	3.9651
946431	AF1-307 C	6.2779	50/50	6.2779
946432	AF1-307 E	4.1852	50/50	4.1852
946571	AF1-321 C O1	1.5589	50/50	1.5589
946572	AF1-321 E O1	1.0393	50/50	1.0393
957001	AF2-001 C O1	1.5589	50/50	1.5589
957002	AF2-001 E O1	1.0393	50/50	1.0393
957011	AF2-002 C O1	0.7795	50/50	0.7795
957012	AF2-002 E O1	0.5196	50/50	0.5196
957512	AF2-045 E	2.1605	50/50	2.1605
957561	AF2-050 C	1.1634	Adder	2.58
957562	AF2-050 E	0.7756	Adder	1.72
957931	AF2-087 C	0.1172	Adder	0.26
957932	AF2-087 E	0.1615	Adder	0.36
957981	AF2-092 C	0.8530	50/50	0.8530
957982	AF2-092 E	0.5687	50/50	0.5687
958101	AF2-104 C	0.2763	50/50	0.2763
958102	AF2-104 E	0.1842	50/50	0.1842
958271	AF2-121 C	0.3190	Adder	0.71
958272	AF2-121 E	0.2127	Adder	0.47
958411	AF2-135 C	0.1308	Adder	0.29
958412	AF2-135 E	0.0872	Adder	0.19
958471	AF2-141	0.3487	Adder	0.77
959301	AF2-221 C	0.8014	50/50	0.8014
959302	AF2-221 E	1.1066	50/50	1.1066
959401	AF2-231 C	0.0705	Adder	0.16
959402	AF2-231 E	0.0470	Adder	0.1
959792	AF2-270 E	0.4448	50/50	0.4448
959802	AF2-271 E	0.1080	Adder	0.24
960211	AF2-312 C	0.3910	Adder	0.87
960212	AF2-312 E	0.2607	Adder	0.58
960391	AF2-330 C	5.4227	50/50	5.4227
960392	AF2-330 E	2.3718	50/50	2.3718
960451	AF2-336 C O1	1.4216	50/50	1.4216
960452	AF2-336 E O1	0.9478	50/50	0.9478
960461	AF2-337 C O1	1.4216	50/50	1.4216
960462	AF2-337 E O1	0.9478	50/50	0.9478
960471	AF2-338 C O1	1.4216	50/50	1.4216
960472	AF2-338 E O1	0.9478	50/50	0.9478
960481	AF2-339 C O1	1.4216	50/50	1.4216
960482	AF2-339 E O1	0.9478	50/50	0.9478

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960901	AF2-381 C	10.2531	50/50	10.2531
960902	AF2-381 E	5.3957	50/50	5.3957
NEWTON	NEWTON	0.5168	Confirmed LTF	0.5168
FARMERCITY	FARMERCITY	0.0266	Confirmed LTF	0.0266
G-007A	G-007A	1.4121	Confirmed LTF	1.4121
VFT	VFT	3.8958	Confirmed LTF	3.8958
CALDERWOOD	CALDERWOOD	0.2212	Confirmed LTF	0.2212
PRAIRIE	PRAIRIE	1.2269	Confirmed LTF	1.2269
CHEOAH	CHEOAH	0.2222	Confirmed LTF	0.2222
EDWARDS	EDWARDS	0.1690	Confirmed LTF	0.1690
TILTON	TILTON	0.3056	Confirmed LTF	0.3056
MADISON	MADISON	0.0403	Confirmed LTF	0.0403
GIBSON	GIBSON	0.2648	Confirmed LTF	0.2648
BLUEG	BLUEG	0.8472	Confirmed LTF	0.8472
TRIMBLE	TRIMBLE	0.2721	Confirmed LTF	0.2721
CATAWBA	CATAWBA	0.1421	Confirmed LTF	0.1421

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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
99596316	200767	26HOMER CT	PENELEC	200795	26SHELOCTA	PENELEC	1	PN-P1-2-PN-345-107T	single	917.0	148.44	149.62	DC	10.78

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200503	26C.SLOPE (Deactivation : 07/06/2019)	21.8285	80/20	21.8285
200642	26SENECA#1	8.0557	80/20	8.0557
200643	26SENECA#2	7.6082	80/20	7.6082
200644	26SENECA#3	0.7491	80/20	0.7491
200794	26CONEMAGH	0.4042	80/20	0.4042
200805	26COLVER13 (Deactivation : 01/09/2020)	10.0503	Adder	11.82
200809	26SITHE	2.3929	80/20	2.3929
200828	26HNSMLK 1	2.0014	80/20	2.0014
200829	26HNSMLK 2	2.0014	80/20	2.0014
200830	26HNSMLK 3	2.0014	80/20	2.0014
200831	26HNSMLK 4	2.0014	80/20	2.0014
200832	26HNSMLK 5	2.0014	80/20	2.0014
200833	26SEWRDB34	23.2757	80/20	23.2757
200834	26SW_E13_K22	0.0691	80/20	0.0691
200837	26HOMER C1	41.2116	80/20	41.2116
200838	26HOMER C2	35.1995	80/20	35.1995
200839	26HOMER C3	37.2634	80/20	37.2634
200846	26FORWARD	0.2470	80/20	0.2470
200886	26ARWF_N39	0.6484	80/20	0.6484
200888	26HIGHLAND	0.5293	80/20	0.5293
200889	26STNY CRK	0.4118	80/20	0.4118
200898	26AA1-106	2.6350	Adder	3.1
200915	26CHSTN_FL	0.2811	80/20	0.2811
200925	26R32	0.6108	80/20	0.6108
201477	26Y2-055	5.7435	80/20	5.7435
202225	26SCI_S29B	0.1075	80/20	0.1075
203034	26NA_O38_P22	0.5674	80/20	0.5674
203349	26Z1-069 C	0.4764	80/20	0.4764
203909	26Z1-038	1.9214	Adder	2.26
203910	26Z1-091	2.4510	Adder	2.88
915951	Y3-092 FTIR	192.3300	Merchant Transmission	192.3300
919201	AA1-144 OP	19.6311	Adder	23.1
919491	AA2-000	57.4701	Adder	67.61
920341	AA2-132 (Suspended)	2.6995	Adder	3.18
922932	AB1-082 OP (Suspended)	4.3036	80/20	4.3036
923442	AB1-160 C	0.1361	80/20	0.1361
930511	AB1-092	2.1101	Adder	2.48
935191	AD1-154	2.1961	Adder	2.58

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
936421	AD2-055	4.3444	Adder	5.11
936991	AD2-133 C	2.8213	Adder	3.32
938351	AE1-053	1.5925	Adder	1.87
938881	AE1-116	1.0012	80/20	1.0012
938951	AE1-123	2.2356	Adder	2.63
938991	AE1-128 C	16.8091	80/20	16.8091
939171	AE1-147 C	1.3204	Adder	1.55
939291	AE1-160 C	1.8792	Adder	2.21
940201	AE2-001 C	1.3184	Adder	1.55
940681	AE2-055 C (Suspended)	1.2873	Adder	1.51
940861	AE2-074 C	3.2677	80/20	3.2677
941191	AE2-113 C	12.6014	80/20	12.6014
941231	AE2-117 C	1.5908	Adder	1.87
941241	AE2-118 C	1.5908	Adder	1.87
941261	AE2-120 C	1.3172	Adder	1.55
941271	AE2-121 C	0.7039	Adder	0.83
941321	AE2-126 C	1.6846	Adder	1.98
941331	AE2-129 C	1.7421	Adder	2.05
941351	AE2-131 C	1.7421	Adder	2.05
941421	AE2-139 C	7.3172	Adder	8.61
942121	AE2-224 C	15.9210	80/20	15.9210
942351	AE2-248 C	1.0402	Adder	1.22
942491	AE2-262 C	5.9296	Adder	6.98
942501	AE2-263 C	5.5738	Adder	6.56
942511	AE2-264 C	7.4709	Adder	8.79
942811	AE2-299 C	5.3143	Adder	6.25
942961	AE2-316 C	5.5600	Adder	6.54
943151	AE2-344 C	11.5182	Adder	13.55
943351	AF1-006 C	2.1004	Adder	2.47
943711	AF1-039 C O1	1.0988	Adder	1.29
943751	AF1-043	13.0332	Adder	15.33
944001	AF1-068 C O1	1.3828	Adder	1.63
944181	AF1-086 C O1	2.1801	Adder	2.56
944261	AF1-094 C	1.8988	Adder	2.23
944281	AF1-096 C	1.7756	Adder	2.09
944301	AF1-098 C	7.9340	Adder	9.33
944311	AF1-099 C	9.0011	Adder	10.59
944321	AF1-100 C	18.8317	Adder	22.15
944381	AF1-103 O1	3.3667	Adder	3.96
944391	AF1-104 O1	3.2762	Adder	3.85
944411	AF1-106 O1	2.9167	Adder	3.43
944471	AF1-112 C	1.3906	Adder	1.64
944671	AF1-132 C O1	1.2942	Adder	1.52
944691	AF1-134 C O1	1.4014	Adder	1.65
944751	AF1-140 C	2.2196	80/20	2.2196
944771	AF1-142 C	14.4018	Adder	16.94
944781	AF1-143 C	9.5549	Adder	11.24
944841	AF1-149 C	1.3171	Adder	1.55
944881	AF1-153 C O1	1.6027	Adder	1.89
944901	AF1-155 C	1.6020	Adder	1.88
945021	AF1-167 C	0.9343	Adder	1.1
945051	AF1-170 C	7.6414	Adder	8.99

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945121	AF1-177	0.8417	Adder	0.99
945161	AF1-181	0.1005	Adder	0.12
945171	AF1-182	0.5025	Adder	0.59
945181	AF1-183	0.1282	Adder	0.15
945331	AF1-198	0.3852	Adder	0.45
945451	AF1-210 C	1.0200	Adder	1.2
945491	AF1-214 C	1.3172	Adder	1.55
945551	AF1-220 C	13.3684	Adder	15.73
945671	AF1-232 C O2	23.4676	80/20	23.4676
945751	AF1-240 C O1	1.3176	Adder	1.55
946081	AF1-273 C O1	11.5357	80/20	11.5357
946111	AF1-276 C	15.0743	80/20	15.0743
946121	AF1-277 C	15.0743	80/20	15.0743
946131	AF1-278 C	12.0145	80/20	12.0145
946211	AF1-286 C O1	1.1813	Adder	1.39
946221	AF1-287 C	1.9781	Adder	2.33
946381	AF1-302 C	2.4280	Adder	2.86
946401	AF1-304 C	8.7475	Adder	10.29
946421	AF1-306 C	6.7886	Adder	7.99
946431	AF1-307 C	8.5410	80/20	8.5410
946571	AF1-321 C O1	3.0025	80/20	3.0025
946771	AF1-217 C O2	1.9781	Adder	2.33
957001	AF2-001 C O1	3.0025	80/20	3.0025
957011	AF2-002 C O1	1.5013	80/20	1.5013
957161	AF2-010 C	3.8458	Adder	8.54
957451	AF2-039 C	0.5621	Adder	1.25
957561	AF2-050 C	7.9605	80/20	7.9605
957571	AF2-051 C O1	2.9150	Adder	6.47
957581	AF2-052 C	8.0253	80/20	8.0253
957681	AF2-062 C	27.4632	80/20	27.4632
957931	AF2-087 C	0.6212	80/20	0.6212
957941	AF2-088 C	0.2707	Adder	0.6
957951	AF2-089 C	0.2588	Adder	0.57
957981	AF2-092 C	1.6705	80/20	1.6705
958031	AF2-097 C	0.2609	Adder	0.58
958101	AF2-104 C	0.5340	80/20	0.5340
958271	AF2-121 C	0.9233	Adder	2.05
958361	AF2-130 C	0.8471	Adder	1.88
958411	AF2-135 C	0.2532	Adder	0.56
958471	AF2-141	0.6752	Adder	1.5
958731	AF2-164 C O1	10.4098	80/20	10.4098
958741	AF2-165 C	0.9170	Adder	2.04
958751	AF2-166 C	0.8471	Adder	1.88
958791	AF2-170 C	1.0418	Adder	2.31
959061	AF2-197 C O1	2.6610	Adder	5.91
959301	AF2-221 C	1.5451	80/20	1.5451
959401	AF2-231 C	0.2108	Adder	0.47
959441	AF2-235 C	0.4705	Adder	1.04
959461	AF2-237 C	0.5032	Adder	1.12
959471	AF2-238 C	0.9410	Adder	2.09
959481	AF2-239 C	0.7234	Adder	1.61
959491	AF2-240 C	0.8348	Adder	1.85

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959501	AF2-241 C	0.8734	Adder	1.94
959521	AF2-243 C	0.6877	Adder	1.53
959741	AF2-265 C	0.6744	Adder	1.5
960031	AF2-294 C	0.8627	Adder	1.91
960041	AF2-295 C	0.8491	Adder	1.88
960051	AF2-296 C	0.7427	Adder	1.65
960211	AF2-312 C	0.8059	Adder	1.79
960271	AF2-318 C	0.7821	Adder	1.74
960321	AF2-323 C O1	2.3330	Adder	5.18
960391	AF2-330 C	10.7793	80/20	10.7793
960451	AF2-336 C O1	2.7841	80/20	2.7841
960461	AF2-337 C O1	2.7841	80/20	2.7841
960471	AF2-338 C O1	2.7841	80/20	2.7841
960481	AF2-339 C O1	2.7841	80/20	2.7841
960901	AF2-381 C	19.8673	80/20	19.8673
961141	AF2-405	0.7729	Adder	1.72
961151	AF2-406	5.7969	Adder	12.87
961201	AF2-411 O1	63.9870	80/20	63.9870
961211	AF2-412 O1	11.5924	Adder	25.73
961451	AF2-436	0.0885	Adder	0.2
NEWTON	NEWTON	1.5150	Confirmed LTF	1.5150
FARMERCITY	FARMERCITY	0.0783	Confirmed LTF	0.0783
G-007A	G-007A	2.6205	Confirmed LTF	2.6205
VFT	VFT	7.5078	Confirmed LTF	7.5078
CALDERWOOD	CALDERWOOD	0.6565	Confirmed LTF	0.6565
PRAIRIE	PRAIRIE	3.6033	Confirmed LTF	3.6033
CHEOAH	CHEOAH	0.6597	Confirmed LTF	0.6597
EDWARDS	EDWARDS	0.4963	Confirmed LTF	0.4963
TILTON	TILTON	0.8946	Confirmed LTF	0.8946
MADISON	MADISON	0.0706	Confirmed LTF	0.0706
GIBSON	GIBSON	0.7731	Confirmed LTF	0.7731
BLUEG	BLUEG	2.4651	Confirmed LTF	2.4651
TRIMBLE	TRIMBLE	0.7908	Confirmed LTF	0.7908
CATAWBA	CATAWBA	0.4323	Confirmed LTF	0.4323

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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
99596115	200793	26SEWARD 2	PENELEC	200912	26CONEMAGH	PENELEC	1	PN-P2_3- PN-230- 0252-A	breaker	1147.0	116.41	118.2	DC	21.32

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200503	26C.SLOPE (Deactivation : 07/06/2019)	31.2262	50/50	31.2262
200794	26CONEMAGH	0.6545	50/50	0.6545
200805	26COLVER13 (Deactivation : 01/09/2020)	23.2600	Adder	27.36
200809	26SITHE	2.0167	50/50	2.0167
200833	26SEWRDB34	37.4753	50/50	37.4753
200834	26SW_E13_K22	0.0875	50/50	0.0875
200837	26HOMER C1	34.7328	50/50	34.7328
200838	26HOMER C2	29.3172	50/50	29.3172
200839	26HOMER C3	31.0362	50/50	31.0362
200846	26FORWARD	0.3117	50/50	0.3117
200864	K-013 E	7.2275	50/50	7.2275
200883	Q-053 E	14.0093	50/50	14.0093
200886	26ARWF_N39	0.8478	50/50	0.8478
200888	26HIGHLAND	0.7206	50/50	0.7206
200889	26STNY CRK	0.5285	50/50	0.5285
200894	26K02	5.7263	Adder	6.74
200898	26AA1-106	2.1159	Adder	2.49
200915	26CHSTN_FL	0.3826	50/50	0.3826
200925	26R32	0.8314	50/50	0.8314
200945	26CT_V3-030	0.2531	50/50	0.2531
201477	26Y2-055	3.4623	Adder	4.07
202225	26SCI_S29B	0.1361	50/50	0.1361
203034	26NA_O38_P22	0.7418	50/50	0.7418
203910	26Z1-091	1.8412	Adder	2.17
203999	P-047 E	9.8717	Adder	11.61
235003	AC1-025 E	0.1587	Adder	0.19
236828	01GRAYMONT	0.4288	Adder	0.5
290086	Q-036 E	7.8836	Adder	9.27
292350	K-023	6.6881	Adder	7.87
292542	L-013 1	6.5052	Adder	7.65
293301	N-039 E	19.6595	50/50	19.6595
293393	V3-030E	7.7347	50/50	7.7347
293432	R-040 E	0.3659	Adder	0.43
293603	O-018 E	16.7097	50/50	16.7097
293902	O-048 E	5.8546	Adder	6.89
294515	O38_P22	17.2021	50/50	17.2021
294903	P-060 E	12.2552	50/50	12.2552

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
296332	R-032 E	19.2804	50/50	19.2804
913142	Y1-033 E OP1	5.3852	Adder	6.34
916202	Z1-069 E	8.0004	Adder	9.41
917672	Z2-108 E	3.6591	Adder	4.3
919201	AA1-144 OP	15.1504	Adder	17.82
919491	AA2-000	51.6967	Adder	60.82
920341	AA2-132 (Suspended)	2.0572	Adder	2.42
922932	AB1-082 OP (Suspended)	2.9413	Adder	3.46
923443	AB1-160 E	2.2858	Adder	2.69
930511	AB1-092	1.8982	Adder	2.23
935191	AD1-154	3.2936	Adder	3.87
936421	AD2-055	3.9080	Adder	4.6
936991	AD2-133 C	3.5476	Adder	4.17
936992	AD2-133 E	16.2264	Adder	19.09
938351	AE1-053	2.0329	Adder	2.39
938881	AE1-116	1.2677	50/50	1.2677
938951	AE1-123	2.3069	Adder	2.71
938991	AE1-128 C	21.9226	50/50	21.9226
938992	AE1-128 E	14.6150	50/50	14.6150
939171	AE1-147 C	1.2893	Adder	1.52
939172	AE1-147 E	0.8595	Adder	1.01
939291	AE1-160 C	1.4262	Adder	1.68
939292	AE1-160 E	0.8198	Adder	0.96
940201	AE2-001 C	1.2877	Adder	1.51
940202	AE2-001 E	0.8585	Adder	1.01
940681	AE2-055 C (Suspended)	1.2646	Adder	1.49
940682	AE2-055 E (Suspended)	0.8431	Adder	0.99
940861	AE2-074 C	2.2334	Adder	2.63
940862	AE2-074 E	2.9399	Adder	3.46
941191	AE2-113 C	9.0111	Adder	10.6
941192	AE2-113 E	9.7021	Adder	11.41
941231	AE2-117 C	1.9331	Adder	2.27
941232	AE2-117 E	1.2887	Adder	1.52
941241	AE2-118 C	1.9331	Adder	2.27
941242	AE2-118 E	1.2887	Adder	1.52
941261	AE2-120 C	1.2869	Adder	1.51
941262	AE2-120 E	0.8580	Adder	1.01
941271	AE2-121 C	0.6868	Adder	0.81
941272	AE2-121 E	0.4586	Adder	0.54
941321	AE2-126 C	1.6708	Adder	1.97
941322	AE2-126 E	1.1138	Adder	1.31
941331	AE2-129 C	2.0887	Adder	2.46
941332	AE2-129 E	1.3924	Adder	1.64
941351	AE2-131 C	2.0887	Adder	2.46
941352	AE2-131 E	1.3924	Adder	1.64
941421	AE2-139 C	5.7887	Adder	6.81
941422	AE2-139 E	3.8592	Adder	4.54
942121	AE2-224 C	21.1128	50/50	21.1128
942122	AE2-224 E	14.0752	50/50	14.0752
942351	AE2-248 C	1.0194	Adder	1.2
942352	AE2-248 E	0.6796	Adder	0.8
942491	AE2-262 C	5.6912	Adder	6.7

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942492	AE2-262 E	3.8245	Adder	4.5
942501	AE2-263 C	5.3497	Adder	6.29
942502	AE2-263 E	3.5718	Adder	4.2
942511	AE2-264 C	9.4052	Adder	11.06
942512	AE2-264 E	6.2701	Adder	7.38
942811	AE2-299 C	3.0513	Adder	3.59
942812	AE2-299 E	12.2052	Adder	14.36
942961	AE2-316 C	5.0155	Adder	5.9
942962	AE2-316 E	7.1522	Adder	8.41
943151	AE2-344 C	6.5475	Adder	7.7
943152	AE2-344 E	4.3650	Adder	5.14
943711	AF1-039 C O1	1.4247	Adder	1.68
943712	AF1-039 E O1	0.9498	Adder	1.12
943751	AF1-043	11.7239	Adder	13.79
944001	AF1-068 C O1	1.3561	Adder	1.6
944002	AF1-068 E O1	0.7628	Adder	0.9
944181	AF1-086 C O1	4.0187	Adder	4.73
944182	AF1-086 E O1	17.4836	Adder	20.57
944261	AF1-094 C	1.1977	Adder	1.41
944262	AF1-094 E	0.7985	Adder	0.94
944281	AF1-096 C	1.3476	Adder	1.59
944282	AF1-096 E	0.8984	Adder	1.06
944301	AF1-098 C	4.7042	Adder	5.53
944302	AF1-098 E	3.1362	Adder	3.69
944311	AF1-099 C	8.6392	Adder	10.16
944312	AF1-099 E	5.7595	Adder	6.78
944321	AF1-100 C	18.3065	Adder	21.54
944322	AF1-100 E	12.2043	Adder	14.36
944381	AF1-103 O1	2.3868	Adder	2.81
944411	AF1-106 O1	2.2629	Adder	2.66
944471	AF1-112 C	1.3618	Adder	1.6
944472	AF1-112 E	0.7660	Adder	0.9
944671	AF1-132 C O1	1.2697	Adder	1.49
944672	AF1-132 E O1	0.8465	Adder	1.0
944691	AF1-134 C O1	2.0909	Adder	2.46
944692	AF1-134 E O1	1.3939	Adder	1.64
944751	AF1-140 C	3.0046	50/50	3.0046
944752	AF1-140 E	2.0031	50/50	2.0031
944771	AF1-142 C	13.8227	Adder	16.26
944772	AF1-142 E	9.2152	Adder	10.84
944781	AF1-143 C	12.1972	Adder	14.35
944782	AF1-143 E	6.5052	Adder	7.65
944841	AF1-149 C	1.2868	Adder	1.51
944842	AF1-149 E	0.8579	Adder	1.01
944881	AF1-153 C O1	1.4700	Adder	1.73
944882	AF1-153 E O1	0.9800	Adder	1.15
944901	AF1-155 C	1.4695	Adder	1.73
944902	AF1-155 E	0.9797	Adder	1.15
945021	AF1-167 C	0.9039	Adder	1.06
945022	AF1-167 E	0.6037	Adder	0.71
945121	AF1-177	0.5967	Adder	0.7
945161	AF1-181	0.0985	Adder	0.12

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945171	AF1-182	0.4925	Adder	0.58
945181	AF1-183	0.1340	Adder	0.16
945331	AF1-198	0.3071	Adder	0.36
945451	AF1-210 C	0.9958	Adder	1.17
945452	AF1-210 E	0.6639	Adder	0.78
945491	AF1-214 C	1.2869	Adder	1.51
945492	AF1-214 E	0.8580	Adder	1.01
945551	AF1-220 C	12.2600	Adder	14.42
945552	AF1-220 E	8.1778	Adder	9.62
945671	AF1-232 C O2	29.9790	50/50	29.9790
945672	AF1-232 E O2	16.1426	50/50	16.1426
945751	AF1-240 C O1	1.9761	Adder	2.32
945752	AF1-240 E O1	1.3174	Adder	1.55
946071	AF1-272 C O1	12.9445	Adder	15.23
946072	AF1-272 E O1	8.6297	Adder	10.15
946081	AF1-273 C O1	14.7579	50/50	14.7579
946082	AF1-273 E O1	9.8386	50/50	9.8386
946111	AF1-276 C	10.1126	Adder	11.9
946112	AF1-276 E	4.9808	Adder	5.86
946121	AF1-277 C	10.1126	Adder	11.9
946122	AF1-277 E	4.9808	Adder	5.86
946131	AF1-278 C	8.0599	Adder	9.48
946132	AF1-278 E	4.0088	Adder	4.72
946211	AF1-286 C O1	0.9165	Adder	1.08
946212	AF1-286 E O1	0.6223	Adder	0.73
946221	AF1-287 C	1.1296	Adder	1.33
946222	AF1-287 E	0.7531	Adder	0.89
946381	AF1-302 C	2.1902	Adder	2.58
946382	AF1-302 E	2.9203	Adder	3.44
946401	AF1-304 C	6.8962	Adder	8.11
946402	AF1-304 E	4.5975	Adder	5.41
946421	AF1-306 C	6.1273	Adder	7.21
946422	AF1-306 E	24.5094	Adder	28.83
946431	AF1-307 C	13.6494	50/50	13.6494
946432	AF1-307 E	9.0996	50/50	9.0996
946571	AF1-321 C O1	3.7594	50/50	3.7594
946572	AF1-321 E O1	2.5062	50/50	2.5062
946771	AF1-217 C O2	1.1296	Adder	1.33
946772	AF1-217 E O2	0.7531	Adder	0.89
957001	AF2-001 C O1	3.7594	50/50	3.7594
957002	AF2-001 E O1	2.5062	50/50	2.5062
957011	AF2-002 C O1	1.8797	50/50	1.8797
957012	AF2-002 E O1	1.2531	50/50	1.2531
957161	AF2-010 C	2.4478	Adder	5.43
957162	AF2-010 E	1.6496	Adder	3.66
957451	AF2-039 C	0.6259	Adder	1.39
957452	AF2-039 E	0.4173	Adder	0.93
957512	AF2-045 E	5.8171	50/50	5.8171
957561	AF2-050 C	10.5564	50/50	10.5564
957562	AF2-050 E	7.0376	50/50	7.0376
957571	AF2-051 C O1	1.8332	Adder	4.07
957572	AF2-051 E O1	0.9444	Adder	2.1

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957581	AF2-052 C	2.9522	Adder	6.55
957582	AF2-052 E	1.4362	Adder	3.19
957681	AF2-062 C	9.8097	Adder	21.78
957682	AF2-062 E	6.5398	Adder	14.52
957931	AF2-087 C	0.8194	50/50	0.8194
957932	AF2-087 E	1.1283	50/50	1.1283
957941	AF2-088 C	0.3014	Adder	0.67
957942	AF2-088 E	0.2009	Adder	0.45
957951	AF2-089 C	0.1964	Adder	0.44
957952	AF2-089 E	0.1012	Adder	0.22
957981	AF2-092 C	2.1966	50/50	2.1966
957982	AF2-092 E	1.4644	50/50	1.4644
958101	AF2-104 C	0.6761	50/50	0.6761
958102	AF2-104 E	0.4507	50/50	0.4507
958271	AF2-121 C	1.1070	Adder	2.46
958272	AF2-121 E	0.7380	Adder	1.64
958361	AF2-130 C	0.7857	Adder	1.74
958362	AF2-130 E	0.5238	Adder	1.16
958411	AF2-135 C	0.3232	Adder	0.72
958412	AF2-135 E	0.2155	Adder	0.48
958471	AF2-141	0.8619	Adder	1.91
958731	AF2-164 C O1	3.3089	Adder	7.34
958732	AF2-164 E O1	2.2059	Adder	4.9
958741	AF2-165 C	0.7534	Adder	1.67
958742	AF2-165 E	0.5023	Adder	1.11
958751	AF2-166 C	0.7857	Adder	1.74
958752	AF2-166 E	0.5238	Adder	1.16
959061	AF2-197 C O1	2.0415	Adder	4.53
959062	AF2-197 E O1	3.0622	Adder	6.8
959301	AF2-221 C	2.0266	50/50	2.0266
959302	AF2-221 E	2.7987	50/50	2.7987
959401	AF2-231 C	0.2561	Adder	0.57
959402	AF2-231 E	0.1708	Adder	0.38
959441	AF2-235 C	0.3571	Adder	0.79
959442	AF2-235 E	0.2381	Adder	0.53
959461	AF2-237 C	0.3174	Adder	0.7
959462	AF2-237 E	0.2116	Adder	0.47
959471	AF2-238 C	0.7426	Adder	1.65
959472	AF2-238 E	0.4950	Adder	1.1
959481	AF2-239 C	0.5535	Adder	1.23
959482	AF2-239 E	0.4438	Adder	0.99
959491	AF2-240 C	0.6476	Adder	1.44
959492	AF2-240 E	0.5517	Adder	1.22
959501	AF2-241 C	0.6776	Adder	1.5
959502	AF2-241 E	0.5217	Adder	1.16
959521	AF2-243 C	0.5651	Adder	1.25
959522	AF2-243 E	0.3767	Adder	0.84
959741	AF2-265 C	0.5322	Adder	1.18
959742	AF2-265 E	0.3960	Adder	0.88
959792	AF2-270 E	1.1330	50/50	1.1330
959802	AF2-271 E	0.3327	Adder	0.74
959822	AF2-273 E	0.2111	Adder	0.47

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960022	AF2-293 E	0.0664	Adder	0.15
960031	AF2-294 C	0.6575	Adder	1.46
960032	AF2-294 E	0.4383	Adder	0.97
960041	AF2-295 C	0.7788	Adder	1.73
960042	AF2-295 E	0.5192	Adder	1.15
960051	AF2-296 C	1.1082	Adder	2.46
960052	AF2-296 E	0.7388	Adder	1.64
960211	AF2-312 C	2.9816	50/50	2.9816
960212	AF2-312 E	1.9877	50/50	1.9877
960271	AF2-318 C	0.5983	Adder	1.33
960272	AF2-318 E	0.3989	Adder	0.89
960321	AF2-323 C O1	1.4727	Adder	3.27
960322	AF2-323 E O1	0.9818	Adder	2.18
960391	AF2-330 C	14.8326	50/50	14.8326
960392	AF2-330 E	6.4873	50/50	6.4873
960451	AF2-336 C O1	3.6611	50/50	3.6611
960452	AF2-336 E O1	2.4407	50/50	2.4407
960461	AF2-337 C O1	3.6611	50/50	3.6611
960462	AF2-337 E O1	2.4407	50/50	2.4407
960471	AF2-338 C O1	3.6611	50/50	3.6611
960472	AF2-338 E O1	2.4407	50/50	2.4407
960481	AF2-339 C O1	3.6611	50/50	3.6611
960482	AF2-339 E O1	2.4407	50/50	2.4407
960901	AF2-381 C	25.3292	50/50	25.3292
960902	AF2-381 E	13.3295	50/50	13.3295
961141	AF2-405	0.5997	Adder	1.33
961151	AF2-406	4.4975	Adder	9.98
961201	AF2-411 O1	22.9633	Adder	50.97
961211	AF2-412 O1	9.1953	Adder	20.41
WEC	WEC	0.0652	Confirmed LTF	0.0652
LGEE	LGEE	0.0764	Confirmed LTF	0.0764
CALDERWOOD	CALDERWOOD	0.0452	Confirmed LTF	0.0452
CBM-W2	CBM-W2	0.5569	Confirmed LTF	0.5569
CBM-W1	CBM-W1	3.8281	Confirmed LTF	3.8281
O-066	O-066	8.3866	Confirmed LTF	8.3866
CHEOAH	CHEOAH	0.0485	Confirmed LTF	0.0485
CBM-S1	CBM-S1	0.0596	Confirmed LTF	0.0596
G-007	G-007	1.3936	Confirmed LTF	1.3936
MEC	MEC	0.2447	Confirmed LTF	0.2447
CATAWBA	CATAWBA	0.0952	Confirmed LTF	0.0952

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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
99595884	200795	26SHELOCTA	PENELEC	200810	26KEYSTONE	PENELEC	1	ATSI-P2-3-CEI-345-004D	breaker	917.0	192.9	193.78	DC	17.65

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200636	26IUP CO-G	0.7309	50/50	0.7309
200794	26CONEMAGH	0.4993	50/50	0.4993
200805	26COLVER13 (Deactivation : 01/09/2020)	29.3843	50/50	29.3843
200809	26SITHE	2.2832	50/50	2.2832
200833	26SEWRDB34	24.0546	50/50	24.0546
200837	26HOMER C1	39.3219	50/50	39.3219
200838	26HOMER C2	34.1161	50/50	34.1161
200839	26HOMER C3	36.1164	50/50	36.1164
200846	26FORWARD	0.2706	50/50	0.2706
200864	K-013 E	6.2749	50/50	6.2749
200883	Q-053 E	9.9862	Adder	11.75
200888	26HIGHLAND	0.5912	50/50	0.5912
200894	26K02	7.1452	Adder	8.41
200898	26AA1-106	2.6743	Adder	3.15
200925	26R32	0.6821	50/50	0.6821
201477	26Y2-055	4.9421	Adder	5.81
202158	26CON.GEN1	0.1250	50/50	0.1250
203910	26Z1-091	2.4312	Adder	2.86
203999	P-047 E	12.4397	Adder	14.63
235003	AC1-025 E	0.1777	Adder	0.21
236828	01GRAYMONT	0.4827	Adder	0.57
290086	Q-036 E	7.3243	Adder	8.62
292350	K-023	5.7633	Adder	6.78
292542	L-013 1	5.6056	Adder	6.59
293301	N-039 E	13.1545	Adder	15.48
293393	V3-030E	6.1438	Adder	7.23
293432	R-040 E	0.3153	Adder	0.37
293603	O-018 E	13.7093	50/50	13.7093
293902	O-048 E	5.0451	Adder	5.94
294515	O38_P22	11.5102	Adder	13.54
294903	P-060 E	8.9489	Adder	10.53
296332	R-032 E	15.8184	50/50	15.8184
913142	Y1-033 E OP1	4.5943	Adder	5.41
915951	Y3-092 FTIR	216.0000	Merchant Transmission	216.0000
916202	Z1-069 E	9.9846	Adder	11.75
917672	Z2-108 E	3.1532	Adder	3.71
918682	AA1-082 E	6.9319	Adder	8.16
919201	AA1-144 OP	19.7240	Adder	23.2

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
919491	AA2-000	61.9605	Adder	72.89
920341	AA2-132 (Suspended)	2.6754	Adder	3.15
922932	AB1-082 OP (Suspended)	3.6694	Adder	4.32
923443	AB1-160 E	2.8527	Adder	3.36
930511	AB1-092	2.2750	Adder	2.68
935191	AD1-154	3.8233	Adder	4.5
936421	AD2-055	4.6838	Adder	5.51
936991	AD2-133 C	3.2959	Adder	3.88
936992	AD2-133 E	15.0752	Adder	17.74
938351	AE1-053	1.7518	Adder	2.06
938881	AE1-116	0.9335	Adder	1.1
938951	AE1-123	2.9365	Adder	3.45
938991	AE1-128 C	15.8502	Adder	18.65
938992	AE1-128 E	10.5668	Adder	12.43
939171	AE1-147 C	1.4523	Adder	1.71
939172	AE1-147 E	0.9682	Adder	1.14
939291	AE1-160 C	2.1456	Adder	2.52
939292	AE1-160 E	1.2333	Adder	1.45
940201	AE2-001 C	1.4499	Adder	1.71
940202	AE2-001 E	0.9666	Adder	1.14
940681	AE2-055 C (Suspended)	1.4141	Adder	1.66
940682	AE2-055 E (Suspended)	0.9428	Adder	1.11
940861	AE2-074 C	2.7861	Adder	3.28
940862	AE2-074 E	3.6675	Adder	4.31
941191	AE2-113 C	11.1012	Adder	13.06
941192	AE2-113 E	11.9524	Adder	14.06
941231	AE2-117 C	1.6666	Adder	1.96
941232	AE2-117 E	1.1111	Adder	1.31
941241	AE2-118 C	1.6666	Adder	1.96
941242	AE2-118 E	1.1111	Adder	1.31
941261	AE2-120 C	1.4486	Adder	1.7
941262	AE2-120 E	0.9657	Adder	1.14
941271	AE2-121 C	0.7743	Adder	0.91
941272	AE2-121 E	0.5170	Adder	0.61
941321	AE2-126 C	1.9222	Adder	2.26
941322	AE2-126 E	1.2815	Adder	1.51
941331	AE2-129 C	2.0674	Adder	2.43
941332	AE2-129 E	1.3783	Adder	1.62
941351	AE2-131 C	2.0674	Adder	2.43
941352	AE2-131 E	1.3783	Adder	1.62
941421	AE2-139 C	7.4309	Adder	8.74
941422	AE2-139 E	4.9540	Adder	5.83
942121	AE2-224 C	16.2642	50/50	16.2642
942122	AE2-224 E	10.8428	50/50	10.8428
942351	AE2-248 C	1.1433	Adder	1.35
942352	AE2-248 E	0.7622	Adder	0.9
942491	AE2-262 C	6.5458	Adder	7.7
942492	AE2-262 E	4.3988	Adder	5.18
942501	AE2-263 C	6.1531	Adder	7.24
942502	AE2-263 E	4.1082	Adder	4.83
942511	AE2-264 C	7.8026	Adder	9.18
942512	AE2-264 E	5.2017	Adder	6.12

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942811	AE2-299 C	5.2363	Adder	6.16
942812	AE2-299 E	20.9451	Adder	24.64
942961	AE2-316 C	6.1301	Adder	7.21
942962	AE2-316 E	8.7415	Adder	10.28
943151	AE2-344 C	12.0975	Adder	14.23
943152	AE2-344 E	8.0650	Adder	9.49
943351	AF1-006 C	2.1870	Adder	2.57
943352	AF1-006 E	1.2302	Adder	1.45
943711	AF1-039 C O1	1.2154	Adder	1.43
943712	AF1-039 E O1	0.8103	Adder	0.95
943751	AF1-043	14.0515	Adder	16.53
944001	AF1-068 C O1	1.5196	Adder	1.79
944002	AF1-068 E O1	0.8548	Adder	1.01
944181	AF1-086 C O1	4.2701	Adder	5.02
944182	AF1-086 E O1	18.5773	Adder	21.86
944261	AF1-094 C	1.9969	Adder	2.35
944262	AF1-094 E	1.3312	Adder	1.57
944281	AF1-096 C	2.0274	Adder	2.39
944282	AF1-096 E	1.3516	Adder	1.59
944301	AF1-098 C	7.9568	Adder	9.36
944302	AF1-098 E	5.3045	Adder	6.24
944311	AF1-099 C	9.9366	Adder	11.69
944312	AF1-099 E	6.6244	Adder	7.79
944321	AF1-100 C	21.1140	Adder	24.84
944322	AF1-100 E	14.0760	Adder	16.56
944381	AF1-103 O1	3.4080	Adder	4.01
944391	AF1-104 O1	3.5894	Adder	4.22
944411	AF1-106 O1	2.8975	Adder	3.41
944471	AF1-112 C	1.5285	Adder	1.8
944472	AF1-112 E	0.8598	Adder	1.01
944671	AF1-132 C O1	1.4221	Adder	1.67
944672	AF1-132 E O1	0.9481	Adder	1.12
944691	AF1-134 C O1	2.2431	Adder	2.64
944692	AF1-134 E O1	1.4954	Adder	1.76
944751	AF1-140 C	2.1234	Adder	2.5
944752	AF1-140 E	1.4156	Adder	1.67
944771	AF1-142 C	15.8986	Adder	18.7
944772	AF1-142 E	10.5990	Adder	12.47
944781	AF1-143 C	10.5106	Adder	12.37
944782	AF1-143 E	5.6056	Adder	6.59
944841	AF1-149 C	1.4485	Adder	1.7
944842	AF1-149 E	0.9657	Adder	1.14
944881	AF1-153 C O1	1.7741	Adder	2.09
944882	AF1-153 E O1	1.1827	Adder	1.39
944901	AF1-155 C	1.7742	Adder	2.09
944902	AF1-155 E	1.1828	Adder	1.39
945021	AF1-167 C	1.1249	Adder	1.32
945022	AF1-167 E	0.7513	Adder	0.88
945051	AF1-170 C	8.2473	Adder	9.7
945052	AF1-170 E	5.4982	Adder	6.47
945121	AF1-177	0.8520	Adder	1.0
945161	AF1-181	0.1132	Adder	0.13

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945171	AF1-182	0.5659	Adder	0.67
945181	AF1-183	0.1499	Adder	0.18
945331	AF1-198	0.3852	Adder	0.45
945451	AF1-210 C	1.2304	Adder	1.45
945452	AF1-210 E	0.8203	Adder	0.97
945491	AF1-214 C	1.4487	Adder	1.7
945492	AF1-214 E	0.9658	Adder	1.14
945551	AF1-220 C	14.6462	Adder	17.23
945552	AF1-220 E	9.7695	Adder	11.49
945671	AF1-232 C O2	21.9541	Adder	25.83
945672	AF1-232 E O2	11.8215	Adder	13.91
945751	AF1-240 C O1	2.2940	Adder	2.7
945752	AF1-240 E O1	1.5293	Adder	1.8
946071	AF1-272 C O1	22.7773	50/50	22.7773
946072	AF1-272 E O1	15.1848	50/50	15.1848
946081	AF1-273 C O1	10.7976	Adder	12.7
946082	AF1-273 E O1	7.1984	Adder	8.47
946111	AF1-276 C	12.8576	Adder	15.13
946112	AF1-276 E	6.3328	Adder	7.45
946121	AF1-277 C	12.8576	Adder	15.13
946122	AF1-277 E	6.3328	Adder	7.45
946131	AF1-278 C	10.2477	Adder	12.06
946132	AF1-278 E	5.0970	Adder	6.0
946211	AF1-286 C O1	1.1735	Adder	1.38
946212	AF1-286 E O1	0.7968	Adder	0.94
946221	AF1-287 C	2.0775	Adder	2.44
946222	AF1-287 E	1.3850	Adder	1.63
946381	AF1-302 C	2.6769	Adder	3.15
946382	AF1-302 E	3.5692	Adder	4.2
946401	AF1-304 C	10.1689	Adder	11.96
946402	AF1-304 E	6.7793	Adder	7.98
946421	AF1-306 C	7.4059	Adder	8.71
946422	AF1-306 E	29.6235	Adder	34.85
946431	AF1-307 C	10.4821	50/50	10.4821
946432	AF1-307 E	6.9881	50/50	6.9881
946571	AF1-321 C O1	3.2800	50/50	3.2800
946572	AF1-321 E O1	2.1866	50/50	2.1866
946771	AF1-217 C O2	2.0775	Adder	2.44
946772	AF1-217 E O2	1.3850	Adder	1.63
957001	AF2-001 C O1	3.2800	50/50	3.2800
957002	AF2-001 E O1	2.1866	50/50	2.1866
957011	AF2-002 C O1	1.6400	50/50	1.6400
957012	AF2-002 E O1	1.0933	50/50	1.0933
957161	AF2-010 C	4.0601	Adder	9.01
957162	AF2-010 E	2.7361	Adder	6.07
957451	AF2-039 C	0.6828	Adder	1.52
957452	AF2-039 E	0.4552	Adder	1.01
957512	AF2-045 E	2.1054	Adder	4.67
957561	AF2-050 C	8.1321	50/50	8.1321
957562	AF2-050 E	5.4214	50/50	5.4214
957571	AF2-051 C O1	3.1689	Adder	7.03
957572	AF2-051 E O1	1.6325	Adder	3.62

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957581	AF2-052 C	3.6694	Adder	8.15
957582	AF2-052 E	1.7851	Adder	3.96
957681	AF2-062 C	12.3878	Adder	27.5
957682	AF2-062 E	8.2586	Adder	18.33
957931	AF2-087 C	0.3080	Adder	0.68
957932	AF2-087 E	0.4241	Adder	0.94
957941	AF2-088 C	0.3288	Adder	0.73
957942	AF2-088 E	0.2192	Adder	0.49
957951	AF2-089 C	0.2955	Adder	0.66
957952	AF2-089 E	0.1522	Adder	0.34
957981	AF2-092 C	0.8375	Adder	1.86
957982	AF2-092 E	0.5583	Adder	1.24
958031	AF2-097 C	0.2717	Adder	0.6
958032	AF2-097 E	0.1811	Adder	0.4
958101	AF2-104 C	0.2639	Adder	0.59
958102	AF2-104 E	0.1759	Adder	0.39
958271	AF2-121 C	1.0957	Adder	2.43
958272	AF2-121 E	0.7305	Adder	1.62
958361	AF2-130 C	1.0593	Adder	2.35
958362	AF2-130 E	0.7062	Adder	1.57
958411	AF2-135 C	0.2785	Adder	0.62
958412	AF2-135 E	0.1857	Adder	0.41
958471	AF2-141	0.7427	Adder	1.65
958731	AF2-164 C O1	4.9949	Adder	11.09
958732	AF2-164 E O1	3.3300	Adder	7.39
958741	AF2-165 C	1.0893	Adder	2.42
958742	AF2-165 E	0.7262	Adder	1.61
958751	AF2-166 C	1.0593	Adder	2.35
958752	AF2-166 E	0.7062	Adder	1.57
958791	AF2-170 C	1.1414	Adder	2.53
958792	AF2-170 E	0.7609	Adder	1.69
959061	AF2-197 C O1	2.6587	Adder	5.9
959062	AF2-197 E O1	3.9880	Adder	8.85
959301	AF2-221 C	1.7042	50/50	1.7042
959302	AF2-221 E	2.3534	50/50	2.3534
959401	AF2-231 C	0.2208	Adder	0.49
959402	AF2-231 E	0.1472	Adder	0.33
959441	AF2-235 C	0.5372	Adder	1.19
959442	AF2-235 E	0.3582	Adder	0.8
959461	AF2-237 C	0.5292	Adder	1.17
959462	AF2-237 E	0.3528	Adder	0.78
959471	AF2-238 C	0.9386	Adder	2.08
959472	AF2-238 E	0.6257	Adder	1.39
959481	AF2-239 C	0.7226	Adder	1.6
959482	AF2-239 E	0.5794	Adder	1.29
959491	AF2-240 C	0.8293	Adder	1.84
959492	AF2-240 E	0.7064	Adder	1.57
959501	AF2-241 C	0.8677	Adder	1.93
959502	AF2-241 E	0.6680	Adder	1.48
959521	AF2-243 C	0.8169	Adder	1.81
959522	AF2-243 E	0.5446	Adder	1.21
959741	AF2-265 C	0.6727	Adder	1.49

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959742	AF2-265 E	0.5006	Adder	1.11
959792	AF2-270 E	0.4341	Adder	0.96
959802	AF2-271 E	0.3002	Adder	0.67
959822	AF2-273 E	0.2616	Adder	0.58
960022	AF2-293 E	0.0748	Adder	0.17
960031	AF2-294 C	0.8551	Adder	1.9
960032	AF2-294 E	0.5700	Adder	1.27
960041	AF2-295 C	0.9403	Adder	2.09
960042	AF2-295 E	0.6269	Adder	1.39
960051	AF2-296 C	1.1888	Adder	2.64
960052	AF2-296 E	0.7926	Adder	1.76
960211	AF2-312 C	1.2463	Adder	2.77
960212	AF2-312 E	0.8308	Adder	1.84
960271	AF2-318 C	0.7812	Adder	1.73
960272	AF2-318 E	0.5208	Adder	1.16
960321	AF2-323 C O1	2.5387	Adder	5.64
960322	AF2-323 E O1	1.6925	Adder	3.76
960391	AF2-330 C	5.5322	Adder	12.28
960392	AF2-330 E	2.4196	Adder	5.37
960451	AF2-336 C O1	1.3958	Adder	3.1
960452	AF2-336 E O1	0.9306	Adder	2.07
960461	AF2-337 C O1	1.3958	Adder	3.1
960462	AF2-337 E O1	0.9306	Adder	2.07
960471	AF2-338 C O1	1.3958	Adder	3.1
960472	AF2-338 E O1	0.9306	Adder	2.07
960481	AF2-339 C O1	1.3958	Adder	3.1
960482	AF2-339 E O1	0.9306	Adder	2.07
960901	AF2-381 C	21.8509	50/50	21.8509
960902	AF2-381 E	11.4991	50/50	11.4991
961141	AF2-405	0.7678	Adder	1.7
961151	AF2-406	5.7587	Adder	12.78
961201	AF2-411 O1	28.4018	Adder	63.05
961211	AF2-412 O1	11.4817	Adder	25.49
961451	AF2-436	0.0883	Adder	0.2
NEWTON	NEWTON	1.4033	Confirmed LTF	1.4033
FARMERCITY	FARMERCITY	0.0725	Confirmed LTF	0.0725
G-007A	G-007A	2.1458	Confirmed LTF	2.1458
VFT	VFT	6.2243	Confirmed LTF	6.2243
CALDERWOOD	CALDERWOOD	0.6118	Confirmed LTF	0.6118
PRAIRIE	PRAIRIE	3.3398	Confirmed LTF	3.3398
CHEOAH	CHEOAH	0.6151	Confirmed LTF	0.6151
EDWARDS	EDWARDS	0.4592	Confirmed LTF	0.4592
TILTON	TILTON	0.8285	Confirmed LTF	0.8285
MADISON	MADISON	0.0625	Confirmed LTF	0.0625
GIBSON	GIBSON	0.7158	Confirmed LTF	0.7158
BLUEG	BLUEG	2.2828	Confirmed LTF	2.2828
TRIMBLE	TRIMBLE	0.7324	Confirmed LTF	0.7324
CATAWBA	CATAWBA	0.4053	Confirmed LTF	0.4053

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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
99596014	200810	26KEYSTONE	PENELEC	999401	KEYSTONE	PJM	4	PJM500_PN_P4-500-001D	breaker	635.0	145.25	146.11	DC	11.92

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200636	26IUP CO-G	0.5021	50/50	0.5021
200794	26CONEMAGH	0.3401	50/50	0.3401
200805	26COLVER13 (Deactivation : 01/09/2020)	19.4986	50/50	19.4986
200809	26SITHE	1.5787	50/50	1.5787
200833	26SEWRDB34	16.4203	50/50	16.4203
200837	26HOMER C1	27.1889	50/50	27.1889
200838	26HOMER C2	22.7783	50/50	22.7783
200839	26HOMER C3	24.1138	50/50	24.1138
200846	26FORWARD	0.1849	50/50	0.1849
200864	K-013 E	4.2867	50/50	4.2867
200883	Q-053 E	6.7034	Adder	7.89
200888	26HIGHLAND	0.4021	50/50	0.4021
200894	26K02	4.2797	Adder	5.03
200898	26AA1-106	1.6191	Adder	1.9
200906	26KEYSTN#3	0.8346	50/50	0.8346
200925	26R32	0.4640	50/50	0.4640
201477	26Y2-055	2.5158	Adder	2.96
202158	26CON.GEN1	0.0871	50/50	0.0871
202160	26CON.GEN2	0.0608	50/50	0.0608
203910	26Z1-091	1.4616	Adder	1.72
203999	P-047 E	7.6650	Adder	9.02
235003	AC1-025 E	0.1066	Adder	0.13
236828	01GRAYMONT	0.2892	Adder	0.34
290086	Q-036 E	4.7423	Adder	5.58
292350	K-023	3.9316	Adder	4.63
292542	L-013 1	3.8240	Adder	4.5
293301	N-039 E	8.9004	Adder	10.47
293393	V3-030E	4.0991	Adder	4.82
293432	R-040 E	0.2151	Adder	0.25
293603	O-018 E	9.3246	50/50	9.3246
293902	O-048 E	3.4416	Adder	4.05
294515	O38_P22	7.7878	Adder	9.16
294903	P-060 E	6.1011	Adder	7.18
296332	R-032 E	10.7592	50/50	10.7592
913142	Y1-033 E OP1	3.1285	Adder	3.68
916202	Z1-069 E	6.1111	Adder	7.19
917672	Z2-108 E	2.1510	Adder	2.53
918682	AA1-082 E	4.1676	Adder	4.9
919201	AA1-144 OP	11.8571	Adder	13.95
919491	AA2-000	36.9465	Adder	43.47

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
920341	AA2-132 (Suspended)	1.6179	Adder	1.9
922932	AB1-082 OP (Suspended)	2.2235	Adder	2.62
923443	AB1-160 E	1.7460	Adder	2.05
930511	AB1-092	1.3566	Adder	1.6
935191	AD1-154	2.3474	Adder	2.76
936421	AD2-055	2.7929	Adder	3.29
936991	AD2-133 C	2.1340	Adder	2.51
936992	AD2-133 E	9.7609	Adder	11.48
938351	AE1-053	1.1950	Adder	1.41
938881	AE1-116	0.6374	Adder	0.75
938951	AE1-123	1.6446	Adder	1.93
938991	AE1-128 C	12.6893	50/50	12.6893
938992	AE1-128 E	8.4595	50/50	8.4595
939171	AE1-147 C	0.8699	Adder	1.02
939172	AE1-147 E	0.5799	Adder	0.68
939291	AE1-160 C	1.0211	Adder	1.2
939292	AE1-160 E	0.5869	Adder	0.69
940201	AE2-001 C	0.8685	Adder	1.02
940202	AE2-001 E	0.5790	Adder	0.68
940681	AE2-055 C (Suspended)	0.8483	Adder	1.0
940682	AE2-055 E (Suspended)	0.5656	Adder	0.67
940861	AE2-074 C	1.6883	Adder	1.99
940862	AE2-074 E	2.2224	Adder	2.61
941191	AE2-113 C	6.6071	Adder	7.77
941192	AE2-113 E	7.1137	Adder	8.37
941231	AE2-117 C	1.0882	Adder	1.28
941232	AE2-117 E	0.7255	Adder	0.85
941241	AE2-118 C	1.0882	Adder	1.28
941242	AE2-118 E	0.7255	Adder	0.85
941261	AE2-120 C	0.8677	Adder	1.02
941262	AE2-120 E	0.5785	Adder	0.68
941271	AE2-121 C	0.4637	Adder	0.55
941272	AE2-121 E	0.3096	Adder	0.36
941321	AE2-126 C	1.1540	Adder	1.36
941322	AE2-126 E	0.7694	Adder	0.91
941331	AE2-129 C	1.3112	Adder	1.54
941332	AE2-129 E	0.8741	Adder	1.03
941351	AE2-131 C	1.3112	Adder	1.54
941352	AE2-131 E	0.8741	Adder	1.03
941421	AE2-139 C	4.4628	Adder	5.25
941422	AE2-139 E	2.9752	Adder	3.5
942121	AE2-224 C	11.0940	50/50	11.0940
942122	AE2-224 E	7.3960	50/50	7.3960
942351	AE2-248 C	0.6854	Adder	0.81
942352	AE2-248 E	0.4570	Adder	0.54
942491	AE2-262 C	3.9028	Adder	4.59
942492	AE2-262 E	2.6227	Adder	3.09
942501	AE2-263 C	3.6686	Adder	4.32
942502	AE2-263 E	2.4494	Adder	2.88
942511	AE2-264 C	5.1755	Adder	6.09
942512	AE2-264 E	3.4503	Adder	4.06
942811	AE2-299 C	2.1929	Adder	2.58

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942812	AE2-299 E	8.7715	Adder	10.32
942961	AE2-316 C	3.5685	Adder	4.2
942962	AE2-316 E	5.0887	Adder	5.99
943151	AE2-344 C	4.6736	Adder	5.5
943152	AE2-344 E	3.1157	Adder	3.67
943351	AF1-006 C	0.8073	Adder	0.95
943352	AF1-006 E	0.4541	Adder	0.53
943711	AF1-039 C O1	0.8277	Adder	0.97
943712	AF1-039 E O1	0.5518	Adder	0.65
943751	AF1-043	8.3788	Adder	9.86
944001	AF1-068 C O1	0.9112	Adder	1.07
944002	AF1-068 E O1	0.5125	Adder	0.6
944181	AF1-086 C O1	2.7924	Adder	3.29
944182	AF1-086 E O1	12.1484	Adder	14.29
944261	AF1-094 C	0.8554	Adder	1.01
944262	AF1-094 E	0.5702	Adder	0.67
944281	AF1-096 C	0.9648	Adder	1.14
944282	AF1-096 E	0.6432	Adder	0.76
944301	AF1-098 C	3.3713	Adder	3.97
944302	AF1-098 E	2.2475	Adder	2.64
944311	AF1-099 C	5.9244	Adder	6.97
944312	AF1-099 E	3.9496	Adder	4.65
944321	AF1-100 C	12.6059	Adder	14.83
944322	AF1-100 E	8.4040	Adder	9.89
944381	AF1-103 O1	1.7343	Adder	2.04
944411	AF1-106 O1	1.7626	Adder	2.07
944471	AF1-112 C	0.9162	Adder	1.08
944472	AF1-112 E	0.5154	Adder	0.61
944671	AF1-132 C O1	0.8528	Adder	1.0
944672	AF1-132 E O1	0.5685	Adder	0.67
944691	AF1-134 C O1	1.4353	Adder	1.69
944692	AF1-134 E O1	0.9569	Adder	1.13
944751	AF1-140 C	1.4386	Adder	1.69
944752	AF1-140 E	0.9590	Adder	1.13
944771	AF1-142 C	9.4791	Adder	11.15
944772	AF1-142 E	6.3194	Adder	7.43
944781	AF1-143 C	7.1701	Adder	8.44
944782	AF1-143 E	3.8240	Adder	4.5
944841	AF1-149 C	0.8677	Adder	1.02
944842	AF1-149 E	0.5785	Adder	0.68
944881	AF1-153 C O1	1.0338	Adder	1.22
944882	AF1-153 E O1	0.6892	Adder	0.81
944901	AF1-155 C	1.0336	Adder	1.22
944902	AF1-155 E	0.6890	Adder	0.81
945021	AF1-167 C	0.6395	Adder	0.75
945022	AF1-167 E	0.4272	Adder	0.5
945051	AF1-170 C	2.9067	Adder	3.42
945052	AF1-170 E	1.9378	Adder	2.28
945121	AF1-177	0.4336	Adder	0.51
945161	AF1-181	0.0677	Adder	0.08
945171	AF1-182	0.3383	Adder	0.4
945181	AF1-183	0.0910	Adder	0.11

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945331	AF1-198	0.2365	Adder	0.28
945451	AF1-210 C	0.6992	Adder	0.82
945452	AF1-210 E	0.4662	Adder	0.55
945491	AF1-214 C	0.8678	Adder	1.02
945492	AF1-214 E	0.5785	Adder	0.68
945551	AF1-220 C	8.6431	Adder	10.17
945552	AF1-220 E	5.7652	Adder	6.78
945671	AF1-232 C O2	14.9758	Adder	17.62
945672	AF1-232 E O2	8.0639	Adder	9.49
945751	AF1-240 C O1	1.4084	Adder	1.66
945752	AF1-240 E O1	0.9389	Adder	1.1
946071	AF1-272 C O1	15.7799	50/50	15.7799
946072	AF1-272 E O1	10.5200	50/50	10.5200
946081	AF1-273 C O1	7.3643	Adder	8.66
946082	AF1-273 E O1	4.9095	Adder	5.78
946111	AF1-276 C	7.5744	Adder	8.91
946112	AF1-276 E	3.7307	Adder	4.39
946121	AF1-277 C	7.5744	Adder	8.91
946122	AF1-277 E	3.7307	Adder	4.39
946131	AF1-278 C	6.0369	Adder	7.1
946132	AF1-278 E	3.0026	Adder	3.53
946211	AF1-286 C O1	0.7138	Adder	0.84
946212	AF1-286 E O1	0.4847	Adder	0.57
946221	AF1-287 C	0.8067	Adder	0.95
946222	AF1-287 E	0.5378	Adder	0.63
946381	AF1-302 C	1.5583	Adder	1.83
946382	AF1-302 E	2.0777	Adder	2.44
946401	AF1-304 C	4.9399	Adder	5.81
946402	AF1-304 E	3.2932	Adder	3.87
946421	AF1-306 C	4.3129	Adder	5.07
946422	AF1-306 E	17.2515	Adder	20.3
946431	AF1-307 C	7.1345	50/50	7.1345
946432	AF1-307 E	4.7563	50/50	4.7563
946571	AF1-321 C O1	2.2427	50/50	2.2427
946572	AF1-321 E O1	1.4951	50/50	1.4951
946771	AF1-217 C O2	0.8067	Adder	0.95
946772	AF1-217 E O2	0.5378	Adder	0.63
957001	AF2-001 C O1	2.2427	50/50	2.2427
957002	AF2-001 E O1	1.4951	50/50	1.4951
957011	AF2-002 C O1	1.1213	50/50	1.1213
957012	AF2-002 E O1	0.7476	50/50	0.7476
957161	AF2-010 C	1.7484	Adder	3.88
957162	AF2-010 E	1.1783	Adder	2.62
957451	AF2-039 C	0.4203	Adder	0.93
957452	AF2-039 E	0.2802	Adder	0.62
957512	AF2-045 E	1.4273	Adder	3.17
957561	AF2-050 C	5.5470	50/50	5.5470
957562	AF2-050 E	3.6980	50/50	3.6980
957571	AF2-051 C O1	1.3230	Adder	2.94
957572	AF2-051 E O1	0.6815	Adder	1.51
957581	AF2-052 C	2.2007	Adder	4.89
957582	AF2-052 E	1.0706	Adder	2.38

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957681	AF2-062 C	7.3711	Adder	16.36
957682	AF2-062 E	4.9141	Adder	10.91
957931	AF2-087 C	0.2059	Adder	0.46
957932	AF2-087 E	0.2835	Adder	0.63
957941	AF2-088 C	0.2023	Adder	0.45
957942	AF2-088 E	0.1349	Adder	0.3
957951	AF2-089 C	0.1406	Adder	0.31
957952	AF2-089 E	0.0724	Adder	0.16
957981	AF2-092 C	0.5693	Adder	1.26
957982	AF2-092 E	0.3796	Adder	0.84
958031	AF2-097 C	0.1003	Adder	0.22
958032	AF2-097 E	0.0669	Adder	0.15
958101	AF2-104 C	0.1802	Adder	0.4
958102	AF2-104 E	0.1201	Adder	0.27
958271	AF2-121 C	0.6949	Adder	1.54
958272	AF2-121 E	0.4633	Adder	1.03
958361	AF2-130 C	0.5615	Adder	1.25
958362	AF2-130 E	0.3743	Adder	0.83
958411	AF2-135 C	0.1900	Adder	0.42
958412	AF2-135 E	0.1267	Adder	0.28
958471	AF2-141	0.5067	Adder	1.12
958731	AF2-164 C O1	2.4513	Adder	5.44
958732	AF2-164 E O1	1.6342	Adder	3.63
958741	AF2-165 C	0.5404	Adder	1.2
958742	AF2-165 E	0.3603	Adder	0.8
958751	AF2-166 C	0.5615	Adder	1.25
958752	AF2-166 E	0.3743	Adder	0.83
959061	AF2-197 C O1	1.6039	Adder	3.56
959062	AF2-197 E O1	2.4058	Adder	5.34
959301	AF2-221 C	1.1633	50/50	1.1633
959302	AF2-221 E	1.6065	50/50	1.6065
959401	AF2-231 C	0.1442	Adder	0.32
959402	AF2-231 E	0.0961	Adder	0.21
959441	AF2-235 C	0.2557	Adder	0.57
959442	AF2-235 E	0.1705	Adder	0.38
959461	AF2-237 C	0.2267	Adder	0.5
959462	AF2-237 E	0.1511	Adder	0.34
959471	AF2-238 C	0.5755	Adder	1.28
959472	AF2-238 E	0.3836	Adder	0.85
959481	AF2-239 C	0.4355	Adder	0.97
959482	AF2-239 E	0.3492	Adder	0.78
959491	AF2-240 C	0.5044	Adder	1.12
959492	AF2-240 E	0.4297	Adder	0.95
959501	AF2-241 C	0.5278	Adder	1.17
959502	AF2-241 E	0.4064	Adder	0.9
959521	AF2-243 C	0.4053	Adder	0.9
959522	AF2-243 E	0.2702	Adder	0.6
959741	AF2-265 C	0.4124	Adder	0.92
959742	AF2-265 E	0.3069	Adder	0.68
959792	AF2-270 E	0.6558	50/50	0.6558
959802	AF2-271 E	0.1963	Adder	0.44
959822	AF2-273 E	0.1487	Adder	0.33

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960022	AF2-293 E	0.0448	Adder	0.1
960031	AF2-294 C	0.5171	Adder	1.15
960032	AF2-294 E	0.3447	Adder	0.77
960041	AF2-295 C	0.5478	Adder	1.22
960042	AF2-295 E	0.3652	Adder	0.81
960051	AF2-296 C	0.7607	Adder	1.69
960052	AF2-296 E	0.5072	Adder	1.13
960211	AF2-312 C	0.8320	Adder	1.85
960212	AF2-312 E	0.5547	Adder	1.23
960271	AF2-318 C	0.4709	Adder	1.05
960272	AF2-318 E	0.3139	Adder	0.7
960321	AF2-323 C O1	1.0633	Adder	2.36
960322	AF2-323 E O1	0.7088	Adder	1.57
960391	AF2-330 C	3.7356	Adder	8.29
960392	AF2-330 E	1.6339	Adder	3.63
960451	AF2-336 C O1	0.9489	Adder	2.11
960452	AF2-336 E O1	0.6326	Adder	1.4
960461	AF2-337 C O1	0.9489	Adder	2.11
960462	AF2-337 E O1	0.6326	Adder	1.4
960471	AF2-338 C O1	0.9489	Adder	2.11
960472	AF2-338 E O1	0.6326	Adder	1.4
960481	AF2-339 C O1	0.9489	Adder	2.11
960482	AF2-339 E O1	0.6326	Adder	1.4
960901	AF2-381 C	14.9091	50/50	14.9091
960902	AF2-381 E	7.8459	50/50	7.8459
961141	AF2-405	0.4671	Adder	1.04
961151	AF2-406	3.5031	Adder	7.78
961201	AF2-411 O1	17.8114	Adder	39.54
961211	AF2-412 O1	7.1197	Adder	15.8
961451	AF2-436	0.0528	Adder	0.12
NEWTON	NEWTON	0.5437	Confirmed LTF	0.5437
FARMERCITY	FARMERCITY	0.0283	Confirmed LTF	0.0283
G-007A	G-007A	0.0216	Confirmed LTF	0.0216
VFT	VFT	0.3289	Confirmed LTF	0.3289
CALDERWOOD	CALDERWOOD	0.2863	Confirmed LTF	0.2863
PRAIRIE	PRAIRIE	1.3277	Confirmed LTF	1.3277
CHEOAH	CHEOAH	0.2888	Confirmed LTF	0.2888
EDWARDS	EDWARDS	0.1694	Confirmed LTF	0.1694
TILTON	TILTON	0.3106	Confirmed LTF	0.3106
MADISON	MADISON	0.0302	Confirmed LTF	0.0302
GIBSON	GIBSON	0.2779	Confirmed LTF	0.2779
BLUEG	BLUEG	0.9027	Confirmed LTF	0.9027
TRIMBLE	TRIMBLE	0.2894	Confirmed LTF	0.2894
CATAWBA	CATAWBA	0.2138	Confirmed LTF	0.2138

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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
99596065	200912	26CONEMAGH	PENELEC	200005	CONEM-GH	PJM	3	PN-P2_3-PN-230-0252-A	breaker	1066.0	125.25	127.18	DC	21.32

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200503	26C.SLOPE (Deactivation : 07/06/2019)	31.2262	50/50	31.2262
200794	26CONEMAGH	0.6545	50/50	0.6545
200805	26COLVER13 (Deactivation : 01/09/2020)	23.2600	Adder	27.36
200809	26SITHE	2.0167	50/50	2.0167
200833	26SEWRDB34	37.4753	50/50	37.4753
200834	26SW_E13_K22	0.0875	50/50	0.0875
200837	26HOMER C1	34.7328	50/50	34.7328
200838	26HOMER C2	29.3172	50/50	29.3172
200839	26HOMER C3	31.0362	50/50	31.0362
200846	26FORWARD	0.3117	50/50	0.3117
200864	K-013 E	7.2275	50/50	7.2275
200883	Q-053 E	14.0093	50/50	14.0093
200886	26ARWF_N39	0.8478	50/50	0.8478
200888	26HIGHLAND	0.7206	50/50	0.7206
200889	26STNY CRK	0.5285	50/50	0.5285
200894	26K02	5.7263	Adder	6.74
200898	26AA1-106	2.1159	Adder	2.49
200915	26CHSTN_FL	0.3826	50/50	0.3826
200925	26R32	0.8314	50/50	0.8314
200945	26CT_V3-030	0.2531	50/50	0.2531
201477	26Y2-055	3.4623	Adder	4.07
202225	26SCI_S29B	0.1361	50/50	0.1361
203034	26NA_O38_P22	0.7418	50/50	0.7418
203910	26Z1-091	1.8412	Adder	2.17
203999	P-047 E	9.8717	Adder	11.61
235003	AC1-025 E	0.1587	Adder	0.19
236828	01GRAYMONT	0.4288	Adder	0.5
290086	Q-036 E	7.8836	Adder	9.27
292350	K-023	6.6881	Adder	7.87
292542	L-013 1	6.5052	Adder	7.65
293301	N-039 E	19.6595	50/50	19.6595
293393	V3-030E	7.7347	50/50	7.7347
293432	R-040 E	0.3659	Adder	0.43
293603	O-018 E	16.7097	50/50	16.7097
293902	O-048 E	5.8546	Adder	6.89
294515	O38_P22	17.2021	50/50	17.2021
294903	P-060 E	12.2552	50/50	12.2552
296332	R-032 E	19.2804	50/50	19.2804

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
913142	Y1-033 E OP1	5.3852	Adder	6.34
916202	Z1-069 E	8.0004	Adder	9.41
917672	Z2-108 E	3.6591	Adder	4.3
919201	AA1-144 OP	15.1504	Adder	17.82
919491	AA2-000	51.6967	Adder	60.82
920341	AA2-132 (Suspended)	2.0572	Adder	2.42
922932	AB1-082 OP (Suspended)	2.9413	Adder	3.46
923443	AB1-160 E	2.2858	Adder	2.69
930511	AB1-092	1.8982	Adder	2.23
935191	AD1-154	3.2936	Adder	3.87
936421	AD2-055	3.9080	Adder	4.6
936991	AD2-133 C	3.5476	Adder	4.17
936992	AD2-133 E	16.2264	Adder	19.09
938351	AE1-053	2.0329	Adder	2.39
938881	AE1-116	1.2677	50/50	1.2677
938951	AE1-123	2.3069	Adder	2.71
938991	AE1-128 C	21.9226	50/50	21.9226
938992	AE1-128 E	14.6150	50/50	14.6150
939171	AE1-147 C	1.2893	Adder	1.52
939172	AE1-147 E	0.8595	Adder	1.01
939291	AE1-160 C	1.4262	Adder	1.68
939292	AE1-160 E	0.8198	Adder	0.96
940201	AE2-001 C	1.2877	Adder	1.51
940202	AE2-001 E	0.8585	Adder	1.01
940681	AE2-055 C (Suspended)	1.2646	Adder	1.49
940682	AE2-055 E (Suspended)	0.8431	Adder	0.99
940861	AE2-074 C	2.2334	Adder	2.63
940862	AE2-074 E	2.9399	Adder	3.46
941191	AE2-113 C	9.0111	Adder	10.6
941192	AE2-113 E	9.7021	Adder	11.41
941231	AE2-117 C	1.9331	Adder	2.27
941232	AE2-117 E	1.2887	Adder	1.52
941241	AE2-118 C	1.9331	Adder	2.27
941242	AE2-118 E	1.2887	Adder	1.52
941261	AE2-120 C	1.2869	Adder	1.51
941262	AE2-120 E	0.8580	Adder	1.01
941271	AE2-121 C	0.6868	Adder	0.81
941272	AE2-121 E	0.4586	Adder	0.54
941321	AE2-126 C	1.6708	Adder	1.97
941322	AE2-126 E	1.1138	Adder	1.31
941331	AE2-129 C	2.0887	Adder	2.46
941332	AE2-129 E	1.3924	Adder	1.64
941351	AE2-131 C	2.0887	Adder	2.46
941352	AE2-131 E	1.3924	Adder	1.64
941421	AE2-139 C	5.7887	Adder	6.81
941422	AE2-139 E	3.8592	Adder	4.54
942121	AE2-224 C	21.1128	50/50	21.1128
942122	AE2-224 E	14.0752	50/50	14.0752
942351	AE2-248 C	1.0194	Adder	1.2
942352	AE2-248 E	0.6796	Adder	0.8
942491	AE2-262 C	5.6912	Adder	6.7
942492	AE2-262 E	3.8245	Adder	4.5

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942501	AE2-263 C	5.3497	Adder	6.29
942502	AE2-263 E	3.5718	Adder	4.2
942511	AE2-264 C	9.4052	Adder	11.06
942512	AE2-264 E	6.2701	Adder	7.38
942811	AE2-299 C	3.0513	Adder	3.59
942812	AE2-299 E	12.2052	Adder	14.36
942961	AE2-316 C	5.0155	Adder	5.9
942962	AE2-316 E	7.1522	Adder	8.41
943151	AE2-344 C	6.5475	Adder	7.7
943152	AE2-344 E	4.3650	Adder	5.14
943711	AF1-039 C O1	1.4247	Adder	1.68
943712	AF1-039 E O1	0.9498	Adder	1.12
943751	AF1-043	11.7239	Adder	13.79
944001	AF1-068 C O1	1.3561	Adder	1.6
944002	AF1-068 E O1	0.7628	Adder	0.9
944181	AF1-086 C O1	4.0187	Adder	4.73
944182	AF1-086 E O1	17.4836	Adder	20.57
944261	AF1-094 C	1.1977	Adder	1.41
944262	AF1-094 E	0.7985	Adder	0.94
944281	AF1-096 C	1.3476	Adder	1.59
944282	AF1-096 E	0.8984	Adder	1.06
944301	AF1-098 C	4.7042	Adder	5.53
944302	AF1-098 E	3.1362	Adder	3.69
944311	AF1-099 C	8.6392	Adder	10.16
944312	AF1-099 E	5.7595	Adder	6.78
944321	AF1-100 C	18.3065	Adder	21.54
944322	AF1-100 E	12.2043	Adder	14.36
944381	AF1-103 O1	2.3868	Adder	2.81
944411	AF1-106 O1	2.2629	Adder	2.66
944471	AF1-112 C	1.3618	Adder	1.6
944472	AF1-112 E	0.7660	Adder	0.9
944671	AF1-132 C O1	1.2697	Adder	1.49
944672	AF1-132 E O1	0.8465	Adder	1.0
944691	AF1-134 C O1	2.0909	Adder	2.46
944692	AF1-134 E O1	1.3939	Adder	1.64
944751	AF1-140 C	3.0046	50/50	3.0046
944752	AF1-140 E	2.0031	50/50	2.0031
944771	AF1-142 C	13.8227	Adder	16.26
944772	AF1-142 E	9.2152	Adder	10.84
944781	AF1-143 C	12.1972	Adder	14.35
944782	AF1-143 E	6.5052	Adder	7.65
944841	AF1-149 C	1.2868	Adder	1.51
944842	AF1-149 E	0.8579	Adder	1.01
944881	AF1-153 C O1	1.4700	Adder	1.73
944882	AF1-153 E O1	0.9800	Adder	1.15
944901	AF1-155 C	1.4695	Adder	1.73
944902	AF1-155 E	0.9797	Adder	1.15
945021	AF1-167 C	0.9039	Adder	1.06
945022	AF1-167 E	0.6037	Adder	0.71
945121	AF1-177	0.5967	Adder	0.7
945161	AF1-181	0.0985	Adder	0.12
945171	AF1-182	0.4925	Adder	0.58

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945181	AF1-183	0.1340	Adder	0.16
945331	AF1-198	0.3071	Adder	0.36
945451	AF1-210 C	0.9958	Adder	1.17
945452	AF1-210 E	0.6639	Adder	0.78
945491	AF1-214 C	1.2869	Adder	1.51
945492	AF1-214 E	0.8580	Adder	1.01
945551	AF1-220 C	12.2600	Adder	14.42
945552	AF1-220 E	8.1778	Adder	9.62
945671	AF1-232 C O2	29.9790	50/50	29.9790
945672	AF1-232 E O2	16.1426	50/50	16.1426
945751	AF1-240 C O1	1.9761	Adder	2.32
945752	AF1-240 E O1	1.3174	Adder	1.55
946071	AF1-272 C O1	12.9445	Adder	15.23
946072	AF1-272 E O1	8.6297	Adder	10.15
946081	AF1-273 C O1	14.7579	50/50	14.7579
946082	AF1-273 E O1	9.8386	50/50	9.8386
946111	AF1-276 C	10.1126	Adder	11.9
946112	AF1-276 E	4.9808	Adder	5.86
946121	AF1-277 C	10.1126	Adder	11.9
946122	AF1-277 E	4.9808	Adder	5.86
946131	AF1-278 C	8.0599	Adder	9.48
946132	AF1-278 E	4.0088	Adder	4.72
946211	AF1-286 C O1	0.9165	Adder	1.08
946212	AF1-286 E O1	0.6223	Adder	0.73
946221	AF1-287 C	1.1296	Adder	1.33
946222	AF1-287 E	0.7531	Adder	0.89
946381	AF1-302 C	2.1902	Adder	2.58
946382	AF1-302 E	2.9203	Adder	3.44
946401	AF1-304 C	6.8962	Adder	8.11
946402	AF1-304 E	4.5975	Adder	5.41
946421	AF1-306 C	6.1273	Adder	7.21
946422	AF1-306 E	24.5094	Adder	28.83
946431	AF1-307 C	13.6494	50/50	13.6494
946432	AF1-307 E	9.0996	50/50	9.0996
946571	AF1-321 C O1	3.7594	50/50	3.7594
946572	AF1-321 E O1	2.5062	50/50	2.5062
946771	AF1-217 C O2	1.1296	Adder	1.33
946772	AF1-217 E O2	0.7531	Adder	0.89
957001	AF2-001 C O1	3.7594	50/50	3.7594
957002	AF2-001 E O1	2.5062	50/50	2.5062
957011	AF2-002 C O1	1.8797	50/50	1.8797
957012	AF2-002 E O1	1.2531	50/50	1.2531
957161	AF2-010 C	2.4478	Adder	5.43
957162	AF2-010 E	1.6496	Adder	3.66
957451	AF2-039 C	0.6259	Adder	1.39
957452	AF2-039 E	0.4173	Adder	0.93
957512	AF2-045 E	5.8171	50/50	5.8171
957561	AF2-050 C	10.5564	50/50	10.5564
957562	AF2-050 E	7.0376	50/50	7.0376
957571	AF2-051 C O1	1.8332	Adder	4.07
957572	AF2-051 E O1	0.9444	Adder	2.1
957581	AF2-052 C	2.9522	Adder	6.55

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957582	AF2-052 E	1.4362	Adder	3.19
957681	AF2-062 C	9.8097	Adder	21.78
957682	AF2-062 E	6.5398	Adder	14.52
957931	AF2-087 C	0.8194	50/50	0.8194
957932	AF2-087 E	1.1283	50/50	1.1283
957941	AF2-088 C	0.3014	Adder	0.67
957942	AF2-088 E	0.2009	Adder	0.45
957951	AF2-089 C	0.1964	Adder	0.44
957952	AF2-089 E	0.1012	Adder	0.22
957981	AF2-092 C	2.1966	50/50	2.1966
957982	AF2-092 E	1.4644	50/50	1.4644
958101	AF2-104 C	0.6761	50/50	0.6761
958102	AF2-104 E	0.4507	50/50	0.4507
958271	AF2-121 C	1.1070	Adder	2.46
958272	AF2-121 E	0.7380	Adder	1.64
958361	AF2-130 C	0.7857	Adder	1.74
958362	AF2-130 E	0.5238	Adder	1.16
958411	AF2-135 C	0.3232	Adder	0.72
958412	AF2-135 E	0.2155	Adder	0.48
958471	AF2-141	0.8619	Adder	1.91
958731	AF2-164 C O1	3.3089	Adder	7.34
958732	AF2-164 E O1	2.2059	Adder	4.9
958741	AF2-165 C	0.7534	Adder	1.67
958742	AF2-165 E	0.5023	Adder	1.11
958751	AF2-166 C	0.7857	Adder	1.74
958752	AF2-166 E	0.5238	Adder	1.16
959061	AF2-197 C O1	2.0415	Adder	4.53
959062	AF2-197 E O1	3.0622	Adder	6.8
959301	AF2-221 C	2.0266	50/50	2.0266
959302	AF2-221 E	2.7987	50/50	2.7987
959401	AF2-231 C	0.2561	Adder	0.57
959402	AF2-231 E	0.1708	Adder	0.38
959441	AF2-235 C	0.3571	Adder	0.79
959442	AF2-235 E	0.2381	Adder	0.53
959461	AF2-237 C	0.3174	Adder	0.7
959462	AF2-237 E	0.2116	Adder	0.47
959471	AF2-238 C	0.7426	Adder	1.65
959472	AF2-238 E	0.4950	Adder	1.1
959481	AF2-239 C	0.5535	Adder	1.23
959482	AF2-239 E	0.4438	Adder	0.99
959491	AF2-240 C	0.6476	Adder	1.44
959492	AF2-240 E	0.5517	Adder	1.22
959501	AF2-241 C	0.6776	Adder	1.5
959502	AF2-241 E	0.5217	Adder	1.16
959521	AF2-243 C	0.5651	Adder	1.25
959522	AF2-243 E	0.3767	Adder	0.84
959741	AF2-265 C	0.5322	Adder	1.18
959742	AF2-265 E	0.3960	Adder	0.88
959792	AF2-270 E	1.1330	50/50	1.1330
959802	AF2-271 E	0.3327	Adder	0.74
959822	AF2-273 E	0.2111	Adder	0.47
960022	AF2-293 E	0.0664	Adder	0.15

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960031	AF2-294 C	0.6575	Adder	1.46
960032	AF2-294 E	0.4383	Adder	0.97
960041	AF2-295 C	0.7788	Adder	1.73
960042	AF2-295 E	0.5192	Adder	1.15
960051	AF2-296 C	1.1082	Adder	2.46
960052	AF2-296 E	0.7388	Adder	1.64
960211	AF2-312 C	2.9816	50/50	2.9816
960212	AF2-312 E	1.9877	50/50	1.9877
960271	AF2-318 C	0.5983	Adder	1.33
960272	AF2-318 E	0.3989	Adder	0.89
960321	AF2-323 C O1	1.4727	Adder	3.27
960322	AF2-323 E O1	0.9818	Adder	2.18
960391	AF2-330 C	14.8326	50/50	14.8326
960392	AF2-330 E	6.4873	50/50	6.4873
960451	AF2-336 C O1	3.6611	50/50	3.6611
960452	AF2-336 E O1	2.4407	50/50	2.4407
960461	AF2-337 C O1	3.6611	50/50	3.6611
960462	AF2-337 E O1	2.4407	50/50	2.4407
960471	AF2-338 C O1	3.6611	50/50	3.6611
960472	AF2-338 E O1	2.4407	50/50	2.4407
960481	AF2-339 C O1	3.6611	50/50	3.6611
960482	AF2-339 E O1	2.4407	50/50	2.4407
960901	AF2-381 C	25.3292	50/50	25.3292
960902	AF2-381 E	13.3295	50/50	13.3295
961141	AF2-405	0.5997	Adder	1.33
961151	AF2-406	4.4975	Adder	9.98
961201	AF2-411 O1	22.9633	Adder	50.97
961211	AF2-412 O1	9.1953	Adder	20.41
WEC	WEC	0.0652	Confirmed LTF	0.0652
LGEE	LGEE	0.0764	Confirmed LTF	0.0764
CALDERWOOD	CALDERWOOD	0.0452	Confirmed LTF	0.0452
CBM-W2	CBM-W2	0.5569	Confirmed LTF	0.5569
CBM-W1	CBM-W1	3.8281	Confirmed LTF	3.8281
O-066	O-066	8.3866	Confirmed LTF	8.3866
CHEOAH	CHEOAH	0.0485	Confirmed LTF	0.0485
CBM-S1	CBM-S1	0.0596	Confirmed LTF	0.0596
G-007	G-007	1.3936	Confirmed LTF	1.3936
MEC	MEC	0.2447	Confirmed LTF	0.2447
CATAWBA	CATAWBA	0.0952	Confirmed LTF	0.0952

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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
101333919	202650	26HIGHPOINT	PENELEC	200747	26PENN-MAR	PENELEC	1	PN-P7-1-PN-230-001	tower	174.0	148.74	150.39	DC	6.37

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
AA1-082	E. Towanda 230kV	In Service
AA1-106	Grover II 34.5kV	Withdrawn
AA1-144	East Towanda-Grover 230kV	Engineering and Procurement
AA2-000	N/A	N/A
AA2-132	Thompson 34.5kV	Suspended
AB1-082	Potter 46kV	Suspended
AB1-092	Moshannon-East Towanda 230kV	Active
AB1-160	Gold-Sabinsville 115kV	In Service
AC1-025	Dale Summit	In Service
AD1-154	Timblin 34.5 kV	Active
AD2-055	Moshannon-East Towanda 230 kV	Active
AD2-133	Eagle Valley 115kV	Active
AE1-053	Meyersdale North	Active
AE1-071	Shade Gap-Roxbury 115 kV	Active
AE1-116	Somerset Windpower 23 kV	Active
AE1-123	Emlenton 34.5 kV	Engineering and Procurement
AE1-128	Bedford North-Wills Mounain 115 kV	Active
AE1-147	Bellefonte 46 kV	Engineering and Procurement
AE1-160	Venango 34.5 kV	Engineering and Procurement
AE2-001	Nittany-Zion 46 kV	Active
AE2-055	Shingletown-Boalsburg 46 kV	Suspended
AE2-074	Potter 46 kV	Active
AE2-113	Farmers Valley-Ridgeway 115 kV	Active
AE2-117	ABW Tap-Alexandria 46 kV	Active
AE2-118	ABW Tap-Williamsburg 46 kV	Active
AE2-120	Graymont-Zion 46 kV	Active
AE2-121	Milesburg-Tanney Junction 46 kV	Active
AE2-126	Dubois-Curwensville 34.5 kV	Active
AE2-129	Philipsburg-Clarence 34.5 kV	Active
AE2-131	Philipsburg-Karthus 34.5	Active
AE2-139	East Towanda-Grover 230 kV	Active
AE2-224	Bearrock-Johnstown 230 kV	Active
AE2-248	Fillmore-Thompson Farm 46 kV	Active
AE2-262	Moshannon-Milesburg 230 kV	Active
AE2-263	Moshannon-Milesburg 230 kV	Active
AE2-264	Altoona-Raystown 230 kV	Active
AE2-299	Erie East 230 kV	Active
AE2-316	Brookville-Squab Hollow 138 kV	Active
AE2-344	Edinboro South-Venango Junction 115 kV	Active

Queue Number	Project Name	Status
AF1-006	Fairview East 34.5 kV	Active
AF1-039	Listonburg-Highpoint 24.9 kV	Active
AF1-043	Moshannon-East Towanda 230 kV	Active
AF1-068	Boalsburg-Centre Hall 46 kV	Active
AF1-086	Madera-Westover South 115 kV	Active
AF1-094	Union City-Cambridge Springs 34.5 kV	Active
AF1-096	Titusville-Oil Creek 34.5 kV	Active
AF1-098	Four Mile Jct-Corry East 115 kV	Active
AF1-099	Moshannon-Milesburg 230 kV	Active
AF1-100	Shawville-Moshannon 230 kV	Active
AF1-103	Warren 34.5 kV	Active
AF1-104	Erie West 34.5 kV	Active
AF1-106	East Sayre 34.5 kV	Active
AF1-112	Centre Hall-Boalsburg 46 kV	Active
AF1-132	Shingletown-Boalsburg 46 kV	Active
AF1-134	Philipsburg-Madera 34.5 kV	Active
AF1-140	Claysburg 23 kV	Engineering and Procurement
AF1-142	Moshannon-Milesburg 230 kV	Active
AF1-143	Lick Run 115 kV	Active
AF1-149	Graymont-Zion 46 kV	Active
AF1-153	Motion-Ridgeway 46 kV	Active
AF1-155	Paper City-Wilcox 46 kV	Engineering and Procurement
AF1-167	West Freedom-C&K Coal 25 kV	Active
AF1-170	Springboro-Venango Junction 115 kV	Active
AF1-177	Warren 115 kV	Partially in Service - Under Construction
AF1-181	Shawville 3 230 kV	Partially in Service - Under Construction
AF1-182	Shawville 4 230 kV	Partially in Service - Under Construction
AF1-183	Shawville 1 230 kV	Partially in Service - Under Construction
AF1-198	Blossburg #1 CT 34.5 kV	Partially in Service - Under Construction
AF1-210	Burma 23 kV	Engineering and Procurement
AF1-214	Nittany-Zion 46 kV	Active
AF1-217	Edinboro -Cambridge Springs 34.5 kV	Active
AF1-220	Ridgway-Whetstone 115 kV	Active
AF1-232	Allegheny-Somerset 115 kV	Active
AF1-240	Timblin 34.5 kV	Active
AF1-272	Lucerne 115 kV	Active
AF1-273	Allegheny 115 kV	Active
AF1-276	Lewis Run-Pierce Brook 230 kV	Active
AF1-277	Lewis Run-Pierce Brook 2 230 kV	Active
AF1-278	Lewis Run-Pierce Brook 3 230 kV	Active
AF1-286	East Sayre 34.5 kV II	Active
AF1-287	Edinboro South 34.5 kV II	Active
AF1-302	Brookville-Squab Hollow 138 kV	Active
AF1-304	Titusville-Grandview 115 kV	Active
AF1-306	Squab Hollow 230 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
AF2-010	Union City-Titusville 115 kV	Active
AF2-039	Shawville-Clearfield 34.5 kV	Active
AF2-045	Cambria Nug 115 kV	Active

Queue Number	Project Name	Status
AF2-050	Bearrock-Johnstown 230 kV	Active
AF2-051	Geneva 115 kV	Active
AF2-052	Farmers Valley-Ridgeway 115 kV	Active
AF2-062	Lewis Run-Pierce Brook 230 kV	Active
AF2-087	East Altoona-Pinecroft 12.47 kV	Active
AF2-088	Shawville-Clearfield 34.5 kV II	Active
AF2-089	Titusville 34.5 kV	Active
AF2-092	Snake Spring-Bedford Area 23 kV	Active
AF2-097	Fairview East 34.5 kV II	Active
AF2-104	Somerset 23 kV	Active
AF2-121	Philipsburg-Shawville 34.5 kV	Active
AF2-130	Wolfs Corners 34.5 kV	Active
AF2-135	Rockwood-Confluence 23 kV	Active
AF2-141	Lick Run 115 kV	Active
AF2-146	Hill Valley-Valley REC 46 kV	Active
AF2-147	McVeytown-Strodes Mill 46 kV	Active
AF2-148	Shade Gap-Three Springs KTS 23 kV	Active
AF2-164	Handsome Lake 345 kV	Active
AF2-165	Clark Summit-Emlenton 34.5 kV	Active
AF2-166	Clark Summit-Emlenton 34 kV	Active
AF2-170	Erie West-Springboro 34.5 kV	Active
AF2-197	East Towanda 115 kV	Active
AF2-221	Scalp Level 22.9 kV	Active
AF2-231	Belleville 12.47 kV	Active
AF2-235	Titusville-Oil Creek 34.5 kV	Active
AF2-237	Union City-Cambridge Springs 34.5 kV	Active
AF2-238	Mansfield-South Troy 34.5 kV	Active
AF2-239	Wyalusing-Hollenback WRC 34.5 kV	Active
AF2-240	North Orwell 12.47 kV	Active
AF2-241	Athens-Milan 34.5 kV	Active
AF2-243	Clark Summit 34.5 kV	Active
AF2-265	South Troy-Athens 34.5 kV	Active
AF2-270	Bedford South RCB-Bedford Area 23 kV	Active
AF2-271	Pemberton-Sinking Valley 12.47 kV	Active
AF2-273	Sligo 25 kV	Active
AF2-293	Beech Creek 46 kV	Active
AF2-294	Thompson 34.5 kV	Active
AF2-295	Wilcox-Paper City 46 kV	Active
AF2-296	Madera 34.5 kV	Active
AF2-312	Carrolltown-Patton 46 kV	Active
AF2-318	East Towanda-New Albany 34.5 kV	Active
AF2-323	Geneva-Franklin Tap 115 kV	Active
AF2-330	Claysburg-Summit 115 kV	Active
AF2-336	Snake Spring 115 kV	Active
AF2-337	Snake Spring 115 kV	Active
AF2-338	Snake Spring-Saxton 115 kV	Active
AF2-339	Snake Spring-Saxton 115 kV	Active
AF2-381	Bedford North-Central City West 115 kV	Active
AF2-405	East Sayre 34.5 kV III	Active
AF2-406	Sayre 115 kV	Active
AF2-411	Mainesburg 345 kV	Active
AF2-412	Mainesburg 115 kV	Active

Queue Number	Project Name	Status
AF2-436	Wyalusing 34.5 kV II	Active
V3-030	St. Benedict-Patton 46kV	In Service
Y1-033	Penn Mar-Rock Wood 115kV	In Service
Y2-055	Elm Street 34.5kV	Withdrawn
Y3-092	Erie West 345kV	Engineering and Procurement
Z1-038	Florey Knob 34.5kV	Withdrawn
Z1-069	Gold-Sabinsville 115kV	In Service
Z1-091	Lenox 34kV	Withdrawn
Z2-108	Meyersdale North 115kV	In Service

11.8 Contingency Descriptions

Contingency Name	Contingency Definition
PN-P2_3-PN-230-0252-B	CONTINGENCY 'PN-P2_3-PN-230-0252-B' /* SHELOCTA 230 KV STUCK BREAKER (KEYSTONE/HOMER CITY) OPEN BRANCH FROM BUS 200795 TO BUS 200810 CKT 1 /* 26SHELOCTA 230.00 26KEYSTONE 230.00 OPEN BRANCH FROM BUS 200795 TO BUS 200767 CKT 1 /* 26SHELOCTA 230.00 26HOMER CT 230.00 END
PN-P2_3-PN-230-0252-C	CONTINGENCY 'PN-P2_3-PN-230-0252-C' /* SHELOCTA 230 KV STUCK BREAKER (HOMER CITY/XFMR) OPEN BRANCH FROM BUS 200795 TO BUS 200767 CKT 1 /* 26SHELOCTA 230.00 26HOMER CT 230.00 OPEN BRANCH FROM BUS 200795 TO BUS 200739 CKT 2 /* 26SHELOCTA 230.00 26SHELOCTA 115.00 END
PN-P2_3-PN-230-0252-A	CONTINGENCY 'PN-P2_3-PN-230-0252-A' /* SHELOCTA 230 KV STUCK BREAKER (KEYSTONE/XFMR) OPEN BRANCH FROM BUS 200795 TO BUS 200810 CKT 1 /* 26SHELOCTA 230.00 26KEYSTONE 230.00 OPEN BRANCH FROM BUS 200795 TO BUS 200739 CKT 2 /* 26SHELOCTA 230.00 26SHELOCTA 115.00 END
PN-P2-3-PN-115-55A	CONTINGENCY 'PN-P2-3-PN-115-55A' /* 683 DISCONNECT BRANCH FROM BUS 200520 TO BUS 938380 CKT 1 /* 26ROXBURY 115 AE1-071 TAP 115 DISCONNECT BRANCH FROM BUS 200860 TO BUS 200520 CKT 3 /* 26ROXB SB2 23 26ROXBURY 115 DISCONNECT BRANCH FROM BUS 961480 TO BUS 200520 CKT 1 /* AF2-439 TAP 115 26ROXBURY 115 DISCONNECT BRANCH FROM BUS 200532 TO BUS 200520 CKT 2 /* 26ROXBURY 138 26ROXBURY 115 DISCONNECT BRANCH FROM BUS 200520 TO BUS 200554 CKT 1 /* 26ROXBURY 115 26ROXB SB1 23 END

Contingency Name	Contingency Definition
ATSI-P2-3-CEI-345-004D	CONTINGENCY 'ATSI-P2-3-CEI-345-004D' /* ERIE WEST 345KV BKR 8 DISCONNECT BRANCH FROM BUS 200599 TO BUS 200600 CKT 1 /* 26ERIE W 345 26ERIE SO 345 DISCONNECT BRANCH FROM BUS 200599 TO BUS 238547 CKT 1 /* 26ERIE W 345 02AT 345 DISCONNECT BRANCH FROM BUS 238547 TO BUS 239036 CKT 1 /* 02AT 345 02PERRY 345 DISCONNECT BRANCH FROM BUS 238547 TO BUS 239082 CKT 1 /* 02AT 345 02S8-ATT 345 DISCONNECT BUS 200600 /* 26ERIE SO 345 DISCONNECT BUS 238547 /* 02AT 345 END
PN-P1-2-PN-115-094-A	CONTINGENCY 'PN-P1-2-PN-115-094-A' /* ROXBURY - SHADE GAP 115KV DISCONNECT BRANCH FROM BUS 200520 TO BUS 938380 CKT 1 /* 26ROXBURY 115 AE1-071 TAP 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
PN-P1-2-PN-345-107T	CONTINGENCY 'PN-P1-2-PN-345-107T' /* ERIE WEST - ASHTABULA - PERRY 345KV DISCONNECT BRANCH FROM BUS 200599 TO BUS 238547 CKT 1 /* 26ERIE W 345 02AT 345 DISCONNECT BRANCH FROM BUS 238547 TO BUS 239082 CKT 1 /* 02AT 345 02S8-ATT 345 DISCONNECT BRANCH FROM BUS 238547 TO BUS 239036 CKT 1 /* 02AT 345 02PERRY 345 DISCONNECT BUS 238547 /* 02AT 345 END
PN-P1-3-PN-115-029	CONTINGENCY 'PN-P1-3-PN-115-029' /* HOOVERSVILLE #2 XFMR FAULT DISCONNECT BRANCH FROM BUS 200743 TO BUS 200789 CKT 2 /* 26HOOVERSV 115 26HOOVER#2 23 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200742 CKT 1 /* 26HOOVERSV 115 26TOWER 51 115 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200744 CKT 1 /* 26HOOVERSV 115 26SOMERST 115 END
PN-P1-3-PN-500-001AT	CONTINGENCY 'PN-P1-3-PN-500-001AT' /* KEYSTONE #3 500/230 KV XFMR OPEN BRANCH FROM BUS 200011 TO BUS 200810 CKT 3 /* KEYSTONE 500.00 26KEYSTONE 230.00 END

Contingency Name	Contingency Definition
Base Case	
PN-P1-2-PN-230-025	CONTINGENCY 'PN-P1-2-PN-230-025' /* CONEMAUGH - SEWARD 230KV DISCONNECT BRANCH FROM BUS 200912 TO BUS 200793 CKT 1 /* 26CONEMAGH 230 26SEWARD 2 230 END
PJM500_PN_P4-500-001A	CONTINGENCY 'PJM500_PN_P4-500-001A' /* KEYSTONE 500KV BKR 1 DISCONNECT BRANCH FROM BUS 200011 TO BUS 200810 CKT 3 /* KEYSTONE 500 26KEYSTONE 230 REMOVE MACHINE H FROM BUS 200033 /* KEYS G2 20 REMOVE MACHINE L FROM BUS 200033 /* KEYS G2 20 DISCONNECT BUS 200033 /* KEYS G2 20 END
PJM500_PN_P4-500-001D	CONTINGENCY 'PJM500_PN_P4-500-001D' /* KEYSTONE 500KV BKR 4 DISCONNECT BRANCH FROM BUS 200011 TO BUS 200810 CKT 3 /* KEYSTONE 500 26KEYSTONE 230 REMOVE MACHINE H FROM BUS 200032 /* KEYS G1 20 REMOVE MACHINE L FROM BUS 200032 /* KEYS G1 20 DISCONNECT BUS 200032 /* KEYS G1 20 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
ATSI-P1-2-CEI-345-700T	CONTINGENCY 'ATSI-P1-2-CEI-345-700T' /* PN/ATSI ERIE WEST - ASHTABULA - PERRY 345KV DISCONNECT BRANCH FROM BUS 239036 TO BUS 238547 CKT 1 /* 02PERRY 345 02AT 345 DISCONNECT BRANCH FROM BUS 238547 TO BUS 239082 CKT 1 /* 02AT 345 02S8-ATT 345 DISCONNECT BRANCH FROM BUS 239082 TO BUS 238544 CKT 8 /* 02S8-ATT 345 02ASH_3 138 DISCONNECT BRANCH FROM BUS 238547 TO BUS 200599 CKT 1 /* 02AT 345 26ERIE W 345 END

Contingency Name	Contingency Definition
PN-P1-2-PN-115-082	CONTINGENCY 'PN-P1-2-PN-115-082' /* HILLTOP - KRAYN - RACHEL HILL 115KV DISCONNECT BRANCH FROM BUS 200878 TO BUS 200790 CKT 1 /* 26KRAYN 115 26SALIX 115 DISCONNECT BRANCH FROM BUS 200790 TO BUS 200751 CKT 1 /* 26SALIX 115 26HILLCLAY 115 DISCONNECT BRANCH FROM BUS 200751 TO BUS 200752 CKT 1 /* 26HILLCLAY 115 26HILLTOP 115 DISCONNECT BRANCH FROM BUS 200751 TO BUS 200749 CKT 1 /* 26HILLCLAY 115 26RACHEL H 115 DISCONNECT BRANCH FROM BUS 200790 TO BUS 200785 CKT 1 /* 26SALIX 115 26SALIX 23 DISCONNECT BRANCH FROM BUS 200749 TO BUS 200784 CKT 1 /* 26RACHEL H 115 26RACHEL#1 23 DISCONNECT BUS 200790 /* 26SALIX 115 DISCONNECT BUS 200751 /* 26HILLCLAY 115 END
PN-P2-3-PN-230-9G-A	CONTINGENCY 'PN-P2-3-PN-230-9G-A' /* 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 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200796 CKT 3 /* 26HOOVERSV 115 26HOOVRSVL 230 DISCONNECT BRANCH FROM BUS 200767 TO BUS 200795 CKT 1 /* 26HOMER CT 230 26SHELOCTA 230 END
PJM_P1_APS_B_G692	CONTINGENCY 'PJM_P1_APS_B_G692' / 200011 KEYSTONE 500 235104 01CABOT 500 1 OPEN BRANCH FROM BUS 200011 TO BUS 235104 CKT 1 END
PN-P1_2-PN-230-0104	CONTINGENCY 'PN-P1_2-PN-230-0104' /* SHELOCTA - HOMER CITY 230 KV LINE OPEN BRANCH FROM BUS 200795 TO BUS 200767 CKT 1 /* 26SHELOCTA 230.00 26HOMER CT 230.00 END
PN-P1_2-PN-230-0103	CONTINGENCY 'PN-P1_2-PN-230-0103' /* SHELOCTA - KEYSTONE 230 KV LINE OPEN BRANCH FROM BUS 200795 TO BUS 200810 CKT 1 /* 26SHELOCTA 230.00 26KEYSTONE 230.00 END

Contingency Name	Contingency Definition
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-P1-3-PN-230-001T	CONTINGENCY 'PN-P1-3-PN-230-001T' /* CONEMAUGH #1 500/230KV XFMR DISCONNECT BRANCH FROM BUS 200005 TO BUS 200912 CKT 3 /* CONEM-GH 500 26CONEMAGH 230 END

12 Short Circuit Analysis

The Short Circuit Analysis will be completed during the System Impact Study phase.

13 Affected Systems

13.1 NYISO

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