



**Generation Interconnection
Feasibility Study Report
for
Queue Project AF2-323
GENEVA-FRANKLIN TAP 115 KV
26.4 MW Capacity / 44 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 Crawford County, Pennsylvania. The installed facilities will have a total capability of 44 MW with 26.4 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is April 01, 2022. This study does not imply a TO commitment to this in-service date.

Queue Number	AF2-323
Project Name	GENEVA-FRANKLIN TAP 115 KV
State	Pennsylvania
County	Crawford
Transmission Owner	PENELEC (MAIT)
MFO	44
MWE	44
MWC	26.4
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 Geneva - Wayne 115 kV line into the new station. The new substation will be located approximately 0.9 miles from Geneva 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 Geneva Substation and Wayne Substation.

Attachment 1 shows a one-line diagram of the proposed primary Direct Connection facilities for the AF2-323 generation project to connect to the FirstEnergy ("FE") Transmission System. The IC will be responsible for constructing the facilities on its side of the POI, including the Attachment Facilities which connect the generator to the FE Transmission System's Direct Connection facilities.

5 Cost Summary

The AF2-323 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$8,970,000
Total System Network Upgrade Costs	\$229,098,463 ¹
Total Costs	\$238,068,463

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 Geneva - Wayne 115 kV line into the new station. The new substation will be located approximately 0.9 miles from Geneva 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 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 Geneva - Wayne 115 kV line into the new substation.	\$790,000
Upgrade relaying at Geneva.	\$430,000
Install fiber from new interconnection station to Geneva for relaying.	\$1,860,000
Upgrade relaying at Wayne.	\$430,000
Total Physical Interconnection Costs	\$8,970,000

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.

If the customer is ultimately responsible for network upgrades, then the schedule for those upgrades will be refined in future study phases. The customer would need to wait for those upgrades to be completed prior to commercial operation unless determined deliverable by an interim deliverability study. The elapsed time to complete any network upgrades is provided in the System Reinforcements table of this report¹.

8 Transmission Owner Analysis

FE performed an analysis of its underlying transmission <100 kV system. The AF2-323 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.

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 AF2-323 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 AF2-323 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 - Primary POI

The Queue Project AF2-323 was evaluated as a 44.0 MW (Capacity 26.4 MW) injection tapping the Geneva to Franklin Tap 115 kV line in the PENELEC area. Project AF2-323 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-323 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
100749673	235282	01GARN	138.0	AP	235240	01COLMBGPN	138.0	AP	1	AP-P1-2-WP-138-087	single	151.0	99.34	100.51	DC	1.77

11.2 Multiple Facility Contingency

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

None

11.3 Contribution to Previously Identified Overloads

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
111707308	200572	26EDINB S.	115.0	PENELEC	200567	26ERIE SO.	115.0	PENELEC	1	ATSI-P2-3-CEI-345-004D	breaker	185.0	118.8	123.66	DC	8.98
99582115	200795	26SHELOCTA	230.0	PENELEC	200810	26KEYSTONE	230.0	PENELEC	1	ATSI-P2-3-CEI-345-004D	breaker	917.0	192.43	192.9	DC	9.39
100749464	235121	01ARMSTR	138.0	AP	235204	01KITTAN	138.0	AP	1	ATSI-P2-3-CEI-345-004D	breaker	228.0	126.77	127.49	DC	3.61
100749760	235139	01AL&D6T	138.0	AP	235138	01AL 4J	138.0	AP	1	PN-P1-2-PN-345-107T	single	151.0	127.62	128.87	DC	1.9
100749761	235139	01AL&D6T	138.0	AP	235138	01AL 4J	138.0	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	127.62	128.87	DC	1.9
100749640	235197	01KARNSC	138.0	AP	235152	01BUTLER	138.0	AP	1	PN-P1-2-PN-345-107T	single	179.0	186.95	188.44	DC	2.67
100749641	235197	01KARNSC	138.0	AP	235152	01BUTLER	138.0	AP	1	ATSI-P1-2-CEI-345-700T	single	179.0	186.95	188.44	DC	2.67

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 LOADIN G %	POST PROJECT LOADIN G %	AC DC	MW IMPACT
100749677	235203	01KISSNG	138.0	AP	235197	01KARNSC	138.0	AP	1	ATSI-P1-2-CEI-345-700T	single	268.0	144.31	145.37	DC	2.82
100749678	235203	01KISSNG	138.0	AP	235197	01KARNSC	138.0	AP	1	PN-P1-2-PN-345-107T	single	268.0	144.31	145.37	DC	2.82
100749766	235204	01KITTAN	138.0	AP	235139	01AL&D6T	138.0	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	123.54	124.8	DC	1.9
100749767	235204	01KITTAN	138.0	AP	235139	01AL&D6T	138.0	AP	1	PN-P1-2-PN-345-107T	single	151.0	123.54	124.8	DC	1.9
100749684	235240	01COLMBGN	138.0	AP	235202	01KISKIV	138.0	AP	1	PN-P1-2-PN-345-107T	single	151.0	165.41	166.9	DC	2.25
100749685	235240	01COLMBGN	138.0	AP	235202	01KISKIV	138.0	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	165.41	166.9	DC	2.25
100749669	235282	01GAR RN	138.0	AP	235240	01COLMBGN	138.0	AP	1	PN-P1-2-PN-345-107T	single	151.0	173.89	175.38	DC	2.25
100749670	235282	01GAR RN	138.0	AP	235240	01COLMBGN	138.0	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	173.89	175.38	DC	2.25
101322576	943150	AE2-344 TAP	115.0	PENELEC	200572	26EDINB S.	115.0	PENELEC	1	ATSI-P2-3-CEI-345-004D	breaker	179.0	125.31	129.99	DC	8.38

11.4 Potential Congestion due to Local Energy Deliverability

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which shall study all overload conditions associated with the overloaded element(s) identified.

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	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
111940532	200575	26MRGANST	115.0	PENELE C	200573	26VENGO JT	115.0	PENELE C	1	PN-P1-2-PN-345-001	operatio n	149.0	111.7	122.32	DC	15.84
108625688	200583	26PINEY	115.0	PENELE C	235151	01BURMA	115.0	AP	1	PN-P1-2-PN-345-107T	operatio n	277.0	99.59	101.62	DC	5.62
108625689	200583	26PINEY	115.0	PENELE C	235151	01BURMA	115.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	277.0	99.59	101.62	DC	5.62
111940628	200590	26GENEVA	115.0	PENELE C	200822	26PPGAPI	115.0	PENELE C	1	PN-P1-2-PN-345-001	operatio n	239.0	101.87	108.77	DC	16.5
98875768	200599	26ERIE W	345.0	PENELE C	238547	02AT	345.0	ATSI	1	Base Case	operatio n	1560.0	130.07	131.34	DC	19.92
98875769	200599	26ERIE W	345.0	PENELE C	238547	02AT	345.0	ATSI	1	ATSI-P1-1-CEI-345-711	operatio n	1900.0	118.31	119.36	DC	19.92
99582556	200795	26SHELOCT A	230.0	PENELE C	200810	26KEYSTON E	230.0	PENELE C	1	PN-P1-2-PN-345-107T	operatio n	917.0	191.5	191.96	DC	9.23
99582557	200795	26SHELOCT A	230.0	PENELE C	200810	26KEYSTON E	230.0	PENELE C	1	ATSI-P1-2-CEI-345-700T	operatio n	917.0	191.5	191.96	DC	9.23
111940701	200822	26PPGAPI	115.0	PENELE C	200920	26FRANKLN A	115.0	PENELE C	1	PN-P1-2-PN-345-001	operatio n	245.0	96.6	103.33	DC	16.5
111940661	200920	26FRANKLN A	115.0	PENELE C	200575	26MRGANST	115.0	PENELE C	1	PN-P1-2-PN-345-001	operatio n	239.0	98.98	105.88	DC	16.5
100749778	235121	01ARMSTR	138.0	AP	235204	01KITTAN	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	228.0	123.69	124.38	DC	3.5
100749779	235121	01ARMSTR	138.0	AP	235204	01KITTAN	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	228.0	123.69	124.38	DC	3.5
100749758	235139	01AL&D6T	138.0	AP	235138	01AL 4J	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	151.0	140.76	141.71	DC	3.17
100749759	235139	01AL&D6T	138.0	AP	235138	01AL 4J	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	151.0	140.76	141.71	DC	3.17

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
100749638	235197	01KARNSC	138.0	AP	235152	01BUTLER	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	179.0	242.35	244.84	DC	4.45
100749639	235197	01KARNSC	138.0	AP	235152	01BUTLER	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	179.0	242.35	244.84	DC	4.45
100749675	235203	01KISSNG	138.0	AP	235197	01KARNSC	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	268.0	186.34	188.09	DC	4.69
100749676	235203	01KISSNG	138.0	AP	235197	01KARNSC	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	268.0	186.34	188.09	DC	4.69
100749764	235204	01KITTAN	138.0	AP	235139	01AL&D6T	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	151.0	136.67	137.62	DC	3.17
100749765	235204	01KITTAN	138.0	AP	235139	01AL&D6T	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	151.0	136.67	137.62	DC	3.17
100749682	235240	01COLMBGP N	138.0	AP	235202	01KISKIV	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	151.0	191.61	192.73	DC	3.75
100749683	235240	01COLMBGP N	138.0	AP	235202	01KISKIV	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	151.0	191.61	192.73	DC	3.75
100749667	235282	01GAR RN	138.0	AP	235240	01COLMBGP N	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	151.0	200.09	201.21	DC	3.75
100749668	235282	01GAR RN	138.0	AP	235240	01COLMBGP N	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	151.0	200.09	201.21	DC	3.75
98875862	238547	02AT	345.0	ATSI	239036	02PERRY	345.0	ATSI	1	ATSI-P1-3-SYS-345-722	operatio n	1891.0	102.63	103.65	DC	19.36
111940600	960320	AF2-323 TAP	115.0	PENELE C	200590	26GENEVA	115.0	PENELE C	1	PN-P1-2-PN-345-001	operatio n	245.0	104.74	111.47	DC	16.5

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
100749670,100749673,100749669	1	01GAR RN 138.0 kV - 01COLMBGPN 138.0 kV Ckt 1	<u>APS</u> WP-AF2-F-0017 (711) : Reconductor 10.4 miles of 4/0 CU from Columbia Big Pine - Garretts Run Jct 138 kV (99 spans) Project Type : FAC Cost : \$27,092,520 Time Estimate : 48.0 Months	\$27,092,520
100749464	4	01ARMSTR 138.0 kV - 01KITTAN 138.0 kV Ckt 1	<u>APS</u> WP-AF2-F-0001 (663) : Replace relaying (WT, RT) at Kittaning substation. Project Type : FAC Cost : \$455,884 Time Estimate : 12.0 Months	\$455,884
100749678,100749677	7	01KISSNG 138.0 kV - 01KARNSC 138.0 kV Ckt 1	<u>APS</u> WP-AF2-F-0003A (666) : Reconductor 7.5 miles of 556.5 ACSR from Karns City to Kissinger Jct (47 spans) Project Type : FAC Cost : \$19,537,875 Time Estimate : 42.0 Months WP-AF2-F-0003B (667) : Replace relaying (RT, WT, MT, ZR, OR) at Karns City substation. Project Type : FAC Cost : \$455,884 Time Estimate : 12.0 Months WP-AF2-F-0003C (668) : Replace 954 ACSR & 1024.5 ACAR bus conductor at Karns City substation. Project Type : FAC Cost : \$130,253 Time Estimate : 12.0 Months WP-AF2-F-0003D (669) : Replace 1200 A circuit breaker at Karns City substation. Project Type : FAC Cost : \$781,515 Time Estimate : 12.0 Months WP-AF2-F-0003E (670) : Replace 954 ACSR risers at Karns City substation. Project Type : FAC Cost : \$130,253 Time Estimate : 12.0 Months	\$21,035,758

ID	Idx	Facility	Upgrade Description	Cost
99582115	3	26SHELOCTA 230.0 kV - 26KEYSTONE 230.0 kV Ckt 1	<u>APS</u> 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	\$85,596,000
111707308	2	26EDINB S. 115.0 kV - 26ERIE SO. 115.0 kV Ckt 1	<u>PENELEC</u> s1820: Supplemental upgrade s1820: Erie South - Edinboro South - Venango 115 kV Junction Terminal Equipment replacement. - Edinboro South 115 kV - replace bus section breaker, Line traps, substation conductor, line relaying and CCVTs (s1820.1) - Venango Junction 115 kV Substation - replace Substation conductor, CCVT and arresters. (s1820.2) - Erie South 115 kV Substation - replace Circuit breaker, arresters, CCVT, line trap, line relaying and substation conductor. (s1820.3) The supplemental project has a projected in-service date of 02/29/2020. Project Type: CON Cost : \$0	\$0
100749767,100 749766	8	01KITTAN 138.0 kV - 01AL&D6T 138.0 kV Ckt 1	<u>APS</u> WP-AF2-F-0005A (677) : Replace 4/0 CU line exit at All Dam 6 Tap. Project Type : FAC Cost : \$130,252 Time Estimate : 12.0 Months WP-AF2-F-0005B (678) : Reconductor 6 miles of 4/0 CU from All Dam 6 Tap to Kittaning (49 spans) Project Type : FAC Cost : \$15,630,300 Time Estimate : 42.0 Months	\$15,760,552
100749761,100 749760	5	01AL&D6T 138.0 kV - 01AL 4J 138.0 kV Ckt 1	<u>APS</u> WP-AF2-F-0002A (664) : Replace 4/0 CU line exit at All Dam 6 Tap. Project Type : FAC Cost : \$130,252 Time Estimate : 12.0 Months WP-AF2-F-0002B (665) : Reconductor 7.6 miles of 4/0 CU from All Dam 6 Tap to structure 84 (66 spans) Project Type : FAC Cost : \$19,798,380 Time Estimate : 42.0 Months	\$19,928,632

ID	Idx	Facility	Upgrade Description	Cost
100749640,100749641	6	01KARNSC 138.0 kV - 01BUTLER 138.0 kV Ckt 1	<u>APS</u> WP-AF2-F-0008A (686) : Replace 336 ACSR, 954 ACSR, & 1024.5 ACAR bus conductor at Karns City substation. Project Type : FAC Cost : \$130,252 Time Estimate : 12.0 Months WP-AF2-F-0008B (687) : Replace 350 CU, 1.00 IPS CU, & 954 ACSR bus conductor at Butler substation. Project Type : FAC Cost : \$130,252 Time Estimate : 12.0 Months WP-AF2-F-0008C (688) : Replace 336 ACSR line risers at Butler substation. Project Type : FAC Cost : \$130,252 Time Estimate : 12.0 Months WP-AF2-F-0008D (689) : Replace 336 ACSR line risers at Karns City substation. Project Type : FAC Cost : \$130,252 Time Estimate : 12.0 Months WP-AF2-F-0008E (690) : Reconductor 15.6 miles of 336 ACSR on the Butler - Karns City 138 kV line (102 spans) Project Type : FAC Cost : \$40,638,780 Time Estimate : 60.0 Months WP-AF2-F-0008F (691) : Replace 600 A line side and bus side disconnects at Butler substation. Project Type : FAC Cost : \$390,758 Time Estimate : 12.0 Months WP-AF2-F-0008G (692) : Replace 350 CU wire to WT at Butler substation. Project Type : FAC Cost : \$130,252 Time Estimate : 12.0 Months WP-AF2-F-0008H (693) : Replace relaying (WT, ZR) at Butler substation. Project Type : FAC Cost : \$455,884 Time Estimate : 12.0 Months WP-AF2-F-0008I (694) : Replace relaying (RT, OR, WT, MT) at Karns City substation. Project Type : FAC Cost : \$455,884 Time Estimate : 12.0 Months	\$42,592,568

ID	Idx	Facility	Upgrade Description	Cost
101322576	10	AE2-344 TAP 115.0 kV - 26EDINB S. 115.0 kV Ckt 1	<u>PENELEC</u> PN-AF2-F-0049A (1809) : Replace relays at Edinboro South Project Type : FAC Cost : \$427,980 Time Estimate : 12.0 Months PN-AF2-F-0049B (1810) : Reconductor 2 miles of transmission line Project Type : FAC Cost : \$6,114,000 Time Estimate : 30.0 Months	\$6,541,980
100749684,100 749685	9	01COLMBGPN 138.0 kV - 01KISKIV 138.0 kV Ckt 1	<u>APS</u> WP-AF2-F-0018A (712) : Reconductor 3.7 miles of 4/0 CU Project Type : FAC Cost : \$9,638,685 Time Estimate : 36.0 Months WP-AF2-F-0018B (713) : Replace relays (RT) at Kiski Valley substation. Project Type : FAC Cost : \$455,884 Time Estimate : 12.0 Months	\$10,094,569
			TOTAL COST	\$229,098,463 ¹

11.6 Flow Gate Details - Primary POI

The following indices contain additional information about each facility presented in the body of the report. For each index, a description of the flowgate and its contingency was included for convenience. The intent of the indices is to provide more details on which projects/generators have contributions to the flowgate in question. All New Service Queue Requests, through the end of the Queue under study, that are contributors to a flowgate will be listed in the indices. Please note that there may be contributors that are subsequently queued after the queue under study that are not listed in the indices. Although this information is not used "as is" for cost allocation purposes, it can be used to gage the impact of other projects/generators. It should be noted the project/generator MW contributions presented in the body of the report are Full MW Impact contributions which are also noted in the indices column named "Full MW Impact", whereas the loading percentages reported in the body of the report, take into consideration the PJM Generator Deliverability Test rules such as commercial probability of each project as well as the ramping impact of "Adder" contributions. The MW Impact found and used in the analysis is shown in the indices column named "Gendeliv MW Impact".

11.6.1 Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
100749670	235282	01GAR RN	AP	235240	01COLMBGPN	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	173.89	175.38	DC	2.25

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200608	26PINEY #1	0.5470	80/20	0.5470
200642	26SENECA#1	2.5510	80/20	2.5510
200643	26SENECA#2	2.4093	80/20	2.4093
200644	26SENECA#3	0.2372	80/20	0.2372
200662	26SCRUB GR	1.3466	80/20	1.3466
200828	26HNSMLK 1	0.8468	80/20	0.8468
200829	26HNSMLK 2	0.8468	80/20	0.8468
200830	26HNSMLK 3	0.8468	80/20	0.8468
200831	26HNSMLK 4	0.8468	80/20	0.8468
200832	26HNSMLK 5	0.8468	80/20	0.8468
200849	26LAKVU GN	0.0656	80/20	0.0656
201201	26WRREN CT	0.6553	80/20	0.6553
201477	26Y2-055	1.9323	80/20	1.9323
235030	01MHNG-T155	0.2013	80/20	0.2013
235134	01AL&D6	0.1876	80/20	0.1876
915951	Y3-092 FTIR	79.4500	80/20	79.4500
922932	AB1-082 OP (Suspended)	0.8786	Adder	1.03
935191	AD1-154	1.4444	80/20	1.4444
938951	AE1-123	1.7696	80/20	1.7696
939291	AE1-160 C	1.1259	80/20	1.1259
940861	AE2-074 C	0.6671	Adder	0.78
941191	AE2-113 C	3.0287	Adder	3.56
941321	AE2-126 C	0.5457	Adder	0.64
942811	AE2-299 C	2.3709	80/20	2.3709
942961	AE2-316 C	4.2349	80/20	4.2349
943151	AE2-344 C	5.5745	80/20	5.5745
943351	AF1-006 C	0.9948	80/20	0.9948
944261	AF1-094 C	0.9748	80/20	0.9748
944281	AF1-096 C	1.0638	80/20	1.0638
944301	AF1-098 C	3.5746	80/20	3.5746
944321	AF1-100 C	6.4413	Adder	7.58
944381	AF1-103 O1	1.3330	80/20	1.3330
944391	AF1-104 O1	1.5832	80/20	1.5832
944881	AF1-153 C O1	0.8324	80/20	0.8324
944901	AF1-155 C	0.8386	80/20	0.8386
945021	AF1-167 C	0.9849	80/20	0.9849
945051	AF1-170 C	3.7079	80/20	3.7079
945121	AF1-177	0.3333	80/20	0.3333
945161	AF1-181	0.0343	Adder	0.04
945171	AF1-182	0.1716	Adder	0.2

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945451	AF1-210 C	1.2859	80/20	1.2859
945551	AF1-220 C	4.4314	Adder	5.21
945751	AF1-240 C O1	0.8666	80/20	0.8666
946111	AF1-276 C	3.2928	Adder	3.87
946121	AF1-277 C	3.2928	Adder	3.87
946131	AF1-278 C	2.6245	Adder	3.09
946221	AF1-287 C	0.9586	80/20	0.9586
946381	AF1-302 C	1.8493	80/20	1.8493
946401	AF1-304 C	5.4132	80/20	5.4132
946421	AF1-306 C	3.0393	80/20	3.0393
946771	AF1-217 C O2	0.9586	80/20	0.9586
957161	AF2-010 C	3.7531	80/20	3.7531
957571	AF2-051 C O1	2.8047	80/20	2.8047
957581	AF2-052 C	0.9313	Adder	2.07
957681	AF2-062 C	3.0814	Adder	6.84
957951	AF2-089 C	0.2925	80/20	0.2925
958031	AF2-097 C	0.2332	80/20	0.2332
958361	AF2-130 C	1.1454	80/20	1.1454
958731	AF2-164 C O1	4.4045	80/20	4.4045
958741	AF2-165 C	1.1075	80/20	1.1075
958751	AF2-166 C	1.1454	80/20	1.1454
958791	AF2-170 C	0.9499	80/20	0.9499
959441	AF2-235 C	0.5319	80/20	0.5319
959461	AF2-237 C	0.4874	80/20	0.4874
959521	AF2-243 C	0.8306	80/20	0.8306
960041	AF2-295 C	0.8386	80/20	0.8386
960321	AF2-323 C O1	2.2485	80/20	2.2485
960891	AF2-380 C	0.6152	80/20	0.6152
NEWTON	NEWTON	0.5072	Confirmed LTF	0.5072
FARMERCITY	FARMERCITY	0.0262	Confirmed LTF	0.0262
G-007A	G-007A	1.4529	Confirmed LTF	1.4529
VFT	VFT	4.0313	Confirmed LTF	4.0313
CALDERWOOD	CALDERWOOD	0.2107	Confirmed LTF	0.2107
PRAIRIE	PRAIRIE	1.1985	Confirmed LTF	1.1985
CHEOAH	CHEOAH	0.2112	Confirmed LTF	0.2112
EDWARDS	EDWARDS	0.1673	Confirmed LTF	0.1673
TILTON	TILTON	0.3018	Confirmed LTF	0.3018
MADISON	MADISON	0.0323	Confirmed LTF	0.0323
GIBSON	GIBSON	0.2593	Confirmed LTF	0.2593
BLUEG	BLUEG	0.8263	Confirmed LTF	0.8263
TRIMBLE	TRIMBLE	0.2655	Confirmed LTF	0.2655
CATAWBA	CATAWBA	0.1326	Confirmed LTF	0.1326

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
111707308	200572	26EDINB S.	PENELEC	200567	26ERIE SO.	PENELEC	1	ATSI-P2-3-CEI-345-004D	breaker	185.0	118.8	123.66	DC	8.98

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
915951	Y3-092 FTIR	78.1800	Merchant Transmission	78.1800
942813	AE2-299 BAT	19.3088	50/50	19.3088
943151	AE2-344 C	33.9260	50/50	33.9260
943152	AE2-344 E	22.6173	50/50	22.6173
944382	AF1-103 BAT	1.4978	Merchant Transmission	1.4978
944391	AF1-104 O1	1.5201	Adder	1.79
945051	AF1-170 C	10.9187	50/50	10.9187
945052	AF1-170 E	7.2791	50/50	7.2791
946221	AF1-287 C	5.8433	50/50	5.8433
946222	AF1-287 E	3.8955	50/50	3.8955
946771	AF1-217 C O2	5.8433	50/50	5.8433
946772	AF1-217 E O2	3.8955	50/50	3.8955
957571	AF2-051 C O1	6.9884	50/50	6.9884
957572	AF2-051 E O1	3.6001	50/50	3.6001
958731	AF2-164 C O1	1.1357	Adder	2.52
958732	AF2-164 E O1	0.7571	Adder	1.68
958791	AF2-170 C	0.4834	Adder	1.07
958792	AF2-170 E	0.3223	Adder	0.72
960321	AF2-323 C O1	5.3872	50/50	5.3872
960322	AF2-323 E O1	3.5915	50/50	3.5915
WEC	WEC	0.0230	Confirmed LTF	0.0230
LGEE	LGEE	0.0416	Confirmed LTF	0.0416
CPL	CPL	0.0384	Confirmed LTF	0.0384
CBM-W2	CBM-W2	0.5815	Confirmed LTF	0.5815
NY	NY	0.4463	Confirmed LTF	0.4463
CBM-W1	CBM-W1	0.9007	Confirmed LTF	0.9007
TVA	TVA	0.0966	Confirmed LTF	0.0966
O-066	O-066	0.9408	Confirmed LTF	0.9408
CBM-S2	CBM-S2	0.3584	Confirmed LTF	0.3584
CBM-S1	CBM-S1	0.5964	Confirmed LTF	0.5964
G-007	G-007	0.1352	Confirmed LTF	0.1352
MEC	MEC	0.1144	Confirmed LTF	0.1144

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
99582115	200795	26SHELOCTA	PENELEC	200810	26KEYSTONE	PENELEC	1	ATSI-P2-3-CEI-345-004D	breaker	917.0	192.43	192.9	DC	9.39

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

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
100749464	235121	01ARMSTR	AP	235204	01KITTAN	AP	1	ATSI-P2-3-CEI-345-004D	breaker	228.0	126.77	127.49	DC	3.61

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
201477	26Y2-055	1.4142	Adder	1.66
915951	Y3-092 FTIR	83.1700	Merchant Transmission	83.1700
935191	AD1-154	1.1485	Adder	1.35
938951	AE1-123	1.3755	Adder	1.62
939291	AE1-160 C	0.8690	Adder	1.02
939292	AE1-160 E	0.4995	Adder	0.59
941191	AE2-113 C	2.7563	Adder	3.24
941192	AE2-113 E	2.9676	Adder	3.49
942811	AE2-299 C	1.6486	Adder	1.94
942812	AE2-299 E	6.5944	Adder	7.76
942961	AE2-316 C	3.3523	Adder	3.94
942962	AE2-316 E	4.7805	Adder	5.62
943151	AE2-344 C	4.3397	Adder	5.11
943152	AE2-344 E	2.8931	Adder	3.4
943351	AF1-006 C	0.7667	Adder	0.9
943352	AF1-006 E	0.4313	Adder	0.51
944261	AF1-094 C	0.7193	Adder	0.85
944262	AF1-094 E	0.4795	Adder	0.56
944281	AF1-096 C	0.8211	Adder	0.97
944282	AF1-096 E	0.5474	Adder	0.64
944301	AF1-098 C	2.5561	Adder	3.01
944302	AF1-098 E	1.7041	Adder	2.0
944381	AF1-103 O1	0.9755	Adder	1.15
944391	AF1-104 O1	1.3449	Adder	1.58
944881	AF1-153 C O1	0.6446	Adder	0.76
944882	AF1-153 E O1	0.4298	Adder	0.51
944901	AF1-155 C	0.6493	Adder	0.76
944902	AF1-155 E	0.4329	Adder	0.51
945021	AF1-167 C	0.5074	Adder	0.6
945022	AF1-167 E	0.3389	Adder	0.4
945051	AF1-170 C	3.0501	Adder	3.59
945052	AF1-170 E	2.0334	Adder	2.39
945121	AF1-177	0.2439	Adder	0.29
945551	AF1-220 C	4.0423	Adder	4.76
945552	AF1-220 E	2.6964	Adder	3.17
945751	AF1-240 C O1	0.6891	Adder	0.81
945752	AF1-240 E O1	0.4594	Adder	0.54
946111	AF1-276 C	2.9648	Adder	3.49
946112	AF1-276 E	1.4603	Adder	1.72
946121	AF1-277 C	2.9648	Adder	3.49
946122	AF1-277 E	1.4603	Adder	1.72

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
946131	AF1-278 C	2.3630	Adder	2.78
946132	AF1-278 E	1.1753	Adder	1.38
946221	AF1-287 C	0.7457	Adder	0.88
946222	AF1-287 E	0.4971	Adder	0.58
946381	AF1-302 C	1.4639	Adder	1.72
946382	AF1-302 E	1.9519	Adder	2.3
946401	AF1-304 C	4.2131	Adder	4.96
946402	AF1-304 E	2.8087	Adder	3.3
946421	AF1-306 C	2.3546	Adder	2.77
946422	AF1-306 E	9.4186	Adder	11.08
946771	AF1-217 C O2	0.7458	Adder	0.88
946772	AF1-217 E O2	0.4972	Adder	0.58
957161	AF2-010 C	1.4713	Adder	3.27
957162	AF2-010 E	0.9916	Adder	2.2
957571	AF2-051 C O1	1.2146	Adder	2.7
957572	AF2-051 E O1	0.6257	Adder	1.39
957581	AF2-052 C	0.8474	Adder	1.88
957582	AF2-052 E	0.4123	Adder	0.92
957681	AF2-062 C	2.7857	Adder	6.18
957682	AF2-062 E	1.8571	Adder	4.12
957951	AF2-089 C	0.1197	Adder	0.27
957952	AF2-089 E	0.0617	Adder	0.14
958031	AF2-097 C	0.0952	Adder	0.21
958032	AF2-097 E	0.0635	Adder	0.14
958361	AF2-130 C	0.4746	Adder	1.05
958362	AF2-130 E	0.3164	Adder	0.7
958731	AF2-164 C O1	1.9503	Adder	4.33
958732	AF2-164 E O1	1.3002	Adder	2.89
958741	AF2-165 C	0.4639	Adder	1.03
958742	AF2-165 E	0.3093	Adder	0.69
958751	AF2-166 C	0.4746	Adder	1.05
958752	AF2-166 E	0.3164	Adder	0.7
958791	AF2-170 C	0.4277	Adder	0.95
958792	AF2-170 E	0.2851	Adder	0.63
959441	AF2-235 C	0.2176	Adder	0.48
959442	AF2-235 E	0.1451	Adder	0.32
959461	AF2-237 C	0.1906	Adder	0.42
959462	AF2-237 E	0.1271	Adder	0.28
959521	AF2-243 C	0.3479	Adder	0.77
959522	AF2-243 E	0.2319	Adder	0.51
960041	AF2-295 C	0.3441	Adder	0.76
960042	AF2-295 E	0.2294	Adder	0.51
960321	AF2-323 C O1	0.9749	Adder	2.16
960322	AF2-323 E O1	0.6499	Adder	1.44
960891	AF2-380 C	0.2033	Adder	0.45
960892	AF2-380 E	0.1356	Adder	0.3
NEWTON	NEWTON	0.4835	Confirmed LTF	0.4835
FARMERCITY	FARMERCITY	0.0249	Confirmed LTF	0.0249
G-007A	G-007A	1.4433	Confirmed LTF	1.4433
VFT	VFT	3.9990	Confirmed LTF	3.9990
CALDERWOOD	CALDERWOOD	0.2013	Confirmed LTF	0.2013
PRAIRIE	PRAIRIE	1.1443	Confirmed LTF	1.1443

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CHEOAH	CHEOAH	0.2017	Confirmed LTF	0.2017
EDWARDS	EDWARDS	0.1596	Confirmed LTF	0.1596
TILTON	TILTON	0.2873	Confirmed LTF	0.2873
MADISON	MADISON	0.0302	Confirmed LTF	0.0302
GIBSON	GIBSON	0.2473	Confirmed LTF	0.2473
BLUEG	BLUEG	0.7881	Confirmed LTF	0.7881
TRIMBLE	TRIMBLE	0.2527	Confirmed LTF	0.2527
CATAWBA	CATAWBA	0.1267	Confirmed LTF	0.1267

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
100749761	235139	01AL&D6T	AP	235138	01AL 4J	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	127.62	128.87	DC	1.9

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200608	26PINEY #1	0.4639	80/20	0.4639
200642	26SENECA#1	2.1929	80/20	2.1929
200643	26SENECA#2	2.0711	80/20	2.0711
200644	26SENECA#3	0.2039	80/20	0.2039
200662	26SCRUB GR	1.1398	80/20	1.1398
200828	26HNSMLK 1	0.7131	80/20	0.7131
200829	26HNSMLK 2	0.7131	80/20	0.7131
200830	26HNSMLK 3	0.7131	80/20	0.7131
200831	26HNSMLK 4	0.7131	80/20	0.7131
200832	26HNSMLK 5	0.7131	80/20	0.7131
200849	26LAKVU GN	0.0557	80/20	0.0557
201201	26WRREN CT	0.5611	80/20	0.5611
201477	26Y2-055	1.6547	80/20	1.6547
235030	01MHNG-T155	0.1745	80/20	0.1745
235134	01AL&D6	0.5254	80/20	0.5254
915951	Y3-092 FTIR	67.2000	80/20	67.2000
935191	AD1-154	1.2744	80/20	1.2744
938951	AE1-123	1.5007	80/20	1.5007
939291	AE1-160 C	0.9540	80/20	0.9540
942811	AE2-299 C	2.0144	80/20	2.0144
942961	AE2-316 C	3.5387	80/20	3.5387
943151	AE2-344 C	4.7210	80/20	4.7210
943351	AF1-006 C	0.8433	80/20	0.8433
944261	AF1-094 C	0.8266	80/20	0.8266
944281	AF1-096 C	0.9014	80/20	0.9014
944301	AF1-098 C	3.0379	80/20	3.0379
944381	AF1-103 O1	1.1414	80/20	1.1414
944391	AF1-104 O1	1.3400	80/20	1.3400
944881	AF1-153 C O1	0.7111	80/20	0.7111
944901	AF1-155 C	0.7162	80/20	0.7162
945021	AF1-167 C	0.8314	80/20	0.8314
945051	AF1-170 C	3.1388	80/20	3.1388
945121	AF1-177	0.2853	80/20	0.2853
945451	AF1-210 C	1.0966	80/20	1.0966
945751	AF1-240 C O1	0.7646	80/20	0.7646
946111	AF1-276 C	2.8532	Adder	3.36
946121	AF1-277 C	2.8532	Adder	3.36
946131	AF1-278 C	2.2740	Adder	2.68
946221	AF1-287 C	0.8118	80/20	0.8118
946381	AF1-302 C	1.5453	80/20	1.5453
946401	AF1-304 C	4.5858	80/20	4.5858

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
946421	AF1-306 C	2.6144	80/20	2.6144
946771	AF1-217 C O2	0.8118	80/20	0.8118
957161	AF2-010 C	3.1818	80/20	3.1818
957571	AF2-051 C O1	2.3707	80/20	2.3707
957951	AF2-089 C	0.2479	80/20	0.2479
958031	AF2-097 C	0.1976	80/20	0.1976
958361	AF2-130 C	0.9708	80/20	0.9708
958731	AF2-164 C O1	3.7090	80/20	3.7090
958741	AF2-165 C	0.9378	80/20	0.9378
958751	AF2-166 C	0.9708	80/20	0.9708
958791	AF2-170 C	0.8040	80/20	0.8040
959441	AF2-235 C	0.4507	80/20	0.4507
959461	AF2-237 C	0.4133	80/20	0.4133
959521	AF2-243 C	0.7033	80/20	0.7033
960041	AF2-295 C	0.7162	80/20	0.7162
960321	AF2-323 C O1	1.9005	80/20	1.9005
960891	AF2-380 C	0.5394	80/20	0.5394
NEWTON	NEWTON	0.4577	Confirmed LTF	0.4577
FARMERCITY	FARMERCITY	0.0236	Confirmed LTF	0.0236
G-007A	G-007A	1.4265	Confirmed LTF	1.4265
VFT	VFT	3.9474	Confirmed LTF	3.9474
CALDERWOOD	CALDERWOOD	0.1918	Confirmed LTF	0.1918
PRAIRIE	PRAIRIE	1.0823	Confirmed LTF	1.0823
CHEOAH	CHEOAH	0.1927	Confirmed LTF	0.1927
EDWARDS	EDWARDS	0.1505	Confirmed LTF	0.1505
TILTON	TILTON	0.2715	Confirmed LTF	0.2715
MADISON	MADISON	0.0282	Confirmed LTF	0.0282
GIBSON	GIBSON	0.2337	Confirmed LTF	0.2337
BLUEG	BLUEG	0.7447	Confirmed LTF	0.7447
TRIMBLE	TRIMBLE	0.2393	Confirmed LTF	0.2393
CATAWBA	CATAWBA	0.1218	Confirmed LTF	0.1218

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
100749641	235197	01KARNSC	AP	235152	01BUTLER	AP	1	ATSI-P1-2-CEI-345-700T	single	179.0	186.95	188.44	DC	2.67

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200608	26PINEY #1	0.8922	80/20	0.8922
200642	26SENECA#1	3.0462	80/20	3.0462
200643	26SENECA#2	2.8770	80/20	2.8770
200644	26SENECA#3	0.2833	80/20	0.2833
200662	26SCRUB GR	1.8889	80/20	1.8889
200805	26COLVER13 (Deactivation : 01/09/2020)	6.3056	Adder	7.42
200828	26HNSMLK 1	0.9116	80/20	0.9116
200829	26HNSMLK 2	0.9116	80/20	0.9116
200830	26HNSMLK 3	0.9116	80/20	0.9116
200831	26HNSMLK 4	0.9116	80/20	0.9116
200832	26HNSMLK 5	0.9116	80/20	0.9116
200849	26LAKVU GN	0.0766	80/20	0.0766
201201	26WRREN CT	0.7776	80/20	0.7776
201477	26Y2-055	2.2930	80/20	2.2930
235030	01MHNG-T155	0.1791	80/20	0.1791
915951	Y3-092 FTIR	91.2200	80/20	91.2200
919491	AA2-000	22.6449	Adder	26.64
922932	AB1-082 OP (Suspended)	1.0362	Adder	1.22
930511	AB1-092	0.8315	Adder	0.98
935191	AD1-154	2.3920	80/20	2.3920
936421	AD2-055	1.7118	Adder	2.01
936991	AD2-133 C	0.7902	Adder	0.93
938951	AE1-123	2.8859	80/20	2.8859
939171	AE1-147 C	0.5295	Adder	0.62
939291	AE1-160 C	1.5718	80/20	1.5718
940201	AE2-001 C	0.5281	Adder	0.62
940861	AE2-074 C	0.7868	Adder	0.93
941191	AE2-113 C	3.6593	Adder	4.31
941261	AE2-120 C	0.5273	Adder	0.62
941271	AE2-121 C	0.2828	Adder	0.33
941321	AE2-126 C	0.6930	Adder	0.82
941331	AE2-129 C	0.5788	Adder	0.68
941351	AE2-131 C	0.5788	Adder	0.68
942351	AE2-248 C	0.4127	Adder	0.49
942491	AE2-262 C	2.4939	Adder	2.93
942501	AE2-263 C	2.3443	Adder	2.76
942811	AE2-299 C	2.7680	80/20	2.7680
942961	AE2-316 C	4.4555	80/20	4.4555
943151	AE2-344 C	6.5510	80/20	6.5510

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
943351	AF1-006 C	1.1625	80/20	1.1625
943751	AF1-043	5.1354	Adder	6.04
944001	AF1-068 C O1	0.5476	Adder	0.64
944181	AF1-086 C O1	1.1364	Adder	1.34
944261	AF1-094 C	1.2332	80/20	1.2332
944281	AF1-096 C	1.4851	80/20	1.4851
944301	AF1-098 C	4.2053	80/20	4.2053
944311	AF1-099 C	3.7857	Adder	4.45
944321	AF1-100 C	8.1587	Adder	9.6
944381	AF1-103 O1	1.5818	80/20	1.5818
944391	AF1-104 O1	1.8308	80/20	1.8308
944471	AF1-112 C	0.5528	Adder	0.65
944671	AF1-132 C O1	0.5118	Adder	0.6
944691	AF1-134 C O1	0.6550	Adder	0.77
944771	AF1-142 C	6.0572	Adder	7.13
944841	AF1-149 C	0.5272	Adder	0.62
944881	AF1-153 C O1	1.0910	80/20	1.0910
944901	AF1-155 C	1.1012	80/20	1.1012
945021	AF1-167 C	1.5298	80/20	1.5298
945051	AF1-170 C	4.3199	80/20	4.3199
945121	AF1-177	0.3954	80/20	0.3954
945161	AF1-181	0.0435	Adder	0.05
945171	AF1-182	0.2177	Adder	0.26
945181	AF1-183	0.0540	Adder	0.06
945451	AF1-210 C	1.7315	80/20	1.7315
945491	AF1-214 C	0.5273	Adder	0.62
945551	AF1-220 C	5.5158	Adder	6.49
945751	AF1-240 C O1	1.4352	80/20	1.4352
946111	AF1-276 C	3.8840	Adder	4.57
946121	AF1-277 C	3.8840	Adder	4.57
946131	AF1-278 C	3.0956	Adder	3.64
946221	AF1-287 C	1.1272	80/20	1.1272
946381	AF1-302 C	1.9456	80/20	1.9456
946401	AF1-304 C	7.6914	80/20	7.6914
946421	AF1-306 C	3.7793	80/20	3.7793
946771	AF1-217 C O2	1.1272	80/20	1.1272
957161	AF2-010 C	4.7734	80/20	4.7734
957451	AF2-039 C	0.2300	Adder	0.51
957571	AF2-051 C O1	3.3281	80/20	3.3281
957581	AF2-052 C	1.1083	Adder	2.46
957681	AF2-062 C	3.6269	Adder	8.05
957941	AF2-088 C	0.1108	Adder	0.25
957951	AF2-089 C	0.4084	80/20	0.4084
958031	AF2-097 C	0.2725	80/20	0.2725
958271	AF2-121 C	0.3068	Adder	0.68
958361	AF2-130 C	1.7730	80/20	1.7730
958731	AF2-164 C O1	4.7414	80/20	4.7414
958741	AF2-165 C	1.5952	80/20	1.5952
958751	AF2-166 C	1.7730	80/20	1.7730
958791	AF2-170 C	1.0985	80/20	1.0985
959441	AF2-235 C	0.7426	80/20	0.7426
959461	AF2-237 C	0.6166	80/20	0.6166

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959521	AF2-243 C	1.1964	80/20	1.1964
960041	AF2-295 C	1.1012	80/20	1.1012
960051	AF2-296 C	0.3472	Adder	0.77
960211	AF2-312 C	0.2597	Adder	0.58
960321	AF2-323 C O1	2.6696	80/20	2.6696
960891	AF2-380 C	3.6915	80/20	3.6915
961201	AF2-411 O1	6.7778	Adder	15.05
NEWTON	NEWTON	0.6780	Confirmed LTF	0.6780
FARMERCITY	FARMERCITY	0.0348	Confirmed LTF	0.0348
G-007A	G-007A	1.8077	Confirmed LTF	1.8077
VFT	VFT	5.0052	Confirmed LTF	5.0052
CALDERWOOD	CALDERWOOD	0.2664	Confirmed LTF	0.2664
PRAIRIE	PRAIRIE	1.5911	Confirmed LTF	1.5911
CHEOAH	CHEOAH	0.2668	Confirmed LTF	0.2668
EDWARDS	EDWARDS	0.2258	Confirmed LTF	0.2258
TILTON	TILTON	0.4057	Confirmed LTF	0.4057
MADISON	MADISON	0.0504	Confirmed LTF	0.0504
GIBSON	GIBSON	0.3467	Confirmed LTF	0.3467
BLUEG	BLUEG	1.1006	Confirmed LTF	1.1006
TRIMBLE	TRIMBLE	0.3534	Confirmed LTF	0.3534
CATAWBA	CATAWBA	0.1596	Confirmed LTF	0.1596

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
100749678	235203	01KISSNG	AP	235197	01KARNSC	AP	1	PN-P1-2-PN-345-107T	single	268.0	144.31	145.37	DC	2.82

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200608	26PINEY #1	0.9413	80/20	0.9413
200642	26SENECA#1	3.2162	80/20	3.2162
200643	26SENECA#2	3.0375	80/20	3.0375
200644	26SENECA#3	0.2991	80/20	0.2991
200662	26SCRUB GR	1.9930	80/20	1.9930
200805	26COLVER13 (Deactivation : 01/09/2020)	6.6656	Adder	7.84
200828	26HNSMLK 1	0.9618	80/20	0.9618
200829	26HNSMLK 2	0.9618	80/20	0.9618
200830	26HNSMLK 3	0.9618	80/20	0.9618
200831	26HNSMLK 4	0.9618	80/20	0.9618
200832	26HNSMLK 5	0.9618	80/20	0.9618
200849	26LAKVU GN	0.0808	80/20	0.0808
201201	26WRREN CT	0.8210	80/20	0.8210
201477	26Y2-055	2.4209	80/20	2.4209
915951	Y3-092 FTIR	96.2500	80/20	96.2500
919491	AA2-000	23.9357	Adder	28.16
922932	AB1-082 OP (Suspended)	1.0952	Adder	1.29
930511	AB1-092	0.8788	Adder	1.03
935191	AD1-154	2.5250	80/20	2.5250
936421	AD2-055	1.8094	Adder	2.13
936991	AD2-133 C	0.8358	Adder	0.98
938951	AE1-123	3.0449	80/20	3.0449
939171	AE1-147 C	0.5599	Adder	0.66
939291	AE1-160 C	1.6584	80/20	1.6584
940201	AE2-001 C	0.5584	Adder	0.66
940681	AE2-055 C (Suspended)	0.5365	Adder	0.63
940861	AE2-074 C	0.8316	Adder	0.98
941191	AE2-113 C	3.8652	Adder	4.55
941261	AE2-120 C	0.5576	Adder	0.66
941271	AE2-121 C	0.2990	Adder	0.35
941321	AE2-126 C	0.7320	Adder	0.86
941331	AE2-129 C	0.6120	Adder	0.72
941351	AE2-131 C	0.6120	Adder	0.72
942351	AE2-248 C	0.4366	Adder	0.51
942491	AE2-262 C	2.6354	Adder	3.1
942501	AE2-263 C	2.4773	Adder	2.91
942811	AE2-299 C	2.9216	80/20	2.9216
942961	AE2-316 C	4.6978	80/20	4.6978
943151	AE2-344 C	6.9131	80/20	6.9131

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
943351	AF1-006 C	1.2268	80/20	1.2268
943751	AF1-043	5.4282	Adder	6.39
944001	AF1-068 C O1	0.5791	Adder	0.68
944181	AF1-086 C O1	1.2012	Adder	1.41
944261	AF1-094 C	1.3013	80/20	1.3013
944281	AF1-096 C	1.5670	80/20	1.5670
944301	AF1-098 C	4.4381	80/20	4.4381
944311	AF1-099 C	4.0006	Adder	4.71
944321	AF1-100 C	8.6190	Adder	10.14
944381	AF1-103 O1	1.6700	80/20	1.6700
944391	AF1-104 O1	1.9318	80/20	1.9318
944471	AF1-112 C	0.5846	Adder	0.69
944671	AF1-132 C O1	0.5414	Adder	0.64
944691	AF1-134 C O1	0.6922	Adder	0.81
944771	AF1-142 C	6.4009	Adder	7.53
944841	AF1-149 C	0.5575	Adder	0.66
944881	AF1-153 C O1	1.1507	80/20	1.1507
944901	AF1-155 C	1.1615	80/20	1.1615
945021	AF1-167 C	1.4654	80/20	1.4654
945051	AF1-170 C	4.5584	80/20	4.5584
945121	AF1-177	0.4175	80/20	0.4175
945161	AF1-181	0.0460	Adder	0.05
945171	AF1-182	0.2300	Adder	0.27
945181	AF1-183	0.0571	Adder	0.07
945331	AF1-198	0.1099	Adder	0.13
945451	AF1-210 C	1.3130	80/20	1.3130
945491	AF1-214 C	0.5577	Adder	0.66
945551	AF1-220 C	5.8245	Adder	6.85
945751	AF1-240 C O1	1.5150	80/20	1.5150
946111	AF1-276 C	4.1027	Adder	4.83
946121	AF1-277 C	4.1027	Adder	4.83
946131	AF1-278 C	3.2699	Adder	3.85
946221	AF1-287 C	1.1894	80/20	1.1894
946381	AF1-302 C	2.0515	80/20	2.0515
946401	AF1-304 C	8.1156	80/20	8.1156
946421	AF1-306 C	3.9889	80/20	3.9889
946771	AF1-217 C O2	1.1894	80/20	1.1894
957161	AF2-010 C	5.0365	80/20	5.0365
957451	AF2-039 C	0.2431	Adder	0.54
957571	AF2-051 C O1	3.5119	80/20	3.5119
957581	AF2-052 C	1.1710	Adder	2.6
957681	AF2-062 C	3.8318	Adder	8.51
957941	AF2-088 C	0.1170	Adder	0.26
957951	AF2-089 C	0.4309	80/20	0.4309
958031	AF2-097 C	0.2875	80/20	0.2875
958271	AF2-121 C	0.3244	Adder	0.72
958361	AF2-130 C	1.8707	80/20	1.8707
958731	AF2-164 C O1	5.0026	80/20	5.0026
958741	AF2-165 C	1.6831	80/20	1.6831
958751	AF2-166 C	1.8707	80/20	1.8707
958791	AF2-170 C	1.1591	80/20	1.1591
959441	AF2-235 C	0.7835	80/20	0.7835

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959461	AF2-237 C	0.6506	80/20	0.6506
959521	AF2-243 C	1.2623	80/20	1.2623
960041	AF2-295 C	1.1615	80/20	1.1615
960051	AF2-296 C	0.3669	Adder	0.81
960211	AF2-312 C	0.2747	Adder	0.61
960321	AF2-323 C O1	2.8166	80/20	2.8166
961201	AF2-411 O1	7.1711	Adder	15.92
961211	AF2-412 O1	3.0682	Adder	6.81
NEWTON	NEWTON	0.7307	Confirmed LTF	0.7307
FARMERCITY	FARMERCITY	0.0375	Confirmed LTF	0.0375
G-007A	G-007A	1.9683	Confirmed LTF	1.9683
VFT	VFT	5.4438	Confirmed LTF	5.4438
CALDERWOOD	CALDERWOOD	0.2858	Confirmed LTF	0.2858
PRAIRIE	PRAIRIE	1.7151	Confirmed LTF	1.7151
CHEOAH	CHEOAH	0.2863	Confirmed LTF	0.2863
EDWARDS	EDWARDS	0.2439	Confirmed LTF	0.2439
TILTON	TILTON	0.4378	Confirmed LTF	0.4378
MADISON	MADISON	0.0544	Confirmed LTF	0.0544
GIBSON	GIBSON	0.3740	Confirmed LTF	0.3740
BLUEG	BLUEG	1.1874	Confirmed LTF	1.1874
TRIMBLE	TRIMBLE	0.3812	Confirmed LTF	0.3812
CATAWBA	CATAWBA	0.1708	Confirmed LTF	0.1708

11.6.8 Index 8

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
100749767	235204	01KITTAN	AP	235139	01AL&D6T	AP	1	PN-P1-2-PN-345-107T	single	151.0	123.54	124.8	DC	1.9

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200608	26PINEY #1	0.4641	80/20	0.4641
200642	26SENECA#1	2.1946	80/20	2.1946
200643	26SENECA#2	2.0726	80/20	2.0726
200644	26SENECA#3	0.2041	80/20	0.2041
200662	26SCRUB GR	1.1404	80/20	1.1404
200828	26HNSMLK 1	0.7134	80/20	0.7134
200829	26HNSMLK 2	0.7134	80/20	0.7134
200830	26HNSMLK 3	0.7134	80/20	0.7134
200831	26HNSMLK 4	0.7134	80/20	0.7134
200832	26HNSMLK 5	0.7134	80/20	0.7134
200849	26LAKVU GN	0.0557	80/20	0.0557
201201	26WRREN CT	0.5615	80/20	0.5615
201477	26Y2-055	1.6559	80/20	1.6559
235030	01MHNG-T155	0.1745	80/20	0.1745
915951	Y3-092 FTIR	67.2400	80/20	67.2400
935191	AD1-154	1.2752	80/20	1.2752
938951	AE1-123	1.5014	80/20	1.5014
939291	AE1-160 C	0.9544	80/20	0.9544
942811	AE2-299 C	2.0157	80/20	2.0157
942961	AE2-316 C	3.5404	80/20	3.5404
943151	AE2-344 C	4.7231	80/20	4.7231
943351	AF1-006 C	0.8436	80/20	0.8436
944261	AF1-094 C	0.8269	80/20	0.8269
944281	AF1-096 C	0.9018	80/20	0.9018
944301	AF1-098 C	3.0398	80/20	3.0398
944381	AF1-103 O1	1.1422	80/20	1.1422
944391	AF1-104 O1	1.3406	80/20	1.3406
944881	AF1-153 C O1	0.7116	80/20	0.7116
944901	AF1-155 C	0.7165	80/20	0.7165
945021	AF1-167 C	0.8317	80/20	0.8317
945051	AF1-170 C	3.1401	80/20	3.1401
945121	AF1-177	0.2856	80/20	0.2856
945451	AF1-210 C	1.0970	80/20	1.0970
945751	AF1-240 C O1	0.7651	80/20	0.7651
946111	AF1-276 C	2.8549	Adder	3.36
946121	AF1-277 C	2.8549	Adder	3.36
946131	AF1-278 C	2.2754	Adder	2.68
946221	AF1-287 C	0.8122	80/20	0.8122
946381	AF1-302 C	1.5460	80/20	1.5460
946401	AF1-304 C	4.5882	80/20	4.5882
946421	AF1-306 C	2.6164	80/20	2.6164

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
946771	AF1-217 C O2	0.8122	80/20	0.8122
957161	AF2-010 C	3.1837	80/20	3.1837
957571	AF2-051 C O1	2.3717	80/20	2.3717
957951	AF2-089 C	0.2480	80/20	0.2480
958031	AF2-097 C	0.1977	80/20	0.1977
958361	AF2-130 C	0.9713	80/20	0.9713
958731	AF2-164 C O1	3.7109	80/20	3.7109
958741	AF2-165 C	0.9383	80/20	0.9383
958751	AF2-166 C	0.9713	80/20	0.9713
958791	AF2-170 C	0.8044	80/20	0.8044
959441	AF2-235 C	0.4509	80/20	0.4509
959461	AF2-237 C	0.4135	80/20	0.4135
959521	AF2-243 C	0.7037	80/20	0.7037
960041	AF2-295 C	0.7165	80/20	0.7165
960321	AF2-323 C O1	1.9016	80/20	1.9016
960891	AF2-380 C	0.5396	80/20	0.5396
NEWTON	NEWTON	0.4545	Confirmed LTF	0.4545
FARMERCITY	FARMERCITY	0.0234	Confirmed LTF	0.0234
G-007A	G-007A	1.4337	Confirmed LTF	1.4337
VFT	VFT	3.9667	Confirmed LTF	3.9667
CALDERWOOD	CALDERWOOD	0.1904	Confirmed LTF	0.1904
PRAIRIE	PRAIRIE	1.0745	Confirmed LTF	1.0745
CHEOAH	CHEOAH	0.1912	Confirmed LTF	0.1912
EDWARDS	EDWARDS	0.1494	Confirmed LTF	0.1494
TILTON	TILTON	0.2696	Confirmed LTF	0.2696
MADISON	MADISON	0.0282	Confirmed LTF	0.0282
GIBSON	GIBSON	0.2321	Confirmed LTF	0.2321
BLUEG	BLUEG	0.7395	Confirmed LTF	0.7395
TRIMBLE	TRIMBLE	0.2376	Confirmed LTF	0.2376
CATAWBA	CATAWBA	0.1207	Confirmed LTF	0.1207

11.6.9 Index 9

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
100749685	235240	01COLMBGPN	AP	235202	01KISKIV	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	165.41	166.9	DC	2.25

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200608	26PINEY #1	0.5470	80/20	0.5470
200642	26SENECA#1	2.5510	80/20	2.5510
200643	26SENECA#2	2.4093	80/20	2.4093
200644	26SENECA#3	0.2372	80/20	0.2372
200662	26SCRUB GR	1.3466	80/20	1.3466
200828	26HNSMLK 1	0.8468	80/20	0.8468
200829	26HNSMLK 2	0.8468	80/20	0.8468
200830	26HNSMLK 3	0.8468	80/20	0.8468
200831	26HNSMLK 4	0.8468	80/20	0.8468
200832	26HNSMLK 5	0.8468	80/20	0.8468
200849	26LAKVU GN	0.0656	80/20	0.0656
201201	26WRREN CT	0.6553	80/20	0.6553
201477	26Y2-055	1.9323	80/20	1.9323
235030	01MHNG-T155	0.2013	80/20	0.2013
235134	01AL&D6	0.1876	80/20	0.1876
915951	Y3-092 FTIR	79.4500	80/20	79.4500
922932	AB1-082 OP (Suspended)	0.8786	Adder	1.03
935191	AD1-154	1.4444	80/20	1.4444
938951	AE1-123	1.7696	80/20	1.7696
939291	AE1-160 C	1.1259	80/20	1.1259
940861	AE2-074 C	0.6671	Adder	0.78
941191	AE2-113 C	3.0287	Adder	3.56
941321	AE2-126 C	0.5457	Adder	0.64
942811	AE2-299 C	2.3709	80/20	2.3709
942961	AE2-316 C	4.2349	80/20	4.2349
943151	AE2-344 C	5.5745	80/20	5.5745
943351	AF1-006 C	0.9948	80/20	0.9948
944261	AF1-094 C	0.9748	80/20	0.9748
944281	AF1-096 C	1.0638	80/20	1.0638
944301	AF1-098 C	3.5746	80/20	3.5746
944321	AF1-100 C	6.4413	Adder	7.58
944381	AF1-103 O1	1.3330	80/20	1.3330
944391	AF1-104 O1	1.5832	80/20	1.5832
944881	AF1-153 C O1	0.8324	80/20	0.8324
944901	AF1-155 C	0.8386	80/20	0.8386
945021	AF1-167 C	0.9849	80/20	0.9849
945051	AF1-170 C	3.7079	80/20	3.7079
945121	AF1-177	0.3333	80/20	0.3333
945161	AF1-181	0.0343	Adder	0.04
945171	AF1-182	0.1716	Adder	0.2

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945451	AF1-210 C	1.2859	80/20	1.2859
945551	AF1-220 C	4.4314	Adder	5.21
945751	AF1-240 C O1	0.8666	80/20	0.8666
946111	AF1-276 C	3.2928	Adder	3.87
946121	AF1-277 C	3.2928	Adder	3.87
946131	AF1-278 C	2.6245	Adder	3.09
946221	AF1-287 C	0.9586	80/20	0.9586
946381	AF1-302 C	1.8493	80/20	1.8493
946401	AF1-304 C	5.4132	80/20	5.4132
946421	AF1-306 C	3.0393	80/20	3.0393
946771	AF1-217 C O2	0.9586	80/20	0.9586
957161	AF2-010 C	3.7531	80/20	3.7531
957571	AF2-051 C O1	2.8047	80/20	2.8047
957581	AF2-052 C	0.9313	Adder	2.07
957681	AF2-062 C	3.0814	Adder	6.84
957951	AF2-089 C	0.2925	80/20	0.2925
958031	AF2-097 C	0.2332	80/20	0.2332
958361	AF2-130 C	1.1454	80/20	1.1454
958731	AF2-164 C O1	4.4045	80/20	4.4045
958741	AF2-165 C	1.1075	80/20	1.1075
958751	AF2-166 C	1.1454	80/20	1.1454
958791	AF2-170 C	0.9499	80/20	0.9499
959441	AF2-235 C	0.5319	80/20	0.5319
959461	AF2-237 C	0.4874	80/20	0.4874
959521	AF2-243 C	0.8306	80/20	0.8306
960041	AF2-295 C	0.8386	80/20	0.8386
960321	AF2-323 C O1	2.2485	80/20	2.2485
960891	AF2-380 C	0.6152	80/20	0.6152
NEWTON	NEWTON	0.5072	Confirmed LTF	0.5072
FARMERCITY	FARMERCITY	0.0262	Confirmed LTF	0.0262
G-007A	G-007A	1.4529	Confirmed LTF	1.4529
VFT	VFT	4.0313	Confirmed LTF	4.0313
CALDERWOOD	CALDERWOOD	0.2107	Confirmed LTF	0.2107
PRAIRIE	PRAIRIE	1.1985	Confirmed LTF	1.1985
CHEOAH	CHEOAH	0.2112	Confirmed LTF	0.2112
EDWARDS	EDWARDS	0.1673	Confirmed LTF	0.1673
TILTON	TILTON	0.3018	Confirmed LTF	0.3018
MADISON	MADISON	0.0323	Confirmed LTF	0.0323
GIBSON	GIBSON	0.2593	Confirmed LTF	0.2593
BLUEG	BLUEG	0.8263	Confirmed LTF	0.8263
TRIMBLE	TRIMBLE	0.2655	Confirmed LTF	0.2655
CATAWBA	CATAWBA	0.1326	Confirmed LTF	0.1326

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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
101322576	943150	AE2-344 TAP	PENELEC	200572	26EDINB S.	PENELEC	1	ATSI-P2-3-CEI-345-004D	breaker	179.0	125.31	129.99	DC	8.38

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
915951	Y3-092 FTIR	77.2200	Merchant Transmission	77.2200
942813	AE2-299 BAT	18.6240	50/50	18.6240
943151	AE2-344 C	34.8193	50/50	34.8193
943152	AE2-344 E	23.2129	50/50	23.2129
944382	AF1-103 BAT	1.4446	Merchant Transmission	1.4446
944391	AF1-104 O1	1.5292	Adder	1.8
945051	AF1-170 C	10.9968	50/50	10.9968
945052	AF1-170 E	7.3312	50/50	7.3312
957571	AF2-051 C O1	6.5208	50/50	6.5208
957572	AF2-051 E O1	3.3592	50/50	3.3592
958731	AF2-164 C O1	1.0996	Adder	2.44
958732	AF2-164 E O1	0.7331	Adder	1.63
958791	AF2-170 C	0.4863	Adder	1.08
958792	AF2-170 E	0.3242	Adder	0.72
960321	AF2-323 C O1	5.0295	50/50	5.0295
960322	AF2-323 E O1	3.3530	50/50	3.3530
WEC	WEC	0.0220	Confirmed LTF	0.0220
LGEE	LGEE	0.0399	Confirmed LTF	0.0399
CPL	CPL	0.0370	Confirmed LTF	0.0370
CBM-W2	CBM-W2	0.5569	Confirmed LTF	0.5569
NY	NY	0.4302	Confirmed LTF	0.4302
CBM-W1	CBM-W1	0.8632	Confirmed LTF	0.8632
TVA	TVA	0.0924	Confirmed LTF	0.0924
O-066	O-066	0.9072	Confirmed LTF	0.9072
CBM-S2	CBM-S2	0.3410	Confirmed LTF	0.3410
CBM-S1	CBM-S1	0.5708	Confirmed LTF	0.5708
G-007	G-007	0.1310	Confirmed LTF	0.1310
MEC	MEC	0.1096	Confirmed LTF	0.1096

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
AE1-116	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-Karthaus 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
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

Queue Number	Project Name	Status
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
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

Queue Number	Project Name	Status
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
AF2-164	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
AF2-380	Karns City-Bear Creek 25 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
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
Z1-069	Gold-Sabinsville 115kV	In Service
Z1-091	Lenox 34kV	Withdrawn

Queue Number	Project Name	Status
Z2-108	Meyersdale North 115kV	In Service

11.8 Contingency Descriptions - Primary POI

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
ATSI-P1-3-SYS-345-722	CONTINGENCY 'ATSI-P1-3-SYS-345-722' /* TRAN 02S8-ATT 345 TO 02ASH_3 138 CK 8 DISCONNECT BRANCH FROM BUS 239082 TO BUS 238544 CKT 8 /* 02S8-ATT 345 02ASH_3 138 END
PN-P1-2-PN-345-001	CONTINGENCY 'PN-P1-2-PN-345-001' /* ERIE WEST - WAYNE 345KV DISCONNECT BRANCH FROM BUS 200599 TO BUS 200595 CKT 1 /* 26ERIE W 345 26WAYNE 345 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
AP-P1-2-WP-138-087	CONTINGENCY 'AP-P1-2-WP-138-087' /* ALLEGEHNY DAM - BRACKENRIDGE - SPRINGSDALE 138KV DISCONNECT BRANCH FROM BUS 235131 TO BUS 235825 CKT 1 /* 01BRACKENRDG 138 01ALL L4T 138 DISCONNECT BRANCH FROM BUS 235825 TO BUS 235132 CKT 1 /* 01ALL L4T 138 01AL 4 DISCONNECT BRANCH FROM BUS 235138 TO BUS 235825 CKT 1 /* 01AL 4J 138 01ALL L4T 138 DISCONNECT BRANCH FROM BUS 235138 TO BUS 235256 CKT 1 /* 01AL 4J 138 01SPGDL 138 DISCONNECT BRANCH FROM BUS 235138 TO BUS 235139 CKT 1 /* 01AL 4J 138 01AL&D6T 138 END
Base Case	
ATSI-P1-1-CEI-345-711	CONTINGENCY 'ATSI-P1-1-CEI-345-711' /* GEN 02PERRG1 22.0 UNIT 1 REMOVE MACHINE 1 FROM BUS 239035 /* 02PERRG1 22 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

12 Short Circuit Analysis - Primary POI

The Short Circuit Analysis will be performed in the System Impact Study phase.

13 Summer Peak - Load Flow Analysis - Secondary POI

The Queue Project AF2-323 was evaluated as a 44.0 MW (Capacity 26.4 MW) injection tapping the Geneva to Air Products 115 kV line in the PENELEC area. Project AF2-323 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-323 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

13.1 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
100749673	235282	01GARN	138.0	AP	235240	01COLMBGPN	138.0	AP	1	AP-P1-2-WP-138-087	single	151.0	99.33	100.48	DC	1.74

13.2 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
99582503	200593	26GLADE	230.0	PENELEC	200581	26FOREST	230.0	PENELEC	1	PN-P2-3-PN-230-26A2	breaker	615.0	99.88	100.11	DC	3.12
99582504	200593	26GLADE	230.0	PENELEC	200581	26FOREST	230.0	PENELEC	1	PN-P2-3-PN-230-26B2	breaker	615.0	99.88	100.11	DC	3.12
99582505	200593	26GLADE	230.0	PENELEC	200581	26FOREST	230.0	PENELEC	1	PN-P2-3-PN-230-26A1	breaker	615.0	99.86	100.09	DC	3.12

13.3 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
111707308	200572	26EDINB S.	115.0	PENELEC	200567	26ERIE SO.	115.0	PENELEC	1	ATSI-P2-3-CEI-345-004D	breaker	185.0	118.79	124.08	DC	9.78
98875534	200599	26ERIE W	345.0	PENELEC	238547	02AT	345.0	ATSI	1	PN-P2-4-PN-230-14GT	breaker	1900.0	118.47	119.55	DC	20.53
98875535	200599	26ERIE W	345.0	PENELEC	238547	02AT	345.0	ATSI	1	PN-P2-3-PN-230-14CT	breaker	1900.0	118.19	119.27	DC	20.53
98875536	200599	26ERIE W	345.0	PENELEC	238547	02AT	345.0	ATSI	1	PN-P2-3-PN-230-14FT	breaker	1900.0	118.19	119.27	DC	20.53

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 LOADIN G %	POST PROJECT LOADIN G %	AC DC	MW IMPACT
99582115	200795	26SHELOCTA	230.0	PENELEC	200810	26KEYSTONE	230.0	PENELEC	1	ATSI-P2-3-CEI-345-004D	breaker	917.0	192.4	192.87	DC	9.36
100749464	235121	01ARMSTR	138.0	AP	235204	01KITTAN	138.0	AP	1	ATSI-P2-3-CEI-345-004D	breaker	228.0	126.77	127.48	DC	3.58
100749760	235139	01AL&D6T	138.0	AP	235138	01AL 4J	138.0	AP	1	PN-P1-2-PN-345-107T	single	151.0	127.61	128.87	DC	1.89
100749761	235139	01AL&D6T	138.0	AP	235138	01AL 4J	138.0	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	127.61	128.87	DC	1.89
100749640	235197	01KARNSC	138.0	AP	235152	01BUTLER	138.0	AP	1	PN-P1-2-PN-345-107T	single	179.0	186.94	188.42	DC	2.65
100749641	235197	01KARNSC	138.0	AP	235152	01BUTLER	138.0	AP	1	ATSI-P1-2-CEI-345-700T	single	179.0	186.94	188.42	DC	2.65
100749677	235203	01KISSNG	138.0	AP	235197	01KARNSC	138.0	AP	1	ATSI-P1-2-CEI-345-700T	single	268.0	144.31	145.36	DC	2.8
100749678	235203	01KISSNG	138.0	AP	235197	01KARNSC	138.0	AP	1	PN-P1-2-PN-345-107T	single	268.0	144.31	145.36	DC	2.8
100749766	235204	01KITTAN	138.0	AP	235139	01AL&D6T	138.0	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	123.54	124.79	DC	1.89
100749767	235204	01KITTAN	138.0	AP	235139	01AL&D6T	138.0	AP	1	PN-P1-2-PN-345-107T	single	151.0	123.54	124.79	DC	1.89
100749684	235240	01COLMBGPN	138.0	AP	235202	01KISKIV	138.0	AP	1	PN-P1-2-PN-345-107T	single	151.0	165.41	166.89	DC	2.24
100749685	235240	01COLMBGPN	138.0	AP	235202	01KISKIV	138.0	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	165.41	166.89	DC	2.24
100749669	235282	01GAR RN	138.0	AP	235240	01COLMBGPN	138.0	AP	1	PN-P1-2-PN-345-107T	single	151.0	173.89	175.37	DC	2.24

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 LOADIN G %	POST PROJECT LOADIN G %	AC DC	MW IMPACT
100749670	235282	01GAR RN	138.0	AP	235240	01COLMBGN	138.0	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	173.89	175.37	DC	2.24
101322576	943150	AE2-344 TAP	115.0	PENELEC	200572	26EDINB S.	115.0	PENELEC	1	ATSI-P2-3-CEI-345-004D	breaker	179.0	125.3	130.4	DC	9.12

13.4 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	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC DC	MW IMPACT
111940532	200575	26MRGANST	115.0	PENELEC	200573	26VENGO JT	115.0	PENELEC	1	PN-P1-2-PN-345-001	operation	149.0	111.67	123.25	DC	17.25
108625688	200583	26PINEY	115.0	PENELEC	235151	01BURMA	115.0	AP	1	PN-P1-2-PN-345-107T	operation	277.0	99.59	101.59	DC	5.52
108625689	200583	26PINEY	115.0	PENELEC	235151	01BURMA	115.0	AP	1	ATSI-P1-2-CEI-345-700T	operation	277.0	99.59	101.59	DC	5.52
98875768	200599	26ERIE W	345.0	PENELEC	238547	02AT	345.0	ATSI	1	Base Case	operation	1560.0	130.07	131.37	DC	20.14
98875769	200599	26ERIE W	345.0	PENELEC	238547	02AT	345.0	ATSI	1	ATSI-P1-1-CEI-345-711	operation	1900.0	118.31	119.38	DC	20.14
99582556	200795	26SHELOCTA	230.0	PENELEC	200810	26KEYSTON E	230.0	PENELEC	1	PN-P1-2-PN-345-107T	operation	917.0	191.46	191.92	DC	9.22
99582557	200795	26SHELOCTA	230.0	PENELEC	200810	26KEYSTON E	230.0	PENELEC	1	ATSI-P1-2-CEI-345-700T	operation	917.0	191.46	191.92	DC	9.22

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
111940661	200920	26FRANKLN A	115.0	PENELE C	200575	26MRGAN ST	115.0	PENELE C	1	PN-P1-2-PN-345-001	operatio n	239.0	98.96	106.49	DC	17.98
100749778	235121	01ARMSTR	138.0	AP	235204	01KITTAN	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	228.0	123.69	124.37	DC	3.48
100749779	235121	01ARMSTR	138.0	AP	235204	01KITTAN	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	228.0	123.69	124.37	DC	3.48
100749758	235139	01AL&D6T	138.0	AP	235138	01AL 4J	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	151.0	140.76	141.7	DC	3.15
100749759	235139	01AL&D6T	138.0	AP	235138	01AL 4J	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	151.0	140.76	141.7	DC	3.15
100749638	235197	01KARNSC	138.0	AP	235152	01BUTLER	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	179.0	242.35	244.82	DC	4.42
100749639	235197	01KARNSC	138.0	AP	235152	01BUTLER	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	179.0	242.35	244.82	DC	4.42
100749675	235203	01KISSNG	138.0	AP	235197	01KARNSC	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	268.0	186.34	188.08	DC	4.67
100749676	235203	01KISSNG	138.0	AP	235197	01KARNSC	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	268.0	186.34	188.08	DC	4.67
100749764	235204	01KITTAN	138.0	AP	235139	01AL&D6T	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	151.0	136.67	137.61	DC	3.15
100749765	235204	01KITTAN	138.0	AP	235139	01AL&D6T	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	151.0	136.67	137.61	DC	3.15
100749682	235240	01COLMBGP N	138.0	AP	235202	01KISKIV	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	151.0	191.61	192.72	DC	3.73
100749683	235240	01COLMBGP N	138.0	AP	235202	01KISKIV	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	151.0	191.61	192.72	DC	3.73

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
100749667	235282	01GAR RN	138.0	AP	235240	01COLMBGP N	138.0	AP	1	PN-P1-2-PN-345-107T	operatio n	151.0	200.09	201.2	DC	3.73
100749668	235282	01GAR RN	138.0	AP	235240	01COLMBGP N	138.0	AP	1	ATSI-P1-2-CEI-345-700T	operatio n	151.0	200.09	201.2	DC	3.73
98875862	238547	02AT	345.0	ATSI	239036	02PERRY	345.0	ATSI	1	ATSI-P1-3-SYS-345-722	operatio n	1891.0	102.63	103.67	DC	19.57
152649881	960320	AF2-323 TAP	115.0	PENELE C	200920	26FRANKLN A	115.0	PENELE C	1	PN-P1-2-PN-345-001	operatio n	245.0	96.58	103.92	DC	17.98

13.5 Flow Gate Details - Secondary POI

The following indices contain additional information about each facility presented in the body of the report. For each index, a description of the flowgate and its contingency was included for convenience. The intent of the indices is to provide more details on which projects/generators have contributions to the flowgate in question. All New Service Queue Requests, through the end of the Queue under study, that are contributors to a flowgate will be listed in the indices. Please note that there may be contributors that are subsequently queued after the queue under study that are not listed in the indices. Although this information is not used "as is" for cost allocation purposes, it can be used to gage the impact of other projects/generators. It should be noted the project/generator MW contributions presented in the body of the report are Full MW Impact contributions which are also noted in the indices column named "Full MW Impact", whereas the loading percentages reported in the body of the report, take into consideration the PJM Generator Deliverability Test rules such as commercial probability of each project as well as the ramping impact of "Adder" contributions. The MW Impact found and used in the analysis is shown in the indices column named "Gendeliv MW Impact".

13.5.1 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
100749670	235282	01GAR RN	AP	235240	01COLMBGPN	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	173.89	175.37	DC	2.24

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200608	26PINEY #1	0.5470	80/20	0.5470
200642	26SENECA#1	2.5510	80/20	2.5510
200643	26SENECA#2	2.4093	80/20	2.4093
200644	26SENECA#3	0.2372	80/20	0.2372
200662	26SCRUB GR	1.3466	80/20	1.3466
200828	26HNSMLK 1	0.8468	80/20	0.8468
200829	26HNSMLK 2	0.8468	80/20	0.8468
200830	26HNSMLK 3	0.8468	80/20	0.8468
200831	26HNSMLK 4	0.8468	80/20	0.8468
200832	26HNSMLK 5	0.8468	80/20	0.8468
200849	26LAKVU GN	0.0656	80/20	0.0656
201201	26WRREN CT	0.6553	80/20	0.6553
201477	26Y2-055	1.9323	80/20	1.9323
235030	01MHNG-T155	0.2013	80/20	0.2013
235134	01AL&D6	0.1876	80/20	0.1876
915951	Y3-092 FTIR	79.4500	80/20	79.4500
922932	AB1-082 OP (Suspended)	0.8786	Adder	1.03
935191	AD1-154	1.4444	80/20	1.4444
938951	AE1-123	1.7696	80/20	1.7696
939291	AE1-160 C	1.1259	80/20	1.1259
940861	AE2-074 C	0.6671	Adder	0.78
941191	AE2-113 C	3.0287	Adder	3.56
941321	AE2-126 C	0.5457	Adder	0.64
942811	AE2-299 C	2.3709	80/20	2.3709
942961	AE2-316 C	4.2349	80/20	4.2349
943151	AE2-344 C	5.5745	80/20	5.5745
943351	AF1-006 C	0.9948	80/20	0.9948
944261	AF1-094 C	0.9748	80/20	0.9748
944281	AF1-096 C	1.0638	80/20	1.0638
944301	AF1-098 C	3.5746	80/20	3.5746
944321	AF1-100 C	6.4413	Adder	7.58
944381	AF1-103 O1	1.3330	80/20	1.3330
944391	AF1-104 O1	1.5832	80/20	1.5832
944881	AF1-153 C O1	0.8324	80/20	0.8324
944901	AF1-155 C	0.8386	80/20	0.8386
945021	AF1-167 C	0.9849	80/20	0.9849
945051	AF1-170 C	3.7079	80/20	3.7079
945121	AF1-177	0.3333	80/20	0.3333
945161	AF1-181	0.0343	Adder	0.04
945171	AF1-182	0.1716	Adder	0.2

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945451	AF1-210 C	1.2859	80/20	1.2859
945551	AF1-220 C	4.4314	Adder	5.21
945751	AF1-240 C O1	0.8666	80/20	0.8666
946111	AF1-276 C	3.2928	Adder	3.87
946121	AF1-277 C	3.2928	Adder	3.87
946131	AF1-278 C	2.6245	Adder	3.09
946221	AF1-287 C	0.9586	80/20	0.9586
946381	AF1-302 C	1.8493	80/20	1.8493
946401	AF1-304 C	5.4132	80/20	5.4132
946421	AF1-306 C	3.0393	80/20	3.0393
946771	AF1-217 C O2	0.9586	80/20	0.9586
957161	AF2-010 C	3.7531	80/20	3.7531
957571	AF2-051 C O2	2.8050	80/20	2.8050
957581	AF2-052 C	0.9313	Adder	2.07
957681	AF2-062 C	3.0814	Adder	6.84
957951	AF2-089 C	0.2925	80/20	0.2925
958031	AF2-097 C	0.2332	80/20	0.2332
958361	AF2-130 C	1.1454	80/20	1.1454
958731	AF2-164 C O2	4.3997	80/20	4.3997
958741	AF2-165 C	1.1075	80/20	1.1075
958751	AF2-166 C	1.1454	80/20	1.1454
958791	AF2-170 C	0.9499	80/20	0.9499
959441	AF2-235 C	0.5319	80/20	0.5319
959461	AF2-237 C	0.4874	80/20	0.4874
959521	AF2-243 C	0.8306	80/20	0.8306
960041	AF2-295 C	0.8386	80/20	0.8386
960321	AF2-323 C O2	2.2369	80/20	2.2369
960891	AF2-380 C	0.6152	80/20	0.6152
NEWTON	NEWTON	0.5072	Confirmed LTF	0.5072
FARMERCITY	FARMERCITY	0.0262	Confirmed LTF	0.0262
G-007A	G-007A	1.4529	Confirmed LTF	1.4529
VFT	VFT	4.0313	Confirmed LTF	4.0313
CALDERWOOD	CALDERWOOD	0.2107	Confirmed LTF	0.2107
PRAIRIE	PRAIRIE	1.1985	Confirmed LTF	1.1985
CHEOAH	CHEOAH	0.2112	Confirmed LTF	0.2112
EDWARDS	EDWARDS	0.1673	Confirmed LTF	0.1673
TILTON	TILTON	0.3018	Confirmed LTF	0.3018
MADISON	MADISON	0.0323	Confirmed LTF	0.0323
GIBSON	GIBSON	0.2593	Confirmed LTF	0.2593
BLUEG	BLUEG	0.8263	Confirmed LTF	0.8263
TRIMBLE	TRIMBLE	0.2655	Confirmed LTF	0.2655
CATAWBA	CATAWBA	0.1326	Confirmed LTF	0.1326

13.5.2 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
99582505	200593	26GLADE	PENELEC	200581	26FOREST	PENELEC	1	PN-P2-3-PN-230-26A1	breaker	615.0	99.86	100.09	DC	3.12

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200642	26SENECA#1	19.8221	50/50	19.8221
200643	26SENECA#2	18.7209	50/50	18.7209
200644	26SENECA#3	1.8433	50/50	1.8433
200849	26LAKVU GN	0.1181	50/50	0.1181
201201	26WRREN CT	3.9088	50/50	3.9088
201477	26Y2-055	11.5432	50/50	11.5432
235007	AC1-025 BAT	0.1766	50/50	0.1766
236828	01GRAYMONT	-0.4149	Adder	-0.49
915951	Y3-092 FTIR	81.8200	Merchant Transmission	81.8200
939171	AE1-147 C	-1.2517	Adder	-1.47
940681	AE2-055 C (Suspended)	-1.1883	Adder	-1.4
942811	AE2-299 C	4.0758	50/50	4.0758
942812	AE2-299 E	16.3034	50/50	16.3034
943151	AE2-344 C	7.3577	50/50	7.3577
943152	AE2-344 E	4.9051	50/50	4.9051
943351	AF1-006 C	1.5153	50/50	1.5153
943352	AF1-006 E	0.8523	50/50	0.8523
944261	AF1-094 C	1.2499	50/50	1.2499
944262	AF1-094 E	0.8333	50/50	0.8333
944301	AF1-098 C	9.0187	50/50	9.0187
944302	AF1-098 E	6.0125	50/50	6.0125
944381	AF1-103 O1	7.9510	50/50	7.9510
944391	AF1-104 O1	1.5750	Adder	1.85
944841	AF1-149 C	-1.2454	Adder	-1.47
944842	AF1-149 E	-0.8303	Adder	-0.98
945051	AF1-170 C	3.7750	Adder	4.44
945052	AF1-170 E	2.5167	Adder	2.96
945121	AF1-177	1.9877	50/50	1.9877
946111	AF1-276 C	32.8856	50/50	32.8856
946112	AF1-276 E	16.1974	50/50	16.1974
946121	AF1-277 C	32.8856	50/50	32.8856
946122	AF1-277 E	16.1974	50/50	16.1974
946131	AF1-278 C	26.2103	50/50	26.2103
946132	AF1-278 E	13.0364	50/50	13.0364
946221	AF1-287 C	1.2562	50/50	1.2562
946222	AF1-287 E	0.8374	50/50	0.8374
946423	AF1-306 BAT	54.0870	50/50	54.0870
946771	AF1-217 C O2	1.2562	50/50	1.2562
946772	AF1-217 E O2	0.8374	50/50	0.8374
957161	AF2-010 C	4.6814	50/50	4.6814
957162	AF2-010 E	3.1549	50/50	3.1549

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957571	AF2-051 C O2	1.0264	Adder	2.28
957572	AF2-051 E O2	0.5287	Adder	1.17
957681	AF2-062 C	58.8948	50/50	58.8948
957682	AF2-062 E	39.2632	50/50	39.2632
958031	AF2-097 C	0.3551	50/50	0.3551
958032	AF2-097 E	0.2368	50/50	0.2368
958791	AF2-170 C	0.5009	Adder	1.11
958792	AF2-170 E	0.3339	Adder	0.74
959461	AF2-237 C	0.6250	50/50	0.6250
959462	AF2-237 E	0.4166	50/50	0.4166
959803	AF2-271 BAT	0.0625	Merchant Transmission	0.0625
960023	AF2-293 BAT	0.1433	50/50	0.1433
960321	AF2-323 C O2	0.8420	Adder	1.87
960322	AF2-323 E O2	0.5614	Adder	1.25
WEC	WEC	0.2372	Confirmed LTF	0.2372
LGEE	LGEE	0.3948	Confirmed LTF	0.3948
CPL	CPL	0.1674	Confirmed LTF	0.1674
CBM-W2	CBM-W2	5.2252	Confirmed LTF	5.2252
NY	NY	0.8345	Confirmed LTF	0.8345
CBM-W1	CBM-W1	10.4333	Confirmed LTF	10.4333
TVA	TVA	0.7896	Confirmed LTF	0.7896
O-066	O-066	9.6768	Confirmed LTF	9.6768
CBM-S2	CBM-S2	1.9825	Confirmed LTF	1.9825
CBM-S1	CBM-S1	5.0098	Confirmed LTF	5.0098
G-007	G-007	1.4643	Confirmed LTF	1.4643
MEC	MEC	1.1266	Confirmed LTF	1.1266

13.5.3 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
111707308	200572	26EDINB S.	PENELEC	200567	26ERIE SO.	PENELEC	1	ATSI-P2-3-CEI-345-004D	breaker	185.0	118.79	124.08	DC	9.78

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
915951	Y3-092 FTIR	78.1800	Merchant Transmission	78.1800
942813	AE2-299 BAT	19.3088	50/50	19.3088
943151	AE2-344 C	33.9260	50/50	33.9260
943152	AE2-344 E	22.6173	50/50	22.6173
944382	AF1-103 BAT	1.4978	Merchant Transmission	1.4978
944391	AF1-104 O1	1.5201	Adder	1.79
945051	AF1-170 C	10.9187	50/50	10.9187
945052	AF1-170 E	7.2791	50/50	7.2791
946221	AF1-287 C	5.8433	50/50	5.8433
946222	AF1-287 E	3.8955	50/50	3.8955
946771	AF1-217 C O2	5.8433	50/50	5.8433
946772	AF1-217 E O2	3.8955	50/50	3.8955
957571	AF2-051 C O2	6.9673	50/50	6.9673
957572	AF2-051 E O2	3.5892	50/50	3.5892
958731	AF2-164 C O2	1.1443	Adder	2.54
958732	AF2-164 E O2	0.7629	Adder	1.69
958791	AF2-170 C	0.4834	Adder	1.07
958792	AF2-170 E	0.3223	Adder	0.72
960321	AF2-323 C O2	5.8695	50/50	5.8695
960322	AF2-323 E O2	3.9130	50/50	3.9130
WEC	WEC	0.0230	Confirmed LTF	0.0230
LGEE	LGEE	0.0416	Confirmed LTF	0.0416
CPL	CPL	0.0384	Confirmed LTF	0.0384
CBM-W2	CBM-W2	0.5815	Confirmed LTF	0.5815
NY	NY	0.4463	Confirmed LTF	0.4463
CBM-W1	CBM-W1	0.9007	Confirmed LTF	0.9007
TVA	TVA	0.0966	Confirmed LTF	0.0966
O-066	O-066	0.9408	Confirmed LTF	0.9408
CBM-S2	CBM-S2	0.3584	Confirmed LTF	0.3584
CBM-S1	CBM-S1	0.5964	Confirmed LTF	0.5964
G-007	G-007	0.1352	Confirmed LTF	0.1352
MEC	MEC	0.1144	Confirmed LTF	0.1144

13.5.4 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
98875536	200599	26ERIE W	PENELEC	238547	02AT	ATSI	1	PN-P2-3-PN-230-14FT	breaker	1900.0	118.19	119.27	DC	20.53

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200830	26HNSMLK 3	3.4563	50/50	3.4563
200831	26HNSMLK 4	3.4563	50/50	3.4563
200832	26HNSMLK 5	3.4563	50/50	3.4563
200849	26LAKVU GN	0.4529	50/50	0.4529
200894	26K02	8.4123	Adder	9.9
200898	26AA1-106	2.8992	Adder	3.41
201201	26WRREN CT	3.6957	50/50	3.6957
201477	26Y2-055	10.8930	50/50	10.8930
203999	P-047 E	11.9860	Adder	14.1
235003	AC1-025 E	0.2666	Adder	0.31
236828	01GRAYMONT	0.7137	Adder	0.84
290086	Q-036 E	5.6838	Adder	6.69
915951	Y3-092 FTIR	594.9200	50/50	594.9200
916202	Z1-069 E	10.0540	Adder	11.83
919491	AA2-000	78.4581	Adder	92.3
920341	AA2-132 (Suspended)	2.8025	Adder	3.3
922932	AB1-082 OP (Suspended)	3.9065	Adder	4.6
923443	AB1-160 E	2.8726	Adder	3.38
930511	AB1-092	2.8808	Adder	3.39
935191	AD1-154	3.4605	Adder	4.07
936421	AD2-055	5.9310	Adder	6.98
936991	AD2-133 C	2.5577	Adder	3.01
936992	AD2-133 E	11.6986	Adder	13.76
938951	AE1-123	3.7161	Adder	4.37
939171	AE1-147 C	2.1424	Adder	2.52
939172	AE1-147 E	1.4283	Adder	1.68
939291	AE1-160 C	4.8230	50/50	4.8230
939292	AE1-160 E	2.7722	50/50	2.7722
940201	AE2-001 C	2.1417	Adder	2.52
940202	AE2-001 E	1.4278	Adder	1.68
940681	AE2-055 C (Suspended)	2.1306	Adder	2.51
940682	AE2-055 E (Suspended)	1.4204	Adder	1.67
940861	AE2-074 C	2.9662	Adder	3.49
940862	AE2-074 E	3.9046	Adder	4.59
941191	AE2-113 C	13.1530	Adder	15.47
941192	AE2-113 E	14.1615	Adder	16.66
941261	AE2-120 C	2.1413	Adder	2.52
941262	AE2-120 E	1.4275	Adder	1.68
941271	AE2-121 C	1.1398	Adder	1.34
941272	AE2-121 E	0.7610	Adder	0.9
941321	AE2-126 C	2.3030	Adder	2.71

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
941322	AE2-126 E	1.5353	Adder	1.81
941331	AE2-129 C	1.8780	Adder	2.21
941332	AE2-129 E	1.2520	Adder	1.47
941351	AE2-131 C	1.8780	Adder	2.21
941352	AE2-131 E	1.2520	Adder	1.47
941421	AE2-139 C	8.3248	Adder	9.79
941422	AE2-139 E	5.5499	Adder	6.53
942351	AE2-248 C	1.7081	Adder	2.01
942352	AE2-248 E	1.1388	Adder	1.34
942491	AE2-262 C	9.0806	Adder	10.68
942492	AE2-262 E	6.1021	Adder	7.18
942501	AE2-263 C	8.5357	Adder	10.04
942502	AE2-263 E	5.6990	Adder	6.7
942811	AE2-299 C	16.0387	50/50	16.0387
942812	AE2-299 E	64.1549	50/50	64.1549
942961	AE2-316 C	7.6181	Adder	8.96
942962	AE2-316 E	10.8635	Adder	12.78
943151	AE2-344 C	36.0362	50/50	36.0362
943152	AE2-344 E	24.0242	50/50	24.0242
943351	AF1-006 C	6.8928	50/50	6.8928
943352	AF1-006 E	3.8772	50/50	3.8772
943751	AF1-043	17.7929	Adder	20.93
944001	AF1-068 C O1	2.2761	Adder	2.68
944002	AF1-068 E O1	1.2803	Adder	1.51
944181	AF1-086 C O1	2.9036	Adder	3.42
944182	AF1-086 E O1	12.6322	Adder	14.86
944261	AF1-094 C	5.6024	50/50	5.6024
944262	AF1-094 E	3.7350	50/50	3.7350
944281	AF1-096 C	4.5571	50/50	4.5571
944282	AF1-096 E	3.0381	50/50	3.0381
944301	AF1-098 C	23.4566	50/50	23.4566
944302	AF1-098 E	15.6378	50/50	15.6378
944311	AF1-099 C	13.7843	Adder	16.22
944312	AF1-099 E	9.1895	Adder	10.81
944321	AF1-100 C	27.5795	Adder	32.45
944322	AF1-100 E	18.3863	Adder	21.63
944381	AF1-103 O1	7.5176	50/50	7.5176
944391	AF1-104 O1	11.4266	50/50	11.4266
944411	AF1-106 O1	2.9752	Adder	3.5
944471	AF1-112 C	2.2788	Adder	2.68
944472	AF1-112 E	1.2818	Adder	1.51
944671	AF1-132 C O1	2.1330	Adder	2.51
944672	AF1-132 E O1	1.4220	Adder	1.67
944691	AF1-134 C O1	1.8657	Adder	2.19
944692	AF1-134 E O1	1.2438	Adder	1.46
944771	AF1-142 C	22.0548	Adder	25.95
944772	AF1-142 E	14.7032	Adder	17.3
944841	AF1-149 C	2.1413	Adder	2.52
944842	AF1-149 E	1.4275	Adder	1.68
944881	AF1-153 C O1	2.3452	Adder	2.76
944882	AF1-153 E O1	1.5635	Adder	1.84
944901	AF1-155 C	2.3435	Adder	2.76

Bus #	Bus	Gendoliv MW Impact	Type	Full MW Impact
944902	AF1-155 E	1.5623	Adder	1.84
945021	AF1-167 C	1.3694	Adder	1.61
945022	AF1-167 E	0.9146	Adder	1.08
945051	AF1-170 C	25.3434	50/50	25.3434
945052	AF1-170 E	16.8956	50/50	16.8956
945121	AF1-177	1.8794	50/50	1.8794
945161	AF1-181	0.1471	Adder	0.17
945171	AF1-182	0.7357	Adder	0.87
945181	AF1-183	0.1792	Adder	0.21
945331	AF1-198	0.3825	Adder	0.45
945451	AF1-210 C	1.4950	Adder	1.76
945452	AF1-210 E	0.9967	Adder	1.17
945491	AF1-214 C	2.1413	Adder	2.52
945492	AF1-214 E	1.4275	Adder	1.68
945551	AF1-220 C	18.5733	Adder	21.85
945552	AF1-220 E	12.3890	Adder	14.58
945751	AF1-240 C O1	2.0763	Adder	2.44
945752	AF1-240 E O1	1.3842	Adder	1.63
946111	AF1-276 C	15.5200	Adder	18.26
946112	AF1-276 E	7.6442	Adder	8.99
946121	AF1-277 C	15.5200	Adder	18.26
946122	AF1-277 E	7.6442	Adder	8.99
946131	AF1-278 C	12.3697	Adder	14.55
946132	AF1-278 E	6.1524	Adder	7.24
946211	AF1-286 C O1	1.2049	Adder	1.42
946212	AF1-286 E O1	0.8182	Adder	0.96
946221	AF1-287 C	6.1589	50/50	6.1589
946222	AF1-287 E	4.1059	50/50	4.1059
946381	AF1-302 C	3.3267	Adder	3.91
946382	AF1-302 E	4.4356	Adder	5.22
946401	AF1-304 C	18.4294	Adder	21.68
946402	AF1-304 E	12.2862	Adder	14.45
946421	AF1-306 C	10.0002	Adder	11.76
946422	AF1-306 E	40.0008	Adder	47.06
946771	AF1-217 C O2	6.1589	50/50	6.1589
946772	AF1-217 E O2	4.1059	50/50	4.1059
957161	AF2-010 C	21.2856	50/50	21.2856
957162	AF2-010 E	14.3446	50/50	14.3446
957451	AF2-039 C	0.7479	Adder	1.66
957452	AF2-039 E	0.4986	Adder	1.11
957571	AF2-051 C O2	15.2995	50/50	15.2995
957572	AF2-051 E O2	7.8815	50/50	7.8815
957581	AF2-052 C	4.1393	Adder	9.19
957582	AF2-052 E	2.0137	Adder	4.47
957681	AF2-062 C	14.3135	Adder	31.77
957682	AF2-062 E	9.5423	Adder	21.18
957941	AF2-088 C	0.3601	Adder	0.8
957942	AF2-088 E	0.2401	Adder	0.53
957951	AF2-089 C	1.2532	50/50	1.2532
957952	AF2-089 E	0.6456	50/50	0.6456
958031	AF2-097 C	1.6155	50/50	1.6155
958032	AF2-097 E	1.0770	50/50	1.0770

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
958271	AF2-121 C	0.9954	Adder	2.21
958272	AF2-121 E	0.6636	Adder	1.47
958361	AF2-130 C	1.5562	Adder	3.45
958362	AF2-130 E	1.0375	Adder	2.3
958731	AF2-164 C O2	18.0638	50/50	18.0638
958732	AF2-164 E O2	12.0426	50/50	12.0426
958741	AF2-165 C	1.8376	Adder	4.08
958742	AF2-165 E	1.2250	Adder	2.72
958751	AF2-166 C	1.5562	Adder	3.45
958752	AF2-166 E	1.0375	Adder	2.3
958791	AF2-170 C	6.8560	50/50	6.8560
958792	AF2-170 E	4.5706	50/50	4.5706
959441	AF2-235 C	2.2786	50/50	2.2786
959442	AF2-235 E	1.5190	50/50	1.5190
959461	AF2-237 C	2.8012	50/50	2.8012
959462	AF2-237 E	1.8675	50/50	1.8675
959471	AF2-238 C	0.9336	Adder	2.07
959472	AF2-238 E	0.6224	Adder	1.38
959491	AF2-240 C	0.8515	Adder	1.89
959492	AF2-240 E	0.7253	Adder	1.61
959501	AF2-241 C	0.8909	Adder	1.98
959502	AF2-241 E	0.6859	Adder	1.52
959521	AF2-243 C	1.3782	Adder	3.06
959522	AF2-243 E	0.9188	Adder	2.04
959741	AF2-265 C	0.6691	Adder	1.49
959742	AF2-265 E	0.4979	Adder	1.11
959802	AF2-271 E	0.2138	Adder	0.47
959822	AF2-273 E	0.3180	Adder	0.71
960022	AF2-293 E	0.1104	Adder	0.25
960031	AF2-294 C	0.8957	Adder	1.99
960032	AF2-294 E	0.5971	Adder	1.33
960041	AF2-295 C	1.2420	Adder	2.76
960042	AF2-295 E	0.8280	Adder	1.84
960051	AF2-296 C	0.9888	Adder	2.19
960052	AF2-296 E	0.6592	Adder	1.46
960321	AF2-323 C O2	12.3198	50/50	12.3198
960322	AF2-323 E O2	8.2132	50/50	8.2132
961141	AF2-405	0.7884	Adder	1.75
961151	AF2-406	5.9131	Adder	13.13
961201	AF2-411 O2	24.6527	Adder	54.72
961211	AF2-412 O2	10.6893	Adder	23.73
NEWTON	NEWTON	3.5544	Confirmed LTF	3.5544
FARMERCITY	FARMERCITY	0.1826	Confirmed LTF	0.1826
G-007A	G-007A	9.6356	Confirmed LTF	9.6356
VFT	VFT	26.4257	Confirmed LTF	26.4257
CALDERWOOD	CALDERWOOD	1.2336	Confirmed LTF	1.2336
PRAIRIE	PRAIRIE	8.2449	Confirmed LTF	8.2449
CHEOAH	CHEOAH	1.2322	Confirmed LTF	1.2322
EDWARDS	EDWARDS	1.2211	Confirmed LTF	1.2211
TILTON	TILTON	2.1647	Confirmed LTF	2.1647
MADISON	MADISON	0.1089	Confirmed LTF	0.1089
GIBSON	GIBSON	1.8100	Confirmed LTF	1.8100

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
BLUEG	BLUEG	5.6559	Confirmed LTF	5.6559
TRIMBLE	TRIMBLE	1.8164	Confirmed LTF	1.8164
CATAWBA	CATAWBA	0.6643	Confirmed LTF	0.6643

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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
99582115	200795	26SHELOCTA	PENELEC	200810	26KEYSTONE	PENELEC	1	ATSI-P2-3-CEI-345-004D	breaker	917.0	192.4	192.87	DC	9.36

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 O2	3.2400	50/50	3.2400
957002	AF2-001 E O2	2.1600	50/50	2.1600
957011	AF2-002 C O2	1.6200	50/50	1.6200
957012	AF2-002 E O2	1.0800	50/50	1.0800
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 O2	3.1694	Adder	7.04
957572	AF2-051 E O2	1.6327	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 O2	4.9910	Adder	11.08
958732	AF2-164 E O2	3.3274	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 O2	2.5762	Adder	5.72
959062	AF2-197 E O2	3.8643	Adder	8.58
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 O2	2.5303	Adder	5.62
960322	AF2-323 E O2	1.6869	Adder	3.74
960391	AF2-330 C	5.5322	Adder	12.28
960392	AF2-330 E	2.4196	Adder	5.37
960451	AF2-336 C O2	1.3962	Adder	3.1
960452	AF2-336 E O2	0.9308	Adder	2.07
960461	AF2-337 C O2	1.3962	Adder	3.1
960462	AF2-337 E O2	0.9308	Adder	2.07
960471	AF2-338 C O2	1.3962	Adder	3.1
960472	AF2-338 E O2	0.9308	Adder	2.07
960481	AF2-339 C O2	1.3962	Adder	3.1
960482	AF2-339 E O2	0.9308	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 O2	26.4962	Adder	58.82
961211	AF2-412 O2	12.3074	Adder	27.32
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

13.5.6 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
100749464	235121	01ARMSTR	AP	235204	01KITTAN	AP	1	ATSI-P2-3-CEI-345-004D	breaker	228.0	126.77	127.48	DC	3.58

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
201477	26Y2-055	1.4142	Adder	1.66
915951	Y3-092 FTIR	83.1700	Merchant Transmission	83.1700
935191	AD1-154	1.1485	Adder	1.35
938951	AE1-123	1.3755	Adder	1.62
939291	AE1-160 C	0.8690	Adder	1.02
939292	AE1-160 E	0.4995	Adder	0.59
941191	AE2-113 C	2.7563	Adder	3.24
941192	AE2-113 E	2.9676	Adder	3.49
942811	AE2-299 C	1.6486	Adder	1.94
942812	AE2-299 E	6.5944	Adder	7.76
942961	AE2-316 C	3.3523	Adder	3.94
942962	AE2-316 E	4.7805	Adder	5.62
943151	AE2-344 C	4.3397	Adder	5.11
943152	AE2-344 E	2.8931	Adder	3.4
943351	AF1-006 C	0.7667	Adder	0.9
943352	AF1-006 E	0.4313	Adder	0.51
944261	AF1-094 C	0.7193	Adder	0.85
944262	AF1-094 E	0.4795	Adder	0.56
944281	AF1-096 C	0.8211	Adder	0.97
944282	AF1-096 E	0.5474	Adder	0.64
944301	AF1-098 C	2.5561	Adder	3.01
944302	AF1-098 E	1.7041	Adder	2.0
944381	AF1-103 O1	0.9755	Adder	1.15
944391	AF1-104 O1	1.3449	Adder	1.58
944881	AF1-153 C O1	0.6446	Adder	0.76
944882	AF1-153 E O1	0.4298	Adder	0.51
944901	AF1-155 C	0.6493	Adder	0.76
944902	AF1-155 E	0.4329	Adder	0.51
945021	AF1-167 C	0.5074	Adder	0.6
945022	AF1-167 E	0.3389	Adder	0.4
945051	AF1-170 C	3.0501	Adder	3.59
945052	AF1-170 E	2.0334	Adder	2.39
945121	AF1-177	0.2439	Adder	0.29
945551	AF1-220 C	4.0423	Adder	4.76
945552	AF1-220 E	2.6964	Adder	3.17
945751	AF1-240 C O1	0.6891	Adder	0.81
945752	AF1-240 E O1	0.4594	Adder	0.54
946111	AF1-276 C	2.9648	Adder	3.49
946112	AF1-276 E	1.4603	Adder	1.72
946121	AF1-277 C	2.9648	Adder	3.49
946122	AF1-277 E	1.4603	Adder	1.72

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
946131	AF1-278 C	2.3630	Adder	2.78
946132	AF1-278 E	1.1753	Adder	1.38
946221	AF1-287 C	0.7457	Adder	0.88
946222	AF1-287 E	0.4971	Adder	0.58
946381	AF1-302 C	1.4639	Adder	1.72
946382	AF1-302 E	1.9519	Adder	2.3
946401	AF1-304 C	4.2131	Adder	4.96
946402	AF1-304 E	2.8087	Adder	3.3
946421	AF1-306 C	2.3546	Adder	2.77
946422	AF1-306 E	9.4186	Adder	11.08
946771	AF1-217 C O2	0.7458	Adder	0.88
946772	AF1-217 E O2	0.4972	Adder	0.58
957161	AF2-010 C	1.4713	Adder	3.27
957162	AF2-010 E	0.9916	Adder	2.2
957571	AF2-051 C O2	1.2149	Adder	2.7
957572	AF2-051 E O2	0.6259	Adder	1.39
957581	AF2-052 C	0.8474	Adder	1.88
957582	AF2-052 E	0.4123	Adder	0.92
957681	AF2-062 C	2.7857	Adder	6.18
957682	AF2-062 E	1.8571	Adder	4.12
957951	AF2-089 C	0.1197	Adder	0.27
957952	AF2-089 E	0.0617	Adder	0.14
958031	AF2-097 C	0.0952	Adder	0.21
958032	AF2-097 E	0.0635	Adder	0.14
958361	AF2-130 C	0.4746	Adder	1.05
958362	AF2-130 E	0.3164	Adder	0.7
958731	AF2-164 C O2	1.9485	Adder	4.33
958732	AF2-164 E O2	1.2990	Adder	2.88
958741	AF2-165 C	0.4639	Adder	1.03
958742	AF2-165 E	0.3093	Adder	0.69
958751	AF2-166 C	0.4746	Adder	1.05
958752	AF2-166 E	0.3164	Adder	0.7
958791	AF2-170 C	0.4277	Adder	0.95
958792	AF2-170 E	0.2851	Adder	0.63
959441	AF2-235 C	0.2176	Adder	0.48
959442	AF2-235 E	0.1451	Adder	0.32
959461	AF2-237 C	0.1906	Adder	0.42
959462	AF2-237 E	0.1271	Adder	0.28
959521	AF2-243 C	0.3479	Adder	0.77
959522	AF2-243 E	0.2319	Adder	0.51
960041	AF2-295 C	0.3441	Adder	0.76
960042	AF2-295 E	0.2294	Adder	0.51
960321	AF2-323 C O2	0.9672	Adder	2.15
960322	AF2-323 E O2	0.6448	Adder	1.43
960891	AF2-380 C	0.2033	Adder	0.45
960892	AF2-380 E	0.1356	Adder	0.3
NEWTON	NEWTON	0.4835	Confirmed LTF	0.4835
FARMERCITY	FARMERCITY	0.0249	Confirmed LTF	0.0249
G-007A	G-007A	1.4433	Confirmed LTF	1.4433
VFT	VFT	3.9990	Confirmed LTF	3.9990
CALDERWOOD	CALDERWOOD	0.2013	Confirmed LTF	0.2013
PRAIRIE	PRAIRIE	1.1443	Confirmed LTF	1.1443

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CHEOAH	CHEOAH	0.2017	Confirmed LTF	0.2017
EDWARDS	EDWARDS	0.1596	Confirmed LTF	0.1596
TILTON	TILTON	0.2873	Confirmed LTF	0.2873
MADISON	MADISON	0.0302	Confirmed LTF	0.0302
GIBSON	GIBSON	0.2473	Confirmed LTF	0.2473
BLUEG	BLUEG	0.7881	Confirmed LTF	0.7881
TRIMBLE	TRIMBLE	0.2527	Confirmed LTF	0.2527
CATAWBA	CATAWBA	0.1267	Confirmed LTF	0.1267

13.5.7 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
100749761	235139	01AL&D6T	AP	235138	01AL 4J	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	127.61	128.87	DC	1.89

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200608	26PINEY #1	0.4639	80/20	0.4639
200642	26SENECA#1	2.1929	80/20	2.1929
200643	26SENECA#2	2.0711	80/20	2.0711
200644	26SENECA#3	0.2039	80/20	0.2039
200662	26SCRUB GR	1.1398	80/20	1.1398
200828	26HNSMLK 1	0.7131	80/20	0.7131
200829	26HNSMLK 2	0.7131	80/20	0.7131
200830	26HNSMLK 3	0.7131	80/20	0.7131
200831	26HNSMLK 4	0.7131	80/20	0.7131
200832	26HNSMLK 5	0.7131	80/20	0.7131
200849	26LAKVU GN	0.0557	80/20	0.0557
201201	26WRREN CT	0.5611	80/20	0.5611
201477	26Y2-055	1.6547	80/20	1.6547
235030	01MHNG-T155	0.1745	80/20	0.1745
235134	01AL&D6	0.5254	80/20	0.5254
915951	Y3-092 FTIR	67.2000	80/20	67.2000
935191	AD1-154	1.2744	80/20	1.2744
938951	AE1-123	1.5007	80/20	1.5007
939291	AE1-160 C	0.9540	80/20	0.9540
942811	AE2-299 C	2.0144	80/20	2.0144
942961	AE2-316 C	3.5387	80/20	3.5387
943151	AE2-344 C	4.7210	80/20	4.7210
943351	AF1-006 C	0.8433	80/20	0.8433
944261	AF1-094 C	0.8266	80/20	0.8266
944281	AF1-096 C	0.9014	80/20	0.9014
944301	AF1-098 C	3.0379	80/20	3.0379
944381	AF1-103 O1	1.1414	80/20	1.1414
944391	AF1-104 O1	1.3400	80/20	1.3400
944881	AF1-153 C O1	0.7111	80/20	0.7111
944901	AF1-155 C	0.7162	80/20	0.7162
945021	AF1-167 C	0.8314	80/20	0.8314
945051	AF1-170 C	3.1388	80/20	3.1388
945121	AF1-177	0.2853	80/20	0.2853
945451	AF1-210 C	1.0966	80/20	1.0966
945751	AF1-240 C O1	0.7646	80/20	0.7646
946111	AF1-276 C	2.8532	Adder	3.36
946121	AF1-277 C	2.8532	Adder	3.36
946131	AF1-278 C	2.2740	Adder	2.68
946221	AF1-287 C	0.8118	80/20	0.8118
946381	AF1-302 C	1.5453	80/20	1.5453
946401	AF1-304 C	4.5858	80/20	4.5858

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
946421	AF1-306 C	2.6144	80/20	2.6144
946771	AF1-217 C O2	0.8118	80/20	0.8118
957161	AF2-010 C	3.1818	80/20	3.1818
957571	AF2-051 C O2	2.3711	80/20	2.3711
957951	AF2-089 C	0.2479	80/20	0.2479
958031	AF2-097 C	0.1976	80/20	0.1976
958361	AF2-130 C	0.9708	80/20	0.9708
958731	AF2-164 C O2	3.7051	80/20	3.7051
958741	AF2-165 C	0.9378	80/20	0.9378
958751	AF2-166 C	0.9708	80/20	0.9708
958791	AF2-170 C	0.8040	80/20	0.8040
959441	AF2-235 C	0.4507	80/20	0.4507
959461	AF2-237 C	0.4133	80/20	0.4133
959521	AF2-243 C	0.7033	80/20	0.7033
960041	AF2-295 C	0.7162	80/20	0.7162
960321	AF2-323 C O2	1.8910	80/20	1.8910
960891	AF2-380 C	0.5394	80/20	0.5394
NEWTON	NEWTON	0.4577	Confirmed LTF	0.4577
FARMERCITY	FARMERCITY	0.0236	Confirmed LTF	0.0236
G-007A	G-007A	1.4265	Confirmed LTF	1.4265
VFT	VFT	3.9474	Confirmed LTF	3.9474
CALDERWOOD	CALDERWOOD	0.1918	Confirmed LTF	0.1918
PRAIRIE	PRAIRIE	1.0823	Confirmed LTF	1.0823
CHEOAH	CHEOAH	0.1927	Confirmed LTF	0.1927
EDWARDS	EDWARDS	0.1505	Confirmed LTF	0.1505
TILTON	TILTON	0.2715	Confirmed LTF	0.2715
MADISON	MADISON	0.0282	Confirmed LTF	0.0282
GIBSON	GIBSON	0.2337	Confirmed LTF	0.2337
BLUEG	BLUEG	0.7447	Confirmed LTF	0.7447
TRIMBLE	TRIMBLE	0.2393	Confirmed LTF	0.2393
CATAWBA	CATAWBA	0.1218	Confirmed LTF	0.1218

13.5.8 Index 8

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
100749641	235197	01KARNSC	AP	235152	01BUTLER	AP	1	ATSI-P1-2-CEI-345-700T	single	179.0	186.94	188.42	DC	2.65

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200608	26PINEY #1	0.8922	80/20	0.8922
200642	26SENECA#1	3.0462	80/20	3.0462
200643	26SENECA#2	2.8770	80/20	2.8770
200644	26SENECA#3	0.2833	80/20	0.2833
200662	26SCRUB GR	1.8889	80/20	1.8889
200805	26COLVER13 (Deactivation : 01/09/2020)	6.3056	Adder	7.42
200828	26HNSMLK 1	0.9116	80/20	0.9116
200829	26HNSMLK 2	0.9116	80/20	0.9116
200830	26HNSMLK 3	0.9116	80/20	0.9116
200831	26HNSMLK 4	0.9116	80/20	0.9116
200832	26HNSMLK 5	0.9116	80/20	0.9116
200849	26LAKVU GN	0.0766	80/20	0.0766
201201	26WRREN CT	0.7776	80/20	0.7776
201477	26Y2-055	2.2930	80/20	2.2930
235030	01MHNG-T155	0.1791	80/20	0.1791
915951	Y3-092 FTIR	91.2200	80/20	91.2200
919491	AA2-000	22.6449	Adder	26.64
922932	AB1-082 OP (Suspended)	1.0362	Adder	1.22
930511	AB1-092	0.8315	Adder	0.98
935191	AD1-154	2.3920	80/20	2.3920
936421	AD2-055	1.7118	Adder	2.01
936991	AD2-133 C	0.7902	Adder	0.93
938951	AE1-123	2.8859	80/20	2.8859
939171	AE1-147 C	0.5295	Adder	0.62
939291	AE1-160 C	1.5718	80/20	1.5718
940201	AE2-001 C	0.5281	Adder	0.62
940861	AE2-074 C	0.7868	Adder	0.93
941191	AE2-113 C	3.6593	Adder	4.31
941261	AE2-120 C	0.5273	Adder	0.62
941271	AE2-121 C	0.2828	Adder	0.33
941321	AE2-126 C	0.6930	Adder	0.82
941331	AE2-129 C	0.5788	Adder	0.68
941351	AE2-131 C	0.5788	Adder	0.68
942351	AE2-248 C	0.4127	Adder	0.49
942491	AE2-262 C	2.4939	Adder	2.93
942501	AE2-263 C	2.3443	Adder	2.76
942811	AE2-299 C	2.7680	80/20	2.7680
942961	AE2-316 C	4.4555	80/20	4.4555
943151	AE2-344 C	6.5510	80/20	6.5510

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
943351	AF1-006 C	1.1625	80/20	1.1625
943751	AF1-043	5.1354	Adder	6.04
944001	AF1-068 C O1	0.5476	Adder	0.64
944181	AF1-086 C O1	1.1364	Adder	1.34
944261	AF1-094 C	1.2332	80/20	1.2332
944281	AF1-096 C	1.4851	80/20	1.4851
944301	AF1-098 C	4.2053	80/20	4.2053
944311	AF1-099 C	3.7857	Adder	4.45
944321	AF1-100 C	8.1587	Adder	9.6
944381	AF1-103 O1	1.5818	80/20	1.5818
944391	AF1-104 O1	1.8308	80/20	1.8308
944471	AF1-112 C	0.5528	Adder	0.65
944671	AF1-132 C O1	0.5118	Adder	0.6
944691	AF1-134 C O1	0.6550	Adder	0.77
944771	AF1-142 C	6.0572	Adder	7.13
944841	AF1-149 C	0.5272	Adder	0.62
944881	AF1-153 C O1	1.0910	80/20	1.0910
944901	AF1-155 C	1.1012	80/20	1.1012
945021	AF1-167 C	1.5298	80/20	1.5298
945051	AF1-170 C	4.3199	80/20	4.3199
945121	AF1-177	0.3954	80/20	0.3954
945161	AF1-181	0.0435	Adder	0.05
945171	AF1-182	0.2177	Adder	0.26
945181	AF1-183	0.0540	Adder	0.06
945451	AF1-210 C	1.7315	80/20	1.7315
945491	AF1-214 C	0.5273	Adder	0.62
945551	AF1-220 C	5.5158	Adder	6.49
945751	AF1-240 C O1	1.4352	80/20	1.4352
946111	AF1-276 C	3.8840	Adder	4.57
946121	AF1-277 C	3.8840	Adder	4.57
946131	AF1-278 C	3.0956	Adder	3.64
946221	AF1-287 C	1.1272	80/20	1.1272
946381	AF1-302 C	1.9456	80/20	1.9456
946401	AF1-304 C	7.6914	80/20	7.6914
946421	AF1-306 C	3.7793	80/20	3.7793
946771	AF1-217 C O2	1.1272	80/20	1.1272
957161	AF2-010 C	4.7734	80/20	4.7734
957451	AF2-039 C	0.2300	Adder	0.51
957571	AF2-051 C O2	3.3290	80/20	3.3290
957581	AF2-052 C	1.1083	Adder	2.46
957681	AF2-062 C	3.6269	Adder	8.05
957941	AF2-088 C	0.1108	Adder	0.25
957951	AF2-089 C	0.4084	80/20	0.4084
958031	AF2-097 C	0.2725	80/20	0.2725
958271	AF2-121 C	0.3068	Adder	0.68
958361	AF2-130 C	1.7730	80/20	1.7730
958731	AF2-164 C O2	4.7410	80/20	4.7410
958741	AF2-165 C	1.5952	80/20	1.5952
958751	AF2-166 C	1.7730	80/20	1.7730
958791	AF2-170 C	1.0985	80/20	1.0985
959441	AF2-235 C	0.7426	80/20	0.7426
959461	AF2-237 C	0.6166	80/20	0.6166

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959521	AF2-243 C	1.1964	80/20	1.1964
960041	AF2-295 C	1.1012	80/20	1.1012
960051	AF2-296 C	0.3472	Adder	0.77
960211	AF2-312 C	0.2597	Adder	0.58
960321	AF2-323 C O2	2.6532	80/20	2.6532
960891	AF2-380 C	3.6915	80/20	3.6915
961211	AF2-412 O2	2.9370	Adder	6.52
NEWTON	NEWTON	0.6780	Confirmed LTF	0.6780
FARMERCITY	FARMERCITY	0.0348	Confirmed LTF	0.0348
G-007A	G-007A	1.8077	Confirmed LTF	1.8077
VFT	VFT	5.0052	Confirmed LTF	5.0052
CALDERWOOD	CALDERWOOD	0.2664	Confirmed LTF	0.2664
PRAIRIE	PRAIRIE	1.5911	Confirmed LTF	1.5911
CHEOAH	CHEOAH	0.2668	Confirmed LTF	0.2668
EDWARDS	EDWARDS	0.2258	Confirmed LTF	0.2258
TILTON	TILTON	0.4057	Confirmed LTF	0.4057
MADISON	MADISON	0.0504	Confirmed LTF	0.0504
GIBSON	GIBSON	0.3467	Confirmed LTF	0.3467
BLUEG	BLUEG	1.1006	Confirmed LTF	1.1006
TRIMBLE	TRIMBLE	0.3534	Confirmed LTF	0.3534
CATAWBA	CATAWBA	0.1596	Confirmed LTF	0.1596

13.5.9 Index 9

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
100749678	235203	01KISSNG	AP	235197	01KARNSC	AP	1	PN-P1-2-PN-345-107T	single	268.0	144.31	145.36	DC	2.8

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200608	26PINEY #1	0.9413	80/20	0.9413
200642	26SENECA#1	3.2162	80/20	3.2162
200643	26SENECA#2	3.0375	80/20	3.0375
200644	26SENECA#3	0.2991	80/20	0.2991
200662	26SCRUB GR	1.9930	80/20	1.9930
200805	26COLVER13 (Deactivation : 01/09/2020)	6.6656	Adder	7.84
200828	26HNSMLK 1	0.9618	80/20	0.9618
200829	26HNSMLK 2	0.9618	80/20	0.9618
200830	26HNSMLK 3	0.9618	80/20	0.9618
200831	26HNSMLK 4	0.9618	80/20	0.9618
200832	26HNSMLK 5	0.9618	80/20	0.9618
200849	26LAKVU GN	0.0808	80/20	0.0808
201201	26WRREN CT	0.8210	80/20	0.8210
201477	26Y2-055	2.4209	80/20	2.4209
915951	Y3-092 FTIR	96.2500	80/20	96.2500
919491	AA2-000	23.9357	Adder	28.16
922932	AB1-082 OP (Suspended)	1.0952	Adder	1.29
930511	AB1-092	0.8788	Adder	1.03
935191	AD1-154	2.5250	80/20	2.5250
936421	AD2-055	1.8094	Adder	2.13
936991	AD2-133 C	0.8358	Adder	0.98
938951	AE1-123	3.0449	80/20	3.0449
939171	AE1-147 C	0.5599	Adder	0.66
939291	AE1-160 C	1.6584	80/20	1.6584
940201	AE2-001 C	0.5584	Adder	0.66
940681	AE2-055 C (Suspended)	0.5365	Adder	0.63
940861	AE2-074 C	0.8316	Adder	0.98
941191	AE2-113 C	3.8652	Adder	4.55
941261	AE2-120 C	0.5576	Adder	0.66
941271	AE2-121 C	0.2990	Adder	0.35
941321	AE2-126 C	0.7320	Adder	0.86
941331	AE2-129 C	0.6120	Adder	0.72
941351	AE2-131 C	0.6120	Adder	0.72
942351	AE2-248 C	0.4366	Adder	0.51
942491	AE2-262 C	2.6354	Adder	3.1
942501	AE2-263 C	2.4773	Adder	2.91
942811	AE2-299 C	2.9216	80/20	2.9216
942961	AE2-316 C	4.6978	80/20	4.6978
943151	AE2-344 C	6.9131	80/20	6.9131

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
943351	AF1-006 C	1.2268	80/20	1.2268
943751	AF1-043	5.4282	Adder	6.39
944001	AF1-068 C O1	0.5791	Adder	0.68
944181	AF1-086 C O1	1.2012	Adder	1.41
944261	AF1-094 C	1.3013	80/20	1.3013
944281	AF1-096 C	1.5670	80/20	1.5670
944301	AF1-098 C	4.4381	80/20	4.4381
944311	AF1-099 C	4.0006	Adder	4.71
944321	AF1-100 C	8.6190	Adder	10.14
944381	AF1-103 O1	1.6700	80/20	1.6700
944391	AF1-104 O1	1.9318	80/20	1.9318
944471	AF1-112 C	0.5846	Adder	0.69
944671	AF1-132 C O1	0.5414	Adder	0.64
944691	AF1-134 C O1	0.6922	Adder	0.81
944771	AF1-142 C	6.4009	Adder	7.53
944841	AF1-149 C	0.5575	Adder	0.66
944881	AF1-153 C O1	1.1507	80/20	1.1507
944901	AF1-155 C	1.1615	80/20	1.1615
945021	AF1-167 C	1.4654	80/20	1.4654
945051	AF1-170 C	4.5584	80/20	4.5584
945121	AF1-177	0.4175	80/20	0.4175
945161	AF1-181	0.0460	Adder	0.05
945171	AF1-182	0.2300	Adder	0.27
945181	AF1-183	0.0571	Adder	0.07
945331	AF1-198	0.1099	Adder	0.13
945451	AF1-210 C	1.3130	80/20	1.3130
945491	AF1-214 C	0.5577	Adder	0.66
945551	AF1-220 C	5.8245	Adder	6.85
945751	AF1-240 C O1	1.5150	80/20	1.5150
946111	AF1-276 C	4.1027	Adder	4.83
946121	AF1-277 C	4.1027	Adder	4.83
946131	AF1-278 C	3.2699	Adder	3.85
946221	AF1-287 C	1.1894	80/20	1.1894
946381	AF1-302 C	2.0515	80/20	2.0515
946401	AF1-304 C	8.1156	80/20	8.1156
946421	AF1-306 C	3.9889	80/20	3.9889
946771	AF1-217 C O2	1.1894	80/20	1.1894
957161	AF2-010 C	5.0365	80/20	5.0365
957451	AF2-039 C	0.2431	Adder	0.54
957571	AF2-051 C O2	3.5125	80/20	3.5125
957581	AF2-052 C	1.1710	Adder	2.6
957681	AF2-062 C	3.8318	Adder	8.51
957941	AF2-088 C	0.1170	Adder	0.26
957951	AF2-089 C	0.4309	80/20	0.4309
958031	AF2-097 C	0.2875	80/20	0.2875
958271	AF2-121 C	0.3244	Adder	0.72
958361	AF2-130 C	1.8707	80/20	1.8707
958731	AF2-164 C O2	5.0021	80/20	5.0021
958741	AF2-165 C	1.6831	80/20	1.6831
958751	AF2-166 C	1.8707	80/20	1.8707
958791	AF2-170 C	1.1591	80/20	1.1591
959441	AF2-235 C	0.7835	80/20	0.7835

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959461	AF2-237 C	0.6506	80/20	0.6506
959521	AF2-243 C	1.2623	80/20	1.2623
960041	AF2-295 C	1.1615	80/20	1.1615
960051	AF2-296 C	0.3669	Adder	0.81
960211	AF2-312 C	0.2747	Adder	0.61
960321	AF2-323 C O2	2.7995	80/20	2.7995
961201	AF2-411 O2	7.0805	Adder	15.72
961211	AF2-412 O2	3.1075	Adder	6.9
NEWTON	NEWTON	0.7307	Confirmed LTF	0.7307
FARMERCITY	FARMERCITY	0.0375	Confirmed LTF	0.0375
G-007A	G-007A	1.9683	Confirmed LTF	1.9683
VFT	VFT	5.4438	Confirmed LTF	5.4438
CALDERWOOD	CALDERWOOD	0.2858	Confirmed LTF	0.2858
PRAIRIE	PRAIRIE	1.7151	Confirmed LTF	1.7151
CHEOAH	CHEOAH	0.2863	Confirmed LTF	0.2863
EDWARDS	EDWARDS	0.2439	Confirmed LTF	0.2439
TILTON	TILTON	0.4378	Confirmed LTF	0.4378
MADISON	MADISON	0.0544	Confirmed LTF	0.0544
GIBSON	GIBSON	0.3740	Confirmed LTF	0.3740
BLUEG	BLUEG	1.1874	Confirmed LTF	1.1874
TRIMBLE	TRIMBLE	0.3812	Confirmed LTF	0.3812
CATAWBA	CATAWBA	0.1708	Confirmed LTF	0.1708

13.5.10 Index 10

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
100749767	235204	01KITTAN	AP	235139	01AL&D6T	AP	1	PN-P1-2-PN-345-107T	single	151.0	123.54	124.79	DC	1.89

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200608	26PINEY #1	0.4641	80/20	0.4641
200642	26SENECA#1	2.1946	80/20	2.1946
200643	26SENECA#2	2.0726	80/20	2.0726
200644	26SENECA#3	0.2041	80/20	0.2041
200662	26SCRUB GR	1.1404	80/20	1.1404
200828	26HNSMLK 1	0.7134	80/20	0.7134
200829	26HNSMLK 2	0.7134	80/20	0.7134
200830	26HNSMLK 3	0.7134	80/20	0.7134
200831	26HNSMLK 4	0.7134	80/20	0.7134
200832	26HNSMLK 5	0.7134	80/20	0.7134
200849	26LAKVU GN	0.0557	80/20	0.0557
201201	26WRREN CT	0.5615	80/20	0.5615
201477	26Y2-055	1.6559	80/20	1.6559
235030	01MHNG-T155	0.1745	80/20	0.1745
915951	Y3-092 FTIR	67.2400	80/20	67.2400
935191	AD1-154	1.2752	80/20	1.2752
938951	AE1-123	1.5014	80/20	1.5014
939291	AE1-160 C	0.9544	80/20	0.9544
942811	AE2-299 C	2.0157	80/20	2.0157
942961	AE2-316 C	3.5404	80/20	3.5404
943151	AE2-344 C	4.7231	80/20	4.7231
943351	AF1-006 C	0.8436	80/20	0.8436
944261	AF1-094 C	0.8269	80/20	0.8269
944281	AF1-096 C	0.9018	80/20	0.9018
944301	AF1-098 C	3.0398	80/20	3.0398
944381	AF1-103 O1	1.1422	80/20	1.1422
944391	AF1-104 O1	1.3406	80/20	1.3406
944881	AF1-153 C O1	0.7116	80/20	0.7116
944901	AF1-155 C	0.7165	80/20	0.7165
945021	AF1-167 C	0.8317	80/20	0.8317
945051	AF1-170 C	3.1401	80/20	3.1401
945121	AF1-177	0.2856	80/20	0.2856
945451	AF1-210 C	1.0970	80/20	1.0970
945751	AF1-240 C O1	0.7651	80/20	0.7651
946111	AF1-276 C	2.8549	Adder	3.36
946121	AF1-277 C	2.8549	Adder	3.36
946131	AF1-278 C	2.2754	Adder	2.68
946221	AF1-287 C	0.8122	80/20	0.8122
946381	AF1-302 C	1.5460	80/20	1.5460
946401	AF1-304 C	4.5882	80/20	4.5882
946421	AF1-306 C	2.6164	80/20	2.6164

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
946771	AF1-217 C O2	0.8122	80/20	0.8122
957161	AF2-010 C	3.1837	80/20	3.1837
957571	AF2-051 C O2	2.3724	80/20	2.3724
957951	AF2-089 C	0.2480	80/20	0.2480
958031	AF2-097 C	0.1977	80/20	0.1977
958361	AF2-130 C	0.9713	80/20	0.9713
958731	AF2-164 C O2	3.7066	80/20	3.7066
958741	AF2-165 C	0.9383	80/20	0.9383
958751	AF2-166 C	0.9713	80/20	0.9713
958791	AF2-170 C	0.8044	80/20	0.8044
959441	AF2-235 C	0.4509	80/20	0.4509
959461	AF2-237 C	0.4135	80/20	0.4135
959521	AF2-243 C	0.7037	80/20	0.7037
960041	AF2-295 C	0.7165	80/20	0.7165
960321	AF2-323 C O2	1.8918	80/20	1.8918
960891	AF2-380 C	0.5396	80/20	0.5396
NEWTON	NEWTON	0.4545	Confirmed LTF	0.4545
FARMERCITY	FARMERCITY	0.0234	Confirmed LTF	0.0234
G-007A	G-007A	1.4337	Confirmed LTF	1.4337
VFT	VFT	3.9667	Confirmed LTF	3.9667
CALDERWOOD	CALDERWOOD	0.1904	Confirmed LTF	0.1904
PRAIRIE	PRAIRIE	1.0745	Confirmed LTF	1.0745
CHEOAH	CHEOAH	0.1912	Confirmed LTF	0.1912
EDWARDS	EDWARDS	0.1494	Confirmed LTF	0.1494
TILTON	TILTON	0.2696	Confirmed LTF	0.2696
MADISON	MADISON	0.0282	Confirmed LTF	0.0282
GIBSON	GIBSON	0.2321	Confirmed LTF	0.2321
BLUEG	BLUEG	0.7395	Confirmed LTF	0.7395
TRIMBLE	TRIMBLE	0.2376	Confirmed LTF	0.2376
CATAWBA	CATAWBA	0.1207	Confirmed LTF	0.1207

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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
100749685	235240	01COLMBGPN	AP	235202	01KISKIV	AP	1	ATSI-P1-2-CEI-345-700T	single	151.0	165.41	166.89	DC	2.24

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200608	26PINEY #1	0.5470	80/20	0.5470
200642	26SENECA#1	2.5510	80/20	2.5510
200643	26SENECA#2	2.4093	80/20	2.4093
200644	26SENECA#3	0.2372	80/20	0.2372
200662	26SCRUB GR	1.3466	80/20	1.3466
200828	26HNSMLK 1	0.8468	80/20	0.8468
200829	26HNSMLK 2	0.8468	80/20	0.8468
200830	26HNSMLK 3	0.8468	80/20	0.8468
200831	26HNSMLK 4	0.8468	80/20	0.8468
200832	26HNSMLK 5	0.8468	80/20	0.8468
200849	26LAKVU GN	0.0656	80/20	0.0656
201201	26WRREN CT	0.6553	80/20	0.6553
201477	26Y2-055	1.9323	80/20	1.9323
235030	01MHNG-T155	0.2013	80/20	0.2013
235134	01AL&D6	0.1876	80/20	0.1876
915951	Y3-092 FTIR	79.4500	80/20	79.4500
922932	AB1-082 OP (Suspended)	0.8786	Adder	1.03
935191	AD1-154	1.4444	80/20	1.4444
938951	AE1-123	1.7696	80/20	1.7696
939291	AE1-160 C	1.1259	80/20	1.1259
940861	AE2-074 C	0.6671	Adder	0.78
941191	AE2-113 C	3.0287	Adder	3.56
941321	AE2-126 C	0.5457	Adder	0.64
942811	AE2-299 C	2.3709	80/20	2.3709
942961	AE2-316 C	4.2349	80/20	4.2349
943151	AE2-344 C	5.5745	80/20	5.5745
943351	AF1-006 C	0.9948	80/20	0.9948
944261	AF1-094 C	0.9748	80/20	0.9748
944281	AF1-096 C	1.0638	80/20	1.0638
944301	AF1-098 C	3.5746	80/20	3.5746
944321	AF1-100 C	6.4413	Adder	7.58
944381	AF1-103 O1	1.3330	80/20	1.3330
944391	AF1-104 O1	1.5832	80/20	1.5832
944881	AF1-153 C O1	0.8324	80/20	0.8324
944901	AF1-155 C	0.8386	80/20	0.8386
945021	AF1-167 C	0.9849	80/20	0.9849
945051	AF1-170 C	3.7079	80/20	3.7079
945121	AF1-177	0.3333	80/20	0.3333
945161	AF1-181	0.0343	Adder	0.04
945171	AF1-182	0.1716	Adder	0.2

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945451	AF1-210 C	1.2859	80/20	1.2859
945551	AF1-220 C	4.4314	Adder	5.21
945751	AF1-240 C O1	0.8666	80/20	0.8666
946111	AF1-276 C	3.2928	Adder	3.87
946121	AF1-277 C	3.2928	Adder	3.87
946131	AF1-278 C	2.6245	Adder	3.09
946221	AF1-287 C	0.9586	80/20	0.9586
946381	AF1-302 C	1.8493	80/20	1.8493
946401	AF1-304 C	5.4132	80/20	5.4132
946421	AF1-306 C	3.0393	80/20	3.0393
946771	AF1-217 C O2	0.9586	80/20	0.9586
957161	AF2-010 C	3.7531	80/20	3.7531
957571	AF2-051 C O2	2.8050	80/20	2.8050
957581	AF2-052 C	0.9313	Adder	2.07
957681	AF2-062 C	3.0814	Adder	6.84
957951	AF2-089 C	0.2925	80/20	0.2925
958031	AF2-097 C	0.2332	80/20	0.2332
958361	AF2-130 C	1.1454	80/20	1.1454
958731	AF2-164 C O2	4.3997	80/20	4.3997
958741	AF2-165 C	1.1075	80/20	1.1075
958751	AF2-166 C	1.1454	80/20	1.1454
958791	AF2-170 C	0.9499	80/20	0.9499
959441	AF2-235 C	0.5319	80/20	0.5319
959461	AF2-237 C	0.4874	80/20	0.4874
959521	AF2-243 C	0.8306	80/20	0.8306
960041	AF2-295 C	0.8386	80/20	0.8386
960321	AF2-323 C O2	2.2369	80/20	2.2369
960891	AF2-380 C	0.6152	80/20	0.6152
NEWTON	NEWTON	0.5072	Confirmed LTF	0.5072
FARMERCITY	FARMERCITY	0.0262	Confirmed LTF	0.0262
G-007A	G-007A	1.4529	Confirmed LTF	1.4529
VFT	VFT	4.0313	Confirmed LTF	4.0313
CALDERWOOD	CALDERWOOD	0.2107	Confirmed LTF	0.2107
PRAIRIE	PRAIRIE	1.1985	Confirmed LTF	1.1985
CHEOAH	CHEOAH	0.2112	Confirmed LTF	0.2112
EDWARDS	EDWARDS	0.1673	Confirmed LTF	0.1673
TILTON	TILTON	0.3018	Confirmed LTF	0.3018
MADISON	MADISON	0.0323	Confirmed LTF	0.0323
GIBSON	GIBSON	0.2593	Confirmed LTF	0.2593
BLUEG	BLUEG	0.8263	Confirmed LTF	0.8263
TRIMBLE	TRIMBLE	0.2655	Confirmed LTF	0.2655
CATAWBA	CATAWBA	0.1326	Confirmed LTF	0.1326

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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
101322576	943150	AE2-344 TAP	PENELEC	200572	26EDINB S.	PENELEC	1	ATSI-P2-3-CEI-345-004D	breaker	179.0	125.3	130.4	DC	9.12

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
915951	Y3-092 FTIR	77.2200	Merchant Transmission	77.2200
942813	AE2-299 BAT	18.6240	50/50	18.6240
943151	AE2-344 C	34.8193	50/50	34.8193
943152	AE2-344 E	23.2129	50/50	23.2129
944382	AF1-103 BAT	1.4446	Merchant Transmission	1.4446
944391	AF1-104 O1	1.5292	Adder	1.8
945051	AF1-170 C	10.9968	50/50	10.9968
945052	AF1-170 E	7.3312	50/50	7.3312
957571	AF2-051 C O2	6.5013	50/50	6.5013
957572	AF2-051 E O2	3.3492	50/50	3.3492
958731	AF2-164 C O2	1.1080	Adder	2.46
958732	AF2-164 E O2	0.7387	Adder	1.64
958791	AF2-170 C	0.4863	Adder	1.08
958792	AF2-170 E	0.3242	Adder	0.72
960321	AF2-323 C O2	5.4730	50/50	5.4730
960322	AF2-323 E O2	3.6487	50/50	3.6487
WEC	WEC	0.0220	Confirmed LTF	0.0220
LGEE	LGEE	0.0399	Confirmed LTF	0.0399
CPL	CPL	0.0370	Confirmed LTF	0.0370
CBM-W2	CBM-W2	0.5569	Confirmed LTF	0.5569
NY	NY	0.4302	Confirmed LTF	0.4302
CBM-W1	CBM-W1	0.8632	Confirmed LTF	0.8632
TVA	TVA	0.0924	Confirmed LTF	0.0924
O-066	O-066	0.9072	Confirmed LTF	0.9072
CBM-S2	CBM-S2	0.3410	Confirmed LTF	0.3410
CBM-S1	CBM-S1	0.5708	Confirmed LTF	0.5708
G-007	G-007	0.1310	Confirmed LTF	0.1310
MEC	MEC	0.1096	Confirmed LTF	0.1096

13.6 Contingency Descriptions - Secondary POI

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
ATSI-P1-3-SYS-345-722	CONTINGENCY 'ATSI-P1-3-SYS-345-722' /* TRAN 02S8-ATT 345 TO 02ASH_3 138 CK 8 DISCONNECT BRANCH FROM BUS 239082 TO BUS 238544 CKT 8 /* 02S8-ATT 345 02ASH_3 138 END
PN-P2-4-PN-230-14GT	CONTINGENCY 'PN-P2-4-PN-230-14GT' /* LEWISTOWN STUCK 230KV BUS TIE BREAKER DISCONNECT BRANCH FROM BUS 200513 TO BUS 235248 CKT 1 /* 26LEWISTWN 230 01SHINGL 230 DISCONNECT BRANCH FROM BUS 200513 TO BUS 200517 CKT 1 /* 26LEWISTWN 230 26RAYSTOWN 230 DISCONNECT BRANCH FROM BUS 200513 TO BUS 200512 TO BUS 200548 CKT 1/* 26LEWISTWN 230 26LEWISTWN 115 26LEWISTWN 46.00 DISCONNECT BRANCH FROM BUS 200513 TO BUS 200512 TO BUS 200548 CKT 2/* 26LEWISTWN 230 26LEWISTWN 115 26LEWISTWN 46.00 DISCONNECT BRANCH FROM BUS 200513 TO BUS 200512 CKT 3 /* 26LEWISTWN 230 26LEWISTWN 115 DISCONNECT BRANCH FROM BUS 200513 TO BUS 200531 CKT 1 /* 26LEWISTWN 230 26YEAGRTWN 230 DISCONNECT BRANCH FROM BUS 200513 TO BUS 200531 CKT 2 /* 26LEWISTWN 230 26YEAGRTWN 230 DISCONNECT BRANCH FROM BUS 200513 TO BUS 208005 CKT 1 /* 26LEWISTWN 230 JUNI BU2 230 REDUCE BUS 200513 SHUNT BY 100 PERCENT /* 26LEWISTWN 230 END

Contingency Name	Contingency Definition
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
AP-P1-2-WP-138-087	CONTINGENCY 'AP-P1-2-WP-138-087' /* ALLEGHENY DAM - BRACKENRIDGE - SPRINGSDALE 138KV DISCONNECT BRANCH FROM BUS 235131 TO BUS 235825 CKT 1 /* 01BRACKENRDG 138 01ALL L4T 138 DISCONNECT BRANCH FROM BUS 235825 TO BUS 235132 CKT 1 /* 01ALL L4T 138 01AL 4 DISCONNECT BRANCH FROM BUS 235138 TO BUS 235825 CKT 1 /* 01AL 4J 138 01ALL L4T 138 DISCONNECT BRANCH FROM BUS 235138 TO BUS 235256 CKT 1 /* 01AL 4J 138 01SPGDL 138 DISCONNECT BRANCH FROM BUS 235138 TO BUS 235139 CKT 1 /* 01AL 4J 138 01AL&D6T 138 END
ATSI-P1-1-CEI-345-711	CONTINGENCY 'ATSI-P1-1-CEI-345-711' /* GEN 02PERRG1 22.0 UNIT 1 REMOVE MACHINE 1 FROM BUS 239035 /* 02PERRG1 22 END
PN-P1-2-PN-345-001	CONTINGENCY 'PN-P1-2-PN-345-001' /* ERIE WEST - WAYNE 345KV DISCONNECT BRANCH FROM BUS 200599 TO BUS 200595 CKT 1 /* 26ERIE W 345 26WAYNE 345 END
PN-P2-3-PN-230-14CT	CONTINGENCY 'PN-P2-3-PN-230-14CT' /* LEWISTOWN STUCK 230KV BREAKER - SHINGLETOWN DISCONNECT BRANCH FROM BUS 200513 TO BUS 200517 CKT 1 /* 26LEWISTWN 230 26RAYSTOWN 230 DISCONNECT BRANCH FROM BUS 200513 TO BUS 235248 CKT 1 /* 26LEWISTWN 230 01SHINGL 230 DISCONNECT BRANCH FROM BUS 200513 TO BUS 200531 CKT 2 /* 26LEWISTWN 230 26YEAGRTWN 230 DISCONNECT BRANCH FROM BUS 200513 TO BUS 200512 TO BUS 200548 CKT 2/* 26LEWISTWN 230 26LEWISTWN 115 26LEWISTWN 46.00 DISCONNECT BRANCH FROM BUS 200513 TO BUS 200512 CKT 3 /* 26LEWISTWN 230 26LEWISTWN 115 END
Base Case	

Contingency Name	Contingency Definition
PN-P2-3-PN-230-26B2	CONTINGENCY 'PN-P2-3-PN-230-26B2' /* PIERCE BROOK 230KV SB (115 XFMR/LEWIS RUN) DISCONNECT BRANCH FROM BUS 200943 TO BUS 200944 CKT 2 /* 26PIERCEBRK 230 26PIERCEBRK 115 DISCONNECT BRANCH FROM BUS 200943 TO BUS 957680 CKT 1 /* 26PIERCEBRK 230 AF1-278 TAP 230 END
PN-P2-3-PN-230-14FT	CONTINGENCY 'PN-P2-3-PN-230-14FT' /* LEWISTOWN STUCK 230KV BREAKER B34 (YEAGERTWON #2) DISCONNECT BRANCH FROM BUS 200513 TO BUS 200517 CKT 1 /* 26LEWISTWN 230 26RAYSTOWN 230 DISCONNECT BRANCH FROM BUS 200513 TO BUS 235248 CKT 1 /* 26LEWISTWN 230 01SHINGL 230 DISCONNECT BRANCH FROM BUS 200513 TO BUS 200531 CKT 2 /* 26LEWISTWN 230 26YEAGRTWN 230 DISCONNECT BRANCH FROM BUS 200513 TO BUS 200512 TO BUS 200548 CKT 2/* 26LEWISTWN 230 26LEWISTWN 115 26LEWISTWN 46.00 DISCONNECT BRANCH FROM BUS 200531 TO BUS 200550 CKT 2 /* 26YEAGRTWN 230 26YEAGRTWN 46 DISCONNECT BRANCH FROM BUS 200513 TO BUS 200512 CKT 3 /* 26LEWISTWN 230 26LEWISTWN 115 END
PN-P2-3-PN-230-26A1	CONTINGENCY 'PN-P2-3-PN-230-26A1' /* PIERCE BROOK 230KV SB (345 XFMR/115 XFMR) DISCONNECT BRANCH FROM BUS 200943 TO BUS 200942 CKT 1 /* 26PIERCEBRK 230 26PIERCEBRK 345 DISCONNECT BRANCH FROM BUS 200943 TO BUS 200944 CKT 2 /* 26PIERCEBRK 230 26PIERCEBRK 115 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-P2-3-PN-230-26A2	CONTINGENCY 'PN-P2-3-PN-230-26A2' /* PIERCE BROOK 230KV SB (345 XFMR/LEWIS RN) DISCONNECT BRANCH FROM BUS 200943 TO BUS 200942 CKT 1 /* 26PIERCEBRK 230 26PIERCEBRK 345 DISCONNECT BRANCH FROM BUS 957680 TO BUS 200943 CKT 1 /* AF1-278 TAP 230 26PIERCEBRK 230 END

14 Affected Systems

14.1 NYISO

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