Generation Interconnection

Feasibility Study Report

for

Queue Project AF2-310

JENNINGS-HOYES ROAD 34.5 KV

20 MW Capacity / 20 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 APS.

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.

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3 General

The Interconnection Customer (IC), has proposed a Solar; Storage generating facility. The installed facilities will have a total capability of 20 MW with 20 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is November 30, 2022. This study does not imply a TO commitment to this in-service date.

Queue Number	**AF2-310**
Project Name	JENNINGS-HOYES ROAD 34.5 KV
State	Undetermined
County	Undetermined
Transmission Owner	APS
MFO	20
MWE	20
MWC	20
Fuel	Solar; Storage
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.

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4 Point of Interconnection (POI)

4.1 Primary POI

The interconnection of the project at the Primary POI will be accomplished by tapping the Jennings – Hoyes Rd. 34.5 kV line and constructing a one span tap. The transmission line tap will be located approximately 6.5 miles from Jennings Substation. The IC will be responsible for acquiring all easements, properties, and permits that may be required to construct both the new interconnection line tap and the associated Attachment Facilities. The project will also require Non-Direct Connection upgrades at Jennings Substation and Hoyes Road Substation.

Attachment 1 shows a one-line diagram of the proposed primary Direct Connection facilities for the AF2-310 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.

4.2 Secondary POI

The interconnection of the project at a Secondary POI can be accomplished by constructing a new 138 kV three (3) breaker ring bus substation and looping the Carlos Jct. - Garrett 138 kV line into the new station. The new substation would be located approximately 5 miles from Garrett Substation. A full scope of work or estimated cost is not provided for the proposed Secondary POI.

5 Cost Summary

The AF2-310 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$2,511,000
Total System Network Upgrade Costs	$20,701,800[1]
Total Costs	$23,212,800

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

[1] This project currently contributes overloads of the Transmission System (see Summer Peak Load Flow Analysis section below) and therefore has potential to have cost allocation for the system reinforcement 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.

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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.

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6 Transmission Owner Scope of Work

The interconnection of the project at the Primary POI will be accomplished by tapping the Jennings – Hoyes Rd. 34.5 kV line and constructing a one span tap. The transmission line tap will be located approximately 6.5 miles from Jennings Substation. The IC will be responsible for acquiring all easements, properties, and permits that may be required to construct both the new interconnection line tap and the associated Attachment Facilities. The project will also require Non-Direct Connection upgrades at Jennings Substation and Hoyes Road Substation.

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

Description	Total Cost
Construct a one span 34.5 kV tap into the interconnection customer's substation	$520,000
Install FE owned 34.5 kV metering in the interconnection customer's substation	$260,000
Construct a tap and install 34.5 kV switches on the Jennings - Garrett 34.5 kV line	$961,000
Upgrade relaying at Jennings substation	$385,000
Upgrade relaying at Garrett substation	$385,000
Total Physical Interconnection Costs	$2,511,000

7 Schedule

Based on the scope of work for the interconnection facilities, it is expected to take a minimum of **24 months** to complete the installation after the signing of an Interconnection Construction Service Agreement and holding the construction kick-off call. This assumes that there will be no environmental issues with any of the new properties associated with this project, that there will be no delays in acquiring the necessary permits for implementing the defined direct connection and network upgrades, and that all transmission system outages will be allowed when requested.

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 report**Error! Bookmark not defined.**.

8 Transmission Owner Analysis

FE performed an analysis of its underlying transmission <100 kV system. The AF2-310 project did not contribute to any overloads on the FE transmission system.

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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 34.5 kV circuit breaker to protect the AF2-310 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 AF2-310 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 system.

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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:

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

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11 Summer Peak - Load Flow Analysis - Primary POI

The Queue Project AF2-310 was evaluated as a 20.0 MW (Capacity 20.0 MW) injection at the Jennings 34.5 kV substation in the APS area. Project AF2-310 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-310 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

11.1 Generation Deliverability

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

None

11.2 Multiple Facility Contingency

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

None

11.3 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONTNAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
10073669 1	235449	01CARLOS	138.0	AP	237310	01DANSMTN	138.0	AP	1	AP-P2-3-MP-138-150	breaker	182.0	114.36	115.61	DC	2.26
10073670 9	235469	01GARRET	138.0	AP	235449	01CARLOS	138.0	AP	1	AP-P2-3-MP-138-150	breaker	206.0	108.75	109.79	DC	2.15

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

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Request, a subsequent analysis will be performed which shall study all overload conditions associated with the overloaded element(s) identified.

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
100737042	235297	01HAZELT	138.0	AP	235305	01 106 J	138.0	AP	1	235504 01RIDGLY 138 940460 AE2-030 TAP 138 1	operation	311.0	100.92	107.35	DC	20.0
100736994	235305	01 106 J	138.0	AP	235120	01ALBRIG	138.0	AP	1	235504 01RIDGLY 138 940460 AE2-030 TAP 138 1	operation	186.0	116.8	122.25	DC	10.13
100737051	235468	01FROSTB	138.0	AP	940460	AE2-030 TAP	138.0	AP	1	AP-P1-2-WP-138-071-B	operation	306.0	100.25	106.79	DC	20.0
100737052	235468	01FROSTB	138.0	AP	940460	AE2-030 TAP	138.0	AP	1	235478 01JENING 138 235297 01HAZELT 138 1	operation	306.0	100.25	106.79	DC	20.0
100737030	235478	01JENING	138.0	AP	235297	01HAZELT	138.0	AP	1	235504 01RIDGLY 138 940460 AE2-030 TAP 138 1	operation	311.0	104.43	110.86	DC	20.0
100737067	235484	01MESSCK	138.0	AP	235490	01MORGAN	138.0	AP	1	AP-P1-2-WP-500-013	operation	228.0	99.78	100.91	DC	2.58
100737024	235504	01RIDGLY	138.0	AP	235484	01MESSCK	138.0	AP	1	AP-P1-2-WP-500-013	operation	229.0	107.25	108.37	DC	2.58
100737017	940460	AE2-030 TAP	138.0	AP	235504	01RIDGLY	138.0	AP	1	AP-P1-2-WP-138-071-B	operation	306.0	106.13	112.67	DC	20.0
100737018	940460	AE2-030 TAP	138.0	AP	235504	01RIDGLY	138.0	AP	1	235478 01JENING 138 235297 01HAZELT 138 1	operation	306.0	106.13	112.67	DC	20.0

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11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
100736691	1	**01CARLOS 138.0 kV - 01DANSMTN 138.0 kV Ckt 1**	**APS** **n4655 (541) : Reconfigure Albright 138 kV SS to breaker-and-a-half layout** **Project Type : CON** **Cost : $20,701,800** **Time Estimate : 30.0 Months**	$20,701,800
100736709	2	**01GARRET 138.0 kV - 01CARLOS 138.0 kV Ckt 1**		
N/A	N/A	**01GARRET 138.0 kV -AD1-068 TAP 138.0 kV Ckt 1**	**Note: The AF2-310 queue project has a dependency on a PJM upgrade which was not included. The impact of this PJM upgrade on AF2-310 will be evaluated in the impact study phase.**	TBD
N/A	N/A	**01RIDGLY 138.0 kV - 01HAMPS2 138.0 kV Ckt 1**	**Note: The AF2-310 queue project has a dependency on a PJM upgrade which was not included. The impact of this PJM upgrade on AF2-310 will be evaluated in the impact study phase.**	TBD
			TOTAL COST	**$20,701,800**

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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
100736691	235449	01CARLOS	AP	237310	01DANSMTN	AP	1	AP-P2-3-MP-138-150	breaker	182.0	114.36	115.61	DC	2.26

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.3913	50/50	0.3913
200834	26SW_E13_K22	0.0415	50/50	0.0415
200835	26DSGENWIN	0.3958	50/50	0.3958
200840	26DEEPCRK1	0.9037	50/50	0.9037
200841	26DEEPCRK2	0.9037	50/50	0.9037
200864	K-013 E	1.4244	Adder	1.68
200889	26STNY CRK	0.1934	50/50	0.1934
200890	26BF_G21_K23	0.1941	50/50	0.1941
200891	26CSLMN_L13	0.3045	50/50	0.3045
200892	26LOOKOUT	0.2892	50/50	0.2892
202225	26SCI_S29B	0.0645	50/50	0.0645
202652	26RGH_Y1-033	0.2825	50/50	0.2825
235013	01AB1-065 C	0.4298	50/50	0.4298
235532	AA1-100 BAT	1.2453	50/50	1.2453
292350	K-023	7.2587	50/50	7.2587
292542	L-013 1	7.0602	50/50	7.0602
293432	R-040 E	0.3971	50/50	0.3971
293902	O-048 E	6.3541	50/50	6.3541
294903	P-060 E	4.4843	50/50	4.4843

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
913142	Y1-033 E OP1	11.1865	50/50	11.1865
917672	Z2-108 E	3.9713	50/50	3.9713
923971	AB2-038	-0.4042	Adder	-0.48
924001	AB2-041 C	-0.3560	Adder	-0.42
924002	AB2-041 E	-1.5108	Adder	-1.78
930262	**AB1-065 E (Suspended)**	**4.1324**	**50/50**	**4.1324**
933951	**AD1-018 C (Suspended)**	**1.4566**	**50/50**	**1.4566**
933952	**AD1-018 E (Suspended)**	**2.3766**	**50/50**	**2.3766**
934441	AD1-068 C	7.1457	50/50	7.1457
934442	AD1-068 E	41.4647	50/50	41.4647
938351	AE1-053	2.2063	50/50	2.2063
938881	AE1-116	0.6014	50/50	0.6014
938991	AE1-128 C	4.4658	Adder	5.25
938992	AE1-128 E	2.9772	Adder	3.5
942901	AE2-309 C	3.1109	50/50	3.1109
942902	AE2-309 E	0.5938	50/50	0.5938
943301	AF1-001 C	3.9501	50/50	3.9501
943302	AF1-001 E	4.4059	50/50	4.4059
943711	AF1-039 C O1	2.9594	50/50	2.9594
943712	AF1-039 E O1	1.9729	50/50	1.9729
944781	AF1-143 C	13.2378	50/50	13.2378
944782	AF1-143 E	7.0602	50/50	7.0602
945671	AF1-232 C O2	12.0827	50/50	12.0827
945672	AF1-232 E O2	6.5061	50/50	6.5061
946081	AF1-273 C O1	5.7742	50/50	5.7742
946082	AF1-273 E O1	3.8495	50/50	3.8495
946571	AF1-321 C O1	0.7348	Adder	0.86
946572	AF1-321 E O1	0.4899	Adder	0.58
957001	AF2-001 C O1	0.3894	Adder	0.86
957002	AF2-001 E O1	0.2596	Adder	0.58
957011	AF2-002 C O1	0.1947	Adder	0.43
957012	AF2-002 E O1	0.1298	Adder	0.29
957981	AF2-092 C	0.2212	Adder	0.49
957982	AF2-092 E	0.1475	Adder	0.33
958101	AF2-104 C	0.3207	50/50	0.3207
958102	AF2-104 E	0.2138	50/50	0.2138
958411	AF2-135 C	0.6619	50/50	0.6619
958412	AF2-135 E	0.4413	50/50	0.4413
958471	AF2-141	1.7650	50/50	1.7650
959792	AF2-270 E	0.1223	Adder	0.27
960192	AF2-310 BAT	2.2642	50/50	2.2642
960451	AF2-336 C O1	0.3687	Adder	0.82
960452	AF2-336 E O1	0.2458	Adder	0.55
960461	AF2-337 C O1	0.3687	Adder	0.82
960462	AF2-337 E O1	0.2458	Adder	0.55
960471	AF2-338 C O1	0.3687	Adder	0.82
960472	AF2-338 E O1	0.2458	Adder	0.55
960481	AF2-339 C O1	0.3687	Adder	0.82
960482	AF2-339 E O1	0.2458	Adder	0.55
960901	AF2-381 C	2.6735	Adder	5.93
960902	AF2-381 E	1.4069	Adder	3.12
NEWTON	NEWTON	0.1279	Confirmed LTF	0.1279

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
FARMERCITY	FARMERCITY	0.0071	Confirmed LTF	0.0071
G-007A	G-007A	0.4939	Confirmed LTF	0.4939
VFT	VFT	1.3932	Confirmed LTF	1.3932
CALDERWOOD	CALDERWOOD	0.0974	Confirmed LTF	0.0974
PRAIRIE	PRAIRIE	0.3384	Confirmed LTF	0.3384
CHEOAH	CHEOAH	0.0991	Confirmed LTF	0.0991
EDWARDS	EDWARDS	0.0374	Confirmed LTF	0.0374
TILTON	TILTON	0.0687	Confirmed LTF	0.0687
GIBSON	GIBSON	0.0639	Confirmed LTF	0.0639
BLUEG	BLUEG	0.2048	Confirmed LTF	0.2048
TRIMBLE	TRIMBLE	0.0651	Confirmed LTF	0.0651
CATAWBA	CATAWBA	0.0900	Confirmed LTF	0.0900

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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
100736709	235469	01GARRET	AP	235449	01CARLOS	AP	1	AP-P2-3-MP-138-150	breaker	206.0	108.75	109.79	DC	2.15

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.4123	50/50	0.4123
200834	26SW_E13_K22	0.0437	50/50	0.0437
200835	26DSGENWIN	0.4170	50/50	0.4170
200840	26DEEPCRK1	0.9523	50/50	0.9523
200841	26DEEPCRK2	0.9523	50/50	0.9523
200864	K-013 E	1.5001	Adder	1.76
200889	26STNY CRK	0.2037	50/50	0.2037
200890	26BF_G21_K23	0.2045	50/50	0.2045
200891	26CSLMN_L13	0.3208	50/50	0.3208
200892	26LOOKOUT	0.3047	50/50	0.3047
202225	26SCI_S29B	0.0680	50/50	0.0680
202652	26RGH_Y1-033	0.2976	50/50	0.2976
235013	01AB1-065 C	0.4529	50/50	0.4529
235532	AA1-100 BAT	1.1832	50/50	1.1832
292350	K-023	7.6479	50/50	7.6479
292542	L-013 1	7.4387	50/50	7.4387
293432	R-040 E	0.4184	50/50	0.4184
293902	O-048 E	6.6948	50/50	6.6948
294903	P-060 E	4.7237	50/50	4.7237
913142	Y1-033 E OP1	11.7869	50/50	11.7869
917672	Z2-108 E	4.1843	50/50	4.1843
923971	AB2-038	-0.3840	Adder	-0.45
924001	AB2-041 C	-0.3382	Adder	-0.4
924002	AB2-041 E	-1.4353	Adder	-1.69
930262	**AB1-065 E (Suspended)**	**4.3545**	**50/50**	**4.3545**
934441	AD1-068 C	7.5298	50/50	7.5298
934442	AD1-068 E	43.6934	50/50	43.6934
938351	AE1-053	2.3246	50/50	2.3246
938881	AE1-116	0.6336	50/50	0.6336
938991	AE1-128 C	4.7032	Adder	5.53
938992	AE1-128 E	3.1355	Adder	3.69
942903	AE2-309 BAT	1.3793	50/50	1.3793
943301	AF1-001 C	4.1624	50/50	4.1624
943302	AF1-001 E	4.6427	50/50	4.6427
943711	AF1-039 C O1	3.1182	50/50	3.1182
943712	AF1-039 E O1	2.0788	50/50	2.0788
944781	AF1-143 C	13.9476	50/50	13.9476
944782	AF1-143 E	7.4387	50/50	7.4387
945671	AF1-232 C O2	12.7286	50/50	12.7286
945672	AF1-232 E O2	6.8538	50/50	6.8538
946081	AF1-273 C O1	6.0828	50/50	6.0828

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
946082	AF1-273 E O1	4.0552	50/50	4.0552
946571	AF1-321 C O1	0.7740	Adder	0.91
946572	AF1-321 E O1	0.5160	Adder	0.61
957001	AF2-001 C O1	0.4102	Adder	0.91
957002	AF2-001 E O1	0.2735	Adder	0.61
957011	AF2-002 C O1	0.2051	Adder	0.46
957012	AF2-002 E O1	0.1367	Adder	0.3
957981	AF2-092 C	0.2330	Adder	0.52
957982	AF2-092 E	0.1553	Adder	0.34
958101	AF2-104 C	0.3379	50/50	0.3379
958102	AF2-104 E	0.2253	50/50	0.2253
958411	AF2-135 C	0.6974	50/50	0.6974
958412	AF2-135 E	0.4649	50/50	0.4649
958471	AF2-141	1.8597	50/50	1.8597
959792	AF2-270 E	0.1288	Adder	0.29
960192	AF2-310 BAT	2.1510	50/50	2.1510
960451	AF2-336 C O1	0.3884	Adder	0.86
960452	AF2-336 E O1	0.2589	Adder	0.57
960461	AF2-337 C O1	0.3884	Adder	0.86
960462	AF2-337 E O1	0.2589	Adder	0.57
960471	AF2-338 C O1	0.3884	Adder	0.86
960472	AF2-338 E O1	0.2589	Adder	0.57
960481	AF2-339 C O1	0.3884	Adder	0.86
960482	AF2-339 E O1	0.2589	Adder	0.57
960901	AF2-381 C	2.8159	Adder	6.25
960902	AF2-381 E	1.4819	Adder	3.29
NEWTON	NEWTON	0.1429	Confirmed LTF	0.1429
FARMERCITY	FARMERCITY	0.0078	Confirmed LTF	0.0078
G-007A	G-007A	0.5346	Confirmed LTF	0.5346
VFT	VFT	1.5093	Confirmed LTF	1.5093
CALDERWOOD	CALDERWOOD	0.1049	Confirmed LTF	0.1049
PRAIRIE	PRAIRIE	0.3720	Confirmed LTF	0.3720
CHEOAH	CHEOAH	0.1066	Confirmed LTF	0.1066
EDWARDS	EDWARDS	0.0420	Confirmed LTF	0.0420
TILTON	TILTON	0.0769	Confirmed LTF	0.0769
GIBSON	GIBSON	0.0710	Confirmed LTF	0.0710
BLUEG	BLUEG	0.2292	Confirmed LTF	0.2292
TRIMBLE	TRIMBLE	0.0729	Confirmed LTF	0.0729
CATAWBA	CATAWBA	0.0952	Confirmed LTF	0.0952

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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
AA1-100	Warrior Run 138kV	In Service
AB1-065	Jennings-Hoyes 34.5kV	Suspended
AB2-038	Frostburg 138kV	Engineering and Procurement
AB2-041	Frostburg 138kV	Engineering and Procurement
AD1-018	Carlos Jct - Plaza 34 kV	Suspended
AD1-068	Albright-Garrett 138 kV	Active
AE1-053	Meyersdale North	Active
AE1-116	Somerset Windpower 23 kV	Active
AE1-128	Bedford North-Wills Mounain 115 kV	Active
AE2-309	Carlos Junction-Lonaconing 34.5 kV	Active
AF1-001	Thayerville 34.5 kV	Engineering and Procurement
AF1-039	Listonburg-Highpoint 24.9 kV	Active
AF1-143	Lick Run 115 kV	Active
AF1-232	Allegheny-Somerset 115 kV	Active
AF1-273	Allegheny 115 kV	Active
AF1-321	Hooversville 115 kV I	Active
AF2-001	Hooversville 115 kV II	Active
AF2-002	Hooversville 115 kV III	Active
AF2-092	Snake Spring-Bedford Area 23 kV	Active
AF2-104	Somerset 23 kV	Active
AF2-135	Rockwood-Confluence 23 kV	Active
AF2-141	Lick Run 115 kV	Active
AF2-270	Bedford South RCB-Bedford Area 23 kV	Active
AF2-310	Jennings-Hoyes Road 34.5 kV	Active
AF2-336	Snake Spring 115 kV	Active
AF2-337	Snake Spring 115 kV	Active
AF2-338	Snake Spring-Saxton 115 kV	Active
AF2-339	Snake Spring-Saxton 115 kV	Active
AF2-381	Bedford North-Central City West 115 kV	Active
Y1-033	Penn Mar-Rock Wood 115kV	In Service
Z2-108	Meyersdale North 115kV	In Service

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11.8 Contingency Descriptions - Primary POI

Contingency Name	Contingency Definition
AP-P1-2-WP-500-013	CONTINGENCY 'AP-P1-2-WP-500-013' /* BLACK OAK - HATFIELD 500KV WITH SPS DISCONNECT BRANCH FROM BUS 235108 TO BUS 235103 CKT 1 /* 01HATFLD 500 01BLACKO 500 DISCONNECT BRANCH FROM BUS 235103 TO BUS 235446 CKT 3 /* 01BLACKO 500 01BLACKO 138 END
AP-P2-3-MP-138-150	CONTINGENCY 'AP-P2-3-MP-138-150' /* ALBRIGHT-BRANDONVILLE 106 JCT. STK BKR AT ALBRIGHT DISCONNECT BRANCH FROM BUS 235120 TO BUS 235305 CKT 1 /* 01ALBRIG 138 01 106 J 138 DISCONNECT BRANCH FROM BUS 938800 TO BUS 235305 CKT 1 /* AE1-106 TAP 138 01 106 J 138 /* CONTINGENCY LINE ADDED FOR AE1 BUILD DISCONNECT BRANCH FROM BUS 235297 TO BUS 235305 CKT 1 /* 01HAZELT 138 01 106 J 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 960650 CKT 1 /* 01ALBRIG 138 01MTZION 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235402 CKT 1 /* 01ALBRIG 138 01SNOW T 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235320 CKT 1 /* 01ALBRIG 138 01DENVER 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 934440 CKT 1 /* 01ALBRIG 138 AD1-068 TAP 138 /* CONTINGENCY LINE ADDED FOR AE1 BUILD END
AP-P1-2-WP-138-071-B	CONTINGENCY 'AP-P1-2-WP-138-071-B' /* ALBRIGHT - HAZELTON - LAKE LYNN 138KV (BRANDONVILLE JUNCTION) DISCONNECT BRANCH FROM BUS 938800 TO BUS 235305 CKT 1 /* AE1-106 TAP 138 01 106 J 138 DISCONNECT BRANCH FROM BUS 235305 TO BUS 235297 CKT 1 /* 01 106 J 138 01HAZELT 138 DISCONNECT BRANCH FROM BUS 235305 TO BUS 235120 CKT 1 /* 01 106 J 138 01ALBRIG 138 DISCONNECT BUS 235297 /* 01HAZELT 138 DISCONNECT BUS 235305 /* 01 106 J 138 END
235504 01RIDGLY 138 940460 AE2-030 TAP 138 1	CONTINGENCY '235504 01RIDGLY 138 940460 AE2-030 TAP 138 1' OPEN BRANCH FROM BUS 235504 TO BUS 940460 CKT 1 END
235478 01JENING 138 235297 01HAZELT 138 1	CONTINGENCY '235478 01JENING 138 235297 01HAZELT 138 1' OPEN BRANCH FROM BUS 235478 TO BUS 235297 CKT 1 END

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12 Short Circuit Analysis - Primary POI

Short Circuit Analysis to be performed in the System Impact phase.

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13 Summer Peak - Load Flow Analysis - Secondary POI

The Queue Project AF2-310 was evaluated as a 20.0 MW (Capacity 20.0 MW) injection tapping the Garrett to Carlos 138 kV line in the APS area. Project AF2-310 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-310 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)

None

13.2 Multiple Facility Contingency

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

None

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
10130498 5	200745	26ALLEGHEN	115.0	PENELEC	200884	26NEW BALT	115.0	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	167.62	168.14	DC	1.85
10130497 7	200746	26ROCKWOOD	115.0	PENELEC	202650	26HIGHPOINT	115.0	PENELEC	1	PN-P2-3-PN-115-35E	breaker	179.0	160.15	160.7	DC	1.85
10130607 0	200746	26ROCKWOOD	115.0	PENELEC	202650	26HIGHPOINT	115.0	PENELEC	1	PN-P7-1-PN-230-001	tower	179.0	133.86	135.27	DC	2.52
10130494 0	200747	26PENN-MAR	115.0	PENELEC	200762	26GARRETT	115.0	PENELEC	1	PN-P2-3-PN-115-35E	breaker	167.0	189.46	190.04	DC	1.85
10130495 0	200884	26NEW BALT	115.0	PENELEC	200501	26BDFORDN	115.0	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	191.24	191.76	DC	1.85

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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
101304945	202650	26HIGHPOINT	115.0	PENELEC	200747	26PENN-MAR	115.0	PENELEC	1	PN-P2-3-PN-115-35E	breaker	174.0	179.6	180.16	DC	1.85
101306065	202650	26HIGHPOINT	115.0	PENELEC	200747	26PENN-MAR	115.0	PENELEC	1	PN-P7-1-PN-230-001	tower	174.0	148.87	150.32	DC	2.52
100736511	235305	01 106 J	138.0	AP	235120	01ALBRIG	138.0	AP	1	AP-P2-2-PE-138-021A	bus	186.0	116.67	117.21	DC	1.89
100736692	235449	01CARLOS	138.0	AP	237310	01DANSMTN	138.0	AP	1	AP-P2-4-MP-138-200	breaker	182.0	115.49	122.69	DC	13.1
100736668	235469	01GARRET	138.0	AP	934440	AD1-068 TAP	138.0	AP	1	PN-P2-3-PN-115-35E	breaker	191.0	131.01	136.61	DC	10.68
151886653	235469	01GARRET	138.0	AP	960190	AF2-310 TAP	138.0	AP	1	AP-P2-2-MP-138-101-A	bus	206.0	109.28	112.29	DC	6.19
151886972	235469	01GARRET	138.0	AP	960190	AF2-310 TAP	138.0	AP	1	AP-P2-4-MP-138-200	breaker	206.0	109.61	112.64	DC	6.22
151886973	235469	01GARRET	138.0	AP	960190	AF2-310 TAP	138.0	AP	1	AP-P2-3-MP-138-159	breaker	206.0	109.24	112.26	DC	6.22
151886974	235469	01GARRET	138.0	AP	960190	AF2-310 TAP	138.0	AP	1	AP-P2-3-MP-138-153	breaker	206.0	109.09	112.11	DC	6.23
151886975	235469	01GARRET	138.0	AP	960190	AF2-310 TAP	138.0	AP	1	AP-P2-3-MP-138-150	breaker	206.0	108.85	111.99	DC	6.47
100736649	237310	01DANSMTN	138.0	AP	235504	01RIDGLY	138.0	AP	1	AP-P2-4-MP-138-200	breaker	182.0	141.43	148.63	DC	13.1
101305089	945670	AF1-232 TAP	115.0	PENELEC	200745	26ALLEGHEN	115.0	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	136.85	137.37	DC	1.85
151886648	960190	AF2-310 TAP	138.0	AP	235449	01CARLOS	138.0	AP	1	AP-P2-2-MP-138-101-A	bus	206.0	109.23	115.93	DC	13.81

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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
151886960	960190	AF2-310 TAP	138.0	AP	235449	01CARLOS	138.0	AP	1	AP-P2-4-MP-138-200	breaker	206.0	109.56	116.26	DC	13.78
151886961	960190	AF2-310 TAP	138.0	AP	235449	01CARLOS	138.0	AP	1	AP-P2-3-MP-138-159	breaker	206.0	109.19	115.88	DC	13.78
151886962	960190	AF2-310 TAP	138.0	AP	235449	01CARLOS	138.0	AP	1	AP-P2-3-MP-138-153	breaker	206.0	108.99	115.68	DC	13.77

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	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
152642651	200744	26SOMERST	115.0	PENELEC	200802	26RALPHTON	115.0	PENELEC	1	PN-P1-2-PN-115-066-A	operation	185.0	111.08	111.54	DC	1.89
101305339	200746	26ROCKWOOD	115.0	PENELEC	200744	26SOMERST	115.0	PENELEC	1	Base Case	operation	148.0	125.15	127.07	DC	2.85
101305414	200746	26ROCKWOOD	115.0	PENELEC	202650	26HIGHPOINT	115.0	PENELEC	1	Base Case	operation	148.0	135.05	136.98	DC	2.85
152642427	200746	26ROCKWOOD	115.0	PENELEC	202650	26HIGHPOINT	115.0	PENELEC	1	PN-P1-3-PN-115-029-A	operation	179.0	129.84	131.28	DC	2.58
101305330	200747	26PENN-MAR	115.0	PENELEC	200762	26GARRETT	115.0	PENELEC	1	Base Case	operation	137.0	161.88	163.97	DC	2.85
988649466	200762	26GARRETT	115.0	PENELEC	235470	01GARRET	115.0	AP	1	Base Case	operation	133.0	180.31	182.45	DC	2.85
101305376	202650	26HIGHPOINT	115.0	PENELEC	200747	26PENN-MAR	115.0	PENELEC	1	Base Case	operation	137.0	158.34	160.42	DC	2.85

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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
100737009	235449	01CARLOS	138.0	AP	237310	01DANSMTN	138.0	AP	1	AP-P1-2-MP-138-160-A	operation	182.0	115.31	122.54	DC	13.15
100736983	235469	01GARRET	138.0	AP	934440	AD1-068 TAP	138.0	AP	1	Base Case	operation	164.0	108.84	114.95	DC	10.0
151887384	235469	01GARRET	138.0	AP	934440	AD1-068 TAP	138.0	AP	1	PN-P1-3-PN-115-025-A	operation	191.0	131.81	138.05	DC	11.92
151887423	235469	01GARRET	138.0	AP	960190	AF2-310 TAP	138.0	AP	1	AP-P1-2-MP-138-160-A	operation	206.0	108.71	111.7	DC	6.17
100736933	235470	01GARRET	115.0	AP	235469	01GARRET	138.0	AP	1	Base Case	operation	169.0	141.9	143.59	DC	2.85
100737067	235484	01MESSCK	138.0	AP	235490	01MORGAN	138.0	AP	1	AP-P1-2-WP-500-013	operation	228.0	99.78	100.7	DC	2.09
100736960	237310	01DANSMTN	138.0	AP	235504	01RIDGLY	138.0	AP	1	AP-P1-2-MP-138-160-A	operation	182.0	141.35	148.58	DC	13.15
100736923	934440	AD1-068 TAP	138.0	AP	235120	01ALBRIG	138.0	AP	1	Base Case	operation	164.0	140.38	146.48	DC	10.0
151887293	934440	AD1-068 TAP	138.0	AP	235120	01ALBRIG	138.0	AP	1	PN-P1-3-PN-115-025-A	operation	191.0	166.27	172.51	DC	11.92
151887419	960190	AF2-310 TAP	138.0	AP	235449	01CARLOS	138.0	AP	1	AP-P1-2-MP-138-160-A	operation	206.0	108.61	115.33	DC	13.83

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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".

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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
101304985	200745	26ALLEGHEN	PENELEC	200884	26NEW BALT	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	167.62	168.14	DC	1.85

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.3199	50/50	0.3199
200834	26SW_E13_K22	0.1642	50/50	0.1642
200835	26DSGENWIN	0.8086	50/50	0.8086
200840	26DEEPCRK1	0.2957	50/50	0.2957
200841	26DEEPCRK2	0.2957	50/50	0.2957
200890	26BF_G21_K23	0.3965	50/50	0.3965
200891	26CSLMN_L13	0.6220	50/50	0.6220
200892	26LOOKOUT	0.5909	50/50	0.5909
202225	26SCI_S29B	0.2555	50/50	0.2555
202652	26RGH_Y1-033	0.3036	50/50	0.3036
235013	01AB1-065 C	0.0725	50/50	0.0725
292350	K-023	14.8290	50/50	14.8290
292542	L-013 1	14.4234	50/50	14.4234
293432	R-040 E	0.8113	50/50	0.8113
293902	O-048 E	12.9810	50/50	12.9810
913142	Y1-033 E OP1	12.0233	50/50	12.0233
917672	Z2-108 E	8.1131	50/50	8.1131
930262	**AB1-065 E (Suspended)**	**0.6975**	**50/50**	**0.6975**
938351	AE1-053	4.5073	50/50	4.5073
938881	AE1-116	2.3804	50/50	2.3804
943301	AF1-001 C	0.6667	50/50	0.6667
943302	AF1-001 E	0.7436	50/50	0.7436
943711	AF1-039 C O1	3.1808	50/50	3.1808
943712	AF1-039 E O1	2.1205	50/50	2.1205
944781	AF1-143 C	27.0438	50/50	27.0438
944782	AF1-143 E	14.4234	50/50	14.4234
945671	AF1-232 C O2	64.6058	50/50	64.6058
945672	AF1-232 E O2	34.7878	50/50	34.7878
946081	AF1-273 C O1	32.4793	50/50	32.4793
946082	AF1-273 E O1	21.6529	50/50	21.6529
957001	AF2-001 C O2	6.3467	50/50	6.3467
957002	AF2-001 E O2	4.2311	50/50	4.2311
957011	AF2-002 C O2	3.1733	50/50	3.1733
957012	AF2-002 E O2	2.1156	50/50	2.1156
958101	AF2-104 C	1.2696	50/50	1.2696
958102	AF2-104 E	0.8464	50/50	0.8464
958411	AF2-135 C	1.3522	50/50	1.3522
958412	AF2-135 E	0.9015	50/50	0.9015
958471	AF2-141	3.6058	50/50	3.6058
959793	AF2-270 BAT	0.2258	50/50	0.2258
960191	AF2-310 O2	0.8328	Adder	1.85

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
WEC	WEC	0.0589	Confirmed LTF	0.0589
LGEE	LGEE	0.1124	Confirmed LTF	0.1124
CPLE	CPLE	0.1568	Confirmed LTF	0.1568
CBM-W2	CBM-W2	1.6544	Confirmed LTF	1.6544
NY	NY	0.3290	Confirmed LTF	0.3290
CBM-W1	CBM-W1	2.1642	Confirmed LTF	2.1642
TVA	TVA	0.2954	Confirmed LTF	0.2954
O-066	O-066	2.1907	Confirmed LTF	2.1907
CBM-S2	CBM-S2	1.3352	Confirmed LTF	1.3352
CBM-S1	CBM-S1	1.7807	Confirmed LTF	1.7807
G-007	G-007	0.3276	Confirmed LTF	0.3276
MADISON	MADISON	0.0020	Confirmed LTF	0.0020
MEC	MEC	0.3051	Confirmed LTF	0.3051

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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
101304977	200746	26ROCKWOOD	PENELEC	202650	26HIGHPOINT	PENELEC	1	PN-P2-3-PN-115-35E	breaker	179.0	160.15	160.7	DC	1.85

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200834	26SW_E13_K22	0.1462	50/50	0.1462
200835	26DSGENWIN	0.9850	50/50	0.9850
200864	K-013 E	1.7949	Adder	2.11
200889	26STNY CRK	0.5957	50/50	0.5957
200890	26BF_G21_K23	0.4830	50/50	0.4830
200891	26CSLMN_L13	0.7577	50/50	0.7577
200892	26LOOKOUT	0.7198	50/50	0.7198
202225	26SCI_S29B	0.2274	50/50	0.2274
292350	K-023	18.0647	50/50	18.0647
292542	L-013 1	17.5706	50/50	17.5706
293432	R-040 E	0.9883	50/50	0.9883
293902	O-048 E	15.8135	50/50	15.8135
294903	P-060 E	13.8130	50/50	13.8130
917672	Z2-108 E	9.8834	50/50	9.8834
938351	AE1-053	5.4908	50/50	5.4908
938881	AE1-116	2.1188	50/50	2.1188
938991	AE1-128 C	10.8245	50/50	10.8245
938992	AE1-128 E	7.2163	50/50	7.2163
944781	AF1-143 C	32.9448	50/50	32.9448
944782	AF1-143 E	17.5706	50/50	17.5706
945671	AF1-232 C O2	39.3744	50/50	39.3744
945672	AF1-232 E O2	21.2016	50/50	21.2016
946081	AF1-273 C O1	18.5115	50/50	18.5115
946082	AF1-273 E O1	12.3410	50/50	12.3410
957001	AF2-001 C O2	5.6510	50/50	5.6510
957002	AF2-001 E O2	3.7674	50/50	3.7674
957011	AF2-002 C O2	2.8255	50/50	2.8255
957012	AF2-002 E O2	1.8837	50/50	1.8837
957981	AF2-092 C	0.9707	50/50	0.9707
957982	AF2-092 E	0.6471	50/50	0.6471
958101	AF2-104 C	1.1300	50/50	1.1300
958102	AF2-104 E	0.7533	50/50	0.7533
958411	AF2-135 C	1.6472	50/50	1.6472
958412	AF2-135 E	1.0982	50/50	1.0982
958471	AF2-141	4.3926	50/50	4.3926
959792	AF2-270 E	0.5594	50/50	0.5594
960192	AF2-310 BAT	0.9817	Merchant Transmission	0.9817
960451	AF2-336 C O2	1.6336	50/50	1.6336
960452	AF2-336 E O2	1.0890	50/50	1.0890
960461	AF2-337 C O2	1.6336	50/50	1.6336

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960462	AF2-337 E O2	1.0890	50/50	1.0890
960471	AF2-338 C O2	1.6336	50/50	1.6336
960472	AF2-338 E O2	1.0890	50/50	1.0890
960481	AF2-339 C O2	1.6336	50/50	1.6336
960482	AF2-339 E O2	1.0890	50/50	1.0890
960901	AF2-381 C	9.0082	50/50	9.0082
960902	AF2-381 E	4.7406	50/50	4.7406
NEWTON	NEWTON	0.2278	Confirmed LTF	0.2278
FARMERCITY	FARMERCITY	0.0119	Confirmed LTF	0.0119
G-007A	G-007A	0.7121	Confirmed LTF	0.7121
VFT	VFT	1.9672	Confirmed LTF	1.9672
CALDERWOOD	CALDERWOOD	0.1173	Confirmed LTF	0.1173
PRAIRIE	PRAIRIE	0.5553	Confirmed LTF	0.5553
CHEOAH	CHEOAH	0.1186	Confirmed LTF	0.1186
EDWARDS	EDWARDS	0.0721	Confirmed LTF	0.0721
TILTON	TILTON	0.1310	Confirmed LTF	0.1310
GIBSON	GIBSON	0.1158	Confirmed LTF	0.1158
BLUEG	BLUEG	0.3732	Confirmed LTF	0.3732
TRIMBLE	TRIMBLE	0.1191	Confirmed LTF	0.1191
CATAWBA	CATAWBA	0.0872	Confirmed LTF	0.0872

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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
101304940	200747	26PENN-MAR	PENELEC	200762	26GARRETT	PENELEC	1	PN-P2-3-PN-115-35E	breaker	167.0	189.46	190.04	DC	1.85

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.7148	50/50	0.7148
200834	26SW_E13_K22	0.1462	50/50	0.1462
200835	26DSGENWIN	0.9849	50/50	0.9849
200889	26STNY CRK	0.5956	50/50	0.5956
200890	26BF_G21_K23	0.4830	50/50	0.4830
200891	26CSLMN_L13	0.7576	50/50	0.7576
200892	26LOOKOUT	0.7198	50/50	0.7198
202225	26SCI_S29B	0.2274	50/50	0.2274
202652	26RGH_Y1-033	0.5552	50/50	0.5552
292350	K-023	18.0631	50/50	18.0631
292542	L-013 1	17.5690	50/50	17.5690
293432	R-040 E	0.9883	50/50	0.9883
293902	O-048 E	15.8121	50/50	15.8121
294903	P-060 E	13.8104	50/50	13.8104
913142	Y1-033 E OP1	21.9885	50/50	21.9885
917672	Z2-108 E	9.8825	50/50	9.8825
938351	AE1-053	5.4903	50/50	5.4903
938881	AE1-116	2.1185	50/50	2.1185
938991	AE1-128 C	10.8202	50/50	10.8202
938992	AE1-128 E	7.2134	50/50	7.2134
943711	AF1-039 C O1	5.8171	50/50	5.8171
943712	AF1-039 E O1	3.8780	50/50	3.8780
944781	AF1-143 C	32.9418	50/50	32.9418
944782	AF1-143 E	17.5690	50/50	17.5690
945671	AF1-232 C O2	39.3692	50/50	39.3692
945672	AF1-232 E O2	21.1988	50/50	21.1988
946081	AF1-273 C O1	18.5084	50/50	18.5084
946082	AF1-273 E O1	12.3389	50/50	12.3389
957001	AF2-001 C O2	5.6503	50/50	5.6503
957002	AF2-001 E O2	3.7669	50/50	3.7669
957011	AF2-002 C O2	2.8252	50/50	2.8252
957012	AF2-002 E O2	1.8834	50/50	1.8834
957981	AF2-092 C	0.9703	50/50	0.9703
957982	AF2-092 E	0.6468	50/50	0.6468
958101	AF2-104 C	1.1299	50/50	1.1299
958102	AF2-104 E	0.7532	50/50	0.7532
958411	AF2-135 C	1.6471	50/50	1.6471
958412	AF2-135 E	1.0981	50/50	1.0981
958471	AF2-141	4.3922	50/50	4.3922
959792	AF2-270 E	0.5592	50/50	0.5592
960192	AF2-310 BAT	0.9823	Merchant Transmission	0.9823

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960451	AF2-336 C O2	1.6330	50/50	1.6330
960452	AF2-336 E O2	1.0886	50/50	1.0886
960461	AF2-337 C O2	1.6330	50/50	1.6330
960462	AF2-337 E O2	1.0886	50/50	1.0886
960471	AF2-338 C O2	1.6330	50/50	1.6330
960472	AF2-338 E O2	1.0886	50/50	1.0886
960481	AF2-339 C O2	1.6330	50/50	1.6330
960482	AF2-339 E O2	1.0886	50/50	1.0886
960901	AF2-381 C	9.0041	50/50	9.0041
960902	AF2-381 E	4.7384	50/50	4.7384
NEWTON	NEWTON	0.2342	Confirmed LTF	0.2342
FARMERCITY	FARMERCITY	0.0123	Confirmed LTF	0.0123
G-007A	G-007A	0.6977	Confirmed LTF	0.6977
VFT	VFT	1.9285	Confirmed LTF	1.9285
CALDERWOOD	CALDERWOOD	0.1203	Confirmed LTF	0.1203
PRAIRIE	PRAIRIE	0.5708	Confirmed LTF	0.5708
CHEOAH	CHEOAH	0.1216	Confirmed LTF	0.1216
EDWARDS	EDWARDS	0.0742	Confirmed LTF	0.0742
TILTON	TILTON	0.1348	Confirmed LTF	0.1348
GIBSON	GIBSON	0.1190	Confirmed LTF	0.1190
BLUEG	BLUEG	0.3837	Confirmed LTF	0.3837
TRIMBLE	TRIMBLE	0.1224	Confirmed LTF	0.1224
CATAWBA	CATAWBA	0.0893	Confirmed LTF	0.0893

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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
101304950	200884	26NEW BALT	PENELEC	200501	26BDFORD N	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	191.24	191.76	DC	1.85

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.3199	50/50	0.3199
200834	26SW_E13_K22	0.1642	50/50	0.1642
200835	26DSGENWIN	0.8085	50/50	0.8085
200840	26DEEPCRK1	0.2956	50/50	0.2956
200841	26DEEPCRK2	0.2956	50/50	0.2956
200889	26STNY CRK	1.2151	50/50	1.2151
200890	26BF_G21_K23	0.3965	50/50	0.3965
200891	26CSLMN_L13	0.6219	50/50	0.6219
200892	26LOOKOUT	0.5908	50/50	0.5908
202225	26SCI_S29B	0.2555	50/50	0.2555
202652	26RGH_Y1-033	0.3036	50/50	0.3036
235013	01AB1-065 C	0.0725	50/50	0.0725
292350	K-023	14.8274	50/50	14.8274
292542	L-013 1	14.4218	50/50	14.4218
293432	R-040 E	0.8112	50/50	0.8112
293902	O-048 E	12.9796	50/50	12.9796
294903	P-060 E	28.1770	50/50	28.1770
913142	Y1-033 E OP1	12.0216	50/50	12.0216
917672	Z2-108 E	8.1122	50/50	8.1122
930262	**AB1-065 E (Suspended)**	**0.6971**	**50/50**	**0.6971**
938351	AE1-053	4.5068	50/50	4.5068
938881	AE1-116	2.3801	50/50	2.3801
943301	AF1-001 C	0.6663	50/50	0.6663
943302	AF1-001 E	0.7432	50/50	0.7432
943711	AF1-039 C O1	3.1803	50/50	3.1803
943712	AF1-039 E O1	2.1202	50/50	2.1202
944781	AF1-143 C	27.0408	50/50	27.0408
944782	AF1-143 E	14.4218	50/50	14.4218
945671	AF1-232 C O2	64.6006	50/50	64.6006
945672	AF1-232 E O2	34.7850	50/50	34.7850
946081	AF1-273 C O1	32.4763	50/50	32.4763
946082	AF1-273 E O1	21.6509	50/50	21.6509
957001	AF2-001 C O2	6.3461	50/50	6.3461
957002	AF2-001 E O2	4.2307	50/50	4.2307
957011	AF2-002 C O2	3.1730	50/50	3.1730
957012	AF2-002 E O2	2.1154	50/50	2.1154
958101	AF2-104 C	1.2694	50/50	1.2694
958102	AF2-104 E	0.8463	50/50	0.8463
958411	AF2-135 C	1.3520	50/50	1.3520
958412	AF2-135 E	0.9014	50/50	0.9014
958471	AF2-141	3.6054	50/50	3.6054

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959793	AF2-270 BAT	0.2259	50/50	0.2259
960191	AF2-310 O2	0.8323	Adder	1.85
WEC	WEC	0.0570	Confirmed LTF	0.0570
LGEE	LGEE	0.1090	Confirmed LTF	0.1090
CPLE	CPLE	0.1528	Confirmed LTF	0.1528
CBM-W2	CBM-W2	1.6052	Confirmed LTF	1.6052
NY	NY	0.3318	Confirmed LTF	0.3318
CBM-W1	CBM-W1	2.0892	Confirmed LTF	2.0892
TVA	TVA	0.2870	Confirmed LTF	0.2870
O-066	O-066	2.2310	Confirmed LTF	2.2310
CBM-S2	CBM-S2	1.3005	Confirmed LTF	1.3005
CBM-S1	CBM-S1	1.7296	Confirmed LTF	1.7296
G-007	G-007	0.3338	Confirmed LTF	0.3338
MADISON	MADISON	0.0020	Confirmed LTF	0.0020
MEC	MEC	0.2956	Confirmed LTF	0.2956

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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
101304945	202650	26HIGHPOINT	PENELEC	200747	26PENN-MAR	PENELEC	1	PN-P2-3-PN-115-35E	breaker	174.0	179.6	180.16	DC	1.85

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200834	26SW_E13_K22	0.1462	50/50	0.1462
200835	26DSGENWIN	0.9850	50/50	0.9850
200864	K-013 E	1.7945	Adder	2.11
200889	26STNY CRK	0.5956	50/50	0.5956
200890	26BF_G21_K23	0.4830	50/50	0.4830
200891	26CSLMN_L13	0.7577	50/50	0.7577
200892	26LOOKOUT	0.7198	50/50	0.7198
202225	26SCI_S29B	0.2274	50/50	0.2274
202652	26RGH_Y1-033	0.5552	50/50	0.5552
292350	K-023	18.0641	50/50	18.0641
292542	L-013 1	17.5699	50/50	17.5699
293432	R-040 E	0.9883	50/50	0.9883
293902	O-048 E	15.8129	50/50	15.8129
294903	P-060 E	13.8117	50/50	13.8117
913142	Y1-033 E OP1	21.9895	50/50	21.9895
917672	Z2-108 E	9.8831	50/50	9.8831
938351	AE1-053	5.4906	50/50	5.4906
938881	AE1-116	2.1186	50/50	2.1186
938991	AE1-128 C	10.8223	50/50	10.8223
938992	AE1-128 E	7.2149	50/50	7.2149
943711	AF1-039 C O1	5.8173	50/50	5.8173
943712	AF1-039 E O1	3.8782	50/50	3.8782
944781	AF1-143 C	32.9436	50/50	32.9436
944782	AF1-143 E	17.5699	50/50	17.5699
945671	AF1-232 C O2	39.3723	50/50	39.3723
945672	AF1-232 E O2	21.2005	50/50	21.2005
946081	AF1-273 C O1	18.5099	50/50	18.5099
946082	AF1-273 E O1	12.3400	50/50	12.3400
957001	AF2-001 C O2	5.6508	50/50	5.6508
957002	AF2-001 E O2	3.7672	50/50	3.7672
957011	AF2-002 C O2	2.8254	50/50	2.8254
957012	AF2-002 E O2	1.8836	50/50	1.8836
957981	AF2-092 C	0.9706	50/50	0.9706
957982	AF2-092 E	0.6470	50/50	0.6470
958101	AF2-104 C	1.1299	50/50	1.1299
958102	AF2-104 E	0.7533	50/50	0.7533
958411	AF2-135 C	1.6472	50/50	1.6472
958412	AF2-135 E	1.0981	50/50	1.0981
958471	AF2-141	4.3925	50/50	4.3925
959792	AF2-270 E	0.5593	50/50	0.5593
960192	AF2-310 BAT	0.9820	Merchant Transmission	0.9820

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960451	AF2-336 C O2	1.6333	50/50	1.6333
960452	AF2-336 E O2	1.0889	50/50	1.0889
960461	AF2-337 C O2	1.6333	50/50	1.6333
960462	AF2-337 E O2	1.0889	50/50	1.0889
960471	AF2-338 C O2	1.6333	50/50	1.6333
960472	AF2-338 E O2	1.0889	50/50	1.0889
960481	AF2-339 C O2	1.6333	50/50	1.6333
960482	AF2-339 E O2	1.0889	50/50	1.0889
960901	AF2-381 C	9.0065	50/50	9.0065
960902	AF2-381 E	4.7397	50/50	4.7397
NEWTON	NEWTON	0.2310	Confirmed LTF	0.2310
FARMERCITY	FARMERCITY	0.0121	Confirmed LTF	0.0121
G-007A	G-007A	0.7049	Confirmed LTF	0.7049
VFT	VFT	1.9479	Confirmed LTF	1.9479
CALDERWOOD	CALDERWOOD	0.1188	Confirmed LTF	0.1188
PRAIRIE	PRAIRIE	0.5631	Confirmed LTF	0.5631
CHEOAH	CHEOAH	0.1201	Confirmed LTF	0.1201
EDWARDS	EDWARDS	0.0732	Confirmed LTF	0.0732
TILTON	TILTON	0.1329	Confirmed LTF	0.1329
GIBSON	GIBSON	0.1174	Confirmed LTF	0.1174
BLUEG	BLUEG	0.3784	Confirmed LTF	0.3784
TRIMBLE	TRIMBLE	0.1208	Confirmed LTF	0.1208
CATAWBA	CATAWBA	0.0882	Confirmed LTF	0.0882

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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
100736511	235305	01 106 J	AP	235120	01ALBRIG	AP	1	AP-P2-2-PE-138-021A	bus	186.0	116.67	117.21	DC	1.89

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
235098	U2-073A E	58.3368	50/50	58.3368
235099	U2-073B E	23.4654	50/50	23.4654
235530	01TR_U2-073A	1.9935	50/50	1.9935
235531	01TR_U2-073B	0.8667	50/50	0.8667
237319	01FMR_U2-030	0.6760	50/50	0.6760
923971	AB2-038	2.1104	50/50	2.1104
924001	AB2-041 C	1.8591	50/50	1.8591
924002	AB2-041 E	7.8888	50/50	7.8888
929522	U2-030 E	16.1795	50/50	16.1795
938342	AE1-052 BAT	0.7290	Merchant Transmission	0.7290
938801	AE1-106 C	23.7510	50/50	23.7510
938802	AE1-106 E	16.3439	50/50	16.3439
940461	AE2-030 C	3.8188	50/50	3.8188
940462	AE2-030 E	5.2257	50/50	5.2257
942731	AE2-289 C	5.9090	50/50	5.9090
942732	AE2-289 E	34.2886	50/50	34.2886
942903	AE2-309 BAT	0.7308	Merchant Transmission	0.7308
943213	AF1-000 BAT	4.3011	Merchant Transmission	4.3011
943511	AF1-022 C	0.4285	Adder	0.5
943512	AF1-022 E	0.2857	Adder	0.34
944341	AF1-102	0.6136	Adder	0.72
959832	AF2-274 E	0.0986	Adder	0.22
960192	AF2-310 BAT	1.0007	Merchant Transmission	1.0007
WEC	WEC	0.0227	Confirmed LTF	0.0227
LGEE	LGEE	0.0342	Confirmed LTF	0.0342
CALDERWOOD	CALDERWOOD	0.0015	Confirmed LTF	0.0015
CBM-W2	CBM-W2	0.3112	Confirmed LTF	0.3112
NY	NY	0.0426	Confirmed LTF	0.0426
CBM-W1	CBM-W1	1.0634	Confirmed LTF	1.0634
TVA	TVA	0.0210	Confirmed LTF	0.0210
O-066	O-066	0.6586	Confirmed LTF	0.6586
CHEOAH	CHEOAH	0.0025	Confirmed LTF	0.0025
CBM-S1	CBM-S1	0.1960	Confirmed LTF	0.1960
G-007	G-007	0.1050	Confirmed LTF	0.1050
MEC	MEC	0.0953	Confirmed LTF	0.0953
CATAWBA	CATAWBA	0.0178	Confirmed LTF	0.0178

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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
100736692	235449	01CARLOS	AP	237310	01DANSMTN	AP	1	AP-P2-4-MP-138-200	breaker	182.0	115.49	122.69	DC	13.1

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.3990	50/50	0.3990
200834	26SW_E13_K22	0.0423	50/50	0.0423
200835	26DSGENWIN	0.4034	50/50	0.4034
200840	26DEEPCRK1	0.9218	50/50	0.9218
200841	26DEEPCRK2	0.9218	50/50	0.9218
200864	K-013 E	1.4480	Adder	1.7
200889	26STNY CRK	0.1968	50/50	0.1968
200890	26BF_G21_K23	0.1978	50/50	0.1978
200891	26CSLMN_L13	0.3103	50/50	0.3103
200892	26LOOKOUT	0.2948	50/50	0.2948
202225	26SCI_S29B	0.0657	50/50	0.0657
202652	26RGH_Y1-033	0.2880	50/50	0.2880
235013	01AB1-065 C	0.4384	50/50	0.4384
235532	AA1-100 BAT	1.0554	Merchant Transmission	1.0554
292350	K-023	7.3986	50/50	7.3986
292542	L-013 1	7.1962	50/50	7.1962
293432	R-040 E	0.4048	50/50	0.4048
293902	O-048 E	6.4765	50/50	6.4765
294903	P-060 E	4.5646	50/50	4.5646
913142	Y1-033 E OP1	11.4062	50/50	11.4062
917672	Z2-108 E	4.0478	50/50	4.0478
923971	AB2-038	-0.2980	Adder	-0.35
924001	AB2-041 C	-0.2625	Adder	-0.31
924002	AB2-041 E	-1.1139	Adder	-1.31
930262	**AB1-065 E (Suspended)**	**4.2153**	**50/50**	**4.2153**
933951	**AD1-018 C (Suspended)**	**1.5651**	**50/50**	**1.5651**
933952	**AD1-018 E (Suspended)**	**2.5537**	**50/50**	**2.5537**
934441	AD1-068 C	7.2891	50/50	7.2891
934442	AD1-068 E	42.2965	50/50	42.2965
938351	AE1-053	2.2488	50/50	2.2488
938881	AE1-116	0.6125	50/50	0.6125
938991	AE1-128 C	4.5410	Adder	5.34
938992	AE1-128 E	3.0274	Adder	3.56
942901	AE2-309 C	3.3457	50/50	3.3457
942902	AE2-309 E	0.6386	50/50	0.6386
943301	AF1-001 C	4.0293	50/50	4.0293
943302	AF1-001 E	4.4943	50/50	4.4943
943711	AF1-039 C O1	3.0175	50/50	3.0175
943712	AF1-039 E O1	2.0117	50/50	2.0117
944781	AF1-143 C	13.4928	50/50	13.4928
944782	AF1-143 E	7.1962	50/50	7.1962

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945671	AF1-232 C O2	12.3022	50/50	12.3022
945672	AF1-232 E O2	6.6242	50/50	6.6242
946081	AF1-273 C O1	5.8788	50/50	5.8788
946082	AF1-273 E O1	3.9192	50/50	3.9192
946571	AF1-321 C O1	0.7470	Adder	0.88
946572	AF1-321 E O1	0.4980	Adder	0.59
957001	AF2-001 C O2	0.4345	Adder	0.96
957002	AF2-001 E O2	0.2897	Adder	0.64
957011	AF2-002 C O2	0.2173	Adder	0.48
957012	AF2-002 E O2	0.1448	Adder	0.32
957981	AF2-092 C	0.2249	Adder	0.5
957982	AF2-092 E	0.1499	Adder	0.33
958101	AF2-104 C	0.3267	50/50	0.3267
958102	AF2-104 E	0.2178	50/50	0.2178
958411	AF2-135 C	0.6746	50/50	0.6746
958412	AF2-135 E	0.4498	50/50	0.4498
958471	AF2-141	1.7990	50/50	1.7990
959792	AF2-270 E	0.1244	Adder	0.28
960191	AF2-310 O2	13.1020	50/50	13.1020
960451	AF2-336 C O2	0.3771	Adder	0.84
960452	AF2-336 E O2	0.2514	Adder	0.56
960461	AF2-337 C O2	0.3771	Adder	0.84
960462	AF2-337 E O2	0.2514	Adder	0.56
960471	AF2-338 C O2	0.3771	Adder	0.84
960472	AF2-338 E O2	0.2514	Adder	0.56
960481	AF2-339 C O2	0.3771	Adder	0.84
960482	AF2-339 E O2	0.2514	Adder	0.56
960901	AF2-381 C	2.7185	Adder	6.03
960902	AF2-381 E	1.4306	Adder	3.18
NEWTON	NEWTON	0.1644	Confirmed LTF	0.1644
FARMERCITY	FARMERCITY	0.0088	Confirmed LTF	0.0088
G-007A	G-007A	0.5754	Confirmed LTF	0.5754
VFT	VFT	1.6125	Confirmed LTF	1.6125
CALDERWOOD	CALDERWOOD	0.1069	Confirmed LTF	0.1069
PRAIRIE	PRAIRIE	0.4184	Confirmed LTF	0.4184
CHEOAH	CHEOAH	0.1086	Confirmed LTF	0.1086
EDWARDS	EDWARDS	0.0497	Confirmed LTF	0.0497
TILTON	TILTON	0.0907	Confirmed LTF	0.0907
GIBSON	GIBSON	0.0824	Confirmed LTF	0.0824
BLUEG	BLUEG	0.2656	Confirmed LTF	0.2656
TRIMBLE	TRIMBLE	0.0846	Confirmed LTF	0.0846
CATAWBA	CATAWBA	0.0921	Confirmed LTF	0.0921

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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
100736668	235469	01GARRET	AP	934440	AD1-068 TAP	AP	1	PN-P2-3-PN-115-35E	breaker	191.0	131.01	136.61	DC	10.68

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.4798	50/50	0.4798
200834	26SW_E13_K22	0.0980	50/50	0.0980
200835	26DSGENWIN	0.6608	50/50	0.6608
200840	26DEEPCRK1	0.9479	50/50	0.9479
200841	26DEEPCRK2	0.9479	50/50	0.9479
200889	26STNY CRK	0.3988	50/50	0.3988
200890	26BF_G21_K23	0.3240	50/50	0.3240
200891	26CSLMN_L13	0.5083	50/50	0.5083
200892	26LOOKOUT	0.4829	50/50	0.4829
202225	26SCI_S29B	0.1525	50/50	0.1525
202652	26RGH_Y1-033	0.3727	50/50	0.3727
235013	01AB1-065 C	0.4262	50/50	0.4262
235098	U2-073A E	9.3465	Adder	11.0
235099	U2-073B E	3.7595	Adder	4.42
235526	01WR_AA1-100	1.3826	50/50	1.3826
236001	01WARRIOR RN	3.9025	50/50	3.9025
237312	01DANS_S-014	3.0611	50/50	3.0611
290229	S-014 E	12.2444	50/50	12.2444
292350	K-023	12.1187	50/50	12.1187
292542	L-013 1	11.7872	50/50	11.7872
293432	R-040 E	0.6630	50/50	0.6630
293902	O-048 E	10.6085	50/50	10.6085
294903	P-060 E	9.2484	50/50	9.2484
913142	Y1-033 E OP1	14.7586	50/50	14.7586
917672	Z2-108 E	6.6303	50/50	6.6303
923971	AB2-038	0.3381	Adder	0.4
924001	AB2-041 C	0.2979	Adder	0.35
924002	AB2-041 E	1.2639	Adder	1.49
930262	**AB1-065 E (Suspended)**	**4.0977**	**50/50**	**4.0977**
933951	**AD1-018 C (Suspended)**	**1.0813**	**50/50**	**1.0813**
933952	**AD1-018 E (Suspended)**	**1.7643**	**50/50**	**1.7643**
938351	AE1-053	3.6835	50/50	3.6835
938881	AE1-116	1.4207	50/50	1.4207
938991	AE1-128 C	7.2058	50/50	7.2058
938992	AE1-128 E	4.8038	50/50	4.8038
940461	AE2-030 C	0.8251	50/50	0.8251
940462	AE2-030 E	1.1290	50/50	1.1290
942731	AE2-289 C	0.9467	Adder	1.11
942732	AE2-289 E	5.4936	Adder	6.46
942901	AE2-309 C	2.3174	50/50	2.3174
942902	AE2-309 E	0.4423	50/50	0.4423

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
943301	AF1-001 C	3.9169	50/50	3.9169
943302	AF1-001 E	4.3688	50/50	4.3688
943711	AF1-039 C O1	3.9044	50/50	3.9044
943712	AF1-039 E O1	2.6029	50/50	2.6029
944781	AF1-143 C	22.1010	50/50	22.1010
944782	AF1-143 E	11.7872	50/50	11.7872
945671	AF1-232 C O2	26.3806	50/50	26.3806
945672	AF1-232 E O2	14.2050	50/50	14.2050
946081	AF1-273 C O1	12.3996	50/50	12.3996
946082	AF1-273 E O1	8.2664	50/50	8.2664
957001	AF2-001 C O2	3.7892	50/50	3.7892
957002	AF2-001 E O2	2.5262	50/50	2.5262
957011	AF2-002 C O2	1.8946	50/50	1.8946
957012	AF2-002 E O2	1.2631	50/50	1.2631
957981	AF2-092 C	0.2908	Adder	0.65
957982	AF2-092 E	0.1939	Adder	0.43
958101	AF2-104 C	0.7577	50/50	0.7577
958102	AF2-104 E	0.5051	50/50	0.5051
958411	AF2-135 C	1.1050	50/50	1.1050
958412	AF2-135 E	0.7367	50/50	0.7367
958471	AF2-141	2.9468	50/50	2.9468
959792	AF2-270 E	0.3724	50/50	0.3724
960191	AF2-310 O2	10.6764	50/50	10.6764
960451	AF2-336 C O2	0.4894	Adder	1.09
960452	AF2-336 E O2	0.3263	Adder	0.72
960461	AF2-337 C O2	0.4894	Adder	1.09
960462	AF2-337 E O2	0.3263	Adder	0.72
960471	AF2-338 C O2	0.4894	Adder	1.09
960472	AF2-338 E O2	0.3263	Adder	0.72
960481	AF2-339 C O2	0.4894	Adder	1.09
960482	AF2-339 E O2	0.3263	Adder	0.72
NEWTON	NEWTON	0.3976	Confirmed LTF	0.3976
FARMERCITY	FARMERCITY	0.0201	Confirmed LTF	0.0201
G-007A	G-007A	0.9326	Confirmed LTF	0.9326
VFT	VFT	2.5219	Confirmed LTF	2.5219
CALDERWOOD	CALDERWOOD	0.1471	Confirmed LTF	0.1471
PRAIRIE	PRAIRIE	0.9221	Confirmed LTF	0.9221
CHEOAH	CHEOAH	0.1466	Confirmed LTF	0.1466
EDWARDS	EDWARDS	0.1316	Confirmed LTF	0.1316
TILTON	TILTON	0.2388	Confirmed LTF	0.2388
MADISON	MADISON	0.0605	Confirmed LTF	0.0605
GIBSON	GIBSON	0.2047	Confirmed LTF	0.2047
BLUEG	BLUEG	0.6579	Confirmed LTF	0.6579
TRIMBLE	TRIMBLE	0.2120	Confirmed LTF	0.2120
CATAWBA	CATAWBA	0.0759	Confirmed LTF	0.0759

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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
151886974	235469	01GARRET	AP	960190	AF2-310 TAP	AP	1	AP-P2-3-MP-138-153	breaker	206.0	109.09	112.11	DC	6.23

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.4195	50/50	0.4195
200834	26SW_E13_K22	0.0444	50/50	0.0444
200835	26DSGENWIN	0.4241	50/50	0.4241
200840	26DEEPCRK1	0.9690	50/50	0.9690
200841	26DEEPCRK2	0.9690	50/50	0.9690
200864	K-013 E	1.5224	Adder	1.79
200889	26STNY CRK	0.2069	50/50	0.2069
200890	26BF_G21_K23	0.2080	50/50	0.2080
200891	26CSLMN_L13	0.3262	50/50	0.3262
200892	26LOOKOUT	0.3099	50/50	0.3099
202225	26SCI_S29B	0.0691	50/50	0.0691
202652	26RGH_Y1-033	0.3028	50/50	0.3028
235013	01AB1-065 C	0.4609	50/50	0.4609
235532	AA1-100 BAT	1.0073	Merchant Transmission	1.0073
292350	K-023	7.7776	50/50	7.7776
292542	L-013 1	7.5648	50/50	7.5648
293432	R-040 E	0.4255	50/50	0.4255
293902	O-048 E	6.8083	50/50	6.8083
294903	P-060 E	4.7989	50/50	4.7989
913142	Y1-033 E OP1	11.9907	50/50	11.9907
917672	Z2-108 E	4.2552	50/50	4.2552
923971	AB2-038	-0.2842	Adder	-0.33
924001	AB2-041 C	-0.2503	Adder	-0.29
924002	AB2-041 E	-1.0623	Adder	-1.25
930262	**AB1-065 E (Suspended)**	**4.4312**	**50/50**	**4.4312**
934441	AD1-068 C	7.6623	50/50	7.6623
934442	AD1-068 E	44.4625	50/50	44.4625
938351	AE1-053	2.3640	50/50	2.3640
938881	AE1-116	0.6439	50/50	0.6439
938991	AE1-128 C	4.7742	Adder	5.62
938992	AE1-128 E	3.1828	Adder	3.74
942903	AE2-309 BAT	1.2300	50/50	1.2300
943301	AF1-001 C	4.2357	50/50	4.2357
943302	AF1-001 E	4.7244	50/50	4.7244
943711	AF1-039 C O1	3.1721	50/50	3.1721
943712	AF1-039 E O1	2.1148	50/50	2.1148
944781	AF1-143 C	14.1840	50/50	14.1840
944782	AF1-143 E	7.5648	50/50	7.5648
945671	AF1-232 C O2	12.9334	50/50	12.9334
945672	AF1-232 E O2	6.9642	50/50	6.9642
946081	AF1-273 C O1	6.1802	50/50	6.1802

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
946082	AF1-273 E O1	4.1201	50/50	4.1201
946571	AF1-321 C O1	0.7854	Adder	0.92
946572	AF1-321 E O1	0.5236	Adder	0.62
957001	AF2-001 C O2	0.4569	Adder	1.01
957002	AF2-001 E O2	0.3046	Adder	0.68
957011	AF2-002 C O2	0.2284	Adder	0.51
957012	AF2-002 E O2	0.1523	Adder	0.34
957981	AF2-092 C	0.2365	Adder	0.52
957982	AF2-092 E	0.1576	Adder	0.35
958101	AF2-104 C	0.3434	50/50	0.3434
958102	AF2-104 E	0.2289	50/50	0.2289
958411	AF2-135 C	0.7092	50/50	0.7092
958412	AF2-135 E	0.4728	50/50	0.4728
958471	AF2-141	1.8912	50/50	1.8912
959792	AF2-270 E	0.1308	Adder	0.29
960192	AF2-310 BAT	6.2270	50/50	6.2270
960451	AF2-336 C O2	0.3964	Adder	0.88
960452	AF2-336 E O2	0.2643	Adder	0.59
960461	AF2-337 C O2	0.3964	Adder	0.88
960462	AF2-337 E O2	0.2643	Adder	0.59
960471	AF2-338 C O2	0.3964	Adder	0.88
960472	AF2-338 E O2	0.2643	Adder	0.59
960481	AF2-339 C O2	0.3964	Adder	0.88
960482	AF2-339 E O2	0.2643	Adder	0.59
960901	AF2-381 C	2.8580	Adder	6.34
960902	AF2-381 E	1.5040	Adder	3.34
NEWTON	NEWTON	0.1741	Confirmed LTF	0.1741
FARMERCITY	FARMERCITY	0.0094	Confirmed LTF	0.0094
G-007A	G-007A	0.6066	Confirmed LTF	0.6066
VFT	VFT	1.6964	Confirmed LTF	1.6964
CALDERWOOD	CALDERWOOD	0.1133	Confirmed LTF	0.1133
PRAIRIE	PRAIRIE	0.4443	Confirmed LTF	0.4443
CHEOAH	CHEOAH	0.1146	Confirmed LTF	0.1146
EDWARDS	EDWARDS	0.0528	Confirmed LTF	0.0528
TILTON	TILTON	0.0964	Confirmed LTF	0.0964
GIBSON	GIBSON	0.0874	Confirmed LTF	0.0874
BLUEG	BLUEG	0.2812	Confirmed LTF	0.2812
TRIMBLE	TRIMBLE	0.0902	Confirmed LTF	0.0902
CATAWBA	CATAWBA	0.0973	Confirmed LTF	0.0973

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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
100736649	237310	01DANSMTN	AP	235504	01RIDGLY	AP	1	AP-P2-4-MP-138-200	breaker	182.0	141.43	148.63	DC	13.1

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.3990	50/50	0.3990
200834	26SW_E13_K22	0.0423	50/50	0.0423
200835	26DSGENWIN	0.4034	50/50	0.4034
200840	26DEEPCRK1	0.9218	50/50	0.9218
200841	26DEEPCRK2	0.9218	50/50	0.9218
200889	26STNY CRK	0.1968	50/50	0.1968
200890	26BF_G21_K23	0.1978	50/50	0.1978
200891	26CSLMN_L13	0.3103	50/50	0.3103
200892	26LOOKOUT	0.2948	50/50	0.2948
202225	26SCI_S29B	0.0657	50/50	0.0657
202652	26RGH_Y1-033	0.2880	50/50	0.2880
235013	01AB1-065 C	0.4384	50/50	0.4384
235532	AA1-100 BAT	1.0554	Merchant Transmission	1.0554
237312	01DANS_S-014	11.5987	50/50	11.5987
290229	S-014 E	46.3949	50/50	46.3949
292350	K-023	7.3986	50/50	7.3986
292542	L-013 1	7.1962	50/50	7.1962
293432	R-040 E	0.4048	50/50	0.4048
293902	O-048 E	6.4765	50/50	6.4765
294903	P-060 E	4.5646	50/50	4.5646
913142	Y1-033 E OP1	11.4062	50/50	11.4062
917672	Z2-108 E	4.0478	50/50	4.0478
923971	AB2-038	-0.2980	Adder	-0.35
924001	AB2-041 C	-0.2625	Adder	-0.31
924002	AB2-041 E	-1.1139	Adder	-1.31
930262	**AB1-065 E (Suspended)**	**4.2153**	**50/50**	**4.2153**
933951	**AD1-018 C (Suspended)**	**1.5651**	**50/50**	**1.5651**
933952	**AD1-018 E (Suspended)**	**2.5537**	**50/50**	**2.5537**
934441	AD1-068 C	7.2891	50/50	7.2891
934442	AD1-068 E	42.2965	50/50	42.2965
938351	AE1-053	2.2488	50/50	2.2488
938881	AE1-116	0.6125	50/50	0.6125
942901	AE2-309 C	3.3457	50/50	3.3457
942902	AE2-309 E	0.6386	50/50	0.6386
943301	AF1-001 C	4.0293	50/50	4.0293
943302	AF1-001 E	4.4943	50/50	4.4943
943711	AF1-039 C O1	3.0175	50/50	3.0175
943712	AF1-039 E O1	2.0117	50/50	2.0117
944781	AF1-143 C	13.4928	50/50	13.4928
944782	AF1-143 E	7.1962	50/50	7.1962
945671	AF1-232 C O2	12.3022	50/50	12.3022

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945672	AF1-232 E O2	6.6242	50/50	6.6242
946081	AF1-273 C O1	5.8788	50/50	5.8788
946082	AF1-273 E O1	3.9192	50/50	3.9192
957001	AF2-001 C O2	0.4345	Adder	0.96
957002	AF2-001 E O2	0.2897	Adder	0.64
957011	AF2-002 C O2	0.2173	Adder	0.48
957012	AF2-002 E O2	0.1448	Adder	0.32
958101	AF2-104 C	0.3267	50/50	0.3267
958102	AF2-104 E	0.2178	50/50	0.2178
958411	AF2-135 C	0.6746	50/50	0.6746
958412	AF2-135 E	0.4498	50/50	0.4498
958471	AF2-141	1.7990	50/50	1.7990
960191	AF2-310 O2	13.1020	50/50	13.1020
NEWTON	NEWTON	0.1644	Confirmed LTF	0.1644
FARMERCITY	FARMERCITY	0.0088	Confirmed LTF	0.0088
G-007A	G-007A	0.5754	Confirmed LTF	0.5754
VFT	VFT	1.6125	Confirmed LTF	1.6125
CALDERWOOD	CALDERWOOD	0.1069	Confirmed LTF	0.1069
PRAIRIE	PRAIRIE	0.4184	Confirmed LTF	0.4184
CHEOAH	CHEOAH	0.1086	Confirmed LTF	0.1086
EDWARDS	EDWARDS	0.0497	Confirmed LTF	0.0497
TILTON	TILTON	0.0907	Confirmed LTF	0.0907
GIBSON	GIBSON	0.0824	Confirmed LTF	0.0824
BLUEG	BLUEG	0.2656	Confirmed LTF	0.2656
TRIMBLE	TRIMBLE	0.0846	Confirmed LTF	0.0846
CATAWBA	CATAWBA	0.0921	Confirmed LTF	0.0921

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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
101305089	945670	AF1-232 TAP	PENELEC	200745	26ALLEGHEN	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	136.85	137.37	DC	1.85

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.3199	50/50	0.3199
200834	26SW_E13_K22	0.1642	50/50	0.1642
200835	26DSGENWIN	0.8086	50/50	0.8086
200840	26DEEPCRK1	0.2957	50/50	0.2957
200841	26DEEPCRK2	0.2957	50/50	0.2957
200890	26BF_G21_K23	0.3965	50/50	0.3965
200891	26CSLMN_L13	0.6220	50/50	0.6220
200892	26LOOKOUT	0.5909	50/50	0.5909
202225	26SCI_S29B	0.2555	50/50	0.2555
202652	26RGH_Y1-033	0.3036	50/50	0.3036
235013	01AB1-065 C	0.0725	50/50	0.0725
292350	K-023	14.8290	50/50	14.8290
292542	L-013 1	14.4234	50/50	14.4234
293432	R-040 E	0.8113	50/50	0.8113
293902	O-048 E	12.9810	50/50	12.9810
913142	Y1-033 E OP1	12.0233	50/50	12.0233
917672	Z2-108 E	8.1131	50/50	8.1131
930262	**AB1-065 E (Suspended)**	**0.6975**	**50/50**	**0.6975**
938351	AE1-053	4.5073	50/50	4.5073
938881	AE1-116	2.3804	50/50	2.3804
943301	AF1-001 C	0.6667	50/50	0.6667
943302	AF1-001 E	0.7436	50/50	0.7436
943711	AF1-039 C O1	3.1808	50/50	3.1808
943712	AF1-039 E O1	2.1205	50/50	2.1205
944781	AF1-143 C	27.0438	50/50	27.0438
944782	AF1-143 E	14.4234	50/50	14.4234
945671	AF1-232 C O2	64.6058	50/50	64.6058
945672	AF1-232 E O2	34.7878	50/50	34.7878
957001	AF2-001 C O2	6.3467	50/50	6.3467
957002	AF2-001 E O2	4.2311	50/50	4.2311
957011	AF2-002 C O2	3.1733	50/50	3.1733
957012	AF2-002 E O2	2.1156	50/50	2.1156
958101	AF2-104 C	1.2696	50/50	1.2696
958102	AF2-104 E	0.8464	50/50	0.8464
958411	AF2-135 C	1.3522	50/50	1.3522
958412	AF2-135 E	0.9015	50/50	0.9015
958471	AF2-141	3.6058	50/50	3.6058
959793	AF2-270 BAT	0.2258	50/50	0.2258
960191	AF2-310 O2	0.8328	Adder	1.85
WEC	WEC	0.0589	Confirmed LTF	0.0589
LGEE	LGEE	0.1124	Confirmed LTF	0.1124

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CPLE	CPLE	0.1568	Confirmed LTF	0.1568
CBM-W2	CBM-W2	1.6544	Confirmed LTF	1.6544
NY	NY	0.3290	Confirmed LTF	0.3290
CBM-W1	CBM-W1	2.1642	Confirmed LTF	2.1642
TVA	TVA	0.2954	Confirmed LTF	0.2954
O-066	O-066	2.1907	Confirmed LTF	2.1907
CBM-S2	CBM-S2	1.3352	Confirmed LTF	1.3352
CBM-S1	CBM-S1	1.7807	Confirmed LTF	1.7807
G-007	G-007	0.3276	Confirmed LTF	0.3276
MADISON	MADISON	0.0020	Confirmed LTF	0.0020
MEC	MEC	0.3051	Confirmed LTF	0.3051

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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
151886960	960190	AF2-310 TAP	AP	235449	01CARLOS	AP	1	AP-P2-4-MP-138-200	breaker	206.0	109.56	116.26	DC	13.78

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.4196	50/50	0.4196
200834	26SW_E13_K22	0.0444	50/50	0.0444
200835	26DSGENWIN	0.4242	50/50	0.4242
200840	26DEEPCRK1	0.9693	50/50	0.9693
200841	26DEEPCRK2	0.9693	50/50	0.9693
200864	K-013 E	1.5228	Adder	1.79
200889	26STNY CRK	0.2070	50/50	0.2070
200890	26BF_G21_K23	0.2080	50/50	0.2080
200891	26CSLMN_L13	0.3263	50/50	0.3263
200892	26LOOKOUT	0.3100	50/50	0.3100
202225	26SCI_S29B	0.0691	50/50	0.0691
202652	26RGH_Y1-033	0.3029	50/50	0.3029
235013	01AB1-065 C	0.4610	50/50	0.4610
235532	AA1-100 BAT	1.0046	Merchant Transmission	1.0046
292350	K-023	7.7799	50/50	7.7799
292542	L-013 1	7.5670	50/50	7.5670
293432	R-040 E	0.4256	50/50	0.4256
293902	O-048 E	6.8103	50/50	6.8103
294903	P-060 E	4.8002	50/50	4.8002
913142	Y1-033 E OP1	11.9941	50/50	11.9941
917672	Z2-108 E	4.2565	50/50	4.2565
923971	AB2-038	-0.2839	Adder	-0.33
924001	AB2-041 C	-0.2501	Adder	-0.29
924002	AB2-041 E	-1.0612	Adder	-1.25
930262	**AB1-065 E (Suspended)**	**4.4324**	**50/50**	**4.4324**
934441	AD1-068 C	7.6646	50/50	7.6646
934442	AD1-068 E	44.4754	50/50	44.4754
938351	AE1-053	2.3647	50/50	2.3647
938881	AE1-116	0.6440	50/50	0.6440
938991	AE1-128 C	4.7754	Adder	5.62
938992	AE1-128 E	3.1836	Adder	3.75
942903	AE2-309 BAT	1.2214	50/50	1.2214
943301	AF1-001 C	4.2369	50/50	4.2369
943302	AF1-001 E	4.7258	50/50	4.7258
943711	AF1-039 C O1	3.1730	50/50	3.1730
943712	AF1-039 E O1	2.1154	50/50	2.1154
944781	AF1-143 C	14.1882	50/50	14.1882
944782	AF1-143 E	7.5670	50/50	7.5670
945671	AF1-232 C O2	12.9366	50/50	12.9366
945672	AF1-232 E O2	6.9658	50/50	6.9658
946081	AF1-273 C O1	6.1817	50/50	6.1817

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
946082	AF1-273 E O1	4.1211	50/50	4.1211
946571	AF1-321 C O1	0.7856	Adder	0.92
946572	AF1-321 E O1	0.5237	Adder	0.62
957001	AF2-001 C O2	0.4570	Adder	1.01
957002	AF2-001 E O2	0.3046	Adder	0.68
957011	AF2-002 C O2	0.2285	Adder	0.51
957012	AF2-002 E O2	0.1523	Adder	0.34
957981	AF2-092 C	0.2365	Adder	0.52
957982	AF2-092 E	0.1577	Adder	0.35
958101	AF2-104 C	0.3435	50/50	0.3435
958102	AF2-104 E	0.2290	50/50	0.2290
958411	AF2-135 C	0.7094	50/50	0.7094
958412	AF2-135 E	0.4729	50/50	0.4729
958471	AF2-141	1.8918	50/50	1.8918
959792	AF2-270 E	0.1308	Adder	0.29
960191	AF2-310 O2	13.7768	50/50	13.7768
960451	AF2-336 C O2	0.3965	Adder	0.88
960452	AF2-336 E O2	0.2644	Adder	0.59
960461	AF2-337 C O2	0.3965	Adder	0.88
960462	AF2-337 E O2	0.2644	Adder	0.59
960471	AF2-338 C O2	0.3965	Adder	0.88
960472	AF2-338 E O2	0.2644	Adder	0.59
960481	AF2-339 C O2	0.3965	Adder	0.88
960482	AF2-339 E O2	0.2644	Adder	0.59
960901	AF2-381 C	2.8587	Adder	6.35
960902	AF2-381 E	1.5044	Adder	3.34
NEWTON	NEWTON	0.1773	Confirmed LTF	0.1773
FARMERCITY	FARMERCITY	0.0095	Confirmed LTF	0.0095
G-007A	G-007A	0.6114	Confirmed LTF	0.6114
VFT	VFT	1.7092	Confirmed LTF	1.7092
CALDERWOOD	CALDERWOOD	0.1143	Confirmed LTF	0.1143
PRAIRIE	PRAIRIE	0.4520	Confirmed LTF	0.4520
CHEOAH	CHEOAH	0.1156	Confirmed LTF	0.1156
EDWARDS	EDWARDS	0.0536	Confirmed LTF	0.0536
TILTON	TILTON	0.0983	Confirmed LTF	0.0983
GIBSON	GIBSON	0.0890	Confirmed LTF	0.0890
BLUEG	BLUEG	0.2864	Confirmed LTF	0.2864
TRIMBLE	TRIMBLE	0.0913	Confirmed LTF	0.0913
CATAWBA	CATAWBA	0.0977	Confirmed LTF	0.0977

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13.6 Contingency Descriptions - Secondary POI

Contingency Name	Contingency Definition
AP-P1-2-MP-138-160-A	CONTINGENCY 'AP-P1-2-MP-138-160-A' /* 1518 DISCONNECT BRANCH FROM BUS 235120 TO BUS 934440 CKT 1 /* 01ALBRIG 138 AD1-068 TAP 138 END
PN-P1-3-PN-115-025-A	CONTINGENCY 'PN-P1-3-PN-115-025-A' /* SOMERSET #1 XFMR FAULT DISCONNECT BRANCH FROM BUS 200744 TO BUS 200774 CKT 1 /* 26SOMERST 115 26SOMRSET1 23 DISCONNECT BRANCH FROM BUS 200744 TO BUS 200746 CKT 1 /* 26SOMERST 115 26ROCKWOOD 115 DISCONNECT BRANCH FROM BUS 200744 TO BUS 202637 CKT 1 /* 26SOMERST 115 26PRIDE 115 DISCONNECT BRANCH FROM BUS 202637 TO BUS 202647 CKT 1 /* 26PRIDE 115 26KIMRUN TAP 115 DISCONNECT BRANCH FROM BUS 200744 TO BUS 957000 CKT 1 /* 26SOMERST 115 AF2-001 TAP 115 END
AP-P2-3-MP-138-153	CONTINGENCY 'AP-P2-3-MP-138-153' /* OAK PARK-KELSO GAP STK BKR AT ALBRIGHT DISCONNECT BRANCH FROM BUS 235120 TO BUS 235485 CKT 1 /* 01ALBRIG 138 01METTIK 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 960650 CKT 1 /* 01ALBRIG 138 01MTZION 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235305 CKT 1 /* 01ALBRIG 138 01 106 J 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235320 CKT 1 /* 01ALBRIG 138 01DENVER 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 934440 CKT 1 /* 01ALBRIG 138 AD1-068 TAP 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235402 CKT 1 /* 01ALBRIG 138 01SNOW T 138 DISCONNECT BRANCH FROM BUS 235402 TO BUS 235403 CKT 1 /* 01SNOW T 138 01SNWYCK 138 DISCONNECT BRANCH FROM BUS 235402 TO BUS 235497 CKT 1 /* 01SNOW T 138 01OAKPRK 138 DISCONNECT BRANCH FROM BUS 235403 TO BUS 237273 CKT 1 /* 01SNWYCK 138 01SNOW C 66 DISCONNECT BRANCH FROM BUS 235497 TO BUS 237313 CKT 1 /* 01OAKPRK 138 01KELSOG 138 END

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Contingency Name	Contingency Definition
PN-P2-3-PN-115-35E	CONTINGENCY 'PN-P2-3-PN-115-35E' /* #14 STUCK TIE BREAKER BETWEEN BUSES 1 AND 2 DISCONNECT BRANCH FROM BUS 200734 TO BUS 200743 CKT 1 /* 26SCALP L. 115 26HOOVERSV 115 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200802 CKT 1 /* 26HOOVERSV 115 26RALPHTON 115 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200776 CKT 1 /* 26HOOVERSV 115 26HOOVER#1 23 DISCONNECT BRANCH FROM BUS 200743 TO BUS 957000 CKT 1 /* 26HOOVERSV 115 AF2-001 TAP 115 DISCONNECT BRANCH FROM BUS 200742 TO BUS 200743 CKT 1 /* 26TOWER 51 115 26HOOVERSV 115 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200789 CKT 2 /* 26HOOVERSV 115 26HOOVER#2 23 END
AP-P2-2-MP-138-101-A	CONTINGENCY 'AP-P2-2-MP-138-101-A' /* ALBRIGHT-138-SOUTH DISCONNECT BRANCH FROM BUS 235120 TO BUS 235320 CKT 1 /* 01ALBRIG 138 01DENVER 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235402 CKT 1 /* 01ALBRIG 138 01SNOW T 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 934440 CKT 1 /* 01ALBRIG 138 AD1-068 TAP 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235485 CKT 1 /* 01ALBRIG 138 01METTIK 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235305 CKT 1 /* 01ALBRIG 138 01 106 J 138 END
PN-P1-2-PN-115-066-A	CONTINGENCY 'PN-P1-2-PN-115-066-A' /* HOOVERSVILLE - SOMERSET 115KV DISCONNECT BRANCH FROM BUS 200743 TO BUS 957000 CKT 1 /* 26HOOVERSV 115 AF2-001 TAP 115 END
AP-P1-2-WP-500-013	CONTINGENCY 'AP-P1-2-WP-500-013' /* BLACK OAK - HATFIELD 500KV WITH SPS DISCONNECT BRANCH FROM BUS 235108 TO BUS 235103 CKT 1 /* 01HATFLD 500 01BLACKO 500 DISCONNECT BRANCH FROM BUS 235103 TO BUS 235446 CKT 3 /* 01BLACKO 500 01BLACKO 138 END

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Contingency Name	Contingency Definition
AP-P2-3-MP-138-150	CONTINGENCY 'AP-P2-3-MP-138-150' /* ALBRIGHT-BRANDONVILLE 106 JCT. STK BKR AT ALBRIGHT DISCONNECT BRANCH FROM BUS 235120 TO BUS 235305 CKT 1 /* 01ALBRIG 138 01 106 J 138 DISCONNECT BRANCH FROM BUS 938800 TO BUS 235305 CKT 1 /* AE1-106 TAP 138 01 106 J 138 /* CONTINGENCY LINE ADDED FOR AE1 BUILD DISCONNECT BRANCH FROM BUS 235297 TO BUS 235305 CKT 1 /* 01HAZELT 138 01 106 J 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 960650 CKT 1 /* 01ALBRIG 138 01MTZION 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235402 CKT 1 /* 01ALBRIG 138 01SNOW T 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235320 CKT 1 /* 01ALBRIG 138 01DENVER 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 934440 CKT 1 /* 01ALBRIG 138 AD1-068 TAP 138 /* CONTINGENCY LINE ADDED FOR AE1 BUILD END
AP-P2-4-MP-138-200	CONTINGENCY 'AP-P2-4-MP-138-200' /* ALBRIGHT BREAKER FAILURE - TIE BREAKER DISCONNECT BRANCH FROM BUS 235120 TO BUS 235304 CKT 1 /* 01ALBRIG 138 01BRANDN 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235305 CKT 1 /* 01ALBRIG 138 01 106 J 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235320 CKT 1 /* 01ALBRIG 138 01DENVER 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235356 CKT 1 /* 01ALBRIG 138 01KINGWD 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235398 CKT 1 /* 01ALBRIG 138 01RUTHBL 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235402 CKT 1 /* 01ALBRIG 138 01SNOW T 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 934440 CKT 1 /* 01ALBRIG 138 AD1-068 TAP 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235485 CKT 1 /* 01ALBRIG 138 01METTIK 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 960650 CKT 1 /* 01ALBRIG 138 01MTZION 138 END
Base Case	

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Contingency Name	Contingency Definition
PN-P7-1-PN-230-001	CONTINGENCY 'PN-P7-1-PN-230-001' /* HOMER CITY - HOOVERSVILLE 230KV & SEWARD - TOWER 51 115KV DISCONNECT BRANCH FROM BUS 200767 TO BUS 200768 CKT 1 /* 26HOMER CT 230 26QUEMAHON 230 DISCONNECT BRANCH FROM BUS 200768 TO BUS 200796 CKT 1 /* 26QUEMAHON 230 26HOOVRSVL 230 DISCONNECT BRANCH FROM BUS 200796 TO BUS 200743 CKT 3 /* 26HOOVRSVL 230 26HOOVERSV 115 DISCONNECT BRANCH FROM BUS 200741 TO BUS 200742 CKT 1 /* 26SEWARD 115 26TOWER 51 115 END
PN-P1-3-PN-115-029-A	CONTINGENCY 'PN-P1-3-PN-115-029-A' /* HOOVERSVILLE #2 XFMR FAULT DISCONNECT BRANCH FROM BUS 200743 TO BUS 200789 CKT 2 /* 26HOOVERSV 115 26HOOVER#2 23 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200742 CKT 1 /* 26HOOVERSV 115 26TOWER 51 115 DISCONNECT BRANCH FROM BUS 200743 TO BUS 957000 CKT 1 /* 26HOOVERSV 115 AF2-001 TAP 115 END
AP-P2-2-PE-138-021A	CONTINGENCY 'AP-P2-2-PE-138-021A' /* 42 DISCONNECT BRANCH FROM BUS 237310 TO BUS 235504 CKT 1 /* 01DANSMTN 138 01RIDGLY 138 DISCONNECT BRANCH FROM BUS 235454 TO BUS 235504 CKT 1 /* 01CUMBRL 138 01RIDGLY 138 DISCONNECT BRANCH FROM BUS 940460 TO BUS 235504 CKT 1 /* AE2-030 TAP 138 01RIDGLY 138 /* CONTINGENCY LINE ADDED FOR AE1 BUILD DISCONNECT BRANCH FROM BUS 235484 TO BUS 235504 CKT 1 /* 01MESSCK 138 01RIDGLY 138 DISCONNECT BRANCH FROM BUS 235504 TO BUS 235593 CKT 1 /* 01RIDGLY 138 01HAMPS2 138 DISCONNECT BRANCH FROM BUS 235504 TO BUS 237036 CKT ZB /* 01RIDGLY 138 01RIDGLY CAP138 DISCONNECT BRANCH FROM BUS 235504 TO BUS 236001 CKT 1 /* 01RIDGLY 138 01WARRIOR RN 18 DISCONNECT BRANCH FROM BUS 235504 TO BUS 237498 CKT 1 /* 01RIDGLY 138 01RIDGL#1 35 DISCONNECT BRANCH FROM BUS 235504 TO BUS 237499 CKT 2 /* 01RIDGLY 138 01RIDGL#2 35 END

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Contingency Name	Contingency Definition
AP-P2-3-MP-138-159	CONTINGENCY 'AP-P2-3-MP-138-159' /* ALBRIGHT-DENVER STK BKR AT ALBRIGHT DISCONNECT BRANCH FROM BUS 235120 TO BUS 235320 CKT 1 /* 01ALBRIG 138 01DENVER 138 DISCONNECT BRANCH FROM BUS 235320 TO BUS 235810 CKT 1 /* 01DENVER 138 01INT COAL 138 DISCONNECT BRANCH FROM BUS 235338 TO BUS 235810 CKT 1 /* 01GRAFTN 138 01INT COAL 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 934440 CKT 1 /* 01ALBRIG 138 AD1-068 TAP 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235402 CKT 1 /* 01ALBRIG 138 01SNOW T 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 960650 CKT 1 /* 01ALBRIG 138 01MTZION 138 DISCONNECT BRANCH FROM BUS 235120 TO BUS 235305 CKT 1 /* 01ALBRIG 138 01 106 J 138 END

14 Affected Systems

None