Generation Interconnection

Feasibility Study Report

for

Queue Project AF2-135

ROCKWOOD-CONFLUENCE 23 KV

3 MW Capacity / 5 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 Somerset County, Pennsylvania. The installed facilities will have a total capability of 5 MW with 3 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is June 01, 2022. This study does not imply a TO commitment to this in-service date.

Queue Number	AF2-135
Project Name	ROCKWOOD-CONFLUENCE 23 KV
State	Pennsylvania
County	Somerset
Transmission Owner	MAIT (PENELEC zone)
MFO	5
MWE	5
MWC	3
Fuel	Solar
Basecase Study Year	2023

Any new service customers who can feasibly be commercially operable prior to June 1st of the basecase study year are required to request interim deliverability analysis.

4 Point of Interconnection

AF2-135 will interconnect with the PENELEC distribution system POI pole RD-5112, which is located on the 22.86kV Confluence ckt#00023-12 @ Rockwood substation.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AF2-135 generation project to connect to the Penelec distribution system. IC will be responsible for constructing all of the facilities on its side of the POI, including the attachment facilities which connect the generator to the Penelec distribution system's direct connection facilities.

5 Cost Summary

The AF2-135 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$139,600
Total System Network Upgrade Costs	$77,759,400[1]
Total Costs	$77,899,000

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 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

AF2-135 will interconnect with the PENELEC distribution system POI pole RD-5112, which is located on the 22.86kV Confluence ckt#00023-12 @ Rockwood substation.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AF2-135 generation project to connect to the Penelec distribution system. IC will be responsible for constructing all of the facilities on its side of the POI, including the attachment facilities which connect the generator to the Penelec distribution system's direct connection facilities.

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

Description	Total Cost
Tap the existing 22.86kV Confluence ckt#00023-12 @ Rockwood at POI pole RD-5112 and install a SCADA controlled 22.86kV recloser to interconnect queue project AF2-135. Install 22.86kV metering in customer's facilities. The customer is responsible to build their own line from their site to Penelec' s existing facilities.	$100,000
Nameplates & Customer Drawing Review @ AF2-135	$25,200
Rockwood 22.86kV SS. Adjust Remote Relay and Metering Settings.	$14,400
Total Physical Interconnection Costs	$139,600

7 Schedule

Based on the scope of work for the interconnection facilities, it is expected to take a minimum of **9 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 direct connection and network upgrades, and that all transmission system outages will be allowed when requested.

8 Transmission Owner Analysis

Penelec performed an analysis of its distribution system. The AF2-135 project did not contribute to any overloads on the distribution system.

9 Interconnection Customer Requirements

9.1 Protection Requirements

An analysis was conducted to assess the impact of the Rockwood - Confluence 23kV (AF2-135) Project on the system protection requirements in the area. The results of this review show that the following relay additions will be required:

Proposed single line diagrams show the IC constructing a generation facility that will connect to Penelec's 22.86kV Rockwood substation ckt#00023-12 via a customer owned tap to pole RD-5112.

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

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

9.2 General Concerns

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

9.3 Requirements for IC's Facility

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

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

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

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

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

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

9.4 Compliance Issues

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

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

10 Revenue Metering and SCADA Requirements

10.1 PJM Requirements

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

10.2 Meteorological Data Reporting Requirements

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

- Back Panel temperature (Fahrenheit)
- Irradiance (Watts/meter2)
- Ambient air temperature (Fahrenheit) – (Accepted, not required)
- Wind speed (meters/second) – (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/

These FE requirements are the following:

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

11 Summer Peak - Load Flow Analysis

The Queue Project AF2-135 was evaluated as a 5.0 MW (Capacity 3.0 MW) injection at the Rockwood 23 kV substation in the PENELEC area. Project AF2-135 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-135 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
10105723 1	20074 5	26ALLEGHEN	115. 0	PENELEC	20088 4	26NEW BALT	115. 0	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	153.9	155.31	DC	2.25
10105722 3	20074 6	26ROCKWOOD	115. 0	PENELEC	20265 0	26HIGHPOINT	115. 0	PENELEC	1	PN-P2-3-PN-115-35E	breaker	179.0	148.59	150.12	DC	2.75
10105831 6	20074 6	26ROCKWOOD	115. 0	PENELEC	20265 0	26HIGHPOINT	115. 0	PENELEC	1	PN-P7-1-PN-230-001	tower	179.0	129.24	130.32	DC	1.93
10105718 6	20074 7	26PENN-MAR	115. 0	PENELEC	20076 2	26GARRETT	115. 0	PENELEC	1	PN-P2-3-PN-115-35E	breaker	167.0	177.47	179.11	DC	2.75
98713643	20076 2	26GARRETT	115. 0	PENELEC	23547 0	01GARRET	115. 0	AP	1	PN-P2-3-PN-115-35E	breaker	160.0	195.58	197.29	DC	2.74
10105719 1	20265 0	26HIGHPOINT	115. 0	PENELEC	20074 7	26PENN-MAR	115. 0	PENELEC	1	PN-P2-3-PN-115-35E	breaker	174.0	167.05	168.63	DC	2.75
10105831 1	20265 0	26HIGHPOINT	115. 0	PENELEC	20074 7	26PENN-MAR	115. 0	PENELEC	1	PN-P7-1-PN-230-001	tower	174.0	144.12	145.22	DC	1.93
10055679 4	23547 0	01GARRET	115. 0	AP	23546 9	01GARRET	138. 0	AP	1	PN-P2-3-PN-115-35E	breaker	196.0	159.65	161.05	DC	2.74
10105733 5	94567 0	AF1-232 TAP	115. 0	PENELEC	20074 5	26ALLEGHEN	115. 0	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	123.13	124.54	DC	2.25

11.4 Potential Congestion due to Local Energy Deliverability

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

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
101057773	200744	26SOMERST	115.0	PENELEC	200743	26HOOVERSV	115.0	PENELEC	1	AP-P1-3-PN-115-010	operation	190.0	112.55	113.74	DC	2.26
101057828	200744	26SOMERST	115.0	PENELEC	200802	26RALPHTON	115.0	PENELEC	1	PN-P1-2-PN-115-066	operation	185.0	103.24	104.49	DC	2.31
101057580	200746	26ROCKWOOD	115.0	PENELEC	200744	26SOMERST	115.0	PENELEC	1	AP-P1-3-PN-115-010	operation	179.0	166.99	169.78	DC	5.0
101057585	200746	26ROCKWOOD	115.0	PENELEC	200744	26SOMERST	115.0	PENELEC	1	Base Case	operation	148.0	118.94	121.29	DC	3.47
101057659	200746	26ROCKWOOD	115.0	PENELEC	202650	26HIGHPOINT	115.0	PENELEC	1	PN-P1-3-PN-115-029	operation	179.0	124.14	125.18	DC	1.85
101057660	200746	26ROCKWOOD	115.0	PENELEC	202650	26HIGHPOINT	115.0	PENELEC	1	Base Case	operation	148.0	130.44	131.47	DC	1.53
101057574	200747	26PENN-MAR	115.0	PENELEC	200762	26GARRETT	115.0	PENELEC	1	PN-P1-3-PN-115-025	operation	167.0	167.62	170.61	DC	5.0
101057576	200747	26PENN-MAR	115.0	PENELEC	200762	26GARRETT	115.0	PENELEC	1	Base Case	operation	137.0	156.9	158.02	DC	1.53
98713858	200762	26GARRETT	115.0	PENELEC	235470	01GARRET	115.0	AP	1	PN-P1-3-PN-115-025	operation	160.0	186.82	189.94	DC	5.0
98713860	200762	26GARRETT	115.0	PENELEC	235470	01GARRET	115.0	AP	1	Base Case	operation	133.0	175.18	176.33	DC	1.53
101057622	202650	26HIGHPOINT	115.0	PENELEC	200747	26PENN-MAR	115.0	PENELEC	1	Base Case	operation	137.0	153.36	154.48	DC	1.53
101057623	202650	26HIGHPOINT	115.0	PENELEC	200747	26PENN-MAR	115.0	PENELEC	1	PN-P1-3-PN-115-025	operation	174.0	157.41	160.29	DC	5.0

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
10055716 3	235469	01GARRET	138.0	AP	934440	AD1-068 TAP	138.0	AP	1	PN-P1-3-PN-115-025	operation	191.0	127.24	128.99	DC	3.36
10055711 4	235470	01GARRET	115.0	AP	235469	01GARRET	138.0	AP	1	PN-P1-3-PN-115-025	operation	196.0	152.5	155.05	DC	5.0
10055710 4	934440	AD1-068 TAP	138.0	AP	235120	01ALBRIG	138.0	AP	1	PN-P1-3-PN-115-025	operation	191.0	161.69	163.45	DC	3.36

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
101057335	7	AF1-232 TAP 115.0 kV - 26ALLEGHEN 115.0 kV Ckt 1	PENELEC PN-AF2-F-0036A (1780) : Reconductor 1.7 miles of transmission line Project Type : FAC Cost : $5,196,900 Time Estimate : 24.0 Months PN-AF2-F-0036B (1781) : Replace the bus conductor at Allegheny. Project Type : FAC Cost : $122,280 Time Estimate : 12.0 Months	$5,319,180
100556794	6	01GARRET 115.0 kV - 01GARRET 138.0 kV Ckt 1	PENELEC PN-AF2-F-0065A (732) : Replace transformer. Project Type : FAC Cost : $5,502,600 Time Estimate : 24.0 Months PN-AF2-F-0065B (733) : Replace metering. Project Type : FAC Cost : $489,120 Time Estimate : 12.0 Months PN-AF2-F-0065C (734) : Replace bus conductor. Project Type : FAC Cost : $152,850 Time Estimate : 12.0 Months	$6,144,570
101057186	3	26PENN-MAR 115.0 kV - 26GARRETT 115.0 kV Ckt 1	PENELEC PN-AF2-F-0038A (1783) : Reconductor 1.76 miles of transmission line Project Type : FAC Cost : $5,380,320 Time Estimate : 30.0 Months	$5,380,320
101058316,101057223	2	26ROCKWOOD 115.0 kV - 26HIGHPOINT 115.0 kV Ckt 1	PENELEC PN-AF2-F-0037 (1782) : Rebuild 10.1 miles of transmission line Project Type : FAC Cost : $30,875,700 Time Estimate : 36.0 Months	$30,875,700

ID	Idx	Facility	Upgrade Description	Cost
98713643	4	26GARRETT 115.0 kV - 01GARRET 115.0 kV Ckt 1	**APS** **WP-AF1-F-0003 (640) : Reconductor Garrett Tap - Garrett (~2.0 miles)** **Project Type : FAC** **Cost : $3,780,000** **Time Estimate : 6.0 Months** **PENELEC** **PN-AF2-F-0042A (1794) : Replace line trap at Garrett.** **Project Type : FAC** **Cost : $122,280** **Time Estimate : 12.0 Months** **PN-AF2-F-0042B (1795) : Replace bus conductor at Garrett.** **Project Type : FAC** **Cost : $122,280** **Time Estimate : 12.0 Months**	$4,024,560
101058311,101057191	5	26HIGHPOINT 115.0 kV - 26PENN-MAR 115.0 kV Ckt 1	**PENELEC** **PN-AF2-F-0039A (1786) : Replace circuit breaker at Penn Mar** **Project Type : FAC** **Cost : $733,680** **Time Estimate : 12.0 Months** **PN-AF2-F-0039B (1787) : Rebuild 4.67 miles of transmission line** **Project Type : FAC** **Cost : $14,276,190** **Time Estimate : 36.0 Months** **PN-AF2-F-0039C (1788) : Replace bus conductor at Penn Mar.** **Project Type : FAC** **Cost : $122,280** **Time Estimate : 12.0 Months**	$15,132,150
101057231	1	26ALLEGHEN 115.0 kV - 26NEW BALT 115.0 kV Ckt 1	**PENELEC** **PN-AF2-F-0031A (1773) : Reconductor 3.52 miles of transmission line** **Project Type : FAC** **Cost : $10,760,640** **Time Estimate : 30.0 Months** **PN-AF2-F-0031B (1774) : Replace bus conductor at Allegheny.** **Project Type : FAC** **Cost : $122,280** **Time Estimate : 12.0 Months**	$10,882,920
			TOTAL COST	**$77,759,400**[1]

11.6 Flow Gate Details

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

11.6.1 Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
101057231	200745	26ALLEGHEN	PENELEC	200884	26NEW BALT	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	153.9	155.31	DC	2.25

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
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
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

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
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

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
101057223	200746	26ROCKWOOD	PENELEC	202650	26HIGHPOINT	PENELEC	1	PN-P2-3-PN-115-35E	breaker	179.0	148.59	150.12	DC	2.75

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
944751	AF1-140 C	0.6698	Adder	0.79
944752	AF1-140 E	0.4465	Adder	0.53
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
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
960451	AF2-336 C O1	1.6178	50/50	1.6178
960452	AF2-336 E O1	1.0786	50/50	1.0786
960461	AF2-337 C O1	1.6178	50/50	1.6178
960462	AF2-337 E O1	1.0786	50/50	1.0786
960471	AF2-338 C O1	1.6178	50/50	1.6178
960472	AF2-338 E O1	1.0786	50/50	1.0786
960481	AF2-339 C O1	1.6178	50/50	1.6178

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960482	AF2-339 E O1	1.0786	50/50	1.0786
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

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
101057186	200747	26PENN-MAR	PENELEC	200762	26GARRETT	PENELEC	1	PN-P2-3-PN-115-35E	breaker	167.0	177.47	179.11	DC	2.75

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
200864	K-013 E	1.7937	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	0.7576	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
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
960451	AF2-336 C O1	1.6171	50/50	1.6171
960452	AF2-336 E O1	1.0781	50/50	1.0781
960461	AF2-337 C O1	1.6171	50/50	1.6171
960462	AF2-337 E O1	1.0781	50/50	1.0781

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960471	AF2-338 C O1	1.6171	50/50	1.6171
960472	AF2-338 E O1	1.0781	50/50	1.0781
960481	AF2-339 C O1	1.6171	50/50	1.6171
960482	AF2-339 E O1	1.0781	50/50	1.0781
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

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
98713643	200762	26GARRETT	PENELEC	235470	01GARRET	AP	1	PN-P2-3-PN-115-35E	breaker	160.0	195.58	197.29	DC	2.74

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.7147	50/50	0.7147
200834	26SW_E13_K22	0.1461	50/50	0.1461
200835	26DSGENWIN	0.9847	50/50	0.9847
200840	26DEEPCRK1	1.4114	50/50	1.4114
200841	26DEEPCRK2	1.4114	50/50	1.4114
200889	26STNY CRK	0.5954	50/50	0.5954
200890	26BF_G21_K23	0.4829	50/50	0.4829
200891	26CSLMN_L13	0.7575	50/50	0.7575
200892	26LOOKOUT	0.7196	50/50	0.7196
202225	26SCI_S29B	0.2273	50/50	0.2273
202652	26RGH_Y1-033	0.5551	50/50	0.5551
292350	K-023	18.0595	50/50	18.0595
292542	L-013 1	17.5654	50/50	17.5654
293432	R-040 E	0.9881	50/50	0.9881
293902	O-048 E	15.8089	50/50	15.8089
294903	P-060 E	13.8062	50/50	13.8062
913142	Y1-033 E OP1	21.9847	50/50	21.9847
917672	Z2-108 E	9.8806	50/50	9.8806
938351	AE1-053	5.4892	50/50	5.4892
938881	AE1-116	2.1181	50/50	2.1181
938991	AE1-128 C	10.8130	50/50	10.8130
938992	AE1-128 E	7.2086	50/50	7.2086
943711	AF1-039 C O1	5.8161	50/50	5.8161
943712	AF1-039 E O1	3.8774	50/50	3.8774
944781	AF1-143 C	32.9352	50/50	32.9352
944782	AF1-143 E	17.5654	50/50	17.5654
945671	AF1-232 C O2	39.3588	50/50	39.3588
945672	AF1-232 E O2	21.1932	50/50	21.1932
946081	AF1-273 C O1	18.5033	50/50	18.5033
946082	AF1-273 E O1	12.3355	50/50	12.3355
957981	AF2-092 C	0.9696	50/50	0.9696
957982	AF2-092 E	0.6464	50/50	0.6464
958101	AF2-104 C	1.1296	50/50	1.1296
958102	AF2-104 E	0.7531	50/50	0.7531
958411	AF2-135 C	1.6468	50/50	1.6468
958412	AF2-135 E	1.0978	50/50	1.0978
958471	AF2-141	4.3914	50/50	4.3914
959792	AF2-270 E	0.5588	50/50	0.5588
960451	AF2-336 C O1	1.6159	50/50	1.6159
960452	AF2-336 E O1	1.0773	50/50	1.0773
960461	AF2-337 C O1	1.6159	50/50	1.6159

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960462	AF2-337 E O1	1.0773	50/50	1.0773
960471	AF2-338 C O1	1.6159	50/50	1.6159
960472	AF2-338 E O1	1.0773	50/50	1.0773
960481	AF2-339 C O1	1.6159	50/50	1.6159
960482	AF2-339 E O1	1.0773	50/50	1.0773
960901	AF2-381 C	8.9959	50/50	8.9959
960902	AF2-381 E	4.7341	50/50	4.7341
NEWTON	NEWTON	0.2450	Confirmed LTF	0.2450
FARMERCITY	FARMERCITY	0.0128	Confirmed LTF	0.0128
G-007A	G-007A	0.6737	Confirmed LTF	0.6737
VFT	VFT	1.8640	Confirmed LTF	1.8640
CALDERWOOD	CALDERWOOD	0.1252	Confirmed LTF	0.1252
PRAIRIE	PRAIRIE	0.5967	Confirmed LTF	0.5967
CHEOAH	CHEOAH	0.1266	Confirmed LTF	0.1266
EDWARDS	EDWARDS	0.0777	Confirmed LTF	0.0777
TILTON	TILTON	0.1411	Confirmed LTF	0.1411
GIBSON	GIBSON	0.1245	Confirmed LTF	0.1245
BLUEG	BLUEG	0.4010	Confirmed LTF	0.4010
TRIMBLE	TRIMBLE	0.1280	Confirmed LTF	0.1280
CATAWBA	CATAWBA	0.0927	Confirmed LTF	0.0927

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
101057191	202650	26HIGHPOINT	PENELEC	200747	26PENN-MAR	PENELEC	1	PN-P2-3-PN-115-35E	breaker	174.0	167.05	168.63	DC	2.75

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
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
960451	AF2-336 C O1	1.6176	50/50	1.6176
960452	AF2-336 E O1	1.0784	50/50	1.0784
960461	AF2-337 C O1	1.6176	50/50	1.6176
960462	AF2-337 E O1	1.0784	50/50	1.0784
960471	AF2-338 C O1	1.6176	50/50	1.6176

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960472	AF2-338 E O1	1.0784	50/50	1.0784
960481	AF2-339 C O1	1.6176	50/50	1.6176
960482	AF2-339 E O1	1.0784	50/50	1.0784
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

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
100556794	235470	01GARRET	AP	235469	01GARRET	AP	1	PN-P2-3-PN-115-35E	breaker	196.0	159.65	161.05	DC	2.74

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200813	26YOUGH	0.7147	50/50	0.7147
200834	26SW_E13_K22	0.1461	50/50	0.1461
200835	26DSGENWIN	0.9847	50/50	0.9847
200840	26DEEPCRK1	1.4114	50/50	1.4114
200841	26DEEPCRK2	1.4114	50/50	1.4114
200889	26STNY CRK	0.5954	50/50	0.5954
200890	26BF_G21_K23	0.4829	50/50	0.4829
200891	26CSLMN_L13	0.7575	50/50	0.7575
200892	26LOOKOUT	0.7196	50/50	0.7196
202225	26SCI_S29B	0.2273	50/50	0.2273
202652	26RGH_Y1-033	0.5551	50/50	0.5551
292350	K-023	18.0595	50/50	18.0595
292542	L-013 1	17.5654	50/50	17.5654
293432	R-040 E	0.9881	50/50	0.9881
293902	O-048 E	15.8089	50/50	15.8089
294903	P-060 E	13.8062	50/50	13.8062
913142	Y1-033 E OP1	21.9847	50/50	21.9847
917672	Z2-108 E	9.8806	50/50	9.8806
938351	AE1-053	5.4892	50/50	5.4892
938881	AE1-116	2.1181	50/50	2.1181
938991	AE1-128 C	10.8130	50/50	10.8130
938992	AE1-128 E	7.2086	50/50	7.2086
943711	AF1-039 C O1	5.8161	50/50	5.8161
943712	AF1-039 E O1	3.8774	50/50	3.8774
944781	AF1-143 C	32.9352	50/50	32.9352
944782	AF1-143 E	17.5654	50/50	17.5654
945671	AF1-232 C O2	39.3588	50/50	39.3588
945672	AF1-232 E O2	21.1932	50/50	21.1932
946081	AF1-273 C O1	18.5033	50/50	18.5033
946082	AF1-273 E O1	12.3355	50/50	12.3355
957981	AF2-092 C	0.9696	50/50	0.9696
957982	AF2-092 E	0.6464	50/50	0.6464
958101	AF2-104 C	1.1296	50/50	1.1296
958102	AF2-104 E	0.7531	50/50	0.7531
958411	AF2-135 C	1.6468	50/50	1.6468
958412	AF2-135 E	1.0978	50/50	1.0978
958471	AF2-141	4.3914	50/50	4.3914
959792	AF2-270 E	0.5588	50/50	0.5588
960451	AF2-336 C O1	1.6159	50/50	1.6159
960452	AF2-336 E O1	1.0773	50/50	1.0773
960461	AF2-337 C O1	1.6159	50/50	1.6159

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960462	AF2-337 E O1	1.0773	50/50	1.0773
960471	AF2-338 C O1	1.6159	50/50	1.6159
960472	AF2-338 E O1	1.0773	50/50	1.0773
960481	AF2-339 C O1	1.6159	50/50	1.6159
960482	AF2-339 E O1	1.0773	50/50	1.0773
960901	AF2-381 C	8.9959	50/50	8.9959
960902	AF2-381 E	4.7341	50/50	4.7341
NEWTON	NEWTON	0.2450	Confirmed LTF	0.2450
FARMERCITY	FARMERCITY	0.0128	Confirmed LTF	0.0128
G-007A	G-007A	0.6737	Confirmed LTF	0.6737
VFT	VFT	1.8640	Confirmed LTF	1.8640
CALDERWOOD	CALDERWOOD	0.1252	Confirmed LTF	0.1252
PRAIRIE	PRAIRIE	0.5967	Confirmed LTF	0.5967
CHEOAH	CHEOAH	0.1266	Confirmed LTF	0.1266
EDWARDS	EDWARDS	0.0777	Confirmed LTF	0.0777
TILTON	TILTON	0.1411	Confirmed LTF	0.1411
GIBSON	GIBSON	0.1245	Confirmed LTF	0.1245
BLUEG	BLUEG	0.4010	Confirmed LTF	0.4010
TRIMBLE	TRIMBLE	0.1280	Confirmed LTF	0.1280
CATAWBA	CATAWBA	0.0927	Confirmed LTF	0.0927

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
101057335	945670	AF1-232 TAP	PENELEC	200745	26ALLEGHEN	PENELEC	1	PN-P2-3-PN-115-35E	breaker	160.0	123.13	124.54	DC	2.25

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
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
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

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
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

11.7 Queue Dependencies

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

Queue Number	Project Name	Status
AB1-065	Jennings-Hoyes 34.5kV	Suspended
AE1-053	Meyersdale North	Active
AE1-116	Somerset Windpower 23 kV	Active
AE1-128	Bedford North-Wills Mounain 115 kV	Active
AF1-001	Thayerville 34.5 kV	Engineering and Procurement
AF1-039	Listonburg-Highpoint 24.9 kV	Active
AF1-140	Claysburg 23 kV	Engineering and Procurement
AF1-143	Lick Run 115 kV	Active
AF1-232	Allegheny-Somerset 115 kV	Active
AF1-273	Allegheny 115 kV	Active
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
AF2-336	Snake Spring 115 kV I	Active
AF2-337	Snake Spring 115 kV II	Active
AF2-338	Snake Spring 115 kV III	Active
AF2-339	Snake Spring 115 kV IV	Active
AF2-381	Bedford North-Central City West 115 kV	Active
Y1-033	Penn Mar-Rock Wood 115kV	In Service
Z2-108	Meyersdale North 115kV	In Service

11.8 Contingency Descriptions

Contingency Name	Contingency Definition
PN-P1-3-PN-115-029	CONTINGENCY 'PN-P1-3-PN-115-029' /* HOOVERSVILLE #2 XFMR FAULT DISCONNECT BRANCH FROM BUS 200743 TO BUS 200789 CKT 2 /* 26HOOVERSV 115 26HOOVER#2 23 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200742 CKT 1 /* 26HOOVERSV 115 26TOWER 51 115 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200744 CKT 1 /* 26HOOVERSV 115 26SOMERST 115 END
AP-P1-3-PN-115-010	CONTINGENCY 'AP-P1-3-PN-115-010' /* GARRETT 138/115KV XFMR FAULT OPEN BRANCH FROM BUS 235469 TO BUS 235470 CKT 1 /* 01GARRET 138.00 01GARRET 115.00 END
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 200744 CKT 1 /* 26HOOVERSV 115 26SOMERST 115 DISCONNECT BRANCH FROM BUS 200742 TO BUS 200743 CKT 1 /* 26TOWER 51 115 26HOOVERSV 115 DISCONNECT BRANCH FROM BUS 200743 TO BUS 200789 CKT 2 /* 26HOOVERSV 115 26HOOVER#2 23 END
PN-P1-3-PN-115-025	CONTINGENCY 'PN-P1-3-PN-115-025' /* 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 200743 CKT 1 /* 26SOMERST 115 26HOOVERSV 115 END
PN-P1-2-PN-115-066	CONTINGENCY 'PN-P1-2-PN-115-066' /* HOOVERSVILLE - SOMERSET 115KV DISCONNECT BRANCH FROM BUS 200743 TO BUS 200744 CKT 1 /* 26HOOVERSV 115 26SOMERST 115 END

Contingency Name	Contingency Definition
Base Case	
PN-P7-1-PN-230-001	CONTINGENCY 'PN-P7-1-PN-230-001' /* HOMER CITY - HOOVERSVILLE 230KV & SEWARD - TOWER 51 115KV DISCONNECT BRANCH FROM BUS 200767 TO BUS 200768 CKT 1 /* 26HOMER CT 230 26QUEMAHON 230 DISCONNECT BRANCH FROM BUS 200768 TO BUS 200796 CKT 1 /* 26QUEMAHON 230 26HOOVRSVL 230 DISCONNECT BRANCH FROM BUS 200796 TO BUS 200743 CKT 3 /* 26HOOVRSVL 230 26HOOVERSV 115 DISCONNECT BRANCH FROM BUS 200741 TO BUS 200742 CKT 1 /* 26SEWARD 115 26TOWER 51 115 END

12 Short Circuit Analysis

Short circuit analysis will be performed in the System Impact phase.

13 Affected Systems

13.1 NYISO

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

14 Attachment 1: One Line Diagram