Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-248

YORK STORAGE 115 KV

13.8 MW Capacity / 149 MW Energy

April 2021

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1 Introduction

This Feasibility Study has been prepared in accordance with the PJM Open Access Transmission Tariff, 36.2, as well as the Feasibility Study Agreement between the Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is Mid-Atlantic Interstate Transmission (MAIT) (Meted 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.

An Interconnection Customer with a proposed new Customer Facility that has a Maximum Facility Output equal to or greater than 100 MW shall install and maintain, at its expense, phasor measurement units (PMUs). See Section 8.5.3 of Appendix 2 to the Interconnection Service Agreement as well as section 4.3 of PJM Manual 14D for additional information.

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 to replace the existing technology at CAT Tractor NUG (located in York Pennsylvania) with 200 MW of Energy Storage (51 MWE from original project + 149 MW with new AG1-248 project). The AG1-248 queue position intends on transferring their existing 46.2 MW of CIRs (from the original generator) to the new project and is also requesting an additional 13.8 MW of CIRs. The total installed facilities will have a capability of 200 MW with 60 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this uprate project is October 31, 2022. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-248
Project Name	YORK STORAGE 115 KV
State	Pennsylvania
County	York
Transmission Owner	ME
MFO	200
MWE	149
MWC	13.8
Fuel	Storage
Basecase Study Year	2024

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

4 Point of Interconnection

The interconnection of the AG1-248 project will be accomplished by modifying the existing generating facility on the customer side of the POI at the Caterpillar Tractor 115 kV substation. It is anticipated that there will be no direct connect costs associated with this project.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AG1-248 generation project to connect to the FirstEnergy ("FE") transmission system. IC will be responsible for constructing the facilities on its side of the POI, including the attachment facilities which connect the generator to the FE transmission system's direct connection facilities.

5 Cost Summary

The AG1-248 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$0
Total System Network Upgrade Costs	$63,033,910[1]
Total Costs	$63,033,910

This cost excludes a Federal Income Tax Gross Up charges. This tax may or may not be charged based on whether this project meets the eligibility requirements of IRS Notice 2016-36, 2016-25 I.R.B. (6/20/2016). If at a future date it is determined that the Federal Income Tax Gross charge is required, the Transmission Owner shall be reimbursed by the Interconnection Customer for such taxes.

Cost allocations for any System Upgrades will be provided in the System Impact Study Report.

[1] Cost allocations for any System Upgrades will be provided in the System Impact Study Report.

6 Transmission Owner Scope of Work

The interconnection of the AG1-248 project will be accomplished by modifying the existing generating facility on the customer side of the POI at the Caterpillar Tractor 115 kV substation. It is anticipated that there will be no direct connect costs associated with this project.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AG1-248 generation project to connect to the FirstEnergy ("FE") transmission system. 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.

There is no physical interconnection scope of work required.

7 Schedule

AG1-248 is an increase to the existing generation at Caterpillar Tractor 115 kV. Therefore, there are no Attachment Facilities, Direct, and Non-Direct Connection facilities work to be completed by FirstEnergy.

8 Transmission Owner Analysis

8.1 Power Flow Analysis

FE performed an analysis of its underlying transmission <100 kV system. The AG1-248 project did not contribute to any overloads on the FE transmission <100 kV system.

9 Interconnection Customer Requirements

9.1 System Protection

The IC must design its Customer Facilities in accordance with all applicable standards, including the standards in FE's "Requirements for Transmission Connected Facilities" document located at: http://www.pjm.com/planning/design-engineering/to-tech-standards/private-firstenergy.aspx.

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

9.2 Compliance Issues and Interconnection Customer Requirements

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

1. The purchase and installation of a fully rated 115 kV circuit breaker to protect the AG1-248 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 AG1-248 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.

9.3 Power Factor Requirements

The IC shall design its solar-powered 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 Interconnected Transmission Owner Requirements

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

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

11 Summer Peak - Load Flow Analysis

The Queue Project AG1-248 was evaluated as a 149.0 MW (Capacity 13.8 MW) injection at the Cattle Tract 115 kV substation in the ME area. Project AG1-248 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-248 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

11.1 Generation Deliverability

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

None

11.2 Multiple Facility Contingency

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
166586266	204523	27CLY 975	115.0	METED	204524	27CLY 978	115.0	METED	ZB	ME-P7-1-ME-230-008A-B	tower	140.0	89.79	109.08	DC	27.0
166586267	204523	27CLY 975	115.0	METED	204524	27CLY 978	115.0	METED	ZB	ME-P7-1-ME-230-008A-A	tower	140.0	84.65	103.94	DC	27.0
166586258	204539	27HUNTRSTN	115.0	METED	204551	27OXFORD	115.0	METED	1	ME-P7-1-ME-230-003	tower	282.0	97.77	100.76	DC	15.94
166586259	204539	27HUNTRSTN	115.0	METED	204551	27OXFORD	115.0	METED	1	ME-P7-1-ME-230-004	tower	282.0	97.46	100.45	DC	15.93
165953989	204559	27TAXVILLE	115.0	METED	204563	27WESTGATE	115.0	METED	1	ME-P2-3-ME-115-032AT	breaker	282.0	98.14	138.0	DC	112.41
165954041	204563	27WESTGATE	115.0	METED	204558	27SMITHTP	115.0	METED	1	ME-P2-3-ME-115-032AT	breaker	282.0	85.7	125.56	DC	112.41
165954083	204598	27MIDDJCT	115.0	METED	939000	AE1-129 TAP	115.0	METED	1	ME-P2-3-ME-115-032AT	breaker	156.0	96.94	117.18	DC	31.57
165954084	204598	27MIDDJCT	115.0	METED	939000	AE1-129 TAP	115.0	METED	1	ME-P2-3-ME-115-033E	breaker	156.0	96.4	110.96	DC	22.71
165954131	959220	AF2-213 TAP	115.0	METED	204557	27SMITH ST	115.0	METED	1	ME-P2-3-ME-115-033E	breaker	156.0	94.27	108.82	DC	22.71

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
165954132	959220	AF2-213 TAP	115.0	METED	204557	27SMITH ST	115.0	METED	1	ME-P2-3-ME-115-032AT	breaker	156.0	81.63	101.87	DC	31.57

11.3 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
173844486	200009	JUNIATA	500.0	PPL	208005	JUNIBU2	230.0	PPL	2	PL:11:P42:000140	breaker	814.0	118.96	121.55	DC	21.12
165954052	204558	27SMITH TP	115.0	METED	204557	27SMITH ST	115.0	METED	1	ME-P2-ME-230-DTR059	breaker	223.0	115.62	117.9	DC	11.27
165954053	204558	27SMITH TP	115.0	METED	204557	27SMITH ST	115.0	METED	1	ME-P2-ME-230-DTR065	breaker	223.0	115.56	117.83	DC	11.25
179728965	208005	JUNIBU2	230.0	PPL	207955	DAUPTR2	230.0	PPL	1	PL:10:P42:100577	breaker	531.0	115.56	117.2	DC	16.49
165766770	939000	AE1-129 TAP	115.0	METED	204571	27ZIONS VW	115.0	METED	1	ME-P2-2-ME-115-009	bus	156.0	109.98	125.61	DC	24.38
165954007	939000	AE1-129 TAP	115.0	METED	204571	27ZIONS VW	115.0	METED	1	ME-P2-3-ME-115-033E	breaker	156.0	122.33	136.89	DC	22.71
165954008	939000	AE1-129 TAP	115.0	METED	204571	27ZIONS VW	115.0	METED	1	ME-P2-3-ME-115-032AT	breaker	156.0	115.43	135.66	DC	31.57
165954009	939000	AE1-129 TAP	115.0	METED	204571	27ZIONS VW	115.0	METED	1	ME-P2-ME-230-DTR035	breaker	156.0	115.85	132.88	DC	26.55
165954010	939000	AE1-129 TAP	115.0	METED	204571	27ZIONS VW	115.0	METED	1	ME-P2-3-ME-115-012B	breaker	156.0	109.98	125.61	DC	24.38
165954011	939000	AE1-129 TAP	115.0	METED	204571	27ZIONS VW	115.0	METED	1	ME-P2-3-ME-230-019CT	breaker	156.0	109.06	123.82	DC	23.04

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
166194512	204524	27CLY 978	115.0	METED	204682	27ES3	115.0	METED	1	ME-P1-2-ME-115-025-B	operation	130.0	95.2	116.67	DC	27.92
166194526	204682	27ES3	115.0	METED	204572	27RAINTREE	115.0	METED	1	ME-P1-2-ME-115-025-B	operation	130.0	92.35	113.82	DC	27.92
179729242	204701	27YORKANAB	115.0	METED	208720	RED FRONT	115.0	PPL	1	ME-P1-2-ME-115-010	operation	208.0	83.86	123.6	DC	82.65
179729243	204701	27YORKANAB	115.0	METED	208720	RED FRONT	115.0	PPL	1	Base Case	operation	159.0	81.67	110.18	DC	45.33
167646095	208004	JUNI BU1	230.0	PPL	207950	CUMB TR2	230.0	PPL	1	PL:10:P13:001633	operation	618.0	100.28	103.55	DC	20.21
167645930	208005	JUNI BU2	230.0	PPL	208004	JUNI BU1	230.0	PPL	1	PL:10:P13:001633	operation	641.0	119.54	120.62	DC	13.06
167645971	208005	JUNI BU2	230.0	PPL	207955	DAUP TR2	230.0	PPL	1	PL:10:P13:001616	operation	531.0	115.39	117.03	DC	16.49
179729245	208720	RED FRONT	115.0	PPL	204567	27YOE	115.0	METED	1	ME-P1-2-ME-115-010	operation	208.0	81.27	121.0	DC	82.65
179729246	208720	RED FRONT	115.0	PPL	204567	27YOE	115.0	METED	1	Base Case	operation	159.0	78.34	106.84	DC	45.33
166194496	939000	AE1-129 TAP	115.0	METED	204571	27ZIONSVW	115.0	METED	1	ME-P1-2-ME-115-066	operation	156.0	106.32	122.07	DC	24.58
166194498	939000	AE1-129 TAP	115.0	METED	204571	27ZIONSVW	115.0	METED	1	Base Case	operation	129.0	111.11	117.25	DC	14.96

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
173844486	7	JUNIATA 500.0 kV - JUNI BU2 230.0 kV Ckt 2	**PPL** **R-PL-0011 : Replace limiting TR2 lead equipment and bus sections at Juniata 230kV yard.** **Project Type : FAC** **Cost : $750,000** **Time Estimate : 24 Months**	$750,000
165954052,165954053	8	27SMITH TP 115.0 kV - 27SMITH ST 115.0 kV Ckt 1	**METED** **s1640 : Middletown Junction, Install eleven (11) 230 kV Circuit Breakers to complete the double bus configuration including replacement of the #2 (75 MVA) & #5 (75/84 MVA) 230/115 kV transformers with 180/240/300 MVA units, and removal of the #1 (75 MVA) 230/115 kV transformer.** **Project Type : CON** **Cost : $0** **Time Estimate : Projected In-Service Date: 06/01/2025**	$0
166586267,166586266	1	27CLY 975 115.0 kV - 27CLY 978 115.0 kV Ckt ZB	**METED** **s1727.1 : Construct a five (5) breaker 115 kV ring bus at Cly.** **Project Type : CON** **Cost : $0** **Time Estimate : Projected In-Service Date: 12/31/2023**	$0
165954041	4	27WESTGATE 115.0 kV - 27SMITH TP 115.0 kV Ckt 1	**METED** **s1813.5 : PJM RTEP Supplemental Project: Smith St. - Westgate - York Solid Waste 115 kV Line Rebuild and Terminal Upgrades.** **Project Type : FAC** **Cost : $0** **Time Estimate : Projected In-Service Date: 12/30/2022** **ME-AG1-F-0007A: Reconductor line with larger conductor (1.3 miles). At Westgate: Upgrade limiting terminal equipment.** **Project Type : FAC** **Cost : $4,724,450** **Time Estimate : 28 Months**	$4,724,450
165954131,165954132	6	AF2-213 TAP 115.0 kV - 27SMITH ST 115.0 kV Ckt 1	**METED** **s1899 : PJM RTEP Supplemental Project: Middletown Jct - Smith St 115 kV 977 Line Rehab/Rebuild.** **Project Type : FAC** **Cost : $0** **Time Estimate : Projected In-Service Date: 12/31/2022** **ME-AG1-F-0007A: Reconductor line with larger conductor (6.5 miles). At Smith St., replace limiting meter.** **Project Type : FAC** **Cost : $16,232,760** **Time Estimate : 42 Months**	$16,232,760

ID	Idx	Facility	Upgrade Description	Cost
166586258,166586259	2	27HUNTRSTN 115.0 kV - 27OXFORD 115.0 kV Ckt 1	**METED** **ME-AG1-F-0004A : Reconductor line with larger conductor (3.4 miles).** **Project Type : FAC** **Cost : $8,237,520** **Time Estimate : 34 Months**	$8,237,520
165954007,165954010,165954011,165766770,165954009,165954008	10	AE1-129 TAP 115.0 kV - 27ZIONS VW 115.0 kV Ckt 1	**METED** **ME-0007a : Reconductor line with larger conductor (2.9 miles).** **Project Type : FAC** **Cost : $7,100,000** **Time Estimate : 30 Months** **ME-0007b: At Zions View, replace substation conductor.** **Project Type : FAC** **Cost : $121,140** **Time Estimate : 12 Months**	$7,221,140
165953989	3	27TAXVILLE 115.0 kV - 27WESTGATE 115.0 kV Ckt 1	**METED** **s1818.3: PJM RTEP Supplemental Project: Terminal Upgrades at Jackson and Westage. Replace switches at JE Baker Tap.** **Project Type : FAC** **Cost : $0** **Time Estimate : Projected In-Service Date: 05/29/2022** **ME-AG1-F-0003A: Reconductor line with larger conductor (3.5 miles). At Taxville: Upgrade limiting terminal equipment. At Westgate: Upgrade limiting terminal equipment.** **Project Type : FAC** **Cost : $10,418,040** **Time Estimate : 34 Months**	$10,418,040
165954084,165954083	5	27MIDD JCT 115.0 kV - AE1-129 TAP 115.0 kV Ckt 1	**METED** **ME-0006: Reconductor line with larger conductor (5.8 miles). At Midd. Jct., replace thermal relays.** **Project Type : FAC** **Cost : $14,800,000** **Time Estimate : 42 Months**	$14,800,000
179728965	9	JUNI BU2 230.0 kV - DAUP TR2 230.0 kV Ckt 1	**PPL** **R-PL-0016 : Upgrade limiting bay equipment at Juniata for the JUNI-DAUP 230kV line.** **Project Type : FAC** **Cost : $650,000** **Time Estimate : 24 Months**	$650,000
			TOTAL COST	**$63,033,910**

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
166586266	204523	27CLY 975	METED	204524	27CLY 978	METED	ZB	ME-P7-1-ME-230-008A-B	tower	140.0	89.79	109.08	DC	27.0

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
204648	27MOUNT CT	0.8330	50/50	0.8330
939001	AE1-129 C	12.9964	50/50	12.9964
939002	AE1-129 E	9.0146	50/50	9.0146
945271	AF1-192	0.0211	50/50	0.0211
958071	**AF2-101 C (Suspended)**	**0.3033**	**50/50**	**0.3033**
958072	**AF2-101 E (Suspended)**	**0.2022**	**50/50**	**0.2022**
958601	AF2-151 C	0.3116	50/50	0.3116
958602	AF2-151 E	0.2078	50/50	0.2078
959223	AF2-213 BAT	20.8562	50/50	20.8562
960922	AF2-383 BAT	1.4098	Merchant Transmission	1.4098
962081	AG1-052	5.5304	50/50	5.5304
963953	AG1-248 BAT	27.0040	50/50	27.0040
966151	AG1-484	2.6734	50/50	2.6734
G-007A	G-007A	0.1582	Confirmed LTF	0.1582
VFT	VFT	0.4838	Confirmed LTF	0.4838
CALDERWOOD	CALDERWOOD	0.0060	Confirmed LTF	0.0060
PRAIRIE	PRAIRIE	0.0103	Confirmed LTF	0.0103
CHEOAH	CHEOAH	0.0065	Confirmed LTF	0.0065
CBM-N	CBM-N	0.1008	Confirmed LTF	0.1008
COTTONWOOD	COTTONWOOD	0.0189	Confirmed LTF	0.0189
HAMLET	HAMLET	0.0150	Confirmed LTF	0.0150
GIBSON	GIBSON	0.0011	Confirmed LTF	0.0011
BLUEG	BLUEG	0.0035	Confirmed LTF	0.0035
TRIMBLE	TRIMBLE	0.0011	Confirmed LTF	0.0011
CATAWBA	CATAWBA	0.0073	Confirmed LTF	0.0073
CBM-W1	CBM-W1	0.0140	Confirmed LTF	0.0140

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
166586259	204539	27HUNTRSTN	METED	204551	27OXFORD	METED	1	ME-P7-1-ME-230-004	tower	282.0	97.46	100.45	DC	15.93

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
204647	27HUNTR CT	2.3416	50/50	2.3416
204648	27MOUNT CT	0.6777	50/50	0.6777
204649	27ORTAN CT	0.7370	50/50	0.7370
205907	**AC1-048 C (Suspended)**	**2.3815**	**50/50**	**2.3815**
205908	**AC1-048 E (Suspended)**	**3.8856**	**50/50**	**3.8856**
205909	**AC2-053 C (Suspended)**	**1.3609**	**50/50**	**1.3609**
205910	**AC2-053 E (Suspended)**	**2.2203**	**50/50**	**2.2203**
901242	W1-045 E OP1	0.1959	Adder	0.23
923202	AB1-124 C	0.3433	Adder	0.4
923203	AB1-124 E	0.5602	Adder	0.66
923212	AB1-125 C OP	0.2575	Adder	0.3
923213	AB1-125 E OP	0.4202	Adder	0.49
930522	AB1-096 E	0.2747	Adder	0.32
933974	**AD1-020 C (Suspended)**	**12.9331**	**50/50**	**12.9331**
933975	**AD1-020 BAT (Suspended)**	**4.8258**	**50/50**	**4.8258**
933976	**AD1-020 E (Suspended)**	**6.3701**	**50/50**	**6.3701**
938041	**AE1-006 C (Suspended)**	**1.3609**	**50/50**	**1.3609**
938042	**AE1-006 E (Suspended)**	**2.2203**	**50/50**	**2.2203**
939021	AE1-131 C O1	7.4950	50/50	7.4950
939022	AE1-131 E O1	4.9967	50/50	4.9967
939101	AE1-139 C O1	9.1662	50/50	9.1662
939102	AE1-139 E O1	6.1108	50/50	6.1108
941871	AE2-192 C	9.3424	50/50	9.3424
941872	AE2-192 E	6.2283	50/50	6.2283
943161	AE2-345 C	12.1335	50/50	12.1335
943162	AE2-345 E	8.0890	50/50	8.0890
945231	AF1-188	0.0378	50/50	0.0378
945271	AF1-192	0.0172	50/50	0.0172
945281	AF1-193	0.1561	50/50	0.1561
958071	**AF2-101 C (Suspended)**	**0.1337**	**Adder**	**0.16**
958072	**AF2-101 E (Suspended)**	**0.0891**	**Adder**	**0.1**
958081	AF2-102 C	0.3223	50/50	0.3223
958082	AF2-102 E	0.2149	50/50	0.2149
958601	AF2-151 C	0.1293	Adder	0.15
958602	AF2-151 E	0.0862	Adder	0.1
958841	AF2-175 C	0.3943	50/50	0.3943
958842	AF2-175 E	0.2629	50/50	0.2629
958871	AF2-178	0.1709	Adder	0.2
959223	AF2-213 BAT	5.3389	Merchant Transmission	5.3389

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959381	AF2-229 C (Withdrawn : 04/03/2021)	0.4776	Adder	0.56
959382	AF2-229 E (Withdrawn : 04/03/2021)	0.3987	Adder	0.47
959772	AF2-268 E	0.4791	50/50	0.4791
960922	AF2-383 BAT	2.1604	50/50	2.1604
961481	AF2-439 C (Withdrawn : 04/23/2021)	1.1865	Adder	1.4
961482	AF2-439 E (Withdrawn : 04/23/2021)	1.0953	Adder	1.29
962082	AG1-052 BAT	0.6126	Merchant Transmission	0.6126
962092	AG1-053 BAT	0.8145	Merchant Transmission	0.8145
963953	AG1-248 BAT	8.4450	Merchant Transmission	8.4450
964693	AG1-332 BAT	1.7375	50/50	1.7375
965963	AG1-465 BAT	37.2750	50/50	37.2750
966151	AG1-484	2.1748	50/50	2.1748
966171	AG1-486	3.5933	50/50	3.5933
WEC	WEC	0.1414	Confirmed LTF	0.1414
LGEE	LGEE	0.2859	Confirmed LTF	0.2859
CPLE	CPLE	0.3638	Confirmed LTF	0.3638
CBM-W2	CBM-W2	4.1754	Confirmed LTF	4.1754
NY	NY	0.4983	Confirmed LTF	0.4983
TVA	TVA	0.6678	Confirmed LTF	0.6678
O-066	O-066	8.0693	Confirmed LTF	8.0693
SIGE	SIGE	0.1737	Confirmed LTF	0.1737
CBM-S2	CBM-S2	5.3870	Confirmed LTF	5.3870
CBM-S1	CBM-S1	0.1797	Confirmed LTF	0.1797
G-007	G-007	1.2232	Confirmed LTF	1.2232
MEC	MEC	0.7230	Confirmed LTF	0.7230
LAGN	LAGN	0.8312	Confirmed LTF	0.8312
CBM-W1	CBM-W1	6.2109	Confirmed LTF	6.2109

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
165953989	204559	27TAXVILLE	METED	204563	27WESTGATE	METED	1	ME-P2-3-ME-115-032AT	breaker	282.0	98.14	138.0	DC	112.41

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
204639	27GLATFLTR	0.5688	50/50	0.5688
204650	27TOLNA CT	0.7184	50/50	0.7184
939091	AE1-138 C	0.8993	Adder	1.06
939092	AE1-138 E	0.5995	Adder	0.71
945131	AF1-178	0.0278	50/50	0.0278
945141	AF1-179	0.0186	50/50	0.0186
958051	**AF2-099 C (Suspended)**	**0.4446**	**50/50**	**0.4446**
958052	**AF2-099 E (Suspended)**	**0.2964**	**50/50**	**0.2964**
958061	**AF2-100 C (Suspended)**	**0.4446**	**50/50**	**0.4446**
958062	**AF2-100 E (Suspended)**	**0.2964**	**50/50**	**0.2964**
958071	**AF2-101 C (Suspended)**	**-0.2061**	**Adder**	**-0.24**
958601	AF2-151 C	-0.2126	Adder	-0.25
959223	AF2-213 BAT	35.4730	50/50	35.4730
960921	AF2-383	2.3532	50/50	2.3532
962082	AG1-052 BAT	7.8166	50/50	7.8166
963953	AG1-248 BAT	112.4060	50/50	112.4060
964691	AG1-332 C	0.1046	Adder	0.23
964692	AG1-332 E	0.0367	Adder	0.08
965961	AG1-465 C O1	1.5690	Adder	3.48
965962	AG1-465 E O1	2.3535	Adder	5.22
966152	AG1-484 BAT	2.0544	50/50	2.0544
WEC	WEC	0.0192	Confirmed LTF	0.0192
LGEE	LGEE	0.0396	Confirmed LTF	0.0396
CPLE	CPLE	0.0614	Confirmed LTF	0.0614
CBM-W2	CBM-W2	0.6003	Confirmed LTF	0.6003
NY	NY	0.0818	Confirmed LTF	0.0818
TVA	TVA	0.0980	Confirmed LTF	0.0980
O-066	O-066	1.0903	Confirmed LTF	1.0903
SIGE	SIGE	0.0236	Confirmed LTF	0.0236
CBM-S2	CBM-S2	0.8770	Confirmed LTF	0.8770
CBM-S1	CBM-S1	0.0262	Confirmed LTF	0.0262
G-007	G-007	0.1554	Confirmed LTF	0.1554
MEC	MEC	0.1001	Confirmed LTF	0.1001
LAGN	LAGN	0.1225	Confirmed LTF	0.1225
CBM-W1	CBM-W1	0.8272	Confirmed LTF	0.8272

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
165954041	204563	27WESTGATE	METED	204558	27SMITH TP	METED	1	ME-P2-3-ME-115-032AT	breaker	282.0	85.7	125.56	DC	112.41

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
204639	27GLATFLTR	0.5688	50/50	0.5688
204650	27TOLNA CT	0.7184	50/50	0.7184
939091	AE1-138 C	0.8993	Adder	1.06
939092	AE1-138 E	0.5995	Adder	0.71
945131	AF1-178	0.0278	50/50	0.0278
945141	AF1-179	0.0186	50/50	0.0186
958051	**AF2-099 C (Suspended)**	**0.4446**	**50/50**	**0.4446**
958052	**AF2-099 E (Suspended)**	**0.2964**	**50/50**	**0.2964**
958061	**AF2-100 C (Suspended)**	**0.4446**	**50/50**	**0.4446**
958062	**AF2-100 E (Suspended)**	**0.2964**	**50/50**	**0.2964**
958071	**AF2-101 C (Suspended)**	**-0.2061**	**Adder**	**-0.24**
958601	AF2-151 C	-0.2126	Adder	-0.25
959223	AF2-213 BAT	35.4730	50/50	35.4730
960921	AF2-383	2.3532	50/50	2.3532
962082	AG1-052 BAT	7.8166	50/50	7.8166
963953	AG1-248 BAT	112.4060	50/50	112.4060
964691	AG1-332 C	0.1046	Adder	0.23
964692	AG1-332 E	0.0367	Adder	0.08
965961	AG1-465 C O1	1.5690	Adder	3.48
965962	AG1-465 E O1	2.3535	Adder	5.22
966152	AG1-484 BAT	2.0544	50/50	2.0544
WEC	WEC	0.0192	Confirmed LTF	0.0192
LGEE	LGEE	0.0396	Confirmed LTF	0.0396
CPLE	CPLE	0.0614	Confirmed LTF	0.0614
CBM-W2	CBM-W2	0.6003	Confirmed LTF	0.6003
NY	NY	0.0818	Confirmed LTF	0.0818
TVA	TVA	0.0980	Confirmed LTF	0.0980
O-066	O-066	1.0903	Confirmed LTF	1.0903
SIGE	SIGE	0.0236	Confirmed LTF	0.0236
CBM-S2	CBM-S2	0.8770	Confirmed LTF	0.8770
CBM-S1	CBM-S1	0.0262	Confirmed LTF	0.0262
G-007	G-007	0.1554	Confirmed LTF	0.1554
MEC	MEC	0.1001	Confirmed LTF	0.1001
LAGN	LAGN	0.1225	Confirmed LTF	0.1225
CBM-W1	CBM-W1	0.8272	Confirmed LTF	0.8272

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
165954083	204598	27MIDD JCT	METED	939000	AE1-129 TAP	METED	1	ME-P2-3-ME-115-032AT	breaker	156.0	96.94	117.18	DC	31.57

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
204660	27YK H STA	0.2526	50/50	0.2526
959223	AF2-213 BAT	37.3755	50/50	37.3755
960922	AF2-383 BAT	1.1300	Merchant Transmission	1.1300
962082	AG1-052 BAT	11.7494	50/50	11.7494
963953	AG1-248 BAT	31.5700	50/50	31.5700
G-007A	G-007A	0.2925	Confirmed LTF	0.2925
VFT	VFT	0.8192	Confirmed LTF	0.8192
CALDERWOOD	CALDERWOOD	0.0199	Confirmed LTF	0.0199
PRAIRIE	PRAIRIE	0.0904	Confirmed LTF	0.0904
CHEOAH	CHEOAH	0.0205	Confirmed LTF	0.0205
CBM-N	CBM-N	0.1560	Confirmed LTF	0.1560
COTTONWOOD	COTTONWOOD	0.0798	Confirmed LTF	0.0798
HAMLET	HAMLET	0.0277	Confirmed LTF	0.0277
GIBSON	GIBSON	0.0186	Confirmed LTF	0.0186
BLUEG	BLUEG	0.0590	Confirmed LTF	0.0590
TRIMBLE	TRIMBLE	0.0189	Confirmed LTF	0.0189
CATAWBA	CATAWBA	0.0161	Confirmed LTF	0.0161

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
165954131	959220	AF2-213 TAP	METED	204557	27SMITH ST	METED	1	ME-P2-3-ME-115-033E	breaker	156.0	94.27	108.82	DC	22.71

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
204660	27YK H STA	0.8165	50/50	0.8165
939001	AE1-129 C	23.9531	50/50	23.9531
939002	AE1-129 E	16.6143	50/50	16.6143
959221	AF2-213 C	18.9521	50/50	18.9521
959222	AF2-213 E	28.4282	50/50	28.4282
960922	AF2-383 BAT	1.2358	Merchant Transmission	1.2358
962081	AG1-052	10.1928	50/50	10.1928
963953	AG1-248 BAT	22.7120	50/50	22.7120
965963	AG1-465 BAT	2.9516	Merchant Transmission	2.9516
G-007A	G-007A	0.7336	Confirmed LTF	0.7336
VFT	VFT	2.0511	Confirmed LTF	2.0511
CALDERWOOD	CALDERWOOD	0.0557	Confirmed LTF	0.0557
PRAIRIE	PRAIRIE	0.2583	Confirmed LTF	0.2583
CHEOAH	CHEOAH	0.0566	Confirmed LTF	0.0566
CBM-N	CBM-N	0.3888	Confirmed LTF	0.3888
COTTONWOOD	COTTONWOOD	0.2247	Confirmed LTF	0.2247
HAMLET	HAMLET	0.0757	Confirmed LTF	0.0757
GIBSON	GIBSON	0.0530	Confirmed LTF	0.0530
BLUEG	BLUEG	0.1684	Confirmed LTF	0.1684
TRIMBLE	TRIMBLE	0.0540	Confirmed LTF	0.0540
CATAWBA	CATAWBA	0.0437	Confirmed LTF	0.0437

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
173844486	200009	JUNIATA	PPL	208005	JUNI BU2	PPL	2	PL:11:P42:000140	breaker	814.0	118.96	121.55	DC	21.12

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200852	26WARR RDG	-0.2930	Adder	-0.34
204784	27LMR_E02	-0.1215	Adder	-0.14
208769	SISO	-0.1458	Adder	-0.17
209022	**WHFR IPP (Deactivation : 03/03/2020 WD - 01/03/2020)**	**2.2804**	**Adder**	**2.68**
235007	AC1-025 BAT	0.2547	50/50	0.2547
236828	01GRAYMONT	-0.5534	Adder	-0.65
933977	**AD1-020 EBAT (Suspended)**	**1.6422**	**Merchant Transmission**	**1.6422**
939171	AE1-147 C	-1.6488	Adder	-1.94
939891	AE1-225 C O1	0.6485	Adder	0.76
939892	AE1-225 E O1	0.7175	Adder	0.84
940561	AE2-042 C	3.0213	Adder	3.55
940562	AE2-042 E	1.4977	Adder	1.76
940721	AE2-059 C	0.5423	Adder	0.64
940722	AE2-059 E	0.7489	Adder	0.88
940941	AE2-084 C	0.5423	Adder	0.64
940942	AE2-084 E	0.7489	Adder	0.88
941161	AE2-110 C	0.4822	Adder	0.57
941162	AE2-110 E	0.6659	Adder	0.78
941171	AE2-111 C	0.5795	Adder	0.68
941172	AE2-111 E	0.8002	Adder	0.94
941351	**AE2-131 C (Suspended)**	**-0.8537**	**Adder**	**-1.0**
941371	AE2-133 C	0.5795	Adder	0.68
941372	AE2-133 E	0.8002	Adder	0.94
942281	AE2-241 C	0.4822	Adder	0.57
942282	AE2-241 E	0.6659	Adder	0.78
942561	AE2-271 C	3.6095	Adder	4.25
942562	AE2-271 E	2.4063	Adder	2.83
942771	AE2-295 C	1.5003	Adder	1.77
942772	AE2-295 E	8.7042	Adder	10.24
943721	AF1-040 C	0.0690	Adder	0.08
943722	AF1-040 E	1.3107	Adder	1.54
944901	**AF1-155 C (Suspended)**	**-0.7499**	**Adder**	**-0.88**
945511	AF1-216 C1O1	2.7034	Adder	3.18
945512	AF1-216 E1O1	1.8002	Adder	2.12
945521	AF1-216 C2O1	2.7034	Adder	3.18
945522	AF1-216 E2O1	1.8002	Adder	2.12
945611	AF1-226 C	0.8439	Adder	0.99
945612	AF1-226 E	1.1654	Adder	1.37
946423	AF1-306 BAT	19.7027	Merchant Transmission	19.7027

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
946471	AF1-311 C O1	3.3750	Adder	3.97
946472	AF1-311 E O1	5.5066	Adder	6.48
946691	AF1-333 C O1	0.8039	Adder	0.95
946692	AF1-333 E O1	0.5359	Adder	0.63
946731	AF1-337 C	0.8039	Adder	0.95
946732	AF1-337 E	0.5359	Adder	0.63
946741	AF1-338 C	0.8039	Adder	0.95
946742	AF1-338 E	0.5359	Adder	0.63
946751	AF1-339 C O1	0.8039	Adder	0.95
946752	AF1-339 E O1	0.5359	Adder	0.63
946761	AF1-271AC	0.7037	Adder	0.83
946762	AF1-271AE	0.4691	Adder	0.55
957363	AF2-030 BAT	1.2536	Merchant Transmission	1.2536
957621	AF2-056 C	1.7500	Adder	2.06
957622	AF2-056 E	0.9015	Adder	1.06
957881	AF2-082 C	2.2765	Adder	2.68
957882	AF2-082 E	1.5177	Adder	1.79
957921	AF2-086 C	0.6889	Adder	0.81
957922	AF2-086 E	0.4593	Adder	0.54
957931	**AF2-087 C (Suspended)**	**-0.2237**	**Adder**	**-0.26**
958071	**AF2-101 C (Suspended)**	**-0.1544**	**Adder**	**-0.18**
958461	AF2-140	1.8281	Adder	2.15
958511	AF2-145 C1	0.9630	Adder	1.13
958512	AF2-145 E1	0.6420	Adder	0.76
958521	AF2-145 C2	0.9630	Adder	1.13
958522	AF2-145 E2	0.6420	Adder	0.76
958601	AF2-151 C	-0.1548	Adder	-0.18
959121	**AF2-203 C (Withdrawn : 04/12/2021)**	**0.6889**	**Adder**	**0.81**
959122	**AF2-203 E (Withdrawn : 04/12/2021)**	**0.4593**	**Adder**	**0.54**
959223	AF2-213 BAT	9.0668	50/50	9.0668
959411	AF2-232 C	1.3778	Adder	1.62
959412	AF2-232 E	0.9185	Adder	1.08
959421	AF2-233 C	0.8278	Adder	0.97
959422	AF2-233 E	0.5519	Adder	0.65
959431	AF2-234 C	1.6557	Adder	1.95
959432	AF2-234 E	1.1038	Adder	1.3
959773	AF2-268 BAT	0.1224	Merchant Transmission	0.1224
959803	AF2-271 BAT	0.1762	50/50	0.1762
959813	AF2-272 BAT	0.1037	Merchant Transmission	0.1037
959873	AF2-278 BAT	0.4056	50/50	0.4056
959883	AF2-279 BAT	0.1172	Merchant Transmission	0.1172
959893	AF2-280 BAT	0.0902	Merchant Transmission	0.0902
959932	AF2-284 E	0.1225	Adder	0.14
959953	AF2-286 BAT	0.2420	50/50	0.2420
959963	AF2-287 BAT	0.7121	50/50	0.7121
959973	AF2-288 BAT	0.7121	50/50	0.7121
959982	AF2-289 E	0.1837	Adder	0.22
959992	AF2-290 E	0.1291	Adder	0.15
960023	AF2-293 BAT	0.1881	50/50	0.1881
960401	AF2-331 C	1.7763	Adder	2.09
960402	AF2-331 E	1.1842	Adder	1.39

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960411	AF2-332 C	1.7763	Adder	2.09
960412	AF2-332 E	1.1842	Adder	1.39
960421	AF2-333 C	0.7105	Adder	0.84
960422	AF2-333 E	0.4737	Adder	0.56
960431	AF2-334 C	0.7105	Adder	0.84
960432	AF2-334 E	0.4737	Adder	0.56
960922	AF2-383 BAT	2.0632	50/50	2.0632
961271	AF2-418 C	0.6889	Adder	0.81
961272	AF2-418 E	0.4593	Adder	0.54
961331	AF2-424 C	0.7005	Adder	0.82
961332	AF2-424 E	0.4670	Adder	0.55
961341	AF2-425 C	0.7005	Adder	0.82
961342	AF2-425 E	0.4670	Adder	0.55
961362	AF2-427 E	0.1837	Adder	0.22
961412	AF2-432 E	0.1148	Adder	0.14
961421	AF2-433 C O1	0.6889	Adder	0.81
961422	AF2-433 E O1	0.4593	Adder	0.54
961431	AF2-434 C O1	0.6889	Adder	0.81
961432	AF2-434 E O1	0.4593	Adder	0.54
961531	AF2-444 C	0.6889	Adder	0.81
961532	AF2-444 E	0.4670	Adder	0.55
961541	AF2-445AC	0.6258	Adder	0.74
961542	AF2-445AE	0.4243	Adder	0.5
962061	AG1-050	0.6843	Adder	1.52
962082	AG1-052 BAT	2.2644	50/50	2.2644
962092	AG1-053 BAT	2.2692	50/50	2.2692
962151	AG1-060 C	0.7952	Adder	1.77
962152	AG1-060 E	4.6132	Adder	10.24
963751	AG1-227 C	0.3373	Adder	0.75
963752	AG1-227 E	0.2249	Adder	0.5
963761	AG1-228 C	0.3373	Adder	0.75
963762	AG1-228 E	0.2249	Adder	0.5
963911	**AG1-244 C (Withdrawn : 03/10/2021)**	**0.2377**	**Adder**	**0.53**
963912	**AG1-244 E (Withdrawn : 03/10/2021)**	**0.1280**	**Adder**	**0.28**
963953	AG1-248 BAT	21.1220	50/50	21.1220
964051	AG1-259 C	0.3035	Adder	0.67
964052	AG1-259 E	0.4241	Adder	0.94
964061	AG1-260 C	0.3035	Adder	0.67
964062	AG1-260 E	0.4241	Adder	0.94
964671	AG1-330 C	0.1645	Adder	0.37
964672	AG1-330 E	0.0183	Adder	0.04
964693	AG1-332 BAT	0.1500	Merchant Transmission	0.1500
964731	AG1-336 C	0.1426	Adder	0.32
964732	AG1-336 E	0.0402	Adder	0.09
964741	AG1-337 C	0.1389	Adder	0.31
964742	AG1-337 E	0.0439	Adder	0.1
965203	**AG1-385 BAT (Withdrawn : 03/24/2021)**	**0.3367**	**Merchant Transmission**	**0.3367**

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
965303	AG1-395 BAT (Withdrawn : 02/26/2021)	0.3802	Merchant Transmission	0.3802
965311	AG1-396 C (Withdrawn : 03/10/2021)	0.1463	Adder	0.32
965312	AG1-396 E (Withdrawn : 03/10/2021)	0.1280	Adder	0.28
965963	AG1-465 BAT	5.0429	Merchant Transmission	5.0429
966152	AG1-484 BAT	1.0461	Merchant Transmission	1.0461
966172	AG1-486 BAT	0.6487	Merchant Transmission	0.6487
966891	AG1-560 BAT	5.4344	50/50	5.4344
966901	AG1-561 BAT	1.4319	Merchant Transmission	1.4319
WEC	WEC	0.0633	Confirmed LTF	0.0633
LGEE	LGEE	0.1156	Confirmed LTF	0.1156
G-007A	G-007A	2.5437	Confirmed LTF	2.5437
VFT	VFT	8.1463	Confirmed LTF	8.1463
CALDERWOOD	CALDERWOOD	0.0070	Confirmed LTF	0.0070
CBM-W2	CBM-W2	0.9318	Confirmed LTF	0.9318
TVA	TVA	0.0588	Confirmed LTF	0.0588
CHEOAH	CHEOAH	0.0100	Confirmed LTF	0.0100
CBM-S1	CBM-S1	0.0258	Confirmed LTF	0.0258
CBM-N	CBM-N	2.2788	Confirmed LTF	2.2788
HAMLET	HAMLET	0.1588	Confirmed LTF	0.1588
MEC	MEC	0.2654	Confirmed LTF	0.2654
LAGN	LAGN	0.0910	Confirmed LTF	0.0910
CATAWBA	CATAWBA	0.0655	Confirmed LTF	0.0655
CBM-W1	CBM-W1	3.0423	Confirmed LTF	3.0423

11.6.8 Index 8

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
165954053	204558	27SMITH TP	METED	204557	27SMITH ST	METED	1	ME-P2-ME-230-DTR065	breaker	223.0	115.56	117.83	DC	11.25

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
204638	27CAT TRAC	2.0081	Adder	2.36
204642	27YK SOLID	0.5836	50/50	0.5836
958051	**AF2-099 C (Suspended)**	**0.1349**	**Adder**	**0.16**
958052	**AF2-099 E (Suspended)**	**0.0900**	**Adder**	**0.11**
958061	**AF2-100 C (Suspended)**	**0.1349**	**Adder**	**0.16**
958062	**AF2-100 E (Suspended)**	**0.0900**	**Adder**	**0.11**
958071	**AF2-101 C (Suspended)**	**-0.5019**	**Adder**	**-0.59**
958601	AF2-151 C	-0.5141	Adder	-0.6
959223	AF2-213 BAT	61.2427	50/50	61.2427
962082	AG1-052 BAT	14.6602	50/50	14.6602
963951	AG1-248 C	0.4547	Adder	1.01
963952	AG1-248 E	4.6129	Adder	10.24
966152	AG1-484 BAT	5.3660	50/50	5.3660
966891	AG1-560 BAT	1.1671	Merchant Transmission	1.1671
966901	AG1-561 BAT	0.8745	Merchant Transmission	0.8745
G-007A	G-007A	0.7864	Confirmed LTF	0.7864
VFT	VFT	2.1285	Confirmed LTF	2.1285
CALDERWOOD	CALDERWOOD	0.0621	Confirmed LTF	0.0621
PRAIRIE	PRAIRIE	0.3151	Confirmed LTF	0.3151
CHEOAH	CHEOAH	0.0626	Confirmed LTF	0.0626
CBM-N	CBM-N	0.3876	Confirmed LTF	0.3876
COTTONWOOD	COTTONWOOD	0.2604	Confirmed LTF	0.2604
HAMLET	HAMLET	0.0739	Confirmed LTF	0.0739
GIBSON	GIBSON	0.0661	Confirmed LTF	0.0661
BLUEG	BLUEG	0.2118	Confirmed LTF	0.2118
TRIMBLE	TRIMBLE	0.0679	Confirmed LTF	0.0679
CATAWBA	CATAWBA	0.0445	Confirmed LTF	0.0445

11.6.9 Index 9

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
179728965	208005	JUNI BU2	PPL	207955	DAUP TR2	PPL	1	PL:10:P42:100577	breaker	531.0	115.56	117.2	DC	16.49

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200852	26WARR RDG	0.1786	Adder	0.21
204784	27LMR_E02	-0.1188	Adder	-0.14
208769	SISO	-0.1149	Adder	-0.14
235003	AC1-025 E	0.1227	Adder	0.14
236828	01GRAYMONT	0.3170	Adder	0.37
290086	Q-036 E	1.9853	Adder	2.34
293301	N-039 E	3.1552	Adder	3.71
294515	O38_P22	2.7608	Adder	3.25
921642	AA2-000	21.4091	Adder	25.19
930511	AB2-092	0.7861	Adder	0.92
933977	**AD1-020 EBAT (Suspended)**	**1.1830**	**Merchant Transmission**	**1.1830**
936421	AD2-055	1.6184	Adder	1.9
936991	AD2-133 C	0.8934	Adder	1.05
936992	AD2-133 E	4.0862	Adder	4.81
939171	AE1-147 C	0.9460	Adder	1.11
939172	AE1-147 E	0.6307	Adder	0.74
940201	AE2-001 C	0.9488	Adder	1.12
940202	AE2-001 E	0.6325	Adder	0.74
940681	**AE2-055 C (Suspended)**	**0.9910**	**Adder**	**1.17**
940682	**AE2-055 E (Suspended)**	**0.6607**	**Adder**	**0.78**
940731	AE2-060 C	1.9867	50/50	1.9867
940732	AE2-060 E	2.7435	50/50	2.7435
941231	AE2-117 C	0.8353	Adder	0.98
941232	AE2-117 E	0.5569	Adder	0.66
941241	AE2-118 C	0.8007	Adder	0.94
941242	AE2-118 E	0.5338	Adder	0.63
941261	AE2-120 C	0.9503	Adder	1.12
941262	AE2-120 E	0.6336	Adder	0.75
941271	AE2-121 C	0.5004	Adder	0.59
941272	AE2-121 E	0.3341	Adder	0.39
941321	**AE2-126 C (Suspended)**	**0.5864**	**Adder**	**0.69**
941322	**AE2-126 E (Suspended)**	**0.3909**	**Adder**	**0.46**
941331	AE2-129 C	0.6145	Adder	0.72
941332	AE2-129 E	0.4097	Adder	0.48
941351	**AE2-131 C (Suspended)**	**0.6145**	**Adder**	**0.72**
941352	**AE2-131 E (Suspended)**	**0.4097**	**Adder**	**0.48**
942121	AE2-224 C	2.6556	Adder	3.12
942122	AE2-224 E	1.7704	Adder	2.08
942351	AE2-248 C	0.7787	Adder	0.92
942352	AE2-248 E	0.5191	Adder	0.61
942491	AE2-262 C	3.3592	Adder	3.95

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942492	AE2-262 E	2.2574	Adder	2.66
942501	AE2-263 C	3.1576	Adder	3.71
942502	AE2-263 E	2.1082	Adder	2.48
942511	AE2-264 C	3.4696	Adder	4.08
942512	AE2-264 E	2.3131	Adder	2.72
943751	AF1-043	4.8552	Adder	5.71
944001	AF1-068 C O1 (Withdrawn : 12/15/2020)	1.0439	Adder	1.23
944002	AF1-068 E O1 (Withdrawn : 12/15/2020)	0.5872	Adder	0.69
944311	AF1-099 C	5.0993	Adder	6.0
944312	AF1-099 E	3.3995	Adder	4.0
944321	AF1-100 C	8.8345	Adder	10.39
944322	AF1-100 E	5.8896	Adder	6.93
944471	AF1-112 C	0.9688	Adder	1.14
944472	AF1-112 E	0.6459	Adder	0.76
944671	AF1-132 C O1 (Withdrawn : 12/15/2020)	0.9816	Adder	1.15
944672	AF1-132 E O1 (Withdrawn : 12/15/2020)	0.6544	Adder	0.77
944691	AF1-134 C	0.5224	Adder	0.61
944692	AF1-134 E	0.3483	Adder	0.41
944771	AF1-142 C	8.1588	Adder	9.6
944772	AF1-142 E	5.4392	Adder	6.4
944881	AF1-153 C O1	0.5619	Adder	0.66
944882	AF1-153 E O1	0.3746	Adder	0.44
944901	AF1-155 C (Suspended)	0.5593	Adder	0.66
944902	AF1-155 E (Suspended)	0.3728	Adder	0.44
945491	AF1-214 C (Withdrawn : 12/03/2020)	0.9502	Adder	1.12
945492	AF1-214 E (Withdrawn : 12/03/2020)	0.6335	Adder	0.75
946421	AF1-306 C	2.4095	Adder	2.83
946422	AF1-306 E	9.6382	Adder	11.34
957363	AF2-030 BAT	1.4224	Merchant Transmission	1.4224
957451	AF2-039 C	0.4302	Adder	0.51
957452	AF2-039 E	0.2868	Adder	0.34
957561	AF2-050 C	1.3278	Adder	1.56
957562	AF2-050 E	0.8852	Adder	1.04
957931	AF2-087 C (Suspended)	0.1619	Adder	0.19
957932	AF2-087 E (Suspended)	0.2230	Adder	0.26
957941	AF2-088 C	0.2071	Adder	0.24
957942	AF2-088 E	0.1381	Adder	0.16
958071	AF2-101 C (Suspended)	-0.0928	Adder	-0.11
958271	AF2-121 C	0.6145	Adder	0.72
958272	AF2-121 E	0.4097	Adder	0.48
958551	AF2-146 C (Withdrawn : 04/16/2021)	0.8588	Adder	1.01

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
958552	AF2-146 E (Withdrawn : 04/16/2021)	0.5726	Adder	0.67
958571	AF2-148 C (Withdrawn : 04/16/2021)	0.4506	Adder	0.53
958572	AF2-148 E (Withdrawn : 04/16/2021)	0.3004	Adder	0.35
958601	AF2-151 C	-0.0938	Adder	-0.11
959223	AF2-213 BAT	7.1302	Merchant Transmission	7.1302
959773	AF2-268 BAT	0.0881	Merchant Transmission	0.0881
959802	AF2-271 E	0.1921	Adder	0.23
959813	AF2-272 BAT	0.1134	Merchant Transmission	0.1134
959873	AF2-278 BAT	0.5579	50/50	0.5579
959883	AF2-279 BAT	0.0915	Merchant Transmission	0.0915
959903	AF2-281 BAT	0.0928	Merchant Transmission	0.0928
959953	AF2-286 BAT	0.2415	50/50	0.2415
959962	AF2-287 E	0.7095	50/50	0.7095
959972	AF2-288 E	0.7095	50/50	0.7095
960022	AF2-293 E	0.0918	Adder	0.11
960041	AF2-295 C	0.5593	Adder	0.66
960042	AF2-295 E	0.3728	Adder	0.44
960051	AF2-296 C	0.5224	Adder	0.61
960052	AF2-296 E	0.3483	Adder	0.41
960701	AF2-361 C	8.2778	50/50	8.2778
960702	AF2-361 E	11.8255	50/50	11.8255
960922	AF2-383 BAT	1.6132	Merchant Transmission	1.6132
961373	AF2-428 BAT	0.0808	Merchant Transmission	0.0808
961383	AF2-429 BAT	0.0998	Merchant Transmission	0.0998
961393	AF2-430 BAT	0.0922	Merchant Transmission	0.0922
961403	AF2-431 BAT	0.0674	Merchant Transmission	0.0674
962082	AG1-052 BAT	0.9458	Merchant Transmission	0.9458
962092	AG1-053 BAT	0.9904	Merchant Transmission	0.9904
962411	AG1-090 C O1	1.6286	Adder	3.62
962412	AG1-090 E O1	1.0857	Adder	2.41
962951	AG1-144 C (Withdrawn : 03/02/2021)	0.3257	Adder	0.72
962952	AG1-144 E (Withdrawn : 03/02/2021)	0.2171	Adder	0.48
963571	AG1-206 C	0.1647	Adder	0.37
963572	AG1-206 E	0.0887	Adder	0.2
963891	AG1-242 C	0.1500	Adder	0.33
963892	AG1-242 E	0.0808	Adder	0.18
963953	AG1-248 BAT	8.7397	Merchant Transmission	8.7397
964031	AG1-257 C	0.3538	Adder	0.79
964032	AG1-257 E	0.4944	Adder	1.1
964041	AG1-258 C (Withdrawn : 02/25/2021)	0.3538	Adder	0.79
964042	AG1-258 E (Withdrawn : 02/25/2021)	0.4944	Adder	1.1
964191	AG1-280 C	0.2734	Adder	0.61
964192	AG1-280 E	0.1823	Adder	0.4
964201	AG1-281 C	0.2746	Adder	0.61
964202	AG1-281 E	0.1831	Adder	0.41
964391	AG1-301 C	0.4545	Adder	1.01

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
964392	AG1-301 E	0.3030	Adder	0.67
964451	AG1-308 C O1	0.2279	Adder	0.51
964452	AG1-308 E O1	0.3185	Adder	0.71
964693	AG1-332 BAT	0.1118	Merchant Transmission	0.1118
965121	AG1-377 C O1	0.3257	Adder	0.72
965122	AG1-377 E O1	0.2171	Adder	0.48
965131	AG1-378 C O1	0.3257	Adder	0.72
965132	AG1-378 E O1	0.2171	Adder	0.48
965201	**AG1-385 C (Withdrawn : 03/24/2021)**	**0.3829**	**Adder**	**0.85**
965202	**AG1-385 E (Withdrawn : 03/24/2021)**	**0.1134**	**Adder**	**0.25**
965301	**AG1-395 C (Withdrawn : 02/26/2021)**	**0.4185**	**Adder**	**0.93**
965302	**AG1-395 E (Withdrawn : 02/26/2021)**	**0.1243**	**Adder**	**0.28**
965963	AG1-465 BAT	3.8542	Merchant Transmission	3.8542
966041	AG1-473 C	3.8006	50/50	3.8006
966042	AG1-473 E	2.5337	50/50	2.5337
966152	AG1-484 BAT	0.5931	Merchant Transmission	0.5931
966172	AG1-486 BAT	0.4670	Merchant Transmission	0.4670
WEC	WEC	0.2334	Confirmed LTF	0.2334
LGEE	LGEE	0.4473	Confirmed LTF	0.4473
CPLE	CPLE	0.1618	Confirmed LTF	0.1618
CBM-W2	CBM-W2	5.7434	Confirmed LTF	5.7434
TVA	TVA	0.8120	Confirmed LTF	0.8120
O-066	O-066	7.6789	Confirmed LTF	7.6789
SIGE	SIGE	0.1940	Confirmed LTF	0.1940
CBM-S2	CBM-S2	3.5809	Confirmed LTF	3.5809
CBM-S1	CBM-S1	0.2295	Confirmed LTF	0.2295
G-007	G-007	1.2705	Confirmed LTF	1.2705
MEC	MEC	1.1202	Confirmed LTF	1.1202
LAGN	LAGN	1.0342	Confirmed LTF	1.0342
CBM-W1	CBM-W1	10.8515	Confirmed LTF	10.8515

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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
165954007	939000	AE1-129 TAP	METED	204571	27ZIONS VW	METED	1	ME-P2-3-ME-115-033E	breaker	156.0	122.33	136.89	DC	22.71

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
204660	27YK H STA	0.8165	50/50	0.8165
939001	AE1-129 C	23.9531	50/50	23.9531
939002	AE1-129 E	16.6143	50/50	16.6143
959223	AF2-213 BAT	32.8673	50/50	32.8673
960922	AF2-383 BAT	1.2358	Merchant Transmission	1.2358
962081	AG1-052	10.1928	50/50	10.1928
963953	AG1-248 BAT	22.7120	50/50	22.7120
965963	AG1-465 BAT	2.9516	Merchant Transmission	2.9516
G-007A	G-007A	0.7336	Confirmed LTF	0.7336
VFT	VFT	2.0511	Confirmed LTF	2.0511
CALDERWOOD	CALDERWOOD	0.0557	Confirmed LTF	0.0557
PRAIRIE	PRAIRIE	0.2583	Confirmed LTF	0.2583
CHEOAH	CHEOAH	0.0566	Confirmed LTF	0.0566
CBM-N	CBM-N	0.3888	Confirmed LTF	0.3888
COTTONWOOD	COTTONWOOD	0.2247	Confirmed LTF	0.2247
HAMLET	HAMLET	0.0757	Confirmed LTF	0.0757
GIBSON	GIBSON	0.0530	Confirmed LTF	0.0530
BLUEG	BLUEG	0.1684	Confirmed LTF	0.1684
TRIMBLE	TRIMBLE	0.0540	Confirmed LTF	0.0540
CATAWBA	CATAWBA	0.0437	Confirmed LTF	0.0437

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
AA2-000	N/A	N/A
AB1-096	Carroll-Mt. Airy 34.5kV	Engineering and Procurement
AB1-124	Carroll-Monocacy 34.5kV	Engineering and Procurement
AB1-125	Carroll-Monocacy 34.5kV	Engineering and Procurement
AB2-092	Bergen 138kV	Partially in Service - Under Construction
AC1-025	Dale Summit	In Service
AC1-048	Germantown 115kV	Suspended
AC2-053	Germantown 115kV	Suspended
AD1-020	Hunterstown-Lincoln 115 kV	Suspended
AD2-055	Moshannon-East Towanda 230 kV	Active
AD2-133	Eagle Valley 115kV	Active
AE1-006	Germantown 115 kV	Suspended
AE1-129	Zion View - Middletown 115 kV	Active
AE1-131	Gardners-Hunterstown 115 kV	Active
AE1-138	Hamilton 115 kV	Active
AE1-139	Hunterstown 115 kV	Active
AE1-147	Bellefonte 46 kV	Engineering and Procurement
AE1-225	Columbia-Sunbury 69 kV	Active
AE2-001	Nittany-Zion 46 kV	Active
AE2-042	Milton 69 kV	Active
AE2-055	Shingletown-Boalsburg 46 kV	Suspended
AE2-059	Derry Tap-Derry Bus 69 kV	Active
AE2-060	Mifflintown Bus-Mifflintown Tap 69 kV	Active
AE2-084	Derry Tap-Derry Bus 69 kV	Active
AE2-110	Columbia-West Bloomsburg 69 kV	Active
AE2-111	Beavertown Tap-Beavertown Weaving Tap 69kV	Active
AE2-117	ABW Tap-Alexandria 46 kV	Active
AE2-118	ABW Tap-Williamsburg 46 kV	Active
AE2-120	Graymont-Zion 46 kV	Active
AE2-121	Milesburg-Tanney Junction 46 kV	Active
AE2-126	Dubois-Curwensville 34.5 kV	Suspended
AE2-129	Philipsburg-Clarence 34.5 kV	Engineering and Procurement
AE2-131	Philipsburg-Karthaus 34.5	Suspended
AE2-133	Penns Tap-Richfield Tie 69 kV	Active
AE2-192	Orrtanna 115 kV	Active
AE2-224	Bearrock-Johnstown 230 kV	Active
AE2-241	Bloomsburg-Columbia 69 kV	Active
AE2-248	Fillmore-Thompson Farm 46 kV	Active

Queue Number	Project Name	Status
AE2-262	Moshannon-Milesburg 230 kV	Active
AE2-263	Moshannon-Milesburg 230 kV	Active
AE2-264	Altoona-Raystown 230 kV	Active
AE2-271	Montour 230 kV	Active
AE2-295	Eldred 230 kV	Active
AE2-345	Hunterstown-Texas Eastern Tap 115 kV	Active
AF1-040	Gratz Tap 69 kV	Active
AF1-043	Moshannon-East Towanda 230 kV	Active
AF1-068	Boalsburg-Centre Hall 46 kV	Withdrawn
AF1-099	Moshannon-Milesburg 230 kV	Active
AF1-100	Shawville-Moshannon 230 kV	Active
AF1-112	Centre Hall-Boalsburg 46 kV	Active
AF1-132	Shingletown-Boalsburg 46 kV	Withdrawn
AF1-134	Philipsburg-Madera 34.5 kV	Active
AF1-142	Moshannon-Milesburg 230 kV	Active
AF1-153	Motion-Ridgeway 46 kV	Active
AF1-155	Paper City-Wilcox 46 kV	Suspended
AF1-178	Tolna 2 115 kV	Partially in Service - Under Construction
AF1-179	Tolna 1 115 kV	Partially in Service - Under Construction
AF1-188	Orrtanna 115 kV	Partially in Service - Under Construction
AF1-192	Mountain 2 115 kV	Partially in Service - Under Construction
AF1-193	Hunterstown 115 kV	Partially in Service - Under Construction
AF1-214	Nittany-Zion 46 kV	Withdrawn
AF1-216	Lycoming-Lock Haven 69 kV	Active
AF1-226	Bowmans Mill-Scott 69 kV	Active
AF1-271A	Gratz 69 kV	Active
AF1-306	Squab Hollow 230 kV	Active
AF1-311	Montour 230 kV	Active
AF1-333	Laurelton-Mifflinburg 69 kV	Active
AF1-337	Laurelton-Mifflinburg 69 kV	Active
AF1-338	Laurelton-Mifflinburg 69 kV	Active
AF1-339	Laurelton-Mifflinburg 69 kV	Active
AF2-030	Ontelaunee 230 kV	Active
AF2-039	Shawville-Clearfield 34.5 kV	Active
AF2-050	Bearrock-Johnstown 230 kV	Active
AF2-056	Shenandoah Tap 1– Mahanoy Tap 2 69 kV	Active
AF2-082	Dauphin PG Tie–Dauphin Juniata Tie 69 k	Active
AF2-086	Scott Tap-Bowmans Mill Tap 69 kV	Active
AF2-087	East Altoona-Pinecroft 12.47 kV	Suspended
AF2-088	Shawville-Clearfield 34.5 kV II	Active
AF2-099	Taxville 2 13.2 kV	Suspended
AF2-100	Taxville 1 13.2 kV	Suspended
AF2-101	Allen 13.2 kV	Suspended
AF2-102	Germantown 13.2 kV	Active
AF2-121	Philipsburg-Shawville 34.5 kV	Active
AF2-140	Saegers 230 kV	Active
AF2-145	Lycoming-Lock Haven 69 kV	Active
AF2-146	Hill Valley-Valley REC 46 kV	Withdrawn
AF2-148	Shade Gap-Three Springs KTS 23 kV	Withdrawn
AF2-151	Dillsburg 13.2 kV	Engineering and Procurement
AF2-175	Straban 13.2 kV	Active
AF2-178	Roxbury 23 kV II	In Service

Queue Number	Project Name	Status
AF2-203	Rohrsburg 12.5 kV	Withdrawn
AF2-213	Zions View-Smith Street 115 kV	Active
AF2-229	Roxbury 23 kV	Withdrawn
AF2-232	Bowmanns Mill Tap-Scott 69 kV	Active
AF2-233	Penns-Richfield Tie #1 69 kV	Active
AF2-234	Sunbury Yard #1-Richfield Tie #2 69 kV	Active
AF2-268	Orrtanna 13.2 kV	Engineering and Procurement
AF2-271	Pemberton-Sinking Valley 12.47 kV	Engineering and Procurement
AF2-272	Bernville 13.2 kV	Engineering and Procurement
AF2-278	Halifax 12.47 kV	Engineering and Procurement
AF2-279	Letort 12.47 kV	Engineering and Procurement
AF2-280	Buck 12.47 kV	Engineering and Procurement
AF2-281	Lynnville 13.2 kV	Engineering and Procurement
AF2-284	Watson 12.47 kV	Engineering and Procurement
AF2-286	Shermansdale 12.47 kV	Engineering and Procurement
AF2-287	Green Park 12.47 kV	Engineering and Procurement
AF2-288	Benvenue 12.47 kV	Engineering and Procurement
AF2-289	Watson 12.47 kV	Engineering and Procurement
AF2-290	Derry 12.47 kV	Engineering and Procurement
AF2-293	Beech Creek 12.47 kV	Active
AF2-295	Wilcox-Paper City 46 kV	Active
AF2-296	Madera 34.5 kV	Active
AF2-331	Montour 230 kV	Active
AF2-332	Montour 230 kV	Active
AF2-333	Montour 230 kV	Active
AF2-334	Montour 230 kV	Active
AF2-361	Mifflintown Tap 69 kV	Active
AF2-383	Tolna 115 kV	Active
AF2-418	Millville Tap 69 kV	Active
AF2-424	Reed-Reed Tap #1 69 kV	Active
AF2-425	Sunbury-Eldred #2 69 kV	Active
AF2-427	Watson 12.47 kV	Engineering and Procurement
AF2-428	West Boyertown 13.2 kV	Engineering and Procurement
AF2-429	South Hamburg 34.5 kV	Engineering and Procurement
AF2-430	Moselem 13.2 kV	Engineering and Procurement
AF2-431	Baldy 13.2 kV	Engineering and Procurement
AF2-432	University 12.47 kV	Engineering and Procurement
AF2-433	Columbia-Geisinger Tap #1 69 kV	Active
AF2-434	Columbia-Geisinger Tap #1 69 kV	Active
AF2-439	Roxbury-Carlisle 115 kV	Withdrawn
AF2-444	Reed-Fairview Tap #2 69 kV	Active
AF2-445A	Fishbach-Port Carbon 69 kV	Active
AG1-050	Milton 69 kV	Active
AG1-052	Zionsview-Middletown 115 kV II	Active
AG1-053	Jackson-Three Mile Island 230 kV III	Active
AG1-060	Eldred 69 kV	Active
AG1-090	Philipsburg 115 kV	Active
AG1-144	Phillipsburg 34.5 kV	Withdrawn
AG1-206	Snyder Twp 34.5 kV	Active
AG1-227	Altamont-Tuscarora 69 kV	Active
AG1-228	Alta Haute-Tuscarora 69 kV	Active
AG1-242	Beccaria 34.5 kV	Active

Queue Number	Project Name	Status
AG1-244	Middleburg 12.47 kV	Withdrawn
AG1-248	York Storage 115 kV	Active
AG1-257	Madisonburg Jct-Millheim 46 kV	Active
AG1-258	Madisonburg Jct-Millheim 46 kV	Withdrawn
AG1-259	Sunbury-Dalmatia 69 kV	Active
AG1-260	Sunbury-Dalmatia 69 kV	Active
AG1-280	Claysburg-Puzzletown 46 kV	Active
AG1-281	Claysburg-HCR Tap 46 kV	Active
AG1-301	Miller REC-Warrior Ridge 46 kV	Active
AG1-308	Shawville-Philipsburg 115 kV	Active
AG1-330	Beavertown 12.47 kV	Active
AG1-332	Oxford 13.2 kV	Active
AG1-336	Hunter 12.47 kV	Active
AG1-337	Elizabethville 12.47 kV	Active
AG1-377	Philipsburg 115 kV	Active
AG1-378	Philipsburg 115 kV	Active
AG1-385	Motion-Ridgeway 46 kV	Withdrawn
AG1-395	Philipsburg-Karthaus 34.5 kV 2	Withdrawn
AG1-396	Dauphin-Pine Grove 69 kV	Withdrawn
AG1-465	North Hanover-Gitts Run 115 kV	Active
AG1-473	Shingletown-Lewistown 230 kV	Active
AG1-484	Mountain 115 kV	Active
AG1-486	Orrtanna 115 kV	Active
AG1-560	Shade Gap-Roxbury 115 kV II	Active
AG1-561	Roxbury-Greene 138 kV II	Active
W1-045	Roxbury 23 kV	In Service

11.8 Contingency Descriptions

Contingency Name	Contingency Definition
ME-P2-3-ME-115-033E	CONTINGENCY 'ME-P2-3-ME-115-033E' /* CLY 5 DISCONNECT BRANCH FROM BUS 204524 TO BUS 204682 CKT 1 /* 27CLY 978 115 27ES3 115 DISCONNECT BRANCH FROM BUS 204682 TO BUS 204572 CKT 1 /* 27ES3 115 27RAINTREE 115 DISCONNECT BRANCH FROM BUS 204572 TO BUS 204557 CKT 1 /* 27RAINTREE 115 27SMITH ST 115 DISCONNECT BRANCH FROM BUS 204523 TO BUS 204549 CKT 1 /* 27CLY 975 115 27NEWBERRY 115 DISCONNECT BRANCH FROM BUS 204549 TO BUS 204556 CKT 1 /* 27NEWBERRY 115 27ROUND TP 115 END
ME-P2-2-ME-115-009	CONTINGENCY 'ME-P2-2-ME-115-009' /* JACKSON 115 KV 8 BUS FAULT DISCONNECT BRANCH FROM BUS 204540 TO BUS 204548 CKT 1 /* 27JACKSON 115 27N.HANOVR 115 DISCONNECT BRANCH FROM BUS 204540 TO BUS 204541 CKT 1 /* 27JACKSON 115 27BAKER TP 115 DISCONNECT BRANCH FROM BUS 204540 TO BUS 204700 CKT ZB /* 27JACKSON 115 27JACKSON6 115 DISCONNECT BRANCH FROM BUS 204502 TO BUS 204540 CKT 5 /* 27JACKSON 230 27JACKSON 115 END
PL:11:P42:000140	CONTINGENCY 'PL:11:P42:000140' /* JUNI-TMIS 500KV STUCK BREAKER CONNECTED TO JUNI TR1 DISCONNECT BRANCH FROM BUS 200009 TO BUS 200016 CKT 1 /* JUNIATA-3 MILE I 500 REMOVE SWSHUNT FROM BUS 200009 /* 500 CAP BANK DISCONNECT BRANCH FROM BUS 200009 TO BUS 208004 CKT 1 /* JUNIATA-JUNI BU1 500-230 END
ME-P2-ME-230-DTR035	CONTINGENCY 'ME-P2-ME-230-DTR035' /* YORKANA, B14 FAILED TO OPEN DISCONNECT BUS 204540 /* DISCONNECT JACKSON 115 KV BUS DISCONNECT BRANCH FROM BUS 204502 TO BUS 204540 CKT 5 /* JACKSON XFMR 5 END

Contingency Name	Contingency Definition
ME-P7-1-ME-230-008A-A	CONTINGENCY 'ME-P7-1-ME-230-008A-A' /* MIDD JCT-SMITH ST 977 & MIDD JCT-CLY 978 115 KV DISCONNECT BRANCH FROM BUS 204598 TO BUS 204566 CKT 1 /* 27MIDD JCT 115 27YK HAVEN 115 DISCONNECT BRANCH FROM BUS 204566 TO BUS 204660 CKT ZL /* 27YK HAVEN 115 27YK H STA 115 DISCONNECT BRANCH FROM BUS 204566 TO BUS 204524 CKT 1 /* 27YK HAVEN 115 27CLY 978 115 DISCONNECT BRANCH FROM BUS 204598 TO BUS 939000 CKT 1 /* 27MIDD JCT 115 AE1-129 TAP 115 DISCONNECT BUS 204566 /* 27YK HAVEN 115 DISCONNECT BUS 204660 /* 27YK H STA 115 END
PL:10:P13:001616	CONTINGENCY 'PL:10:P13:001616' /* JUNIATA 230/69KV T3 DISCONNECT BRANCH FROM BUS 208004 TO BUS 208005 CKT 1 /* JUNI BU1-JUNI BU2 230 DISCONNECT BRANCH FROM BUS 207950 TO BUS 208004 CKT 1 /* DISCONNECT BRANCH FROM BUS 208004 TO BUS 209997 CKT 3 /* JUNI BU1-JUNI 230-69 DISCONNECT BRANCH FROM BUS 207950 TO BUS 208004 CKT 1 /* CUMB TR2-JUNI BU1 230 DISCONNECT BRANCH FROM BUS 200009 TO BUS 208004 CKT 1 /* JUNIATA-JUNI BU1 500-230 END
ME-P7-1-ME-230-003	CONTINGENCY 'ME-P7-1-ME-230-003' /* HUNTERSTOWN-JACKSON 230 KV & HAMILTON-JACKSON 115 KV DISCONNECT BRANCH FROM BUS 204575 TO BUS 204502 CKT 1 /* 27HUNTRST1 230 27JACKSON 230 DISCONNECT BRANCH FROM BUS 204535 TO BUS 204700 CKT 1 /* 27HAMILTON 115 27JACKSON6 115 END
ME-P7-1-ME-230-004	CONTINGENCY 'ME-P7-1-ME-230-004' /* HUNTRSTWN-JACKSN 230 KV & HUNTRSTWN-HAMILTON 115 KV DISCONNECT BRANCH FROM BUS 204575 TO BUS 204502 CKT 1 /* 27HUNTRST1 230 27JACKSON 230 DISCONNECT BRANCH FROM BUS 204535 TO BUS 204539 CKT 1 /* 27HAMILTON 115 27HUNTRSTN 115 END

Contingency Name	Contingency Definition
ME-P2-3-ME-115-012B	CONTINGENCY 'ME-P2-3-ME-115-012B' /* JACKSON BK5 (JACKSON-B14) DISCONNECT BRANCH FROM BUS 204540 TO BUS 204541 CKT 1 /* 27JACKSON 115 27BAKER TP 115 DISCONNECT BRANCH FROM BUS 204540 TO BUS 204548 CKT 1 /* 27JACKSON 115 27N.HANOVR 115 DISCONNECT BRANCH FROM BUS 204540 TO BUS 204700 CKT ZB /* 27JACKSON 115 27JACKSON6 115 DISCONNECT BRANCH FROM BUS 204502 TO BUS 204540 CKT 5 /* 27JACKSON 230 27JACKSON 115 END
ME-P7-1-ME-230-008A-B	CONTINGENCY 'ME-P7-1-ME-230-008A-B' /* MIDD JCT-SMITH ST 977 & MIDD JCT-CLY 978 115 KV DISCONNECT BRANCH FROM BUS 204598 TO BUS 204566 CKT 1 /* 27MIDD JCT 115 27YK HAVEN 115 DISCONNECT BRANCH FROM BUS 204566 TO BUS 204660 CKT ZL /* 27YK HAVEN 115 27YK H STA 115 DISCONNECT BRANCH FROM BUS 204566 TO BUS 204524 CKT 1 /* 27YK HAVEN 115 27CLY 978 115 DISCONNECT BRANCH FROM BUS 939000 TO BUS 204571 CKT 1 /* AE1-129 TAP 115 27ZIONS VW 115 DISCONNECT BRANCH FROM BUS 204571 TO BUS 959220 CKT 1 /* 27ZIONS VW 115 AF2-213 TAP ST 115 DISCONNECT BUS 204566 /* 27YK HAVEN 115 DISCONNECT BUS 204660 /* 27YK H STA 115 DISCONNECT BUS 204571 /* 27ZIONS VW 115 END
PL:10:P13:001633	CONTINGENCY 'PL:10:P13:001633' /* DAUPHIN 230/69KV T2 DISCONNECT BRANCH FROM BUS 207953 TO BUS 207955 CKT 1 /* DAUP TR1-DAUP TR2 230 DISCONNECT BRANCH FROM BUS 207955 TO BUS 208005 CKT 1 /* DAUP TR2-JUNI BU2 230 DISCONNECT BRANCH FROM BUS 207955 TO BUS 209866 CKT 2 /* DAUP TR2-DAUP 230-69 END
Base Case	
ME-P1-2-ME-115-025-B	CONTINGENCY 'ME-P1-2-ME-115-025-B' /* MIDD JUNCTION-ZIONSVIEW-SMITH STREET 115 KV DISCONNECT BRANCH FROM BUS 939000 TO BUS 204571 CKT 1 /* AE1-129 115 27ZIONS VW 115 DISCONNECT BRANCH FROM BUS 204571 TO BUS 959220 CKT 1 /* 27ZIONS VW 115 AF2-213 TAP 115 REMOVE LOAD 1 FROM BUS 204571 /* 27ZIONS VW 115 REMOVE LOAD 2 FROM BUS 204571 /* 27ZIONS VW 115 DISCONNECT BUS 204571 /* 27ZIONS VW 115 END

Contingency Name	Contingency Definition
PL:10:P42:100577	CONTINGENCY 'PL:10:P42:100577' /* AT JUNIATA 500SUB TR1 230KV CB FAILED" DISCONNECT BUS 208004 /* END
ME-P1-2-ME-115-010	CONTINGENCY 'ME-P1-2-ME-115-010' /* GLADES-WEST HELLAM-PROSPECT-YORKANA 115 KV DISCONNECT BRANCH FROM BUS 204570 TO BUS 204687 CKT 1 /* 27YORKANA 115 27PROSPECT 115 DISCONNECT BRANCH FROM BUS 204687 TO BUS 204562 CKT 1 /* 27PROSPECT 115 27W.HELLAM 115 DISCONNECT BRANCH FROM BUS 204562 TO BUS 204534 CKT 1 /* 27W.HELLAM 115 27GLADES 115 REMOVE LOAD 2 FROM BUS 204534 /* 27GLADES 115 DISCONNECT BUS 204687 /* 27PROSPECT 115 DISCONNECT BUS 204562 /* 27W.HELLAM 115 END
ME-P2-3-ME-230-019CT	CONTINGENCY 'ME-P2-3-ME-230-019CT' /* YORKANA-B11 DISCONNECT BRANCH FROM BUS 204515 TO BUS 208048 CKT 1 /* 27YORKANA 230 OTCR 230 DISCONNECT BRANCH FROM BUS 204515 TO BUS 207922 CKT 1 /* 27YORKANA 230 BRIS 230 DISCONNECT BRANCH FROM BUS 204515 TO BUS 204570 CKT 1 /* 27YORKANA 230 27YORKANA 115 END
ME-P2-ME-230-DTR065	CONTINGENCY 'ME-P2-ME-230-DTR065' /* DISCONNECT MIDTWN JCT XFRM 5 TO MIDTWN JCT AND BKR 64 FAILS TO OPEN DISCONNECT BRANCH FROM BUS 204504 TO BUS 204595 CKT 2 /* DISCONNECT MIDTWN JCT BUS 4 TO XFMR 2 DISCONNECT BUS 204709 /* DISCONNECT BUS 204709 AT MIDTWN JCT END
ME-P1-2-ME-115-066	CONTINGENCY 'ME-P1-2-ME-115-066' /* CLY-SMITH STREET 115 KV DISCONNECT BRANCH FROM BUS 204524 TO BUS 204682 CKT 1 /* 27CLY 978 115 27ES3 115 DISCONNECT BRANCH FROM BUS 204682 TO BUS 204572 CKT 1 /* 27ES3 115 27RAINTREE 115 DISCONNECT BRANCH FROM BUS 204572 TO BUS 204557 CKT 1 /* 27RAINTREE 115 27SMITH ST 115 REMOVE LOAD 1 FROM BUS 204572 /* 27RAINTREE 115 REMOVE LOAD C FROM BUS 204682 /* 27ES3 115 DISCONNECT BUS 204682 /* 27ES3 115 DISCONNECT BUS 204572 /* 27RAINTREE 115 END

Contingency Name	Contingency Definition
ME-P2-ME-230-DTR059	CONTINGENCY 'ME-P2-ME-230-DTR059' /* DISCONNECT MIDTWN JCT XFRM 5 TO MIDTWN JCT AND BKR 28 FAILS TO OPEN DISCONNECT BRANCH FROM BUS 204709 TO BUS 204596 CKT 5 /* XFMR #5 AT MIDTWN JCT DISCONNECT BUS 204504 /* DISCONNECT BUS 204504 AT MIDTWN JCT END
ME-P2-3-ME-115-032AT	CONTINGENCY 'ME-P2-3-ME-115-032AT' /* YORKANA-1B45 (TIE BREAKER) DISCONNECT BRANCH FROM BUS 204570 TO BUS 204687 CKT 1 /* 27YORKANA 115 27PROSPECT 115 DISCONNECT BRANCH FROM BUS 204701 TO BUS 208720 CKT 1 /* 27YORKANAB 115 RED FRONT 115 DISCONNECT BRANCH FROM BUS 204570 TO BUS 204568 CKT 1 /* 27YORKANA 115 27YOE TAP 115 DISCONNECT BRANCH FROM BUS 204570 TO BUS 204701 CKT ZB /* 27YORKANA 115 27YORKANAB 115 DISCONNECT BRANCH FROM BUS 204701 TO BUS 204574 CKT 1 /* 27YORKANAB 115 27MODRN LF 13 DISCONNECT BRANCH FROM BUS 204515 TO BUS 204570 CKT 1 /* 27YORKANA 230 27YORKANA 115 DISCONNECT BRANCH FROM BUS 204515 TO BUS 204701 CKT 3 /* 27YORKANA 230 27YORKANAB 115 REMOVE LOAD 2 FROM BUS 204701 /* 27YORKANAB 115 DISCONNECT BUS 204701 /* 27YORKANAB 115 DISCONNECT BUS 204574 /* 27MODRN LF 13 DISCONNECT BUS 204570 /* 27YORKANA 115 END

12 Short Circuit Analysis

The following Breakers are overdutied:

None

12.1 System Reinforcements - Short Circuit

None

13 Affected Systems

13.1 NYISO

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

13.2 MISO

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

14 Attachment 1: One Line Diagram