



**Generation Interconnection
Feasibility Study Report
for
Queue Project AG1-052
ZIONSVIEW-MIDDLETOWN 115 KV II
20 MW Capacity / 20 MW Energy**

January 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, LLC (MAIT) (ME 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 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 an uprate to a planned Storage generating facility located in York, Pennsylvania. This project is an increase to the Interconnection Customer's AE1-129 project, which will share the same point of interconnection. The AG1-052 queue position is a 20 MW uprate (20 MW Capacity uprate) to the previous project. The total installed facilities will have a capability of 99.6 MW with 67 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this uprate project is September 30, 2021. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-052
Project Name	ZIONSVIEW-MIDDLETOWN 115 KV II
State	Pennsylvania
County	York
Transmission Owner	MAIT (ME)
MFO	99.6
MWE	20
MWC	20
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 project will be accomplished by constructing a new 115 kV three (3) breaker ring bus substation and looping the Middletown Junction – Zions View 115 kV line into the new substation. This direct connection point will be established by the preceding AE1-129 project. 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 AG1-052 generation project to connect to the FirstEnergy (“FE”) transmission system.

5 Cost Summary

The AG1-052 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$0
Total System Network Upgrade Costs	\$57,318,680 ¹
Total Costs	\$57,318,680

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 This project currently causes and/or 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 contributes to a facility that is already overloaded by a prior queue, then they may receive cost allocation.

6 Transmission Owner Scope of Work

The interconnection of the project will be accomplished by constructing a new 115 kV three (3) breaker ring bus substation and looping the Middletown Junction – Zions View 115 kV line into the new substation. This direct connection point will be established by the preceding AE1-129 project. It is anticipated that there will be no direct connect costs associated with this project.

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

Description	Total Cost
Total Physical Interconnection Costs	\$0

7 Schedule

AG1-052 is an increase to the AE1-129 project. Therefore, there are no Attachment Facilities, Direct, and Non-Direct Connection facilities work to be completed outside of the scope of the AE1-129 project.

8 Transmission Owner Analysis

8.1 Power Flow Analysis

FE performed an analysis of its underlying transmission <100 kV system. The AG1-052 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 AG1-052 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 AG1-052 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 AG1-052 was evaluated as a 20.0 MW (Capacity 20.0 MW) injection as an uprate to AE1-129 which is tapping the Zion View to Middletown Junction 115 kV line in the ME area. Project AG1-052 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-052 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	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPAC T
164846202	200504	26CARLISLE	115.0	PENELEC	204528	27GARDNERS	115.0	METED	1	PL:10:P24:100548	bus	160.0	99.97	100.37	DC	1.19

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	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPAC T
165864194	204558	27SMITH TP	115.0	METED	204557	27SMITH ST	115.0	METED	1	ME-P2-ME-230-DTR059	breaker	223.0	109.05	115.62	DC	14.66
165864195	204558	27SMITH TP	115.0	METED	204557	27SMITH ST	115.0	METED	1	ME-P2-ME-230-DTR065	breaker	223.0	108.98	115.56	DC	14.66
165720946	939000	AE1-129 TAP	115.0	METED	204571	27ZIONS VW	115.0	METED	1	ME-P2-2-ME-115-009	bus	156.0	105.05	109.98	DC	7.69
165864149	939000	AE1-129 TAP	115.0	METED	204571	27ZIONS VW	115.0	METED	1	ME-P2-3-ME-115-033E	breaker	156.0	115.8	122.33	DC	10.19
165864150	939000	AE1-129 TAP	115.0	METED	204571	27ZIONS VW	115.0	METED	1	ME-P2-3-ME-115-032AT	breaker	156.0	110.14	115.43	DC	8.25
165864151	939000	AE1-129 TAP	115.0	METED	204571	27ZIONS VW	115.0	METED	1	ME-P2-ME-230-DTR035	breaker	156.0	111.03	115.85	DC	7.53
165864152	939000	AE1-129 TAP	115.0	METED	204571	27ZIONS VW	115.0	METED	1	ME-P2-3-ME-115-012B	breaker	156.0	105.05	109.98	DC	7.69
165864153	939000	AE1-129 TAP	115.0	METED	204571	27ZIONS VW	115.0	METED	1	ME-P2-3-ME-230-019CT	breaker	156.0	103.66	109.06	DC	8.42

11.4 Potential Congestion due to Local Energy Deliverability

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

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPAC T
166119495	939000	AE1-129 TAP	115.0	METED	204571	27ZION SVW	115.0	METED	1	ME-P1-2-ME-115-066	operation	156.0	100.36	106.32	DC	9.29
166119497	939000	AE1-129 TAP	115.0	METED	204571	27ZION SVW	115.0	METED	1	Base Case	operation	129.0	104.28	111.11	DC	8.81

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
165864153,165864152,165864151,165864150,165720946,165864149	3	AE1-129 TAP 115.0 kV - 27ZIONS VW 115.0 kV Ckt 1	<u>METED</u> ME-0007a (2126) : Reconductor line with larger conductor (2.9 miles). Project Type : FAC Cost : \$7,100,000 Time Estimate : 30.0 Months	\$7,100,000
164846202	1	26CARLISLE 115.0 kV - 27GARDNERS 115.0 kV Ckt 1	<u>METED</u> ME-AG1-F-0005A (2140) : Reconductor line with larger conductor (13.1 miles). Project Type : FAC Cost : \$31,738,680 Time Estimate : 50.0 Months <u>PENELEC</u> PN-AG1-F-0035C : Reconductor 7.54 miles of line. Project Type : FAC Cost : \$18,480,000 Time Estimate : 44.0 Months	\$50,218,680
165864195,165864194	2	27SMITH TP 115.0 kV - 27SMITH ST 115.0 kV Ckt 1	<u>METED</u> b3136 (2122) : Replace bus conductor at Smith 115 kV substation Project Type : FAC Cost : \$0 Time Estimate : Projected in-service date: 06/01/2024 Months s1813.1 (2130) : PJM RTEP Supplemental Project: Smith Street Smith Street Tap115 kV Line - Rebuild approximately 1.3 miles of wood pole construction Project Type : FAC Cost : \$0 Time Estimate : Projected in-service date: 11/28/2022 Months	\$0
			TOTAL COST	\$57,318,680¹

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	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPAC T
16484620 2	20050 4	26CARLISL E	PENELE C	20452 8	27GARDNER S	METE D	1	PL:10:P24:10054 8	bus	160.0	99.97	100.37	DC	1.19

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200870	26C_T85_W218	0.3757	50/50	0.3757
203905	26W1-045 C	0.2399	50/50	0.2399
237329	01CHBRG_I12	0.5202	50/50	0.5202
901242	W1-045 E OP1	1.3251	50/50	1.3251
930822	AB1-127 E	0.3881	Adder	0.46
930832	AB1-128 E	0.3881	Adder	0.46
933977	AD1-020 EBAT (Suspended)	1.3794	Merchant Transmission	1.3794
934371	AD1-061 C	0.3669	Adder	0.43
934372	AD1-061 E	0.3186	Adder	0.37
936061	AD2-009 C	2.4854	Adder	2.92
936062	AD2-009 E	1.1316	Adder	1.33
936471	AD2-062 C O1	10.9654	50/50	10.9654
936472	AD2-062 E O1	5.4929	50/50	5.4929
938384	AE1-071-C	14.1867	50/50	14.1867
938385	AE1-071-E	8.6811	50/50	8.6811
938753	AE1-101 C1	1.9142	Adder	2.25
938754	AE1-101 C2	0.9571	Adder	1.13
938756	AE1-101 E1	3.9517	Adder	4.65
938757	AE1-101 E2	1.9729	Adder	2.32
939033	AE1-132 C	2.6352	Adder	3.1
939034	AE1-132 E	1.7568	Adder	2.07
939591	AE1-188 C	0.6808	Adder	0.8
939592	AE1-188 E	0.3999	Adder	0.47
940671	AE2-054 C (Suspended)	0.5756	Adder	0.68
940672	AE2-054 E (Suspended)	0.3837	Adder	0.45
945011	AF1-166 C	0.5644	Adder	0.66
945012	AF1-166 E	0.3763	Adder	0.44
945441	AF1-209 C O1	0.5609	Adder	0.66
945442	AF1-209 E O1	0.3739	Adder	0.44
945591	AF1-224 C	0.4269	Adder	0.5
945592	AF1-224 E	0.2161	Adder	0.25
958071	AF2-101 C	-0.2674	Adder	-0.31
958221	AF2-116 C	0.6872	Adder	0.81
958222	AF2-116 E	0.3462	Adder	0.41
958231	AF2-117 C	2.1961	Adder	2.58
958232	AF2-117 E	1.0978	Adder	1.29
958551	AF2-146 C	1.8602	50/50	1.8602
958552	AF2-146 E	1.2402	50/50	1.2402
958571	AF2-148 C	1.5119	50/50	1.5119
958572	AF2-148 E	1.0080	50/50	1.0080
958601	AF2-151 C	-0.2638	Adder	-0.31

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
958871	AF2-178	1.1561	50/50	1.1561
958881	AF2-179	0.3411	Adder	0.4
958891	AF2-180	0.3411	Adder	0.4
958931	AF2-184	0.2800	Adder	0.33
959223	AF2-213 BAT	4.6893	Merchant Transmission	4.6893
959241	AF2-215 C	0.1578	Adder	0.19
959242	AF2-215 E	0.1052	Adder	0.12
959381	AF2-229 C	3.2312	50/50	3.2312
959382	AF2-229 E	2.6976	50/50	2.6976
959773	AF2-268 BAT	0.1026	Merchant Transmission	0.1026
959842	AF2-275 E	0.1764	Adder	0.21
959852	AF2-276 E	0.1764	Adder	0.21
961481	AF2-439 C	8.0462	50/50	8.0462
961482	AF2-439 E	7.4273	50/50	7.4273
962082	AG1-052 BAT	0.6306	Merchant Transmission	0.6306
963901	AG1-243 C	0.2010	Adder	0.45
963902	AG1-243 E	0.1082	Adder	0.24
964641	AG1-327 C O1	0.6309	Adder	1.4
964642	AG1-327 E O1	0.3250	Adder	0.72
964693	AG1-332 BAT	0.1049	Merchant Transmission	0.1049
965963	AG1-465 BAT	2.9426	Merchant Transmission	2.9426
966041	AG1-473 C	0.7851	Adder	1.74
966042	AG1-473 E	0.5234	Adder	1.16
966152	AG1-484 BAT	3.8508	50/50	3.8508
966172	AG1-486 BAT	0.5437	Merchant Transmission	0.5437
966461	AG1-515 C	0.1450	Adder	0.32
966462	AG1-515 E	0.2176	Adder	0.48
WEC	WEC	0.1304	Confirmed LTF	0.1304
LGEE	LGEE	0.2576	Confirmed LTF	0.2576
CPL	CPL	0.2355	Confirmed LTF	0.2355
CBM-W2	CBM-W2	3.5930	Confirmed LTF	3.5930
NY	NY	0.2030	Confirmed LTF	0.2030
TVA	TVA	0.5502	Confirmed LTF	0.5502
O-066	O-066	6.4608	Confirmed LTF	6.4608
SIGE	SIGE	0.1437	Confirmed LTF	0.1437
CBM-S2	CBM-S2	3.7584	Confirmed LTF	3.7584
CBM-S1	CBM-S1	0.1505	Confirmed LTF	0.1505
G-007	G-007	1.0133	Confirmed LTF	1.0133
MEC	MEC	0.6499	Confirmed LTF	0.6499
LAGN	LAGN	0.6895	Confirmed LTF	0.6895
CBM-W1	CBM-W1	5.8744	Confirmed LTF	5.8744

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
165864195	204558	27SMITH TP	METED	204557	27SMITH ST	METED	1	ME-P2-ME-230-DTR065	breaker	223.0	108.98	115.56	DC	14.66

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	0.1349	Adder	0.16
958052	AF2-099 E	0.0900	Adder	0.11
958061	AF2-100 C	0.1349	Adder	0.16
958062	AF2-100 E	0.0900	Adder	0.11
958071	AF2-101 C	-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

11.6.3 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
165864149	939000	AE1-129 TAP	METED	204571	27ZIONS VW	METED	1	ME-P2-3-ME-115-033E	breaker	156.0	115.8	122.33	DC	10.19

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
AB1-127	St. Thomas-Guilford 34.5kV	In Service
AB1-128	St. Thomas-Mercersburg 34.5kV	In Service
AD1-020	Hunterstown-Lincoln 115 kV	Suspended
AD1-061	McConnellsburg-Mercersburg 34 kV	Active
AD2-009	McConnellsburg 138 kV	Active
AD2-062	Roxbury-Greene 138 kV	Active
AE1-071	Shade Gap-Roxbury 115 kV	Active
AE1-101	McConnellsburg-Texas Eastern 138 kV	Active
AE1-129	Zion View - Middletown 115 kV	Active
AE1-132	McConnellsburg 138 kV	Active
AE1-188	Fayetteville 34.5 kV	Engineering and Procurement
AE2-054	Warfordsburg 34 kV	Suspended
AF1-166	Target-Chambers No.5 34.5 kV	Engineering and Procurement
AF1-209	Guilford 34.5 kV	Active
AF1-224	Fayetteville 34.5 kV	Engineering and Procurement
AF2-099	Taxville 2 13.2 kV	Engineering and Procurement
AF2-100	Taxville 1 13.2 kV	Engineering and Procurement
AF2-101	Allen 13.2 kV	Engineering and Procurement
AF2-116	McConnellsburg 138 kV	Active
AF2-117	Warfordsburg-McConnellsburg 138 kV	Active
AF2-146	Hill Valley-Valley REC 46 kV	Active
AF2-148	Shade Gap-Three Springs KTS 23 kV	Active
AF2-151	Dillsburg 13.2 kV	Engineering and Procurement
AF2-178	Roxbury 23 kV II	In Service
AF2-179	St. Thomas-Mercersburg 34.5 kV II	In Service
AF2-180	St. Thomas-Guilford 34.5 kV II	In Service
AF2-184	McConnellsburg-Mercersburg 34 kV II	Active
AF2-213	Zions View-Smith Street 115 kV	Active
AF2-215	Saint Thomas-LeMasters Junction 34.5 kV	Engineering and Procurement
AF2-229	Roxbury 23 kV	Active
AF2-268	Orrtanna 13.2 kV	Engineering and Procurement
AF2-275	Guilford 12.47 kV	Active
AF2-276	Guilford 12.47 kV	Active
AF2-383	Tolna 115 kV	Active
AF2-439	Roxbury-Carlisle 115 kV	Active
AG1-052	Zionsview-Middletown 115 kV II	Active
AG1-243	Guilford-Fayetteville 34.5 kV	Active
AG1-248	York Storage 115 kV	Active
AG1-327	West Waynesboro-East Waynesboro 138 kV	Active
AG1-332	Oxford 13.2 kV	Active
AG1-465	North Hanover-Gitts Run 115 kV	Active
AG1-473	Shingletown-Lewistown 230 kV	Active
AG1-484	Mountain 115 kV	Active

Queue Number	Project Name	Status
AG1-486	Orrtanna 115 kV	Active
AG1-515	Guilford 138 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.HANOV R 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
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
PL:10:P24:100548	CONTINGENCY 'PL:10:P24:100548' /* JUNI 230KV BUS_SEC_1-2 CB DISCONNECT BUS 208005 /* JUNI BU2 230 DISCONNECT BUS 208004 /* JUNI BU1 230 /* JUNI BU1 230 END
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.HANOV R 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
Base Case	

Contingency Name	Contingency Definition
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
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-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

Contingency Name	Contingency Definition
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

13 Affected Systems

13.1 14.1 NYISO

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

13.2 14.2 MISO

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

14 Attachment 1: One Line Diagram