Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-242

BECCARIA 34.5 KV

6.5 MW Capacity / 10 MW Energy

January 2021

Table of Contents

© PJM Interconnection 2021. All rights reserved

© PJM Interconnection 2021. All rights reserved

1 Introduction

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

2 Preface

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, may also contribute to the need for the same network reinforcement. Cost allocation rules for network upgrades can be found in PJM Manual 14A, Attachment B. The possibility of sharing the reinforcement costs with other projects may be identified in the feasibility study, but the actual allocation will be deferred until the impact study is performed.

The Interconnection Customer seeking to interconnect a wind or solar generation facility shall maintain meteorological data facilities as well as provide that meteorological data which is required per Schedule H to the Interconnection Service Agreement and Section 8 of Manual 14D.

The Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

© PJM Interconnection 2021. All rights reserved

3 General

The Interconnection Customer (IC), has proposed a Solar generating facility located in Clearfield County, Pennsylvania. The installed facilities will have a total capability of 10 MW with 6.5 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is December 31, 2022. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-242
Project Name	BECCARIA 34.5 KV
State	Pennsylvania
County	Clearfield
Transmission Owner	MAIT (PENELEC)
MFO	10
MWE	10
MWC	6.5
Fuel	Solar
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.

© PJM Interconnection 2021. All rights reserved

4 Point of Interconnection

AG1-242 will interconnect with the PENELEC system via a tap on the 34.5 kV Beccaria circuit at pole # MB-18522. The IC's proposed generating unit site is approximately 1.2 miles southeast of Beccaria, PA., near 710 Veterans Street.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AG1-242 generation project to connect to the Penelec distribution system.

5 Cost Summary

The AG1-242 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$188,700
Total System Network Upgrade Costs	$85,600,000[1]
Total Costs	$85,788,700

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.

© PJM Interconnection 2021. All rights reserved

6 Transmission Owner Scope of Work

The AG1-242 will interconnect with the Penelec distribution system via a tap on the 34.5 kV Beccaria circuit at pole # MB-18522. The IC will be responsible for acquiring all easements, properties, and permits that may be required to construct the new interconnection station and the associated facilities.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AG1-242 generation project to connect to the Penelec distribution system. The IC will be responsible for constructing all of the facilities on its side of the POI, including the attachment facilities which connect the generator to the FE distribution system's direct connection facilities.

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

Description	**Total Cost**
Proposed tap point at MB-18522 on existing pole or interspersed pole on existing Madera 34.5kV distribution circuit, add new SCADA switch, add new primary metering. The customer is responsible to build their own line from their site to Penelec's existing facilities.	$ 137,000
Relay settings at sub for AG1-242 tap MW injection. @ Madera	$ 51,700
Total Physical Interconnection Costs	$188,700

© PJM Interconnection 2021. All rights reserved

7 Schedule

Based on the scope of work for the interconnection facilities, it is expected to take a minimum of **14 months** after the signing of an Interconnection Agreement to complete the installation and construction kickoff call. This assumes that there will be no environmental issues with any of the new properties associated with this project, that there will be no delays in acquiring the necessary permits for implementing the defined work and that any system outages will be allowed when requested.

8 Transmission Owner Analysis

Penelec performed an analysis of its distribution system. The AG1-242 project did not contribute to any overloads on the distribution system.

9 Interconnection Customer Requirements

9.1 System Protection

An analysis was conducted to assess the impact of the Beccaria 34.5 kV (AG1-242) Project on the system protection requirements in the area. The results of this review show that the following relay additions will be required:

Proposed single line diagrams show the IC constructing a generation facility they call **"Barkley"** tapping Penelec's Madera – 34.5 kV Beccaria circuit at pole MB-18522.

The 34.5kV interconnection proposal will require Developer to meet applicable "Technical Requirements" as outlined in First Energy's document titled "Technical Requirements for the Interconnection of Customer-Owned Generation to the FirstEnergy Distribution System". Anti-islanding system shall meet IEEE 1547 and UL 1741 Therefore no Direct Transfer Trip (DTT) will be required.

9.2 General Concerns

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

9.3 Requirements for Owner's/Developer's generation IPP Facility

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

© PJM Interconnection 2021. All rights reserved

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

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

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

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

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

9.4 Compliance Issues

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

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

10 Revenue Metering and SCADA Requirements

10.1 PJM Requirements

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

10.2 Meteorological Data Reporting Requirements

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

© PJM Interconnection 2021. All rights reserved

- Back Panel temperature (Fahrenheit) - (Required for plants with Maximum Facility Output of 3 MW or higher)
- Irradiance (Watts/meter^2) - (Required for plants with Maximum Facility Output of 3 MW or higher)
- Ambient air temperature (Fahrenheit) - (Accepted, not required)
- Wind speed (meters/second) - (Accepted, not required)
- Wind direction (decimal degrees from true north) - (Accepted, not required)

10.3 Interconnected Transmission Owner Requirements

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

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

© PJM Interconnection 2021. All rights reserved

11 Summer Peak - Load Flow Analysis

The Queue Project AG1-242 was evaluated as a 10.0 MW (Capacity 6.5 MW) injection at the Madera 34.5 kV substation in the PENELEC area. Project AG1-242 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-242 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

© PJM Interconnection 2021. All rights reserved

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
16497334 3	200810	26KEYSTONE	230.0	PENELEC	999332	KEYSTONE	1.0	PENELEC	4	AP-P7-1-WPP-138-53A	tower	634.0	99.97	100.04	DC	0.98

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)

None

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
16619203 53	200717	26MADERA	115.0	PENELEC	944180	AF1-086 TAP	115.0	PENELEC	1	AP-P1-3-WP-230-326T-B	operation	237.0	98.14	100.17	DC	4.81
16619193 1	200755	26WESTOVER	115.0	PENELEC	200801	26GARMAN	115.0	PENELEC	1	AP-P1-3-WP-230-326T-B	operation	246.0	125.33	127.29	DC	4.81
16619193 5	200755	26WESTOVER	115.0	PENELEC	200801	26GARMAN	115.0	PENELEC	1	Base Case	operation	193.0	104.0	106.4	DC	4.64

© PJM Interconnection 2021. All rights reserved

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
166191908	944180	AF1-086 TAP	115.0	PENELEC	200755	26WESTOVER	115.0	PENELEC	1	AP-P1-3-WP-230-326T-B	operation	237.0	130.89	132.92	DC	4.81
166191911	944180	AF1-086 TAP	115.0	PENELEC	200755	26WESTOVER	115.0	PENELEC	1	Base Case	operation	175.0	115.78	118.43	DC	4.64

© PJM Interconnection 2021. All rights reserved

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
164973343	1	**26KEYSTONE 230.0 kV - KEYSTONE 1.0 kV Ckt 4**	**PENELEC** **PN-AF2-F-0005 (2150) :** **1) Construct 500 kV yard consisting of three-500 kV breakers configured in a breaker-and-a-half layout (initially a ring bus)** **Tap the Keystone - Conemaugh 500 kV line and loop into the new Homer City 500 kV yard** **2) Install one 500/345 kV transformer** **3) Install a new 345 kV breaker-and-a-half string using three new breakers** **Project Type : CON** **Cost : $85,600,000** **Time Estimate : 48.0 Months**	$85,600,000
			TOTAL COST	**$85,600,000**[1]

© PJM Interconnection 2021. All rights reserved

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".

© PJM Interconnection 2021. All rights reserved

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
164973343	200810	26KEYSTONE	PENELEC	999332	KEYSTONE	PENELEC	4	AP-P7-1-WPP-138-53A	tower	634.0	99.97	100.04	DC	0.98

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200636	26IUP CO-G	0.3106	50/50	0.3106
200809	26SITHE	0.9777	50/50	0.9777
200833	26SEWRDB34	10.1584	50/50	10.1584
200835	26ARN_Z1-066	0.6351	Adder	0.75
200837	26HOMER C1	16.8382	50/50	16.8382
200838	26HOMER C2	14.2022	50/50	14.2022
200839	26HOMER C3	15.0349	50/50	15.0349
200846	26FORWARD	0.0631	50/50	0.0631
200852	26WARR RDG	0.1804	Adder	0.21
200864	K-013 E	2.8981	50/50	2.8981
200883	Q-053 E	4.5194	Adder	5.32
200894	26K02	2.9964	Adder	3.53
200906	26KEYSTN#3	0.5123	50/50	0.5123
202158	26CON.GEN1	0.0536	50/50	0.0536
203915	26BF_Z2-108	1.4290	Adder	1.68
203999	P-047 E	5.2749	Adder	6.21
235003	AC1-025 E	0.0762	Adder	0.09
236828	01GRAYMONT	0.2068	Adder	0.24
290086	Q-036 E	3.2150	Adder	3.78
292350	K-023	2.6119	Adder	3.07
292542	L-013 1	2.5405	Adder	2.99
293301	N-039 E	6.0553	Adder	7.12
293393	V3-030E	2.7724	Adder	3.26
293432	R-040 E	0.1429	Adder	0.17
293603	O-018 E	5.3663	Adder	6.31
293902	O-048 E	2.2864	Adder	2.69
294515	O38_P22	5.2984	Adder	6.23
294903	P-060 E	4.1023	Adder	4.83
296332	R-032 E	6.1919	Adder	7.28
913142	Y1-033 E OP1	2.0360	Adder	2.4
916202	Z1-069 E	4.2802	Adder	5.04
919201	AA1-144 OP	8.1689	Adder	9.61
920341	**AA2-132 (Withdrawn : 12/07/2020)**	**1.1100**	**Adder**	**1.31**
921642	AA2-000	26.0609	Adder	30.66
930511	AB2-092	0.9569	Adder	1.13
931092	AB1-160 E	1.2229	Adder	1.44
935191	AD1-154	1.7214	Adder	2.03
936421	AD2-055	1.9700	Adder	2.32
936991	AD2-133 C	1.4468	Adder	1.7
936992	AD2-133 E	6.6174	Adder	7.79

© PJM Interconnection 2021. All rights reserved

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
938351	AE1-053	0.7939	Adder	0.93
938881	AE1-116	0.4279	Adder	0.5
938951	AE1-123	1.3126	Adder	1.54
938993	AE1-128 C	7.2504	Adder	8.53
938994	AE1-128 E	4.8336	Adder	5.69
939171	AE1-147 C	0.6223	Adder	0.73
939172	AE1-147 E	0.4149	Adder	0.49
939291	AE1-160 C	0.7951	Adder	0.94
939292	AE1-160 E	0.4570	Adder	0.54
940201	AE2-001 C	0.6213	Adder	0.73
940202	AE2-001 E	0.4142	Adder	0.49
940681	**AE2-055 C (Suspended)**	**0.6062**	**Adder**	**0.71**
940682	**AE2-055 E (Suspended)**	**0.4041**	**Adder**	**0.48**
940861	AE2-074 C	1.1793	Adder	1.39
940862	AE2-074 E	1.5524	Adder	1.83
941191	AE2-113 C	4.6819	Adder	5.51
941192	AE2-113 E	5.0409	Adder	5.93
941231	AE2-117 C	0.8766	Adder	1.03
941232	AE2-117 E	0.5844	Adder	0.69
941241	AE2-118 C	0.9156	Adder	1.08
941242	AE2-118 E	0.6104	Adder	0.72
941261	AE2-120 C	0.6208	Adder	0.73
941262	AE2-120 E	0.4138	Adder	0.49
941271	AE2-121 C	0.3317	Adder	0.39
941272	AE2-121 E	0.2215	Adder	0.26
941321	AE2-126 C	0.8211	Adder	0.97
941322	AE2-126 E	0.5474	Adder	0.64
941331	AE2-129 C	0.9029	Adder	1.06
941332	AE2-129 E	0.6019	Adder	0.71
941351	**AE2-131 C (Suspended)**	**0.9029**	**Adder**	**1.06**
941352	**AE2-131 E (Suspended)**	**0.6019**	**Adder**	**0.71**
941421	AE2-139 C	1.6147	Adder	3.58
941422	AE2-139 E	1.0765	Adder	2.39
942121	AE2-224 C	5.9486	Adder	7.0
942122	AE2-224 E	3.9658	Adder	4.67
942351	AE2-248 C	0.4900	Adder	0.58
942352	AE2-248 E	0.3267	Adder	0.38
942361	AE2-249 C	0.8157	Adder	0.96
942362	AE2-249 E	0.5438	Adder	0.64
942491	AE2-262 C	2.8016	Adder	3.3
942492	AE2-262 E	1.8827	Adder	2.21
942501	AE2-263 C	2.6335	Adder	3.1
942502	AE2-263 E	1.7583	Adder	2.07
942511	AE2-264 C	3.5655	Adder	4.19
942512	AE2-264 E	2.3770	Adder	2.8
942811	AE2-299 C	1.6198	Adder	1.91
942812	AE2-299 E	6.4790	Adder	7.62
942961	AE2-316 C	2.8632	Adder	3.37
942962	AE2-316 E	4.0830	Adder	4.8
943151	AE2-344 C	3.5376	Adder	4.16
943152	AE2-344 E	2.3584	Adder	2.77
943351	AF1-006 C	0.6066	Adder	0.71

© PJM Interconnection 2021. All rights reserved

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
943352	AF1-006 E	0.3412	Adder	0.4
943711	AF1-039 C O1	0.5386	Adder	0.63
943712	AF1-039 E O1	0.3591	Adder	0.42
943751	AF1-043	5.9101	Adder	6.95
944001	AF1-068 C O1 (Withdrawn : 12/15/2020)	0.6513	Adder	0.77
944002	AF1-068 E O1 (Withdrawn : 12/15/2020)	0.3663	Adder	0.43
944181	AF1-086 C O1	1.9221	Adder	2.26
944182	AF1-086 E O1	8.3620	Adder	9.84
944261	AF1-094 C	0.6509	Adder	0.77
944262	AF1-094 E	0.4339	Adder	0.51
944281	AF1-096 C	0.7512	Adder	0.88
944282	AF1-096 E	0.5008	Adder	0.59
944301	AF1-098 C	2.4953	Adder	2.94
944302	AF1-098 E	1.6636	Adder	1.96
944311	AF1-099 C	4.2528	Adder	5.0
944312	AF1-099 E	2.8352	Adder	3.34
944321	AF1-100 C	9.0512	Adder	10.65
944322	AF1-100 E	6.0342	Adder	7.1
944381	AF1-103 O1	1.2493	Adder	1.47
944411	AF1-106 O1	1.2143	Adder	1.43
944471	AF1-112 C	0.6141	Adder	0.72
944472	AF1-112 E	0.4094	Adder	0.48
944671	AF1-132 C O1 (Withdrawn : 12/15/2020)	0.6094	Adder	0.72
944672	AF1-132 E O1 (Withdrawn : 12/15/2020)	0.4063	Adder	0.48
944691	AF1-134 C	0.9961	Adder	1.17
944692	AF1-134 E	0.6641	Adder	0.78
944751	AF1-140 C	0.9713	Adder	1.14
944752	AF1-140 E	0.6475	Adder	0.76
944771	AF1-142 C	6.8045	Adder	8.01
944772	AF1-142 E	4.5364	Adder	5.34
944781	AF1-143 C	4.7634	Adder	5.6
944782	AF1-143 E	2.5405	Adder	2.99
944881	AF1-153 C O1	0.7715	Adder	0.91
944882	AF1-153 E O1	0.5144	Adder	0.61
944901	AF1-155 C	0.7723	Adder	0.91
944902	AF1-155 E	0.5149	Adder	0.61
945021	AF1-167 C	0.5480	Adder	0.64
945022	AF1-167 E	0.3660	Adder	0.43
945051	AF1-170 C	2.2592	Adder	2.66
945052	AF1-170 E	1.5062	Adder	1.77
945451	AF1-210 C	0.6247	Adder	0.73
945452	AF1-210 E	0.4165	Adder	0.49
945491	AF1-214 C (Withdrawn : 12/03/2020)	0.6208	Adder	0.73
945492	AF1-214 E (Withdrawn : 12/03/2020)	0.4138	Adder	0.49

© PJM Interconnection 2021. All rights reserved

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945671	AF1-232 C (Withdrawn : 01/19/2021)	10.0643	Adder	11.84
945672	AF1-232 E (Withdrawn : 01/19/2021)	5.4193	Adder	6.38
945751	AF1-240 C O1	1.0329	Adder	1.22
945752	AF1-240 E O1	0.6886	Adder	0.81
946071	AF1-272 C O1	10.6405	50/50	10.6405
946072	AF1-272 E O1	7.0937	50/50	7.0937
946111	AF1-276 C	5.3020	Adder	6.24
946112	AF1-276 E	2.6115	Adder	3.07
946121	AF1-277 C	5.3020	Adder	6.24
946122	AF1-277 E	2.6115	Adder	3.07
946131	AF1-278 C	4.2290	Adder	4.98
946132	AF1-278 E	2.1018	Adder	2.47
946211	AF1-286 C	0.4918	Adder	0.58
946212	AF1-286 E	0.3339	Adder	0.39
946221	AF1-287 C	0.6108	Adder	0.72
946222	AF1-287 E	0.4072	Adder	0.48
946381	AF1-302 C	1.2503	Adder	1.47
946382	AF1-302 E	1.6671	Adder	1.96
946401	AF1-304 C	3.9489	Adder	4.65
946402	AF1-304 E	2.6326	Adder	3.1
946421	AF1-306 C	3.1492	Adder	3.7
946422	AF1-306 E	12.5966	Adder	14.82
946571	AF1-321 C O1	1.5148	50/50	1.5148
946572	AF1-321 E O1	1.0098	50/50	1.0098
946771	AF1-217 C	0.6108	Adder	0.72
946772	AF1-217 E	0.4072	Adder	0.48
957001	AF2-001 C O1	1.5148	50/50	1.5148
957002	AF2-001 E O1	1.0098	50/50	1.0098
957011	AF2-002 C O1	0.7574	50/50	0.7574
957012	AF2-002 E O1	0.5049	50/50	0.5049
957161	AF2-010 C	2.5133	Adder	2.96
957162	AF2-010 E	1.6938	Adder	1.99
957451	AF2-039 C	0.5586	Adder	0.66
957452	AF2-039 E	0.3724	Adder	0.44
957512	AF2-045 E	1.8239	Adder	2.15
957561	AF2-050 C	2.9743	Adder	3.5
957562	AF2-050 E	1.9829	Adder	2.33
957571	AF2-051 C	1.9186	Adder	2.26
957572	AF2-051 E	0.9884	Adder	1.16
957931	AF2-087 C (Suspended)	0.2634	Adder	0.31
957932	AF2-087 E (Suspended)	0.3627	Adder	0.43
957941	AF2-088 C	0.2689	Adder	0.32
957942	AF2-088 E	0.1793	Adder	0.21
957981	AF2-092 C	0.7228	Adder	0.85
957982	AF2-092 E	0.4819	Adder	0.57
958101	AF2-104 C (Withdrawn : 12/08/2020)	0.2282	Adder	0.27
958102	AF2-104 E (Withdrawn : 12/08/2020)	0.1522	Adder	0.18
958271	AF2-121 C	0.9029	Adder	1.06
958272	AF2-121 E	0.6019	Adder	0.71

© PJM Interconnection 2021. All rights reserved

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
958361	AF2-130 C	0.8397	Adder	0.99
958362	AF2-130 E	0.5598	Adder	0.66
958471	AF2-141	0.6351	Adder	0.75
958731	AF2-164 C O1	3.5855	Adder	4.22
958732	AF2-164 E O1	2.3903	Adder	2.81
958741	AF2-165 C	0.8012	Adder	0.94
958742	AF2-165 E	0.5341	Adder	0.63
958751	AF2-166 C	0.8397	Adder	0.99
958752	AF2-166 E	0.5598	Adder	0.66
959061	AF2-197 C O1	2.0748	Adder	2.44
959062	AF2-197 E O1	3.1122	Adder	3.66
959441	AF2-235 C	0.3756	Adder	0.44
959442	AF2-235 E	0.2504	Adder	0.29
959471	AF2-238 C	0.7482	Adder	0.88
959472	AF2-238 E	0.4988	Adder	0.59
959481	AF2-239 C	0.5578	Adder	0.66
959482	AF2-239 E	0.4472	Adder	0.53
959491	AF2-240 C	0.2295	Adder	0.27
959492	AF2-240 E	0.1955	Adder	0.23
959501	AF2-241 C	0.6861	Adder	0.81
959502	AF2-241 E	0.5282	Adder	0.62
959521	AF2-243 C	0.6009	Adder	0.71
959522	AF2-243 E	0.4006	Adder	0.47
959741	AF2-265 C	0.5362	Adder	0.63
959742	AF2-265 E	0.3990	Adder	0.47
959792	AF2-270 E	0.3747	Adder	0.44
959802	AF2-271 E	0.2272	Adder	0.27
959822	AF2-273 E	0.2466	Adder	0.29
960022	AF2-293 E	0.0605	Adder	0.07
960031	AF2-294 C	0.6693	Adder	0.79
960032	AF2-294 E	0.4462	Adder	0.52
960041	AF2-295 C	0.7723	Adder	0.91
960042	AF2-295 E	0.5149	Adder	0.61
960051	AF2-296 C	0.9961	Adder	1.17
960052	AF2-296 E	0.6641	Adder	0.78
960271	AF2-318 C	0.6030	Adder	0.71
960272	AF2-318 E	0.4020	Adder	0.47
960451	AF2-336 C	1.2047	Adder	1.42
960452	AF2-336 E	0.8031	Adder	0.94
960461	AF2-337 C	1.2047	Adder	1.42
960462	AF2-337 E	0.8031	Adder	0.94
960471	AF2-338 C	1.2047	Adder	1.42
960472	AF2-338 E	0.8031	Adder	0.94
960481	AF2-339 C	1.2047	Adder	1.42
960482	AF2-339 E	0.8031	Adder	0.94
960901	AF2-381 C	10.0778	50/50	10.0778
960902	AF2-381 E	5.3035	50/50	5.3035
961141	AF2-405	0.6072	Adder	0.71
961151	AF2-406	4.5537	Adder	5.36
961201	**AF2-411 O1 (Withdrawn : 12/08/2020)**	**23.1005**	**Adder**	**27.18**
961211	AF2-412	9.2522	Adder	10.88
961911	AG1-033 C	0.3999	50/50	0.3999

© PJM Interconnection 2021. All rights reserved

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
961912	AG1-033 E	0.2250	50/50	0.2250
961971	AG1-040 C	0.3421	Adder	0.76
961972	AG1-040 E	0.2281	Adder	0.51
961981	AG1-041 C	0.3822	Adder	0.85
961982	AG1-041 E	0.2548	Adder	0.57
962292	AG1-077 E	0.2058	Adder	0.46
962411	AG1-090 C O1	2.3927	Adder	5.31
962412	AG1-090 E O1	1.5951	Adder	3.54
962511	AG1-100 C	0.3234	Adder	0.72
962512	AG1-100 E	0.2156	Adder	0.48
962641	AG1-113	0.1814	Adder	0.4
962651	AG1-114	0.4208	Adder	0.93
962891	AG1-138 C	0.1762	Adder	0.39
962892	AG1-138 E	0.0093	Adder	0.02
962901	AG1-139 C	0.1681	Adder	0.37
962902	AG1-139 E	0.0088	Adder	0.02
962911	AG1-140 C	0.0483	Adder	0.11
962912	AG1-140 E	0.0220	Adder	0.05
962951	AG1-144 C	0.4785	Adder	1.06
962952	AG1-144 E	0.3190	Adder	0.71
963281	AG1-177 C O1	0.3450	Adder	0.77
963282	AG1-177 E O1	0.2300	Adder	0.51
963441	AG1-193 C	0.4104	Adder	0.91
963442	AG1-193 E	0.2736	Adder	0.61
963481	AG1-197 C	0.2597	Adder	0.58
963482	AG1-197 E	0.1731	Adder	0.38
963491	AG1-198 C	0.2070	Adder	0.46
963492	AG1-198 E	0.1380	Adder	0.31
963531	AG1-202 C	0.1657	Adder	0.37
963532	AG1-202 E	0.0854	Adder	0.19
963541	AG1-203 C	0.3343	Adder	0.74
963542	AG1-203 E	0.1800	Adder	0.4
963561	AG1-205 C	0.2735	Adder	0.61
963562	AG1-205 E	0.1473	Adder	0.33
963571	AG1-206 C	0.2353	Adder	0.52
963572	AG1-206 E	0.1267	Adder	0.28
963881	AG1-241 C	0.8124	50/50	0.8124
963882	AG1-241 E	0.4374	50/50	0.4374
963891	AG1-242 C	0.2860	Adder	0.63
963892	AG1-242 E	0.1540	Adder	0.34
963941	AG1-247 C	0.1577	Adder	0.35
963942	AG1-247 E	0.0837	Adder	0.19
963991	AG1-253 C	0.0724	Adder	0.16
963992	AG1-253 E	0.0349	Adder	0.08
964031	AG1-257 C	0.2256	Adder	0.5
964032	AG1-257 E	0.3153	Adder	0.7
964041	AG1-258 C	0.2256	Adder	0.5
964042	AG1-258 E	0.3153	Adder	0.7
964191	AG1-280 C	0.5974	Adder	1.33
964192	AG1-280 E	0.3982	Adder	0.88
964201	AG1-281 C	0.5965	Adder	1.32
964202	AG1-281 E	0.3977	Adder	0.88

© PJM Interconnection 2021. All rights reserved

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
964331	AG1-295 C	0.2574	Adder	0.57
964332	AG1-295 E	0.1366	Adder	0.3
964341	AG1-296 C	0.2441	Adder	0.54
964342	AG1-296 E	0.1314	Adder	0.29
964391	AG1-301 C	0.4589	Adder	1.02
964392	AG1-301 E	0.3059	Adder	0.68
964411	AG1-303 C O1	0.8135	Adder	1.81
964412	AG1-303 E O1	0.5423	Adder	1.2
964451	AG1-308 C O1	0.3225	Adder	0.72
964452	AG1-308 E O1	0.4508	Adder	1.0
964701	AG1-333 C	0.1301	Adder	0.29
964702	AG1-333 E	0.0177	Adder	0.04
964751	AG1-338 C	0.2320	Adder	0.51
964752	AG1-338 E	0.0316	Adder	0.07
964761	AG1-339 C	0.2425	Adder	0.54
964762	AG1-339 E	0.0211	Adder	0.05
964771	AG1-340 C	0.2320	Adder	0.51
964772	AG1-340 E	0.0316	Adder	0.07
964911	AG1-355 C	4.0808	50/50	4.0808
964912	AG1-355 E	2.7205	50/50	2.7205
964921	AG1-356 C	1.1040	Adder	2.45
964922	AG1-356 E	0.7360	Adder	1.63
965121	AG1-377 C O1	0.4785	Adder	1.06
965122	AG1-377 E O1	0.3190	Adder	0.71
965131	AG1-378 C O1	0.4785	Adder	1.06
965132	AG1-378 E O1	0.3190	Adder	0.71
965171	AG1-382 C	0.6318	Adder	1.4
965172	AG1-382 E	0.4212	Adder	0.93
965201	AG1-385 C	0.5258	Adder	1.17
965202	AG1-385 E	0.1557	Adder	0.35
965221	AG1-387 C	0.6318	Adder	1.4
965222	AG1-387 E	0.4212	Adder	0.93
965241	AG1-389 C O1	0.4839	Adder	1.07
965242	AG1-389 E O1	0.3226	Adder	0.72
965251	AG1-390 C O1	0.4839	Adder	1.07
965252	AG1-390 E O1	0.3226	Adder	0.72
965261	AG1-391 C O1	0.4839	Adder	1.07
965262	AG1-391 E O1	0.3226	Adder	0.72
965271	AG1-392 C O1	0.9679	Adder	2.15
965272	AG1-392 E O1	0.6453	Adder	1.43
965301	AG1-395 C	0.6149	Adder	1.36
965302	AG1-395 E	0.1826	Adder	0.41
965861	AG1-455	0.9013	Adder	2.0
965881	AG1-457 C	1.4561	Adder	3.23
965882	AG1-457 E	0.9707	Adder	2.15
966121	AG1-481	0.5142	Adder	1.14
966512	AG1-520 E	0.5049	50/50	0.5049
966771	AG1-548 C	3.2711	Adder	7.26
966772	AG1-548 E	0.9956	Adder	2.21
966781	AG1-549 C O1	21.5361	50/50	21.5361
966782	AG1-549 E O1	6.5545	50/50	6.5545
G-007A	G-007A	0.0743	Confirmed LTF	0.0743

© PJM Interconnection 2021. All rights reserved

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
VFT	VFT	0.3870	Confirmed LTF	0.3870
CALDERWOOD	CALDERWOOD	0.1978	Confirmed LTF	0.1978
PRAIRIE	PRAIRIE	0.9066	Confirmed LTF	0.9066
CHEOAH	CHEOAH	0.1997	Confirmed LTF	0.1997
CBM-N	CBM-N	0.1680	Confirmed LTF	0.1680
COTTONWOOD	COTTONWOOD	0.7875	Confirmed LTF	0.7875
HAMLET	HAMLET	0.2512	Confirmed LTF	0.2512
GIBSON	GIBSON	0.1884	Confirmed LTF	0.1884
BLUEG	BLUEG	0.6145	Confirmed LTF	0.6145
TRIMBLE	TRIMBLE	0.1970	Confirmed LTF	0.1970
CATAWBA	CATAWBA	0.1491	Confirmed LTF	0.1491

© PJM Interconnection 2021. All rights reserved

11.7 Queue Dependencies

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

Queue Number	Project Name	Status
AA1-144	East Towanda-Grover 230kV	Engineering and Procurement
AA2-000	N/A	N/A
AA2-132	Thompson 34.5kV	Withdrawn
AB1-160	Gold-Sabinsville 115kV	In Service
AB2-092	Bergen 138kV	Partially in Service - Under Construction
AC1-025	Dale Summit	In Service
AD1-154	Timblin 34.5 kV	Active
AD2-055	Moshannon-East Towanda 230 kV	Active
AD2-133	Eagle Valley 115kV	Active
AE1-053	Meyersdale North	Active
AE1-116	Somerset Windpower 23 kV	Active
AE1-123	Emlenton 34.5 kV	Engineering and Procurement
AE1-128	Bedford North-Wills Mounain 115 kV	Active
AE1-147	Bellefonte 46 kV	Engineering and Procurement
AE1-160	Venango 34.5 kV	Engineering and Procurement
AE2-001	Nittany-Zion 46 kV	Active
AE2-055	Shingletown-Boalsburg 46 kV	Suspended
AE2-074	Potter 46 kV	Active
AE2-113	Farmers Valley-Ridgeway 115 kV	Active
AE2-117	ABW Tap-Alexandria 46 kV	Active
AE2-118	ABW Tap-Williamsburg 46 kV	Active
AE2-120	Graymont-Zion 46 kV	Active
AE2-121	Milesburg-Tanney Junction 46 kV	Active
AE2-126	Dubois-Curwensville 34.5 kV	Engineering and Procurement
AE2-129	Philipsburg-Clarence 34.5 kV	Engineering and Procurement
AE2-131	Philipsburg-Karthaus 34.5	Suspended
AE2-139	East Towanda-Grover 230 kV	Active
AE2-224	Bearrock-Johnstown 230 kV	Active
AE2-248	Fillmore-Thompson Farm 46 kV	Active
AE2-249	Bedford North-Pennsylvania Hollow 23 kV	Engineering and Procurement
AE2-262	Moshannon-Milesburg 230 kV	Active
AE2-263	Moshannon-Milesburg 230 kV	Active
AE2-264	Altoona-Raystown 230 kV	Active
AE2-299	Erie East 230 kV	Active
AE2-316	Brookville-Squab Hollow 138 kV	Active
AE2-344	Edinboro South-Venango Junction 115 kV	Active
AF1-006	Fairview East 34.5 kV	Active
AF1-039	Listonburg-Highpoint 24.9 kV	Active
AF1-043	Moshannon-East Towanda 230 kV	Active
AF1-068	Boalsburg-Centre Hall 46 kV	Withdrawn
AF1-086	Madera-Westover South 115 kV	Active
AF1-094	Union City-Cambridge Springs 34.5 kV	Active
AF1-096	Titusville-Oil Creek 34.5 kV	Active

© PJM Interconnection 2021. All rights reserved

Queue Number	Project Name	Status
AF1-098	Four Mile Jct-Corry East 115 kV	Active
AF1-099	Moshannon-Milesburg 230 kV	Active
AF1-100	Shawville-Moshannon 230 kV	Active
AF1-103	Warren 34.5 kV	Active
AF1-106	East Sayre 34.5 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
AF1-140	Claysburg 23 kV	Engineering and Procurement
AF1-142	Moshannon-Milesburg 230 kV	Active
AF1-143	Lick Run 115 kV	Active
AF1-153	Motion-Ridgeway 46 kV	Active
AF1-155	Paper City-Wilcox 46 kV	Engineering and Procurement
AF1-167	West Freedom-C&K Coal 25 kV	Active
AF1-170	Springboro-Venango Junction 115 kV	Active
AF1-210	Burma 23 kV	Engineering and Procurement
AF1-214	Nittany-Zion 46 kV	Withdrawn
AF1-217	Edinboro -Cambridge Springs 34.5 kV	Active
AF1-232	Allegheny-Somerset 115 kV	Withdrawn
AF1-240	Timblin 34.5 kV	Active
AF1-272	Lucerne 115 kV	Active
AF1-276	Lewis Run-Pierce Brook 230 kV	Active
AF1-277	Lewis Run-Pierce Brook 2 230 kV	Active
AF1-278	Lewis Run-Pierce Brook 3 230 kV	Active
AF1-286	East Sayre 34.5 kV II	Active
AF1-287	Edinboro South 34.5 kV II	Active
AF1-302	Brookville-Squab Hollow 138 kV	Active
AF1-304	Titusville-Grandview 115 kV	Active
AF1-306	Squab Hollow 230 kV	Active
AF1-321	Hooversville 115 kV I	Active
AF2-001	Hooversville 115 kV II	Active
AF2-002	Hooversville 115 kV III	Active
AF2-010	Union City-Titusville 115 kV	Active
AF2-039	Shawville-Clearfield 34.5 kV	Active
AF2-045	Cambria Nug 115 kV	Engineering and Procurement
AF2-050	Bearrock-Johnstown 230 kV	Active
AF2-051	Geneva 115 kV	Active
AF2-087	East Altoona-Pinecroft 12.47 kV	Suspended
AF2-088	Shawville-Clearfield 34.5 kV II	Active
AF2-092	Snake Spring-Bedford Area 23 kV	Active
AF2-104	Somerset 23 kV	Withdrawn
AF2-121	Philipsburg-Shawville 34.5 kV	Active
AF2-130	Wolfs Corners 34.5 kV	Active
AF2-141	Lick Run 115 kV	Active
AF2-164	Handsome Lake 345 kV	Active
AF2-165	Clark Summit-Emlenton 34.5 kV	Active
AF2-166	Clark Summit-Emlenton 34 kV	Active
AF2-197	East Towanda 115 kV	Active
AF2-235	Titusville-Oil Creek 34.5 kV	Active
AF2-238	Mansfield-South Troy 34.5 kV	Active
AF2-239	Wyalusing-Hollenback WRC 34.5 kV	Active
AF2-240	North Orwell 12.47 kV	Active

© PJM Interconnection 2021. All rights reserved

Queue Number	Project Name	Status
AF2-241	Athens-Milan 34.5 kV	Active
AF2-243	Clark Summit 34.5 kV	Active
AF2-265	South Troy-Athens 34.5 kV	Active
AF2-270	Bedford South RCB-Bedford Area 23 kV	Engineering and Procurement
AF2-271	Pemberton-Sinking Valley 12.47 kV	Engineering and Procurement
AF2-273	Sligo 25 kV	Engineering and Procurement
AF2-293	Beech Creek 12.47 kV	Active
AF2-294	Thompson 34.5 kV	Active
AF2-295	Wilcox-Paper City 46 kV	Active
AF2-296	Madera 34.5 kV	Active
AF2-318	East Towanda-New Albany 34.5 kV	Active
AF2-336	Snake Spring 115 kV I	Active
AF2-337	Snake Spring 115 kV II	Active
AF2-338	Snake Spring 115 kV III	Active
AF2-339	Snake Spring 115 kV IV	Active
AF2-381	Bedford North-Central City West 115 kV	Active
AF2-405	East Sayre 34.5 kV III	Active
AF2-406	Sayre 115 kV	Active
AF2-411	Mainesburg 345 kV	Withdrawn
AF2-412	Mainesburg 115 kV	Active
AG1-033	Scalp Level 23 kV	Active
AG1-040	Morgan Street-Mount Hope 34.5 kV	Active
AG1-041	Osterburg-Bedford North 23 kV	Active
AG1-077	Allegheny Tunnel 23 kV	Active
AG1-090	Philipsburg 115 kV	Active
AG1-100	Venango-Saegertown 34.5 kV	Active
AG1-113	Somerset Windpower 22.86 kV	Active
AG1-114	Meyersdale North 115 kV	Active
AG1-138	Wolfs Corners 34.5 kV	Active
AG1-139	Clark Summit-Emlenton 34.5 kV	Active
AG1-140	Union City 34.5 kV	Active
AG1-144	Phillipsburg 34.5 kV	Active
AG1-177	Union City 34.5 kV	Active
AG1-193	Utica Junction 34.5 kV	Active
AG1-197	Morgan Street-Cochranton 34.5 kV	Active
AG1-198	Union City 34.5 kV	Active
AG1-202	Springboro 12.47 kV	Active
AG1-203	Reels Corner 23 kV	Active
AG1-205	Rockwood 23 kV	Active
AG1-206	Snyder Twp 34.5 kV	Active
AG1-241	Scalp Level 23 kV	Active
AG1-242	Beccaria 34.5 kV	Active
AG1-247	North Orwell 12.47 kV	Active
AG1-253	Erie East-Union City 34.5 kV	Active
AG1-257	Madisonburg Jct-Millheim 46 kV	Active
AG1-258	Madisonburg Jct-Millheim 46 kV	Active
AG1-280	Claysburg-Puzzletown 46 kV	Active
AG1-281	Claysburg-HCR Tap 46 kV	Active
AG1-295	Blairsville East 23 kV	Active
AG1-296	Snyder Township 34.5 kV	Active
AG1-301	Miller REC-Warrior Ridge 46 kV	Active
AG1-303	Geneva 115 kV	Active

© PJM Interconnection 2021. All rights reserved

Queue Number	Project Name	Status
AG1-308	Shawville-Philipsburg 115 kV	Active
AG1-333	Lake Como-Pine Mills 12.47 kV	Active
AG1-338	Curryville-RKB-Yellow Creek 23 kV I	Active
AG1-339	Curryville-RKB-Yellow Creek 23 kV II	Active
AG1-340	Curryville 23 kV	Active
AG1-355	Scalp Level-Hooversville 115 kV	Active
AG1-356	Somerset-Allegheny 115 kV	Active
AG1-377	Philipsburg 115 kV	Active
AG1-378	Philipsburg 115 kV	Active
AG1-382	SGC Tap-Reese REC 46 kV	Active
AG1-385	Motion-Ridgeway 46 kV	Active
AG1-387	Beth 33-Lilly 46 kV	Active
AG1-389	Gold 115 kV I	Active
AG1-390	Gold 115 kV II	Active
AG1-391	Gold 115 kV III	Active
AG1-392	Gold 115 kV IV	Active
AG1-395	Philipsburg-Karthaus 34.5 kV 2	Active
AG1-455	Springboro-Venango Junction 115 kV	Active
AG1-457	Somerset-Rockwood 115 kV	Active
AG1-481	Warren 34.5 kV	Active
AG1-520	Hooversville-Rockingham 23 kV	Active
AG1-548	Erie South-Union City 115 kV	Active
AG1-549	Shelocta 115 kV	Active
V3-030	St. Benedict-Patton 46kV	In Service
Y1-033	Penn Mar-Rock Wood 115kV	In Service
Z1-066	Arnold 34.5kV	In Service
Z1-069	Gold-Sabinsville 115kV	In Service
Z2-108	Meyersdale North 115kV	In Service

© PJM Interconnection 2021. All rights reserved

11.8 Contingency Descriptions

Contingency Name	Contingency Definition
Base Case	
AP-P1-3-WP-230-326T-B	CONTINGENCY 'AP-P1-3-WP-230-326T-B' /* SHINGLETOWN #82 230/46KV XFMR DISCONNECT BRANCH FROM BUS 966040 TO BUS 200513 CKT 1 /* AG1-473 TAP 230 26LEWISTWN 230 END
AP-P7-1-WPP-138-53A	CONTINGENCY 'AP-P7-1-WPP-138-53A' /* 38 DISCONNECT BRANCH FROM BUS 235132 TO BUS 235825 CKT 1 /* 01AL 4 138 01ALL L4T 138 DISCONNECT BRANCH FROM BUS 235132 TO BUS 235742 CKT 4E /* 01AL 4 138 01ALL L4 25 DISCONNECT BRANCH FROM BUS 235132 TO BUS 235742 CKT 4W /* 01AL 4 138 01ALL L4 25 DISCONNECT BRANCH FROM BUS 235134 TO BUS 235139 CKT 1 /* 01AL&D6 138 01AL&D6T 138 DISCONNECT BRANCH FROM BUS 235138 TO BUS 235139 CKT 1 /* 01AL 4J 138 01AL&D6T 138 DISCONNECT BRANCH FROM BUS 235138 TO BUS 235079 CKT 1 /* 01AL 4J 138 01SPGDL 138 DISCONNECT BRANCH FROM BUS 235138 TO BUS 235825 CKT 1 /* 01AL 4J 138 01ALL L4T 138 DISCONNECT BRANCH FROM BUS 235139 TO BUS 235204 CKT 1 /* 01AL&D6T 138 01KITTAN 138 DISCONNECT BRANCH FROM BUS 235121 TO BUS 235282 CKT 1 /* 01ARMSTR 138 01GAR RN 138 DISCONNECT BRANCH FROM BUS 235202 TO BUS 235240 CKT 1 /* 01KISKIV 138 01COLMBGPN 138 DISCONNECT BRANCH FROM BUS 235240 TO BUS 235282 CKT 1 /* 01COLMBGPN 138 01GAR RN 138 DISCONNECT BRANCH FROM BUS 235204 TO BUS 235282 CKT 1 /* 01KITTAN 138 01GAR RN 138 END

© PJM Interconnection 2021. All rights reserved

12 Short Circuit Analysis

The following Breakers are overdutied:

None

© PJM Interconnection 2021. All rights reserved

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).

© PJM Interconnection 2021. All rights reserved

14 Attachment 1: One Line Diagram

© PJM Interconnection 2021. All rights reserved