



**Generation Interconnection
System Impact Study Report
for**

Queue Project AF1-286

EAST SAYRE 34.5 KV II

8.1 MW Capacity / 13.6 MW Energy

August 2020

Table of Contents

1	Introduction.....	4
2	Preface.....	4
3	General	5
4	Point of Interconnection.....	6
5	Cost Summary	6
6	Transmission Owner Scope of Work	8
7	Schedule.....	9
8	Transmission Owner Analysis.....	9
9	Interconnection Customer Requirements.....	9
9.1	System Protection.....	9
9.2	General Concerns	9
9.3	Requirements for Owner's/Developer's generation IPP Facility.....	10
9.4	Compliance Issues	10
10	Revenue Metering and SCADA Requirements	11
10.1	PJM Requirements	11
10.2	Meteorological Data Reporting Requirements	11
10.3	Interconnected Transmission Owner Requirements - PENELEC Requirements	11
11	Summer Peak Analysis	12
11.1	Generation Deliverability	12
11.2	Multiple Facility Contingency	12
11.3	Contribution to Previously Identified Overloads.....	12
11.4	Steady-State Voltage Requirements.....	12
11.5	Potential Congestion due to Local Energy Deliverability.....	12
11.6	System Reinforcements.....	14
11.7	Flow Gate Details.....	15
11.7.1	Index 1	16
11.8	Queue Dependencies	17
11.9	Contingency Descriptions.....	18
12	Light Load Analysis	19
13	Short Circuit Analysis.....	19
13.1	System Reinforcements - Short Circuit.....	19

14	Stability and Reactive Power	20
15	Affected Systems	21
15.1	NYISO	21
16	Attachment 1: One Line Diagram	22

1 Introduction

This System Impact Study has been prepared in accordance with the PJM Open Access Transmission Tariff, 205, as well as the System Impact 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 System Impact Study is to determine a plan, with approximate cost and construction time estimates, to connect the subject generation interconnection project to the PJM network at a location specified by the Interconnection Customer. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system. All facilities required for interconnection of a generation interconnection project must be designed to meet the technical specifications (on PJM web site) for the appropriate transmission owner.

In some instances an Interconnection Customer may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection or merchant transmission upgrade, may also contribute to the need for the same network reinforcement. 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 System Impact Study is performed.

The System Impact 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.

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.

3 General

The Interconnection Customer (IC), has proposed a Solar generating facility located in Bradford County, Pennsylvania. The installed facilities will have a total capability of 13.6 MW with 8.1 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is December 31, 2021. This study does not imply a TO commitment to this in-service date.

Queue Number	AF1-286
Project Name	EAST SAYRE 34.5 KV II
State	Pennsylvania
County	Bradford
Transmission Owner	MAIT – PENELEC Zone
MFO	13.6
MWE	13.6
MWC	8.1
Fuel	Solar
Basecase Study Year	2023

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

4 Point of Interconnection

The AF1-286 project will interconnect with the Penelec distribution system via a tap on the Milan circuit 34.5 kV at the Penelec-owned East Sayre substation. The IC's proposed generating unit site is approximately 1.1 miles north of Sayre, PA., near 420 Ellistown Road.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AF1-286 generation project to connect to the Penelec distribution system. IC will be responsible for constructing all of the facilities on its side of the POI, including the attachment facilities which connect the generator to the Penelec distribution system's direct connection facilities.

5 Cost Summary

The AF1-286 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$217,000
Allocation towards System Network Upgrade Costs*	\$86,370
Total Costs	\$303,370

*As your project progresses through the study process and other projects modify their request or withdraw, then your cost allocation could change.

This cost excludes a Federal Income Tax Gross Up charges. This tax may or may not be charged based on whether this project meets the eligibility requirements of IRS Notice 88-129. If at a future date it is determined that the Federal Income Tax Gross charge is required, the Transmission Owner shall be reimbursed by the Interconnection Customer for such taxes.

Note 1: PJM Open Access Transmission Tariff (OATT) section 217.3A outline cost allocation rules. The rules are further clarified in PJM Manual 14A Attachment B. The allocation of costs for a network upgrade will start with the first Queue project to cause the need for the upgrade. Later queue projects will receive cost allocation contingent on their contribution to the violation and are allocated to the queues that have not closed less than 5 years following the execution of the first Interconnection Service Agreement which identifies the need for this upgrade.

Note 2: For customers with System Reinforcements listed: If your present cost allocation to a System Reinforcement indicates \$0, then please be aware that as changes to the interconnection process occur, such as prior queued projects withdrawing from the queue, reducing in size, etc, the cost responsibilities can change and a cost allocation may be assigned to your project. In addition, although your present cost

allocation to a System Reinforcement is presently \$0, your project may need this system reinforcement completed to be deliverable to the PJM system. If your project comes into service prior to completion of the system reinforcement, an interim deliverability study for your project will be required.

6 Transmission Owner Scope of Work

The AF1-286 project will interconnect with the Penelec distribution system via a tap on the Milan circuit 34.5 kV at the Penelec-owned East Sayre substation. The IC's proposed generating unit site is approximately 1.1 miles north of Sayre, PA., near 420 Ellistown Road.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AF1-286 generation project to connect to the Penelec distribution system. IC will be responsible for constructing all of the facilities on its side of the POI, including the attachment facilities which connect the generator to the Penelec distribution system's direct connection facilities.

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

Description	Total Cost
Tap the existing Milan 34.5kV line at an existing pole or interspersed pole on Penelec's existing distribution circuit (00518-61) near pole ST-861, new SCADA recloser tap to interconnect queue project AF1-286. Install 34.5 kV metering in customer's facilities. The customer will have to provide Penelec with permanent access/roadway to this off-road location/equipment. The customer is responsible to build their own line from their site to Penelec's existing facilities.	\$131,100
East Sayre 34.5kV SS. Adjust Remote Relay and Metering Settings.	\$10,700
Review customer drawings, create nameplates and update CD drawing.	\$75,200
Total Physical Interconnection Costs	\$217,000

7 Schedule

Based on the scope of work for the Direct and Non-Direct Connection facilities, it is expected to take a minimum of **24 months** after the signing of an Interconnection Construction Service Agreement to complete the installation. This includes the requirement for the IC to make a preliminary payment that compensates FE for the first three months of the engineering design work that is related to the construction of the interconnection substation. This assumes that there will be no environmental issues with any of the new properties associated with this project, that there will be no delays in acquiring the necessary permits for implementing the defined direct connection and that any distribution system outages will be allowed when requested.

8 Transmission Owner Analysis

Penelec performed an analysis of its distribution system. The AF1-286 project did not contribute to any overloads on the distribution system for the POI selected.

9 Interconnection Customer Requirements

9.1 System Protection

An analysis was conducted to assess the impact of the East Sayre 34.5 kV (AF1-286) 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 Franklin Energy, LLC (Developer) constructing a generation facility they call **“Parsons Solar”** tapping Penelec’s East Sayre - 34.5kV substation by a new dedicated breaker. This breaker will be controlled and operated by a SEL-351 relay for overload, sync check/ dead-line closing, voltage and frequency monitoring. Anti-islanding system shall meet IEEE 1547 and UL 1741. Therefore, no Direct Transfer Trip (DTT) will be required.

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”.

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:

<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 requirement 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

Franklin Energy, LLC 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. Franklin Energy, LLC is responsible for the installation of equipment on its side of the POI in order to adhere to the criteria stated above by FirstEnergy.

10 Revenue Metering and SCADA Requirements

10.1 PJM Requirements

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

10.2 Meteorological Data Reporting Requirements

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

- Back Panel temperature (Fahrenheit)
- Irradiance (Watts/meter²)
- Ambient air temperature (Fahrenheit) – (Accepted, not required)
- Wind speed (meters/second) – (Accepted, not required)
- Wind direction (decimal degrees from true north) – (Accepted, not required)

10.3 Interconnected Transmission Owner Requirements - PENELEC Requirements

Franklin Energy, LLC will be required to comply with all FE Revenue Metering Requirements for Generation Interconnection Customers. These FE requirements are the following:

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

11 Summer Peak Analysis

The Queue Project AF1-286 was evaluated as a 13.6 MW (Capacity 8.1 MW) injection at the East Sayre 134.5 kV substation in the PENELEC area. Project AF1-286 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF1-286 was studied with a commercial probability of 100.0 %. Potential network impacts were as follows:

11.1 Generation Deliverability

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

None.

11.2 Multiple Facility Contingency

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

None.

11.3 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPAC T
41383639	200676	26E.SAYRE	115.0	PENELEC	130836	N.WAV115	115.0	NYISO	1	AP-P1-2-WP-230-324T_FSA_A-B	single	128.0	111.53	115.47	AC	4.91
41383641	200676	26E.SAYRE	115.0	PENELEC	130836	N.WAV115	115.0	NYISO	1	PN-P1-2-PN-230-101T	single	128.0	101.66	105.49	AC	4.62
49672316	200676	26E.SAYRE	115.0	PENELEC	130836	N.WAV115	115.0	NYISO	1	20090826CHAPMA N+ 230 919490 AA2-000 TAP 230 1	single	128.0	111.53	115.47	AC	4.91
88407477	200676	26E.SAYRE	115.0	PENELEC	130836	N.WAV115	115.0	NYISO	1	20090826CHAPMA N+ 230 235220 01MOSHAN 230 230 1	single	128.0	111.53	115.47	AC	4.91

11.4 Steady-State Voltage Requirements

To be determined in Facilities Study phase.

11.5 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	CON T NAME	Type	Rating MVA	PRE PROJE C T LOADIN G %	POST PROJE C T LOADIN G %	AC/D C	MW IMPAC T
41383260	200674	26TOWANDA	115.0	PENELEC	200677	26NOMESHO	115.0	PENELEC	1	PN-P1-2-PN-230-013A	operation	202.0	171.45	172.6	AC	2.37
41383637	200676	26E.SAYRE	115.0	PENELEC	130836	N.WAV115	115.0	NYISO	1	PN-P1-2-PN-230-101T	operation	128.0	115.65	121.88	AC	7.75

11.6 System Reinforcements

ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF1-286	Upgrade Number																
49672316,8840 7477,41383641, 41383639	1	26E.SAYRE 115.0 kV - N.WAV115 115.0 kV Ckt 1	<div>ProjectId : N6815 (PN-AF2-F-0007C)</div> <div>Description : Replace line relaying at East Sayre.</div> <div>Type : FAC</div> <div>Total Cost : \$427,980</div> <div>Time Estimate : 12.0 Months</div> <div>Ratings : 158.0/201.0/301.0</div> <div>Notes : NYISO limiting elements on the facility will up evaluated in the facility study phase. Additional Upgrades may be required.</div> <table><thead><tr><th>Queue</th><th>MW</th><th>Cost %</th><th>Cost \$</th></tr></thead><tbody><tr><td>AF1-043</td><td>8.01</td><td>32.92%</td><td>\$140,901</td></tr><tr><td>AF1-106</td><td>11.41</td><td>46.90%</td><td>\$200,709</td></tr><tr><td>AF1-286</td><td>4.91</td><td>20.18%</td><td>\$86,370</td></tr></tbody></table>	Queue	MW	Cost %	Cost \$	AF1-043	8.01	32.92%	\$140,901	AF1-106	11.41	46.90%	\$200,709	AF1-286	4.91	20.18%	\$86,370	\$427,980	\$86,370	N6815
Queue	MW	Cost %	Cost \$																			
AF1-043	8.01	32.92%	\$140,901																			
AF1-106	11.41	46.90%	\$200,709																			
AF1-286	4.91	20.18%	\$86,370																			
			TOTAL COST	\$427,980	\$86,370																	

Note : For customers with System Reinforcements listed: If your present cost allocation to a System Reinforcement indicates \$0, then please be aware that as changes to the interconnection process occur, such as prior queued projects withdrawing from the queue, reducing in size, etc, the cost responsibilities can change and a cost allocation may be assigned to your project. In addition, although your present cost allocation to a System Reinforcement is presently \$0, your project may need this system reinforcement completed to be deliverable to the PJM system. If your project comes into service prior to completion of the system reinforcement, an interim deliverability study for your project will be required.

11.7 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".

11.7.1 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
88407477	200676	26E.SAYRE	PENELEC	130836	N.WAV115	NYISO	1	200908 26CHAPMAN+ 230 235220 01MOSHAN 230 230 1	single	128.0	111.53	115.47	AC	4.91

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
200851	26MEHOOP3	0.5818	80/20	0.5818
200898	26AA1-106	1.1992	80/20	1.1992
200917	26MTNTP_P28	0.2958	80/20	0.2958
200949	26X1-109	9.3001	80/20	9.3001
203283	26MANOR_T86	0.0302	80/20	0.0302
203347	26NME_Y1-047	0.1962	80/20	0.1962
203350	26MILZ1-092	2.1369	80/20	2.1369
203351	26GROZ1-110	0.2124	80/20	0.2124
203352	26CANZ2-011	0.2124	80/20	0.2124
203909	26Z1-038	1.2818	80/20	1.2818
919201	AA1-144 OP	11.2144	80/20	11.2144
919491	AA2-000	35.3408	80/20	35.3408
920351	AA2-133	0.3589	80/20	0.3589
930511	AB1-092	1.2976	80/20	1.2976
934801	AD1-108	0.0160	80/20	0.0160
934811	AD1-109	0.0117	80/20	0.0117
934821	AD1-110	0.0148	80/20	0.0148
935061	AD1-142	0.1181	80/20	0.1181
936421	AD2-055	2.6715	80/20	2.6715
941421	AE2-139 C	4.1951	80/20	4.1951
943751	AF1-043	8.0146	80/20	8.0146
944411	AF1-106 O1	12.1260	80/20	12.1260
946211	AF1-286 C O1	4.9110	80/20	4.9110
NEWTON	NEWTON	0.2740	Confirmed LTF	0.2740
FARMERCITY	FARMERCITY	0.0141	Confirmed LTF	0.0141
G-007A	G-007A	1.3090	Confirmed LTF	1.3090
VFT	VFT	3.7281	Confirmed LTF	3.7281
NY	NY	0.9595	Confirmed LTF	0.9595
PRAIRIE	PRAIRIE	0.6457	Confirmed LTF	0.6457
COFFEEN	COFFEEN	0.0509	Confirmed LTF	0.0509
CHEOAH	CHEOAH	0.1106	Confirmed LTF	0.1106
EDWARDS	EDWARDS	0.0914	Confirmed LTF	0.0914
TILTON	TILTON	0.1638	Confirmed LTF	0.1638
MADISON	MADISON	0.0121	Confirmed LTF	0.0121
GIBSON	GIBSON	0.1398	Confirmed LTF	0.1398
CALDERWOOD	CALDERWOOD	0.1103	Confirmed LTF	0.1103
BLUEG	BLUEG	0.4427	Confirmed LTF	0.4427
TRIMBLE	TRIMBLE	0.1425	Confirmed LTF	0.1425
CATAWBA	CATAWBA	0.0682	Confirmed LTF	0.0682

11.8 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
AA1-106	Grover II 34.5kV	Withdrawn
AA1-144	East Towanda-Grover 230kV	Engineering and Procurement
AA2-000	N/A	N/A
AA2-133	Wyalusing 34.5kV	In Service
AB1-092	Moshannon-East Towanda 230kV	Active
AD1-108	Grover 34 kV	In Service
AD1-109	Canton 34.5 kV	In Service
AD1-110	North Meshoppen 34.5 kV	In Service
AD1-142	Milan 34.5 kV	In Service
AD2-055	Moshannon-East Towanda 230 kV	Active
AE2-139	East Towanda-Grover 230 kV	Active
AF1-043	Moshannon-East Towanda 230 kV	Active
AF1-106	East Sayre 34.5 kV	Active
AF1-286	East Sayre 34.5 kV II	Active
X1-109	E. Towanda 230kV	In Service
Y1-047	North Meshoppen 34.5kV	In Service
Z1-038	Florey Knob 34.5kV	Withdrawn
Z1-092	Milan 34kV	In Service
Z1-110	Grover 34kV	In Service
Z2-011	Canton 34.5kV	In Service

11.9 Contingency Descriptions

Contingency Name	Contingency Definition
200908 26CHAPMAN+ 230 235220 01MOSHAN 230 230 1	CONTINGENCY '200908 26CHAPMAN+ 230 235220 01MOSHAN 230 230 1' OPEN BRANCH FROM BUS 200908 TO BUS 235220 CKT 1 END
200908 26CHAPMAN+ 230 919490 AA2-000 TAP 230 1	CONTINGENCY '200908 26CHAPMAN+ 230 919490 AA2-000 TAP 230 1' OPEN BRANCH FROM BUS 200908 TO BUS 919490 CKT 1 END
PN-P1-2-PN-230-101T	CONTINGENCY 'PN-P1-2-PN-230-101T' /* EAST TOWANDA - HILLSIDE 230KV DISCONNECT BRANCH FROM BUS 200675 TO BUS 130763 CKT 1 /* 26E.TWANDA 230 HILSD230 230 END
PN-P1-2-PN-230-013A	CONTINGENCY 'PN-P1-2-PN-230-013A' /* EAST TOWANDA - NORTH MESHOPPEN 230KV DISCONNECT BRANCH FROM BUS 200675 TO BUS 200924 CKT 1 /* 26E.TWANDA 230 26CANYON 230 DISCONNECT BRANCH FROM BUS 200924 TO BUS 200706 CKT 1 /* 26CANYON 230 26N.MESHPN 230 END
AP-P1-2-WP-230-324T_FSA_A-B	CONTINGENCY 'AP-P1-2-WP-230-324T_FSA_A-B' /* MOSHANNON-MARSHALL 230KV APS-PN TIE DISCONNECT BRANCH FROM BUS 235220 TO BUS 200908 CKT 1 /* 01MOSHAN 230 26CHAPMAN+ 230 DISCONNECT BRANCH FROM BUS 200908 TO BUS 919490 CKT 1 /* 26CHAPMAN+ 230 AA2-000 TAP 230 END

12 Light Load Analysis

Light load analysis is not needed for solar projects.

13 Short Circuit Analysis

The following Breakers are overdutied:

None.

13.1 System Reinforcements - Short Circuit

None.

14 Stability and Reactive Power

(Summary of the VAR requirements based upon the results of the dynamic studies)

PJM will not be performing a stability analysis for this project.

15 Affected Systems

15.1 NYISO

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

16 Attachment 1: One Line Diagram

