Generation Interconnection

Feasibility Study Report

for

Queue Project AE2-224

BEAR ROCK-JOHNSTOWN 230 KV

60 MW Capacity / 100 MW Energy

July, 2019

Table Of Contents

1 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.

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

PJM utilizes manufacturer models to ensure the performance of turbines is properly captured during the simulations performed for stability verification and, where applicable, for compliance with low voltage ride through requirements. Turbine manufacturers provide such models to their customers. The list of manufacturer models PJM has already validated is contained in Attachment B of Manual 14G. Manufacturer models may be updated from time to time, for various reasons such as to reflect changes to the control systems or to more accurately represent the capabilities turbines and controls which are currently available in the field. Additionally, as new turbine models are developed, turbine manufacturers provide such new models which must be used in the conduct of these studies. PJM needs adequate time to evaluate the new models in order to reduce delays to the System Impact Study process timeline for the Interconnection Customer as well as other Interconnection Customers in the study group. Therefore, PJM will require that any Interconnection Customer with a new manufacturer model must supply that model to PJM, along with a $10,000 fully refundable deposit, no later than three (3) months prior to the starting date of the System Impact Study (See Section 4.3 for starting dates) for the Interconnection Request which shall specify the use of the new model. The Interconnection Customer will be required to submit a completed dynamic model study request form (Attachment B-1 of Manual 14G) in order to document the request for the study.

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.

2 General

The Interconnection Customer (IC) has proposed a Solar generating facility located in Cambria County, Pennsylvania. The installed facilities will have a total capability of 100 MW with 60 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is September 1, 2021. This study does not imply a Transmission Owner (TO) commitment to this in-service date.

Queue Number	**AE2-224**
Project Name	BEARROCK-JOHNSTOWN 230 KV
Interconnection Customer	
State	None
County	Cambria
Transmission Owner	PENELEC
MFO	100
MWE	100
MWC	60
Fuel	Solar
Basecase Study Year	2022

2.1 Point of Interconnection

Primary POI

The interconnection of the project at the Primary POI will be accomplished by constructing a new 230 kV three (3) breaker ring bus substation and looping the Bear Rock - Johnstown 230 kV line into the new station. The new substation will be located approximately 14.9 miles from Bear Rock substation. The IC will be responsible for acquiring all easements, properties, and permits that may be required to construct both the new interconnection switching station and the associated facilities. The IC will also be responsible for the rough grade of the property and an access road to the proposed three breaker ring bus site. The project will also require non-direct connection upgrades at Altoona, Bear Rock, Johnstown, Lewistown, and Raystown substations.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AE2-224 generation project to connect to the FirstEnergy ("FE") transmission system. Attachment 2 provides the proposed location for the point of interconnection. 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 transmission system's direct connection facilities.

2.2 Cost Summary

The AE2-224 project will be responsible for the following costs:

Description	Total Cost
Attachment Facilities	$ 809,970
Direct Connection Network Upgrade	$7,970,430
Non Direct Connection Network Upgrades	$ 678,000
Total Costs	$9,458,400

In addition, the AE2-224 project may be responsible for a contribution to the following costs

Description	Total Cost
System Upgrades	$260,000

Cost allocations for these upgrades will be provided in the System Impact Study Report.

The costs provided above exclude the Contribution in Aid of Construction ("CIAC") Federal Income Tax Gross Up charge. If, at a future date, it is determined that the CIAC Federal Income Tax Gross charge is required, the Transmission Owner shall be reimbursed by the Interconnection Customer for such taxes.

The required Attachment Facilities and Direct and Non-Direct Connection work for the interconnection of the AE2-224 generation project to the FE Transmission System is detailed in the following sections. The associated one-line with the generation project Attachment Facilities and the Primary Direct and Non-Direct Connection facilities are shown in Attachment 1.

3 Transmission Owner Scope of Work

The interconnection of the project at the Primary POI will be accomplished by constructing a new 230 kV three (3) breaker ring bus substation and looping the Bear Rock - Johnstown 230 kV line into the new station. The new substation will be located approximately 14.9 miles from Bear Rock substation. The IC will be responsible for acquiring all easements, properties, and permits that may be required to construct both the new interconnection switching station and the associated facilities. The IC will also be responsible for the rough grade of the property and an access road to the proposed three breaker ring bus site. The project will also require non-direct connection upgrades at Altoona, Bear Rock, Johnstown, Lewistown, and Raystown substations.

Attachment 1 shows a one-line diagram of the proposed primary direct connection facilities for the AE2-224 generation project to connect to the FirstEnergy ("FE") transmission system. Attachment 2 provides the proposed location for the point of interconnection. 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 transmission system's direct connection facilities.

4 Attachment Facilities

The total preliminary cost estimate for the Attachment work is given in the table below. These costs do not include CIAC Tax Gross-up.

Description	Total Cost
Install line exit take-off structure, foundations, disconnect switch and associated equipment at ring bus substation	$809,970
Total Attachment Facility Costs	$809,970

5 Direct Connection Cost Estimate

The total preliminary cost estimate for the Direct Connection work is given in the table below. These costs do not include CIAC Tax Gross-up.

Description	Total Cost
Construct a new interconnection substation with 3-230 kV breakers in a ring bus.	$7,289,730
Loop the Bear Rock-Johnstown 230 kV into the proposed AE2-224 substation.	$680,700
Total Direct Connection Facility Costs	$7,970,430

6 Non-Direct Connection Cost Estimate

The total preliminary cost estimate for the Non-Direct Connection work is given in the table below. These costs do not include CIAC Tax Gross-up.

Description	Total Cost
Upgrade and extend the anti-islanding scheme to Johnstown substation.	$169,500
Upgrade and extend the anti-islanding scheme to Bear Rock substation.	$169,500
Upgrade and extend the anti-islanding scheme to Altoona substation	$169,500
Upgrade and extend the anti-islanding scheme to Raystown substation	$169,500
Total Non-Direct Connection Facility Costs	$678,000

7 System Reinforcements Cost Estimate

Facility	Upgrade Description	Cost
01ARMSTRONG 345.0 kV - 01ARMSTR 138.0 kV Ckt 2	**WP-0002 (13) : Replace low side transformer risers** **Project Type : FAC** **Cost : $130,000** **Time Estimate : 9.0 Months** **WP-0002a (14) : Replace substation conductor** **Project Type : FAC** **Cost : $130,000** **Time Estimate : 9.0 Months**	$260,000
	TOTAL COST	**$260,000**

8 Schedule

Based on the scope of work for the Attachment Facilities and the Direct and Non-Direct Connection facilities, it is expected to take a minimum of 22 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. Initial full payment will be expected for the cost of the Non-Direct Connection and System Upgrades. This timeframe assumes that there will be no environmental issues with any of the new properties associated with this project, that there will be no delays in acquiring the necessary permits for implementing the defined direct connection and network upgrades, and that all transmission system outages will be allowed when requested.

The schedule for the required Network Impact Reinforcements will be more clearly identified in future study phases. The estimate elapsed time to complete each of the required reinforcements is identified in the "System Reinforcements" section of the report.

9 Transmission Owner Analysis

9.1 Power Flow Analysis

FE performed an analysis of its underlying transmission <100 kV system. The AE2-224 project did not contribute to any overloads on the FE transmission <100 kV system.

10 Interconnection Customer Requirements

10.1 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.

The IC has requested a non-standard GSU transformer winding configuration. This transformer is in violation of section 14.2.6 of FE's "Requirements for Transmission Connected Facilities" document and will not be accepted. The GSU transformer must have a grounded wye connection on the high (utility) side and a delta connection on the low (generator) side.

10.2 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 230 kV circuit breaker to protect the AE2-224 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 AE2-224 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.

10.3 Power Factor Requirements

The IC shall design its 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.

11 Revenue Metering and SCADA Requirements

11.1 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.

11.2 FE Requirements

The IC will be required to comply with all FE revenue metering requirements for generation interconnection customers which can be found in FE's "Requirements for Transmission Connected Facilities" document located at: http://www.pjm.com/planning/design-engineering/to-tech-standards/private-firstenergy.aspx.

12 Network Impacts

The Queue Project AE2-224 was evaluated as a 100.0 MW (Capacity 60.0 MW) injection tapping the Bear Rock to Johnstown 230kV line in the PENELEC area. Project AE2-224 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE2-224 was studied with a commercial probability of 53%. Potential network impacts were as follows:

Summer Peak Load Flow

13 Generation Deliverability

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

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
7219407	235129	01ARMSTRONG	AP	235121	01ARMSTR	AP	2	PN-P1-2-PN-345-003	single	659.0	99.65	100.35	DC	4.56

14 Multiple Facility Contingency

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

None

15 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	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
7219337	200740	26BLRSVL E	PENELEC	200763	26BLAIRSVL	PENELEC	1	PJM_P1_APS_B_G692	single	364.0	101.3	102.41	DC	4.04

16 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	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
7219336	200740	26BLRSVL E	PENELEC	200763	26BLAIRSVL	PENELEC	1	PJM_P1_APS_B_G692	operation	364.0	105.28	106.11	DC	6.73
7219282	200767	26HOMER CT	PENELEC	200795	26SHELOCTA	PENELEC	1	AP-P1-2-WP-345-311T	operation	917.0	104.1	107.28	DC	28.47
7219408	235129	01ARMSTRONG	AP	235121	01ARMSTR	AP	2	PN-P1-2-PN-345-107T	operation	659.0	97.27	97.74	DC	6.86

7219409	235129	01ARMSTRONG	AP	235121	01ARMSTR	AP	2	ATSI-P1-2-CEI-345-700T	operation	659.0	97.27	97.74	DC	6.86

17 System Reinforcements

ID	Index	Facility	Upgrade Description	Cost
7219407	1	01ARMSTRONG 345.0 kV - 01ARMSTR 138.0 kV Ckt 2	WP-0002 (13) : Replace low side transformer risers Project Type : FAC Cost : $130,000 Time Estimate : 9.0 Months WP-0002a (14) : Replace substation conductor Project Type : FAC Cost : $130,000 Time Estimate : 9.0 Months	$260,000
7219337	2	26BLRSVL E 115.0 kV - 26BLAIRSVL 138.0 kV Ckt 1	7219337 Incorrect Rating - Transformer is not overloaded with the updated rating.	$0
			TOTAL COST	$260,000

18 Flow Gate Details

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact. It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

18.1 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
7219407	235129	01ARMSTRONG	AP	235121	01ARMSTR	AP	2	PN-P1-2-PN-345-003	single	659.0	99.65	100.35	DC	4.56

Bus #	Bus	MW Impact
200503	26C.SLOPE	5.51
200809	26SITHE	0.49
200828	26HNSMLK 1	2.62
200829	26HNSMLK 2	2.62
200830	26HNSMLK 3	2.62
200831	26HNSMLK 4	2.62
200832	26HNSMLK 5	2.62
200833	26SEWRDB34	4.84
200837	26HOMER C1	8.51
200838	26HOMER C2	12.87
200839	26HOMER C3	13.63
200846	26FORWARD	0.05
200886	26ARWF_N39	0.13
200887	26ARMNA MT	0.15
200888	26HIGHLAND	0.1
200889	26STNY CRK	0.08
200890	26BF_G21_K23	0.03
200891	26CSLMN_L13	0.05
200892	26LOOKOUT	0.05
200925	26R32	0.12
202225	26SCI_S29B	0.02
203034	26NA_O38_P22	0.11
203261	26BLOSSBCT	0.12
292340	K-022	0.01
916201	Z1-069 C	0.1
930411	AB1-082	1.1
931091	AB1-160 C	0.03
932571	AC2-077	1.23
938351	AE1-053	0.51
938881	AE1-116	0.27
938991	AE1-128 C	4.48
940861	AE2-074 C O1	0.84
941491	AE2-146 C	4.47
942121	AE2-224 C	4.56
942361	AE2-249 C	0.5
AA3-200	AA3-200	35.53
BLUEG	BLUEG	4.82
CALDERWOOD	CALDERWOOD	0.45
CANNELTON	CANNELTON	0.29
CATAWBA	CATAWBA	0.25

CBM-N	CBM-N	1.76
CHEOAH	CHEOAH	0.41
CHILHOWEE	CHILHOWEE	0.15
COFFEEN	COFFEEN	0.51
COTTONWOOD	COTTONWOOD	1.84
DUCKCREEK	DUCKCREEK	1.12
EDWARDS	EDWARDS	0.51
ELMERSMITH	ELMERSMITH	0.49
FARMERCITY	FARMERCITY	0.33
G-007A	G-007A	2.08
GIBSON	GIBSON	0.2
HAMLET	HAMLET	0.38
NEWTON	NEWTON	1.32
NYISO	NYISO	7.62
PRAIRIE	PRAIRIE	2.42
SANTEETLA	SANTEETLA	0.12
SMITHLAND	SMITHLAND	0.19
TATANKA	TATANKA	0.6
TILTON	TILTON	0.61
TRIMBLE	TRIMBLE	0.54
TVA	TVA	1.51
UNIONPOWER	UNIONPOWER	0.66
VFT	VFT	5.72

18.2 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
7219337	200740	26BLRSVLE	PENELEC	200763	26BLAIRSVL	PENELEC	1	PJM_P1_APS_B_G692	single	364.0	101.3	102.41	DC	4.04

Bus #	Bus	MW Impact
200503	26C.SLOPE	8.23
200636	26IUP CO-G	0.2
200805	26COLVER13	10.17
200809	26SITHE	0.26
200833	26SEWRDB34	4.58
200837	26HOMER C1	4.47
200846	26FORWARD	0.06
200886	26ARWF_N39	0.12
200888	26HIGHLAND	0.13
200889	26STNY CRK	0.1
200890	26BF_G21_K23	0.04
200891	26CSLMN_L13	0.06
200892	26LOOKOUT	0.06
200905	26Q36	0.07
200915	26CHSTN_FL	0.09
200925	26R32	0.15
200945	26CT_V3-030	0.06
202158	26CON.GEN1	0.05
202160	26CON.GEN2	0.11
202225	26SCI_S29B	0.03
203034	26NA_O38_P22	0.11
292340	K-022	0.01
935191	AD1-154	1.02
936991	AD2-133 C	1.07
938351	AE1-053	0.6
938361	AE1-054	0.5
938881	AE1-116	0.33
938991	AE1-128 C	5.78
941331	AE2-129 C	0.62
941351	AE2-131 C	0.62
942121	AE2-224 C	4.04
942361	AE2-249 C	0.65
942511	AE2-264 C	2.49
BLUEG	BLUEG	5.53
CALDERWOOD	CALDERWOOD	0.51
CANNELTON	CANNELTON	0.33
CATAWBA	CATAWBA	0.28
CBM-N	CBM-N	1.38
CHEOAH	CHEOAH	0.47
CHILHOWEE	CHILHOWEE	0.17
COFFEEN	COFFEEN	0.58
COTTONWOOD	COTTONWOOD	2.08

DUCKCREEK	DUCKCREEK	1.27
EDWARDS	EDWARDS	0.58
ELMERSMITH	ELMERSMITH	0.56
FARMERCITY	FARMERCITY	0.38
G-007A	G-007A	3.34
GIBSON	GIBSON	0.23
HAMLET	HAMLET	0.42
NEWTON	NEWTON	1.51
NYISO	NYISO	5.99
PRAIRIE	PRAIRIE	2.75
SANTEETLA	SANTEETLA	0.14
SMITHLAND	SMITHLAND	0.21
TATANKA	TATANKA	0.68
TILTON	TILTON	0.7
TRIMBLE	TRIMBLE	0.61
TVA	TVA	1.72
UNIONPOWER	UNIONPOWER	0.75
VFT	VFT	9.11

Affected Systems

19 Affected Systems

19.1 LG&E

LG&E Impacts to be determined during later study phases (as applicable).

19.2 MISO

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

19.3 TVA

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

19.4 Duke Energy Progress

Duke Energy Progress Impacts to be determined during later study phases (as applicable).

19.5 NYISO

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

20 Contingency Descriptions

Contingency Name	Contingency Definition
PN-P1-2-PN-345-003	CONTINGENCY 'PN-P1-2-PN-345-003' /* HANDSOME LAKE - WAYNE 345KV DISCONNECT BRANCH FROM BUS 200826 TO BUS 200595 CKT 1 /* 26HANDSMLK 345 26WAYNE 345 END
AP-P1-2-WP-345-311T	CONTINGENCY 'AP-P1-2-WP-345-311T' /* ARMSTRONG -HOMERCITY 345KV DISCONNECT BRANCH FROM BUS 235129 TO BUS 200769 CKT 1 /* 01ARMSTRONG 345 26HOMER CY 345 END
ATSI-P1-2-CEI-345-700T	CONTINGENCY 'ATSI-P1-2-CEI-345-700T' /* PN/ATSI ERIE WEST - ASHTABULA - PERRY 345KV DISCONNECT BRANCH FROM BUS 239036 TO BUS 238547 CKT 1 /* 02PERRY 345 02AT 345 DISCONNECT BRANCH FROM BUS 238547 TO BUS 239082 CKT 1 /* 02AT 345 02S8-ATT 345 DISCONNECT BRANCH FROM BUS 239082 TO BUS 238544 CKT 8 /* 02S8-ATT 345 02ASH_3 138 DISCONNECT BRANCH FROM BUS 238547 TO BUS 200599 CKT 1 /* 02AT 345 26ERIE W 345 END
PJM_P1_APS_B_G692	CONTINGENCY 'PJM_P1_APS_B_G692' / 200011 KEYSTONE 500 235104 01CABOT 500 1 OPEN BRANCH FROM BUS 200011 TO BUS 235104 CKT 1 END
PN-P1-2-PN-345-107T	CONTINGENCY 'PN-P1-2-PN-345-107T' /* ERIE WEST - ASHTABULA - PERRY 345KV DISCONNECT BRANCH FROM BUS 200599 TO BUS 238547 CKT 1 /* 26ERIE W 345 02AT 345 DISCONNECT BRANCH FROM BUS 238547 TO BUS 239082 CKT 1 /* 02AT 345 02S8-ATT 345 DISCONNECT BRANCH FROM BUS 238547 TO BUS 239036 CKT 1 /* 02AT 345 02PERRY 345 DISCONNECT BUS 238547 /* 02AT 345 END

Short Circuit

21 Short Circuit

The following Breakers are overduty:

None

22 Attachment 1 – One Line

23 Attachment 2 – Project Location