Generation Interconnection

Feasibility Study Report

for

Queue Project AF1-071

COLLEGE CORNER 138 KV

7.6 MW Capacity / 20 MW Energy

January, 2020

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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.

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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.

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2 General

The Interconnection Customer (IC), has proposed a Solar generating facility located in Camden, Preble County, Ohio. The installed facilities will have a capability of 20 MW with 7.6 of new request MW of this output being recognized by PJM as capacity. Note that this project is an increase to the Interconnection Customer's AC2-111 project, which will share the same property and connection point.

The conduct of light load analysis as required under the PJM planning process is not performed during the Generation Interconnection Feasibility Study phase of the PJM study process. Additional reinforcement requirements for this Interconnection Request may be defined during the conduct of the light load analysis which shall be performed following execution of the System Impact Study agreement. The installed facilities will have a total capability of 100 MW with 38 MW of this output being recognized by PJM as Capacity.

The proposed in-service date for this project is 10/01/2022. This study does not imply a TO commitment to this in-service date.

Queue Number	**AF1-071**
Project Name	COLLEGE CORNER 138 KV
State	Ohio
County	Preble
Transmission Owner	AEP
MFO	100
MWE	20
MWC	7.6
Fuel	Solar
Basecase Study Year	2023

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2.1 Point of Interconnection

AF1-071 will interconnect with the AEP transmission system at the College Corner 138 kV substation utilizing the same generation lead as previous queue position AC2-111.

Note: It is assumed that the 138 kV revenue metering system, gen lead and Protection & Control Equipment that will be installed for AC2-111 will be adequate for the additional storage facility connection requested in AF1-071. Depending on the timing of the completion of the AF1-071 interconnection construction relative to the AC2-111 completion, there may (or may not) be a need to review and revise relay settings for the increased generation of AF1-071.

2.2 Cost Summary

The AF1-071 project will be responsible for the following costs:

Description	Total Cost
Attachment Facilities	$0
Direct Connection Network Upgrade	$0
Non Direct Connection Network Upgrades	$0
Total Costs	$0

In addition, the AF1-071 project may be responsible for a contribution to the following costs

Description	Total Cost
System Upgrades	$34,929,461

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

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3 Transmission Owner Scope of Work

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
Total Attachment Facility Costs	$0

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
Total Direct Connection Facility Costs	$0

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
Total Non-Direct Connection Facility Costs	$0

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7 Incremental Capacity Transfer Rights (ICTRs)

Will be determined at a later study phase

8 Schedule

It is anticipated that the time between receipt of executed Agreements and Commercial Operation may range from 12 to 18 months if no line work is required. If line work is required, construction time would generally be between 24 to 36 months after Agreement execution.

9 Interconnection Customer Requirements

It is understood that the Interconnection Customer is responsible for all costs associated with this interconnection. The costs above are reimbursable to AEP. The cost of the Interconnection to the Customer's generating plant and the costs for the line connecting the generating plant to the College Corner 138 kV station are not included in this report; these are assumed to be the Interconnection Customer's responsibility.

The Generation Interconnection Agreement does not in or by itself establish a requirement for American Electric Power to provide power for consumption at the developer's facilities. A separate agreement may be reached with the local utility that provides service in the area to ensure that infrastructure is in place to meet this demand and proper metering equipment is installed. It is the responsibility of the developer to contact the local service provider to determine if a local service agreement is required.

In addition, if the Interconnection Customer considers use of the Option to Build, they should consult the guidance AEP has posted at:
https://www.aep.com/assets/docs/requiredpostings/TransmissionStudies/docs/2019/MerchantGenerationGuidelinesPJMoptiontoBuild.pdf

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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 AEP Requirements

The Interconnection Customer will be required to comply with all AEP Revenue Metering Requirements for Generation Interconnection Customers. The Revenue Metering Requirements may be found within the "Requirements for Connection of New Facilities or Changes to Existing Facilities Connected to the AEP Transmission System" document located at the following link:

http://www.pjm.com/~/media/planning/plan-standards/private-aep/aep-interconnection-requirements.ashx

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11 Network Impacts

The Queue Project AF1-071 was evaluated as a 20.0 MW (Capacity 7.6 MW) injection at the College Corner 138 kV substation in the AEP area. Project AF1-071 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF1-071 was studied with a commercial probability of 0.53. Potential network impacts were as follows:

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Summer Peak Load Flow

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12 Generation Deliverability

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

None

13 Multiple Facility Contingency

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

None

14 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC| DC	MW IMPACT
40966905	243262	05COLLCO	138.0	AEP	250001	08COLINV	138.0	DEO&K	1	DEOK_P7-1_C5 4504MFTANNERS4512EBTANNERS	tower	167.0	120.48	123.16	DC	4.47
41497944	243262	05COLLCO	138.0	AEP	250001	08COLINV	138.0	DEO&K	1	AEP_P4_#10527_05BLUFFP 138_B2	breaker	167.0	124.1	126.89	DC	4.66
41497945	243262	05COLLCO	138.0	AEP	250001	08COLINV	138.0	DEO&K	1	DEOK_P2-3_C2 1403_MIAMIFORT	breaker	167.0	115.51	118.16	DC	4.43
43728560	934960	AD1-128 TAP	138.0	AEP	243278	05DESOTO	138.0	AEP	1	AEP_P4_#10527_05BLUFFP 138_B2	breaker	185.0	104.09	105.48	DC	2.58
43728532	942070	AE2-219 TAP	138.0	AEP	243253	05BLUFFP	138.0	AEP	1	AEP_P4_#6923_05COLLCO 138_C2	breaker	255.0	109.65	110.67	DC	2.61
43729289	942070	AE2-219 TAP	138.0	AEP	243253	05BLUFFP	138.0	AEP	1	DEOK_P7-1_C5 CIRCUIT3281&13803	tower	255.0	109.73	110.75	DC	2.61

15 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.

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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
41157091	243262	05COLLCO	138.0	AEP	250001	08COLINV	138.0	DEO&K	1	AEP_SUBT_P1-3_#786_05JAY 138_1-C	operation	167.0	112.72	115.46	DC	4.57

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16 System Reinforcements

ID	Index	Facility	Upgrade Description	Cost
43728560	2	AD1-128 TAP 138.0 kV - 05DESOTO 138.0 kV Ckt 1	**AEP** **AEPI0021a (262) : A Sag Study will be required on the 10 miles section of ACSR ~ 477 ~ 26/7 ~ HAWK line to mitigate the overload. New Ratings afetr the sag study S/N : 185MVA S/E: 257MVA.Depending on the sag study results, cost for this upgrade is expected to be between $40,000 (no remediations required just sag study) and $15 million (complete line reconductor/rebuild required)** **Project Type : FAC** **Cost : $40,000** **Time Estimate : sag study : 6-12 months Months**	$40,000
40966905,41497944, 41497945	1	05COLLCO 138.0 kV - 08COLINV 138.0 kV Ckt 1	**AEP** **AEPI0005a (147) : A Sag Study will be required on the 0.15 mile section of line to mitigate the overload . New Rating after the Sag Study : S/N: 167 MVA S/E: 245 MVA. Depending on the sag study results, cost for this upgrade is expected to be between $600 (no remediations required just sag study) and $0.3 million (complete line reconductor/rebuild required). Time Estimate: a) Sag Study: 6-12 months b) Rebuild: The standard time required for construction differs from state to state. An approximate construction time would be 24 to 36 months after signing an interconnection agreement.** **Project Type : FAC** **Cost : $600** **Time Estimate : 6-12 Months** **AEPI0005b (148) : Reconductor/Rebuild the 0.15 mile section of ACSR~397.5~30/7~ LARK** **Project Type : FAC** **Cost : $225,000** **Time Estimate : 24-36 months Months** **DEOK** **r3281 (2549) : Rebuild the line** **Project Type : FAC** **Cost : $24,163,861** **Time Estimate : 36.0 Months**	$24,389,461
43728532,43729289	3	AE2-219 TAP 138.0 kV - 05BLUFFP 138.0 kV Ckt 1	**AEP** **AEPI0017a (245) : Reconductor/rebuild 7 miles of ACSR ~ 556.5 ~ 26/7 ~ DOVE conductor sec 1** **Project Type : FAC** **Cost : $10,500,000** **Time Estimate : 24-36 months Months**	$10,500,000
			TOTAL COST	**$34,929,461**

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17 Flow Gate Details

The following indices contain additional information about each flowgate presented in the body of the report. For each index, 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.

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17.1 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
41497944	243262	05COLLCO	AEP	250001	08COLINV	DEO&K	1	AEP_P4_#10527_05BLUFFP 138_B2	breaker	167.0	124.1	126.89	DC	4.66

Bus #	Bus	MW Impact
243415	05WWVSTA	2.1959
247288	05RICHG1	0.7178
247289	05RICHG2	0.7178
247536	05BLUFF P WF	0.6169
247929	S-071 E	17.6774
932841	AC2-111 C O1	7.0853
932842	AC2-111 E O1	11.5603
934961	AD1-128 C	3.8372
934962	AD1-128 E	6.2608
936681	**AD2-087 C O1 (Withdrawn : 12/09/2019)**	**6.4814**
936682	**AD2-087 E O1 (Withdrawn : 12/09/2019)**	**30.3446**
940991	AE2-090 C	16.4229
940992	AE2-090 E	10.9486
942071	AE2-219 C	7.7335
942072	AE2-219 E	10.6795
944031	AF1-071 C	1.7713
944032	AF1-071 E	2.8901
945561	AF1-221 C O1	25.9458
945562	AF1-221 E O1	7.7988
WEC	WEC	0.1342
CBM-W2	CBM-W2	2.2277
NY	NY	0.0321
CBM-W1	CBM-W1	4.4035
TVA	TVA	0.1162
O-066	O-066	0.3898
CHEOAH	CHEOAH	0.0020
CBM-S1	CBM-S1	0.5027
G-007	G-007	0.0603
MADISON	MADISON	6.5641
MEC	MEC	0.5673
CALDERWOOD	CALDERWOOD	0.0015
BLUEG	BLUEG	0.0330
TRIMBLE	TRIMBLE	0.0228
CATAWBA	CATAWBA	0.0133

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17.2 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
4372856 0	93496 0	AD1-128 TAP	AEP	24327 8	05DESOT O	AEP	1	AEP_P4_#10527_05BLUFF P 138_B2	breake r	185.0	104.09	105.48	DC	2.58

Bus #	Bus	MW Impact
243415	05WWVSTA	1.7664
247288	05RICHG1	0.6738
247289	05RICHG2	0.6738
247536	05BLUFF P WF	0.5531
247929	S-071 E	15.8506
932841	AC2-111 C O1	3.9183
932842	AC2-111 E O1	6.3929
934961	AD1-128 C	40.4597
934962	AD1-128 E	66.0133
936681	**AD2-087 C O1 (Withdrawn : 12/09/2019)**	**5.8119**
936682	**AD2-087 E O1 (Withdrawn : 12/09/2019)**	**27.2101**
940991	AE2-090 C	13.6979
940992	AE2-090 E	9.1319
942071	AE2-219 C	6.9346
942072	AE2-219 E	9.5764
944031	AF1-071 C	0.9796
944032	AF1-071 E	1.5982
945561	AF1-221 C O1	14.4061
945562	AF1-221 E O1	4.3301
DUCKCREEK	DUCKCREEK	0.4007
LGEE	LGEE	0.1015
NEWTON	NEWTON	0.2622
CPLE	CPLE	0.0212
FARMERCITY	FARMERCITY	0.0148
G-007A	G-007A	0.0647
VFT	VFT	0.1677
PRAIRIE	PRAIRIE	0.5476
COFFEEN	COFFEEN	0.1438
CBM-S2	CBM-S2	0.1561
EDWARDS	EDWARDS	0.1274
CBM-S1	CBM-S1	0.0256
TILTON	TILTON	0.2155
GIBSON	GIBSON	0.1048

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17.3 Index 3

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
43729289	942070	AE2-219 TAP	AEP	243253	05BLUFFP	AEP	1	DEOK_P7-1_C5 CIRCUIT3281&13803	tower	255.0	109.73	110.75	DC	2.61

Bus #	Bus	MW Impact
243415	05WWVSTA	1.7744
247288	05RICHG1	0.5412
247289	05RICHG2	0.5412
932841	AC2-111 C O1	3.9736
932842	AC2-111 E O1	6.4832
933591	AC2-176 C O1	-1.4109
933592	AC2-176 E O1	-9.4424
936681	**AD2-087 C O1 (Withdrawn : 12/09/2019)**	**19.3702**
936682	**AD2-087 E O1 (Withdrawn : 12/09/2019)**	**90.6878**
940991	AE2-090 C	40.8180
940992	AE2-090 E	27.2120
942071	AE2-219 C	26.3857
942072	AE2-219 E	36.4373
944031	AF1-071 C	0.9934
944032	AF1-071 E	1.6208
945561	AF1-221 C O1	14.6690
945562	AF1-221 E O1	4.4092
DUCKCREEK	DUCKCREEK	0.0818
LGEE	LGEE	0.1466
CPLE	CPLE	0.0245
FARMERCITY	FARMERCITY	0.0015
CBM-W2	CBM-W2	0.4996
NY	NY	0.0066
TVA	TVA	0.1008
O-066	O-066	0.0739
CBM-S2	CBM-S2	0.2659
EDWARDS	EDWARDS	0.0290
CBM-S1	CBM-S1	0.9116
G-007	G-007	0.0114

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Affected Systems

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18 Affected Systems

18.1 LG&E

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

18.2 MISO

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

18.3 TVA

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

18.4 Duke Energy Progress

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

18.5 NYISO

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

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19 Contingency Descriptions

Contingency Name	Contingency Definition
AEP_P1-2_#10526-A	CONTINGENCY 'AEP_P1-2_#10526-A' OPEN BRANCH FROM BUS 243253 TO BUS 942070 CKT 1 / 243253 05BLUFFP 138 942070 AE2-219 TAP 138 1 END
AEP_SUBT_P4_#1101_05BLUFFPNT 69.0_A	CONTINGENCY 'AEP_SUBT_P4_#1101_05BLUFFPNT 69.0_A' OPEN BRANCH FROM BUS 243253 TO BUS 243319 CKT 1 / 243253 05BLUFFP 138 243319 05JAY 138 1 OPEN BRANCH FROM BUS 243253 TO BUS 942070 CKT 1 / 243253 05BLUFFP 138 942070 AE2-219 TAP 138 1 OPEN BRANCH FROM BUS 243253 TO BUS 246014 CKT 1 / 243253 05BLUFFP 138 246014 05BLUFFPNT 69.0 1 OPEN BRANCH FROM BUS 246014 TO BUS 246022 CKT 1 / 246014 05BLUFFPNT 69.0 246022 05PORTLAND 69.0 1 OPEN BRANCH FROM BUS 246020 TO BUS 246022 CKT 1 / 246020 05N PORTLN 69.0 246022 05PORTLAND 69.0 1 END
DEOK_P2-3_C2 1403_MIAMIFORT	CONTINGENCY 'DEOK_P2-3_C2 1403_MIAMIFORT' OPEN BRANCH FROM BUS 243233 TO BUS 249567 CKT 1 / 243233 05TANNER 345 249567 08M.FORT 345 1 OPEN BRANCH FROM BUS 249567 TO BUS 251950 CKT 7 / 249567 08M.FORT 345 251950 08M.FRT7 22.0 7 END
Base Case	
AEP_P4_#10527_05BLUFFP 138_B2	CONTINGENCY 'AEP_P4_#10527_05BLUFFP 138_B2' OPEN BRANCH FROM BUS 243253 TO BUS 243319 CKT 1 / 243253 05BLUFFP 138 243319 05JAY 138 1 OPEN BRANCH FROM BUS 243253 TO BUS 246014 CKT 1 / 243253 05BLUFFP 138 246014 05BLUFFPNT 69.0 1 END

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Contingency Name	Contingency Definition
AEP_SUBT_P1-3_#786_05JAY 138_1-C	CONTINGENCY 'AEP_SUBT_P1-3_#786_05JAY 138_1-C' OPEN BRANCH FROM BUS 246018 TO BUS 243319 CKT 1 / 246018 05JAY EQ 999 243319 05JAY 138 1 OPEN BRANCH FROM BUS 246018 TO BUS 246016 CKT 1 / 246018 05JAY EQ 999 246016 05JAY 69.0 1 OPEN BRANCH FROM BUS 246018 TO BUS 246015 CKT 1 / 246018 05JAY EQ 999 246015 05JAY 34.5 1 OPEN BRANCH FROM BUS 243253 TO BUS 243319 CKT 1 / 243253 05BLUFFP 138 243319 05JAY 138 1 OPEN BRANCH FROM BUS 253250 TO BUS 243319 CKT 1 / 253250 09FTRECV 138 243319 05JAY 138 1 OPEN BRANCH FROM BUS 945580 TO BUS 243319 CKT 1 / 945580 AF1-223 TAP 138 243319 05JAY 138 1 OPEN BRANCH FROM BUS 243319 TO BUS 243358 CKT 1 / 243319 05JAY 138 243358 05PENNVI 138 1 REMOVE SWSHUNT FROM BUS 243319 / 243319 05JAY 138 OPEN BRANCH FROM BUS 246013 TO BUS 246016 CKT 1 / 246013 05ARMSTRON 69.0 246016 05JAY 69.0 1 OPEN BRANCH FROM BUS 246024 TO BUS 246016 CKT 1 / 246024 05GREEN SW 69.0 246016 05JAY 69.0 1 OPEN BRANCH FROM BUS 246026 TO BUS 246015 CKT 1 / 246026 05BARLEY 34.5 246015 05JAY 34.5 1 END
AEP_P2-2_#2812_05TANNER 345_2	CONTINGENCY 'AEP_P2-2_#2812_05TANNER 345_2' OPEN BRANCH FROM BUS 243233 TO BUS 249567 CKT 1 / 243233 05TANNER 345 249567 08M.FORT 345 1 OPEN BRANCH FROM BUS 243233 TO BUS 243382 CKT 5 / 243233 05TANNER 345 243382 05TANNER 138 5 END
DEOK_P7-1_C5 4504MFTANNERS4512EBTANNERS	CONTINGENCY 'DEOK_P7-1_C5 4504MFTANNERS4512EBTANNERS' OPEN BRANCH FROM BUS 243233 TO BUS 249567 CKT 1 / 243233 05TANNER 345 249567 08M.FORT 345 1 OPEN BRANCH FROM BUS 243233 TO BUS 249565 CKT 1 / 243233 05TANNER 345 249565 08EBEND
DEOK_P7-1_C5 CIRCUIT3281&13803	CONTINGENCY 'DEOK_P7-1_C5 CIRCUIT3281&13803' OPEN BRANCH FROM BUS 250001 TO BUS 250144 CKT 1 / 250001 08COLINV 138 250144 08HUSTRC 138 1 OPEN BRANCH FROM BUS 250116 TO BUS 250144 CKT 1 / 250116 08TRENTO 138 250144 08HUSTRC 138 1 OPEN BRANCH FROM BUS 250001 TO BUS 251296 CKT 1 / 250001 08COLINV 138 251296 08COLINV 69.0 1 OPEN BRANCH FROM BUS 243262 TO BUS 250001 CKT 1 / 243262 05COLLCO 138 250001 08COLINV 138 1 OPEN BRANCH FROM BUS 243262 TO BUS 250168 CKT 1 / 243262 05COLLCO 138 250168 08TRENT2 138 1 OPEN BRANCH FROM BUS 250106 TO BUS 250168 CKT 1 / 250106 08TODHJT 138 253057 08TRENT2 138 1 OPEN BRANCH FROM BUS 250106 TO BUS 253057 CKT 1 / 250106 08TODHJT 138 253057 09OHH 138 1 END

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Contingency Name	Contingency Definition
AEP_P4_#6923_05COLLCO 138_C2	CONTINGENCY 'AEP_P4_#6923_05COLLCO 138_C2' OPEN BRANCH FROM BUS 243262 TO BUS 250001 CKT 1 / 243262 05COLLCO 138 250001 08COLINV 138 1 OPEN BRANCH FROM BUS 243262 TO BUS 250168 CKT 1 / 243262 05COLLCO 138 250168 08TRENT2 138 1 OPEN BRANCH FROM BUS 250168 TO BUS 250106 CKT 1 / 250168 08TRENT2 138 250106 08TODHJT 138 1 END

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Short Circuit

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20 Short Circuit

The following Breakers are overduty:

None

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