Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-232

MAGLEY 138 KV

81 MW Capacity / 135 MW Energy

January 2021

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1 Introduction

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

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.

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.

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

3 General

The Interconnection Customer (IC), has proposed a Solar generating facility located in Adams County, Indiana. The installed facilities will have a total capability of 135 MW with 81 MW of this output being recognized by PJM as Capacity.

The proposed in-service date for this project is December 31, 2024. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-232
Project Name	MAGLEY 138 KV
State	Indiana
County	Adams
Transmission Owner	AEP
MFO	135
MWE	135
MWC	81
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.

4 Point of Interconnection

AG1-232 will interconnect with the AEP transmission system via a direct connection to the Magley 138 kV substation.

To accommodate the interconnection to the Magley 138 kV substation, one (1) new 138 kV circuit breaker(s) will be installed (Attachment 1). Installation of associated protection and control equipment, 138 kV line risers, SCADA, and 138 kV revenue metering will also be required. AEP reserves the right to specify the final acceptable configuration considering design practices, future expansion, and compliance requirements.

Installation of the generator lead first span exiting the POI station, including the first structure outside the AEP fence, will also be included in AEP's scope. In the case where the generator lead is a single span, the structure in the customer station will be the customer's responsibility.

5 Cost Summary

The AG1-232 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$1,466,000
Total System Network Upgrade Costs	$100,000
Total Costs	**$1,566,000**

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.

The estimates provided in this report are preliminary in nature, as they were determined without the benefit of detailed engineering studies. Final estimates will require an on-site review and coordination to determine final construction requirements. In addition, Stability analysis will be completed during the Facilities Study stage. It is possible that a need for additional upgrades could be identified by these studies.

6 Transmission Owner Scope of Work

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

6.1 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
138 kV Revenue Metering	$388,000
Generator lead first span exiting the POI station, including the first structure outside the fence	$400,000
Total Attachment Facility Costs	**$788,000**

6.2 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
One (1) new 138 kV circuit breaker(s) will be installed at the (Station Info) substation (Attachment 1). Installation of associated protection and control equipment, 138 kV line risers, and SCADA will also be required.	$633,000
Total Direct Connection Facility Costs	**$633,000**

6.3 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
Review line protection and control settings at the Magley 138 kV substation	$45,000
Total Non-Direct Connection Facility Costs	**$45,000**

7 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 signing Agreement execution.

8 Interconnection Customer Requirements

It is understood that the Interconnection Customer (IC) is responsible for all costs associated with this interconnection. The costs above are reimbursable to the Transmission Owner. The cost of the IC's generating plant and the costs for the line connecting the generating plant to the Point of Interconnection are not included in this report; these are assumed to be the IC's responsibility.

The Generation Interconnection Agreement does not in or by itself establish a requirement for the Transmission Owner 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.

1. An Interconnection Customer entering the New Services Queue on or after October 1, 2012 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.

2. The Interconnection Customer may be required to install and/or pay for metering as necessary to properly track real time output of the facility as well as installing metering which shall be used for billing purposes. See Section 8 of Appendix 2 to the Interconnection Service Agreement as well as Section 4 of PJM Manual 14D for additional information.

9 Revenue Metering and SCADA Requirements

9.1 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.

9.2 Meteorological Data Reporting Requirements

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

- Back Panel temperature (Fahrenheit) - (Required for plants with Maximum Facility Output of 3 MW or higher)
- Irradiance (Watts/meter2) - (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)

9.3 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/

10 Summer Peak - Load Flow Analysis

The Queue Project AG1-232 was evaluated as a 135.0 MW (Capacity 81.0 MW) injection at the Magley 138 kV substation in the AEP area. Project AG1-232 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-232 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

10.1 Generation Deliverability

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

None

10.2 Multiple Facility Contingency

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

None

10.3 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	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
161607894	243233	05TANNER	345.0	AEP	248001	06DEARB1	345.0	OVEC	Z1	DEOK_P7_4504MFTANNERS4512EBTANNERS	tower	1204.0	142.93	143.38	DC	12.61
164416485	243233	05TANNER	345.0	AEP	248001	06DEARB1	345.0	OVEC	Z1	AEP_P4_#14920_05TANNER 345_T	breaker	1204.0	142.93	143.38	DC	12.61

10.4 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
168152840	243334	05MAGLEY	138.0	AEP	243242	05ALLEN	138.0	AEP	1	Base Case	operation	257.0	79.59	108.72	DC	74.87
169933746	946030	AF1-268 TAP	138.0	AEP	243278	05DESOTO	138.0	AEP	1	AEP_P1-2_#10526-B	operation	409.0	94.68	100.85	DC	25.21

10.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
161607894,164416485	1	05TANNER 345.0 kV - 06DEARB1 345.0 kV Ckt Z1	AEP AEPI0024a (9) : Replace Tanner's Creek 345 kV Riser (Sub Cond 2870 MCM ACSR) Project Type : FAC Cost : $100,000 Time Estimate : 12-18 Months	$100,000
			TOTAL COST	$100,000

10.6 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".

10.6.1 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
164416485	243233	05TANNER	AEP	248001	06DEARB1	OVEC	Z1	AEP_P4_#14920_05TANNER 345_T	breaker	1204.0	142.93	143.38	DC	12.61

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243415	05WWVSTA	2.5309	50/50	2.5309
243795	05HDWTR1G C	1.0971	50/50	1.0971
247264	05LAWG1A	15.3783	50/50	15.3783
247265	05LAWG1B	15.3783	50/50	15.3783
247266	05LAWG1S	24.5616	50/50	24.5616
247267	05LAWG2A	15.3783	50/50	15.3783
247268	05LAWG2B	15.3783	50/50	15.3783
247269	05LAWG2S	24.5616	50/50	24.5616
247289	05RICHG2	0.8780	50/50	0.8780
247543	V3-007 C	1.0971	50/50	1.0971
247929	S-071 E	12.2686	Adder	14.43
247935	V3-007 E	46.5363	50/50	46.5363
247958	05WLD G2 E	23.1449	Adder	27.23
247963	05HDWTR1G E	46.5363	50/50	46.5363
247968	Z2-115 E	0.1239	Adder	0.15
920501	AA2-148 C O1	5.7544	50/50	5.7544
920502	AA2-148 E O1	38.5101	50/50	38.5101
923881	AB2-028 C	4.8142	50/50	4.8142
923882	AB2-028 E	32.2178	50/50	32.2178
926881	AC1-175 C	20.3262	50/50	20.3262
926882	AC1-175 E	33.1638	50/50	33.1638
932681	AC2-090 C	10.1631	50/50	10.1631
932682	AC2-090 E	16.5819	50/50	16.5819
932841	AC2-111 C O1	5.5489	50/50	5.5489
932842	AC2-111 E O1	9.0535	50/50	9.0535
933596	AC2-176 E	13.8780	Adder	16.33
934161	AD1-043 C O1	7.4209	50/50	7.4209
934162	AD1-043 E O1	12.1079	50/50	12.1079
934961	AD1-128 C	10.6487	50/50	10.6487
934962	AD1-128 E	17.3743	50/50	17.3743
936561	AD2-071 C	8.3990	Adder	9.88
936562	AD2-071 E	4.1368	Adder	4.87
939761	AE1-207 C	8.1939	Adder	9.64
939762	AE1-207 E	11.3153	Adder	13.31
939771	AE1-208 C	8.9105	50/50	8.9105
939772	AE1-208 E	12.1507	50/50	12.1507
939781	AE1-209 C O1	2.7387	50/50	2.7387
939782	AE1-209 E O1	18.3283	50/50	18.3283
939791	AE1-210 C O1	2.7387	50/50	2.7387
939792	AE1-210 E O1	18.3283	50/50	18.3283
940981	AE2-089 C O1	9.8560	Adder	11.6
940982	AE2-089 E O1	6.5706	Adder	7.73

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
941691	AE2-169	5.3463	50/50	5.3463
941711	AE2-171	4.8822	50/50	4.8822
941721	AE2-172	4.8773	Adder	5.74
942071	AE2-219 C	5.5578	Adder	6.54
942072	AE2-219 E	7.6750	Adder	9.03
942081	AE2-220 C	14.0411	50/50	14.0411
942082	AE2-220 E	19.3901	50/50	19.3901
942221	AE2-234 C O1	2.4758	Adder	2.91
942222	AE2-234 E O1	1.1198	Adder	1.32
942791	AE2-297 C O1	22.6554	50/50	22.6554
942792	AE2-297 E O1	15.1036	50/50	15.1036
944031	AF1-071 C	1.3872	50/50	1.3872
944032	AF1-071 E	2.2634	50/50	2.2634
944531	AF1-118 C O1	31.0803	Adder	36.57
944532	AF1-118 E O1	9.3738	Adder	11.03
944541	AF1-119 C O1	23.8476	50/50	23.8476
944542	AF1-119 E O1	10.2204	50/50	10.2204
944831	AF1-148 C O1	11.4832	Adder	13.51
944832	AF1-148 E O1	7.6554	Adder	9.01
945371	AF1-202 C O1	6.0411	50/50	6.0411
945372	AF1-202 E O1	29.4949	50/50	29.4949
945561	AF1-221 C O1	34.4242	50/50	34.4242
945562	AF1-221 E O1	10.3472	50/50	10.3472
945581	AF1-223 C O1	15.9912	50/50	15.9912
945582	AF1-223 E O1	10.6608	50/50	10.6608
946031	AF1-268 C O1	10.3711	50/50	10.3711
946032	AF1-268 E O1	4.7042	50/50	4.7042
953351	J805	18.8732	PJM External (MISO)	18.8732
954351	J903	9.6360	PJM External (MISO)	9.6360
955151	J993	19.1640	PJM External (MISO)	19.1640
956561	J1152	21.9860	PJM External (MISO)	21.9860
957741	AF2-068 C O1	11.0435	Adder	12.99
957742	AF2-068 E O1	7.3624	Adder	8.66
958711	AF2-162 C	5.1102	50/50	5.1102
958712	AF2-162 E	2.5551	50/50	2.5551
958821	AF2-173 C	17.6963	50/50	17.6963
958822	AF2-173 E	24.4377	50/50	24.4377
958861	AF2-177 C O1	4.3784	50/50	4.3784
958862	AF2-177 E O1	29.3016	50/50	29.3016
959131	AF2-204 C	7.6433	Adder	8.99
959132	AF2-204 E	4.0339	Adder	4.75
959201	AF2-211 C	10.9518	50/50	10.9518
959202	AF2-211 E	7.3012	50/50	7.3012
960441	AF2-335 C	10.8672	50/50	10.8672
960442	AF2-335 E	3.6224	50/50	3.6224
960791	AF2-370	3.6224	50/50	3.6224
960971	AF2-388 C	5.7355	50/50	5.7355
960972	AF2-388 E	26.8525	50/50	26.8525
961161	AF2-407	52.5750	50/50	52.5750
961171	AF2-408	14.3080	50/50	14.3080
961761	AG1-017 C	0.1906	Adder	0.42
961762	AG1-017 E	0.8916	Adder	1.98

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
962031	AG1-047 C	3.9021	Adder	8.66
962032	AG1-047 E	2.6014	Adder	5.77
962051	AG1-049	3.2125	50/50	3.2125
963721	AG1-224 C O1	39.1759	50/50	39.1759
963722	AG1-224 E O1	26.1173	50/50	26.1173
963731	AG1-225 C	10.4416	Adder	23.18
963732	AG1-225 E	7.0115	Adder	15.56
963791	AG1-232 C	3.4086	Adder	7.57
963792	AG1-232 E	2.2724	Adder	5.04
964351	AG1-297 C	55.6400	50/50	55.6400
964352	AG1-297 E	83.4600	50/50	83.4600
964611	AG1-324 C O1	2.1577	Adder	4.79
964612	AG1-324 E O1	0.9247	Adder	2.05
965031	AG1-367 C	12.6402	50/50	12.6402
965032	AG1-367 E	8.4268	50/50	8.4268
965101	AG1-375 C	10.1040	50/50	10.1040
965102	AG1-375 E	6.7360	50/50	6.7360
965111	AG1-376 C	2.0208	50/50	2.0208
965112	AG1-376 E	3.0312	50/50	3.0312
965461	AG1-414 C O1	2.6277	Adder	5.83
965462	AG1-414 E O1	1.7518	Adder	3.89
965651	AG1-433 C	2.8677	50/50	2.8677
965652	AG1-433 E	13.4263	50/50	13.4263
WEC	WEC	1.2880	Confirmed LTF	1.2880
CALDERWOOD	CALDERWOOD	0.1779	Confirmed LTF	0.1779
CBM-W2	CBM-W2	26.8710	Confirmed LTF	26.8710
NY	NY	0.5790	Confirmed LTF	0.5790
TVA	TVA	0.9828	Confirmed LTF	0.9828
O-066	O-066	7.3222	Confirmed LTF	7.3222
SIGE	SIGE	0.5410	Confirmed LTF	0.5410
CHEOAH	CHEOAH	0.1862	Confirmed LTF	0.1862
CBM-S1	CBM-S1	0.0262	Confirmed LTF	0.0262
G-007	G-007	1.1445	Confirmed LTF	1.1445
HAMLET	HAMLET	0.5290	Confirmed LTF	0.5290
MEC	MEC	5.5869	Confirmed LTF	5.5869
BLUEG	BLUEG	6.4232	Confirmed LTF	6.4232
TRIMBLE	TRIMBLE	2.4364	Confirmed LTF	2.4364
LAGN	LAGN	2.3030	Confirmed LTF	2.3030
CATAWBA	CATAWBA	0.3031	Confirmed LTF	0.3031
CBM-W1	CBM-W1	45.6211	Confirmed LTF	45.6211

10.7 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
AA2-148	Madison-Tanners Creek 138kV	Active
AB2-028	Fall Creek-Desoto 345kV	Active
AC1-175	Losantville 345kV	Active
AC2-090	Losantville 345kV	Active
AC2-111	College Corner 138kV	Active
AC2-176	Jay 138 kV	In Service
AD1-043	Makahoy 138 kV	Active
AD1-128	Modoc-Delaware 138 kV	Active
AD2-071	Strawton-Pipe Creek 138 kV	Active
AE1-207	Mississinewa-Gaston 138 kV	Active
AE1-208	Delaware-Van Buren 138 kV	Active
AE1-209	Desoto 345 kV	Active
AE1-210	Desoto 345 kV	Active
AE2-089	Pennville-Adams 138 kV	Active
AE2-169	Delaware-Van Buren 138 kV	Active
AE2-171	Makahoy 138 kV	Active
AE2-172	Mississinewa-Gaston 138 kV	Active
AE2-219	Bluff Point-Randolph 138 kV	Active
AE2-220	Losantville 345 kV	Active
AE2-234	Liberty Center-Buckeye Tap 69 kV	Active
AE2-297	Madison-Tanners Creek 138 kV	Active
AF1-071	College Corner 138 kV	Active
AF1-118	Sorenson-Desoto 345 kV	Active
AF1-119	Keystone-Desoto 345 kV	Active
AF1-148	Sorenson-Desoto 345 kV	Active
AF1-202	Keystone-Desoto 345 kV	Active
AF1-221	College Corner-Drewersburg 138 kV	Active
AF1-223	Jay-Desoto 138 kV	Active
AF1-268	Desoto-Jay 138 kV	Active
AF2-068	Jay 138 kV	Active
AF2-162	Keystone-Desoto 345 kV	Active
AF2-173	Desoto 345 kV	Active
AF2-177	Sorenson-DeSoto #2 345 kV	Active
AF2-204	Van Buren 138 kV	Active
AF2-211	College Corner 138 kV	Active
AF2-335	West Del-Royerton 138 kV	Active
AF2-370	West Del-Royerton 138 kV	Active
AF2-388	Desoto-Sorenson 345 kV	Active
AF2-407	Fall Creek 345 kV	Active

Queue Number	Project Name	Status
AF2-408	Fall Creek 138 kV	Active
AG1-017	Jay 138 kV	Active
AG1-047	Jay 138 kV	Active
AG1-049	College Corner 138 kV	Active
AG1-224	Pendleton-Tanners Creek 138 kV	Active
AG1-225	Adams 138 kV	Active
AG1-232	Magley 138 kV	Active
AG1-297	Hanna-Tanners Creek 345 kV	Active
AG1-324	Jay-Desoto 138 kV	Active
AG1-367	DeSoto 345 kV	Active
AG1-375	Sorenson-Desoto 345 kV	Active
AG1-376	Sorenson-DeSoto 345 kV	Active
AG1-414	Mississinewa 138 kV	Active
AG1-433	DeSoto-Keystone 345 kV	Active
V3-007	Desoto-Tanners Creek #1 345kV	Under Construction
Z2-115	Deer Creek 12.47kV	In Service
J1152	MISO	MISO
J805	MISO	MISO
J903	MISO	MISO
J993	MISO	MISO

10.8 Contingency Descriptions

Contingency Name	Contingency Definition
AEP_P4_#14920_05TANNER 345_T	CONTINGENCY 'AEP_P4_#14920_05TANNER 345_T' OPEN BRANCH FROM BUS 243233 TO BUS 249565 CKT 1 / 243233 05TANNER 345 249565 08EBEND
Base Case	
DEOK_P7_4504MFTANNERS4512EBTANNERS	CONTINGENCY 'DEOK_P7_4504MFTANNERS4512EBTANNERS' OPEN BRANCH FROM BUS 243233 TO BUS 249567 CKT 1 OPEN BRANCH FROM BUS 243233 TO BUS 249565 CKT 1 END
AEP_P1-2_#10526-B	CONTINGENCY 'AEP_P1-2_#10526-B' OPEN BRANCH FROM BUS 942070 TO BUS 243362 CKT 1 / 942070 AE2-219 TAP 138 243362 05RANDOL 138 1 END

11 Short Circuit Analysis

The following Breakers are overdutied:

None.

12 Affected Systems

12.1 TVA

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

12.2 Duke Energy Progress

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

12.3 MISO

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

12.4 LG&E

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