Revised Generation Interconnection

System Impact Study Report

for

Queue Project AF1-223

KEYSTONE – DESOTO 345 KV

90 MW Capacity / 150 MW Energy

April, 2021

Table of Contents

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 AEP.

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.

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.

3 General

The Interconnection Customer (IC), has proposed a Solar generating facility located in Blackford County, Indiana. The installed facilities will have a total capability of 150 MW with 90 MW of this output being recognized by PJM as Capacity.

The proposed in-service date for this project is December 31, 2022. This study does not imply a TO commitment to this in-service date.

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.

Queue Number	**AF1-223**
Project Name	KEYSTONE – DESOTO 345 KV
State	Indiana
County	Blackford
Transmission Owner	AEP
MFO	150
MWE	150
MWC	90
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

AF1-223 will interconnect with the AEP transmission system at the Keystone – Desoto 345 kV circuit utilizing the new switching station to be constructed by previous queue position AF1-202.

To accommodate the interconnection to the proposed AF1-202 switching station, one (1) new 345 kV circuit breaker will be installed (Attachment 1). Installation of associated protection and control equipment, 345 kV line risers, SCADA, and 345 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

This project will be responsible for the following costs:

Description	Total Cost
Attachment Facilities	$1,082,000
Direct Connection Network Upgrade	$2,390,000
Non Direct Connection Network Upgrades	$90,000
Allocation for New System Upgrades*	$0
Contribution to Previously Identified Upgrades*	$3,210,000
Total Costs	**$6,772,000**

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

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.

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.

6 Transmission Owner Scope of Work

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
138kV Revenue Metering	$431,000
Generator lead first span exiting the POI station, including the first structure outside the fence	$651,000
Total Attachment Facility Costs	**$1,082,000**

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
Install one (1) 345 kV circuit breaker. Installation of associated protection and control equipment, 345 kV line risers and SCADA will also be required.	$2,390,000
Total Direct Connection Facility Costs	**$2,390,000**

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 and Revise the P&C relay settings at the 345 kV Keystone station	$45,000*
Review and Revise the P&C relay settings at the 345 kV Desoto station	$45,000
Total Non-Direct Connection Facility Costs	**$90,000**

*The Keystone station is not owned by AEP, but AEP provides maintenance services under an existing Agreement. The estimated cost shown was created in a manner similar to those for AEP facilities.

7 Incremental Capacity Transfer Rights (ICTRs)

None

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 the Interconnected Transmission Owner. The cost of the Interconnection Customer's generating plant and the costs for the line connecting the generating plant to the Interconnected Transmission Owner's Transmission circuit 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 the Interconnected 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.

Requirement from the PJM Open Access Transmission Tariff:

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.

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/meter^2)
- Ambient air temperature (Fahrenheit) – (Accepted, not required)
- Wind speed (meters/second) – (Accepted, not required)

Wind direction (decimal degrees from true north) – (Accepted, not required)

10.3 Interconnected Transmission Owner Requirements

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

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

11 Summer Peak Analysis

The Queue Project AF1-223 was evaluated as a 150.0 MW (Capacity 90.0 MW) injection tapping the Desoto – Keystone 345 kV line (specifically into the AF1-202 Tap interconnection substation which is a tap of the AF1-119 Tap – Desoto 345 kV line) in the AEP area. Project AF1-223 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF1-223 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	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
42768905	248001	06DEARB1	345.0	OVEC	248013	06PIERCE	345.0	OVEC	1	DEOK_P7-1_C5 4504MFTANNERS4512EBTANNERS	tower	972.0	126.88	128.56	AC	15.83

11.4 Steady-State Voltage Requirements

None

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	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
43542337	243218	05DESOTO	345.0	AEP	944830	AF1-148 TAP	345.0	AEP	2	AEP_P1-2_#4817	operation	971.0	104.24	107.95	AC	36.65
43542417	243225	05KEYSTN	345.0	AEP	243232	05SORENS	345.0	AEP	1	AEP_P1-2_#8702-C	operation	1301.0	97.16	101.74	AC	60.17
43542418	243225	05KEYSTN	345.0	AEP	243232	05SORENS	345.0	AEP	1	Base Case	operation	897.0	97.92	103.9	AC	54.05
43542214	944530	AF1-118 TAP	345.0	AEP	243232	05SORENS	345.0	AEP	2	AEP_P1-2_#4817	operation	971.0	134.66	138.38	AC	36.65
43542219	944530	AF1-118 TAP	345.0	AEP	243232	05SORENS	345.0	AEP	2	Base Case	operation	971.0	98.68	100.42	AC	17.07
43542250	944540	AF1-119 TAP	345.0	AEP	243225	05KEYSTN	345.0	AEP	1	AEP_P1-2_#8702-C	operation	897.0	119.05	125.64	AC	60.35
43542288	944830	AF1-148 TAP	345.0	AEP	944530	AF1-118 TAP	345.0	AEP	2	AEP_P1-2_#4817	operation	971.0	113.08	116.77	AC	36.65
43542309	945370	AF1-202 TAP	345.0	AEP	944540	AF1-119 TAP	345.0	AEP	1	AEP_P1-2_#8702-C	operation	897.0	109.42	115.99	AC	60.35

11.6 System Reinforcements

<table>
<tr><th>ID</th><th>Idx</th><th>Facility</th><th>Upgrade Description</th><th>Cost</th><th>Cost Allocated to AF1-223</th><th>Upgrade Number</th></tr>
<tr><td>42238369,42768905</td><td>1</td><td>06DEARB1 345.0 kV - 06PIERCE 345.0 kV Ckt 1</td><td>1) Perform a sag study on the line. OVEC's cost estimate for performing the sag study is $125K. New SE rating to be 1204 MVA. PJM Network Upgrade N6759.1.

This constraint is presently driven by a prior queue cycle. Per PJM cost allocation rules, Queue Project AF1-223 presently does not receive cost allocation for this upgrade.

2) Replace 2, 1600 A switches at Dearborn and 4 switches at Pierce. Cost $7.5M. New SE rating to be 1319 MVA. PJM Network Upgrade N6759.2.

The cost allocation is as follows:

<table>
<tr><th>Queue</th><th>MW contribution</th><th>Percentage of Cost</th><th>$ cost ($9 M)</th></tr>
<tr><td>AF1-202</td><td>4.7</td><td>10.61%</td><td>0.955</td></tr>
<tr><td>AF1-221</td><td>23.8</td><td>53.72%</td><td>4.835</td></tr>
<tr><td>AF1-223</td><td>15.8</td><td>35.67%</td><td>3.210</td></tr>
</table>
</td><td>$125 K + $9 M</td><td>$0 + $3.210 M</td><td>N6759.1
N6759.2</td></tr>
<tr><td></td><td></td><td></td><td>TOTAL COST</td><td>$9,125,000</td><td>$3,210,000</td><td></td></tr>
</table>

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
4276890 5	24800 1	06DEARB 1	OVEC	24801 3	06PIERC E	OVE C	1	DEOK_P7-1_C5 4504MFTANNERS4512EBTANNE RS	towe r	972.0	126.88	128.56	AC	15.83

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243795	05HDWTR1G C	0.7148	50/50	0.7148
247264	05LAWG1A	8.8080	50/50	8.8080
247265	05LAWG1B	8.8080	50/50	8.8080
247266	05LAWG1S	14.0650	50/50	14.0650
247267	05LAWG2A	8.8080	50/50	8.8080
247268	05LAWG2B	8.8080	50/50	8.8080
247269	05LAWG2S	14.0650	50/50	14.0650
247543	V3-007 C	0.7148	50/50	0.7148
247929	S-071 E	7.3505	Adder	8.65
247935	V3-007 E	27.0083	50/50	27.0083
247958	05WLD G2 E	13.9928	Adder	16.46
247963	05HDWTR1G E	27.0083	50/50	27.0083
247968	Z2-115 E	0.0795	Adder	0.09
250163	Y3-099 BAT	0.1994	Merchant Transmission	0.1994
250167	Y3-100 BAT	0.1994	Merchant Transmission	0.1994
251823	Z1-065 BAT	0.3779	Merchant Transmission	0.3779
913222	Y1-054 E	-1.2718	Adder	-1.5
920501	AA2-148 C OP	3.5399	50/50	3.5399
920502	AA2-148 E OP	23.6901	50/50	23.6901
923881	AB2-028 C	2.9055	50/50	2.9055
923882	AB2-028 E	19.4445	50/50	19.4445
926691	AC1-152	2.7785	50/50	2.7785
926851	AC1-172	2.7785	50/50	2.7785
926881	AC1-175 C	11.7967	50/50	11.7967
926882	AC1-175 E	19.2473	50/50	19.2473
932681	AC2-090 C	5.8984	50/50	5.8984
932682	AC2-090 E	9.6236	50/50	9.6236
932841	AC2-111 C O1	2.4228	Adder	2.85
932842	AC2-111 E O1	3.9529	Adder	4.65
933592	AC2-176 E O1	8.6223	Adder	10.14
933601	AC2-177 C O1	4.0357	50/50	4.0357
933602	AC2-177 E O1	27.0083	50/50	27.0083
934161	AD1-043 C O1	3.8082	Adder	4.48
934162	AD1-043 E O1	6.2133	Adder	7.31
934961	AD1-128 C	6.0910	50/50	6.0910
934962	AD1-128 E	9.9380	50/50	9.9380
936561	AD2-071 C	5.0594	Adder	5.95
936562	AD2-071 E	2.4920	Adder	2.93
939761	AE1-207 C	5.0266	Adder	5.91
939762	AE1-207 E	6.9414	Adder	8.17
939771	AE1-208 C	4.5100	Adder	5.31

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939772	AE1-208 E	6.1500	Adder	7.24
939781	AE1-209 C O1	1.6077	50/50	1.6077
939782	AE1-209 E O1	10.7593	50/50	10.7593
939791	AE1-210 C O1	1.6077	50/50	1.6077
939792	AE1-210 E O1	10.7593	50/50	10.7593
940981	AE2-089 C O1	6.1604	Adder	7.25
940982	AE2-089 E O1	4.1069	Adder	4.83
940991	AE2-090 C	6.7682	Adder	7.96
940992	AE2-090 E	4.5122	Adder	5.31
941691	AE2-169	2.7060	Adder	3.18
941711	AE2-171	2.5054	Adder	2.95
941721	AE2-172	2.9920	Adder	3.52
942071	AE2-219 C	3.2551	Adder	3.83
942072	AE2-219 E	4.4952	Adder	5.29
942081	AE2-220 C	8.1490	50/50	8.1490
942082	AE2-220 E	11.2535	50/50	11.2535
942221	AE2-234 C O1	1.5313	Adder	1.8
942222	AE2-234 E O1	0.6926	Adder	0.81
942791	AE2-297 C O1	13.9098	50/50	13.9098
942792	AE2-297 E O1	9.2732	50/50	9.2732
943772	AF1-045 BAT	3.3173	Merchant Transmission	3.3173
944031	AF1-071 C	0.6057	Adder	0.71
944032	AF1-071 E	0.9882	Adder	1.16
944121	AF1-080	1.6084	Adder	1.89
944531	AF1-118 C O1	18.8909	Adder	22.22
944532	AF1-118 E O1	5.6975	Adder	6.7
944541	AF1-119 C O1	14.2128	50/50	14.2128
944542	AF1-119 E O1	6.0912	50/50	6.0912
944831	AF1-148 C O1	6.9535	Adder	8.18
944832	AF1-148 E O1	4.6356	Adder	5.45
945371	AF1-202 C O1	3.5887	50/50	3.5887
945372	AF1-202 E O1	17.5213	50/50	17.5213
945561	AF1-221 C O1	18.2992	50/50	18.2992
945562	AF1-221 E O1	5.5004	50/50	5.5004
945581	AF1-223 C O1	9.4995	50/50	9.4995
945582	AF1-223 E O1	6.3330	50/50	6.3330
946031	AF1-268 C O1	5.9601	50/50	5.9601
946032	AF1-268 E O1	2.7034	50/50	2.7034
946491	AF1-313 C O1	2.5723	50/50	2.5723
946492	AF1-313 E O1	1.7149	50/50	1.7149
956561	J1152	12.1360	PJM External (MISO)	12.1360
WEC	WEC	1.1444	Confirmed LTF	1.1444
LGEE	LGEE	0.9002	Confirmed LTF	0.9002
CBM-W2	CBM-W2	24.8321	Confirmed LTF	24.8321
NY	NY	0.5005	Confirmed LTF	0.5005
TVA	TVA	1.8144	Confirmed LTF	1.8144
O-066	O-066	6.1085	Confirmed LTF	6.1085
CBM-S1	CBM-S1	11.4850	Confirmed LTF	11.4850
G-007	G-007	0.9454	Confirmed LTF	0.9454
MADISON	MADISON	20.2346	Confirmed LTF	20.2346
MEC	MEC	5.2739	Confirmed LTF	5.2739
CATAWBA	CATAWBA	0.0858	Confirmed LTF	0.0858

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CBM-W1	CBM-W1	36.5292	Confirmed LTF	36.5292

11.7.2 Index 2

None

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
AA2-148	Madison-Tanners Creek 138kV	Active
AB2-028	Fall Creek-Desoto 345kV	Active
AC1-152	Lawrenceburg 345kV PB I	In Service
AC1-172	Lawrenceburg 345kV PB II	Partially in Service - Under Construction
AC1-175	Losantville 345kV	Active
AC1-212	Minster 69kV	Engineering and Procurement
AC2-090	Losantville 345kV	Active
AC2-111	College Corner 138kV	Active
AC2-176	Jay 138 kV	Under Construction
AC2-177	Desoto-Tanners Creek 345kV	Active
AD1-043	Makahoy 138 kV	Active
AD1-128	Modoc 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
AE2-090	Randolph-Hodgin 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
AF1-045	Cedarville-Ford 138 kV	Active
AF1-071	College Corner 138 kV	Active
AF1-080	Deer Creek-Fisher Body-Mullin 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	Keystone – Desoto 345 kV	Active
AF1-268	Desoto-Jay 138 kV	Active
AF1-313	Wes Del-Royerton 138 kV	Active
V3-007	Desoto-Tanners Creek #1 345kV	Under Construction
Y1-054	Rochelle 138kV	In Service

Queue Number	Project Name	Status
Y3-099	Beckjord 2 MW-1	In Service
Y3-100	Beckjord 2 MW-2	In Service
Z1-065	Wiley 34.5kV	In Service
Z2-115	Deer Creek 12.47kV	In Service
J1152	MISO	MISO

11.9 Contingency Descriptions

Contingency Name	Contingency Definition
AEP_P1-2_#4817	CONTINGENCY 'AEP_P1-2_#4817' OPEN BRANCH FROM BUS 243225 TO BUS 243232 CKT 1 / 243225 05KEYSTN 345 243232 05SORENS 345 1 END
AEP_P1-2_#8702-C	CONTINGENCY 'AEP_P1-2_#8702-C' OPEN BRANCH FROM BUS 944530 TO BUS 243232 CKT 2 / 944530 AF1-118 TAP 345 243232 05SORENS 345 2 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
AEP_P7-1_#11087-C	CONTINGENCY 'AEP_P7-1_#11087-C' OPEN BRANCH FROM BUS 944540 TO BUS 243225 CKT 1 / 944540 AF1-119 TAP 345 243225 05KEYSTN 345 1 OPEN BRANCH FROM BUS 944530 TO BUS 243232 CKT 2 / 944530 AF1-118 TAP 345 243232 05SORENS 345 2 END
Base Case	
AEP_P7-1_#11019	CONTINGENCY 'AEP_P7-1_#11019' OPEN BRANCH FROM BUS 944530 TO BUS 243232 CKT 2 / 243218 05DESOTO 345 243232 05SORENS 345 2 OPEN BRANCH FROM BUS 243225 TO BUS 243232 CKT 1 / 243225 05KEYSTN 345 243232 05SORENS 345 1 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

12 Light Load Analysis

Not Required

13 Short Circuit Analysis

The following Breakers are overdutied:

None.

14 Stability and Reactive Power

To be determined in the Facilities Study Phase.

15 Affected Systems

15.1 TVA

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

15.2 Duke Energy Progress

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

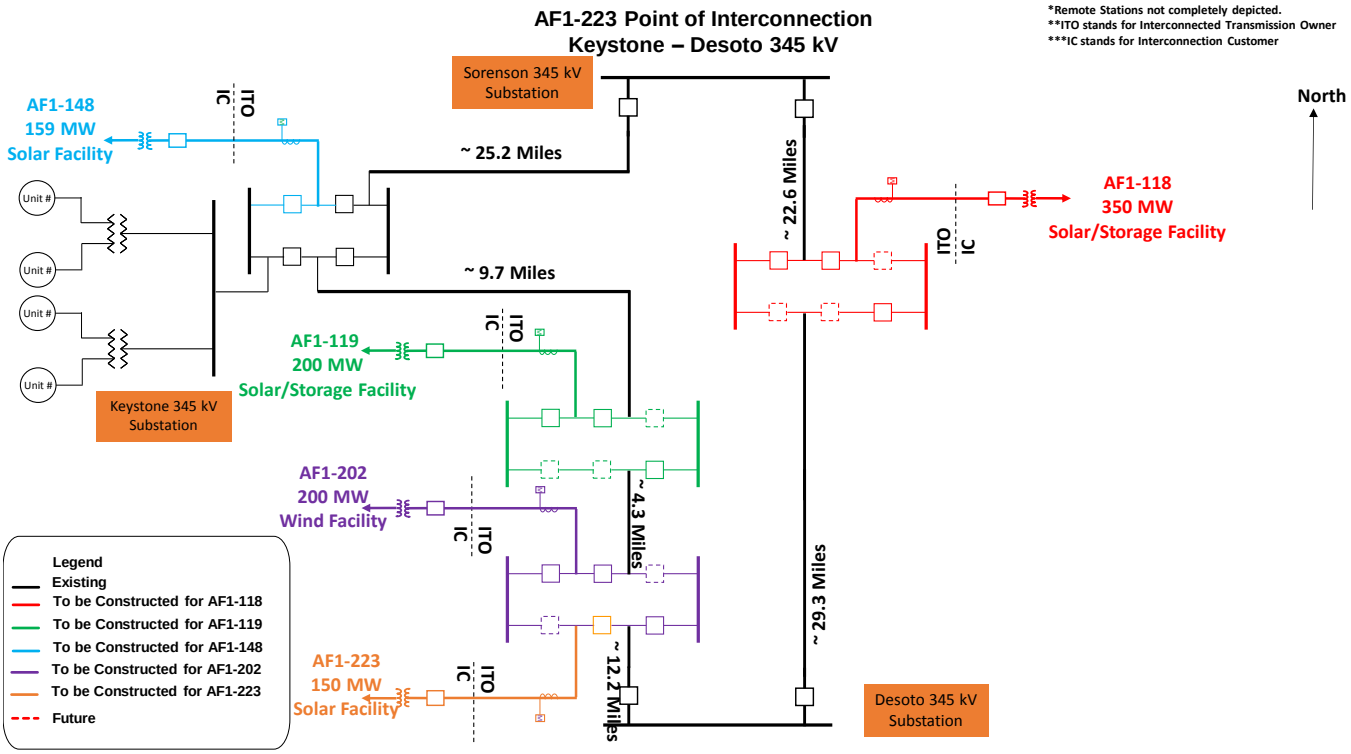
15.3 MISO

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

15.4 LG&E

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

16 Attachment 1: One-Line Diagram



17 Attachment 2: Site Location