Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-526

WEST GARRARD 345 KV

133.2 MW Capacity / 222 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 EKPC.

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 Garrard County, Kentucky. The installed facilities will have a total capability of 222 MW with 133.2 MW of this output being recognized by PJM as Capacity.

The proposed in-service date for this project is June 01, 2023. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-526
Project Name	WEST GARRARD 345 KV
State	Kentucky
County	Garrard
Transmission Owner	EKPC
MFO	222
MWE	222
MWC	133.2
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

AG1-526 will interconnect with the EKPC transmission system at the Garrard 345 kV substation.

5 Cost Summary

The AG1-526 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$4,150,000
Total System Network Upgrade Costs	$51,128,434
Total Costs	**$55,278,434**

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.

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
Install necessary equipment (a 345 kV isolation switch structure and associated switch, plus interconnection metering, fiber-optic connection and telecommunications equipment) at West Garrard substation) to accept the IC generator lead line/bus (Estimated time to implement is 12 months)	$420,000
Total Attachment Facility Costs	**$420,000**

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 additional equipment (switches, bus/bus supports, circuit breakers, relay panels, etc.) at West Garrard substation for connection of the IC generator lead line/bus to the West Garrard switching station (Estimated time to implement is 12 months).	$3,730,000
Total Direct Connection Facility Costs	**$3,730,000**

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
None.	$0
Total Non-Direct Connection Facility Costs	**$0**

7 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.

8 Revenue Metering and SCADA Requirements

8.1 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.

8.2 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)

8.3 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/

9 Summer Peak - Load Flow Analysis

The Queue Project AG1-526 was evaluated as a 222.0 MW (Capacity 133.2 MW) injection at the Garrard 345 kV substation in the EKPC area. Project AG1-526 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-526 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

9.1 Generation Deliverability

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

None

9.2 Multiple Facility Contingency

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

None

9.3 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
165693189	250054	08LONGBR	138.0	DEO&K	250077	08MTZION	138.0	DEO&K	1	34541 34553	tower	284.0	123.6	125.74	DC	13.32
165693209	250077	08MTZION	138.0	DEO&K	249991	08BUFTN1	138.0	DEO&K	1	34541 34553	tower	298.0	113.16	115.2	DC	13.32
164768517	324010	7TRIMBLREAC	345.0	LGEE	248000	06CLIFTY	345.0	OVEC	1	AEP_P1-2_#363_1682	single	1451.0	111.58	112.81	DC	17.94
164768518	324010	7TRIMBLREAC	345.0	LGEE	248000	06CLIFTY	345.0	OVEC	1	AEP_P1-2_#10136	single	1451.0	106.34	107.59	DC	18.0
164769106	342559	4BOONECO	138.0	EKPC	250054	08LONGBR	138.0	DEO&K	1	34541 34553	tower	284.0	131.21	133.35	DC	13.32
164767992	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	EKPC_P2-2_MELD-SPUR 345	bus	1532.0	120.25	121.75	DC	49.71
164768181	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	DEOK_P2-3_1449_ZIMMER	breaker	1532.0	121.92	123.42	DC	49.58
164768182	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	DEOK_P2-3_1493_REDBANK	breaker	1532.0	120.16	121.44	DC	42.19

9.4 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
164768514	324010	7TRIMBL REAC	345.0	LGEE	248000	06CLIFTY	345.0	OVEC	1	AEP_P1-2_#363_1682	operation	1451.0	124.81	126.88	DC	29.91
164768520	324010	7TRIMBL REAC	345.0	LGEE	248000	06CLIFTY	345.0	OVEC	1	Base Case	operation	1134.0	104.67	107.31	DC	29.95
169497979	342541	4AVON	138.0	EKPC	342631	4PARIS T	138.0	EKPC	1	EKPC_P2-1_7N CLARK 345.00 TO 7SPURLOCK 345.00-C	operation	220.0	111.54	113.94	DC	11.71
169497996	342829	7AVON	345.0	EKPC	342541	4AVON	138.0	EKPC	1	EKPC_P2-1_7N CLARK 345.00 TO 7SPURLOCK 345.00-C	operation	526.0	110.19	111.51	DC	15.29
164768504	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	Base Case	operation	1240.0	126.47	127.97	DC	40.04
164768505	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	DEOK_P1_ZIMMER-MELDAHL 34576	operation	1532.0	119.92	121.42	DC	49.62
170078726	958170	AF2-111 TAP	345.0	EKPC	342838	7SPURLOCK	345.0	EKPC	1	EKPC_P2-1_7W GARRARDKU345.00 TO 7W GARRARDEK345.00	operation	1151.0	93.31	103.23	DC	113.93

9.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
164768517,164768518	3	7TRIMBL REAC 345.0 kV - 06CLIFTY 345.0 kV Ckt 1	**LGEE** Limited by LGEE/KU conductor. OVEC owns no equipment on this circuit. (8) : Limited by LGEE/KU conductor. OVEC owns no equipment on this circuit. Project Type : FAC Cost : $0 Time Estimate : 0.0 Months **LGEE** NonPJMArea (2322) : The external (i.e. Non-PJM) Transmission Owner, LGEE, will not evaluate this violation until the impact study phase. Project Type : FAC Cost : $0 Time Estimate : 0.0 Months	$0
165693189	1	08LONGBR 138.0 kV - 08MTZION 138.0 kV Ckt 1	**DEOK** n30581 (30) : Rebuild the line & Replace switch at Mt. Zion Project Type : FAC Cost : $3,228,008 Time Estimate : 30.0 Months	$3,228,008

ID	Idx	Facility	Upgrade Description	Cost
164767992,164768181,164768182	5	7SPURLOCK 345.0 kV - 09STUART 345.0 kV Ckt 1	**DAY** **DAYr190039 (2176) : Reconductor Stuart-Spurlock line with twin bundle 1033 Curlew ACCR conductor. Reconductor Stuart Stuart-Spurlock line with a bundled 795 hi-temperature conductor.** **Project Type : FAC** **Cost : $17,000,000** **Time Estimate : 18.0 Months** **DAY** **DAYr190040 (2177) : Replace Stuart substation riser conductor with 2500AAC (parallel)** **Project Type : FAC** **Cost : $100,000** **Time Estimate : 12.0 Months** **DAY** **DAYr190041 (2178) : Reconductor Stuart substation conductor with twin bundle 1033 Curlew ACCR conductor Reconductor Stuart Substation conductor with a bundled 795 hi-temperature conductor.** **Project Type : FAC** **Cost : $250,000** **Time Estimate : 12.0 Months** **DAY** **r190017 (2179) : A second new 345kV transmission line between Stuart and Spurlock. According to FENo: 173531 the desired rating of the Stuart to Spurloack line is 2245 MVA. After DAYr190041 the limiting element becomes the newly reconductored line conductor as there are no conductor at 345kV that can go up over 2000MVA. Hence to relieve the overloads the only option is to erect a second transmission line between Stuart to Spurlock. The line will be 7.71 miles long and will cost 21.59 million USD approximately. EKPC will need to provide the estimates of this line on the Kentucky side.** **Project Type : FAC** **Cost : $21,590,000** **Time Estimate : 12.0 Months** **EKPC** **r0040 (2277) : Replace the 1500A interconnection metering CTs with 2000A equipment.** **Project Type : FAC** **Cost : $150,000** **Time Estimate : 9.0 Months** **EKPC** **r0041 (2278) : Replace the 3000A wave trap with 3600A equipment.** **Project Type : FAC** **Cost : $170,000** **Time Estimate : 9.0 Months** **EKPC** **r0005 (2331) : No Violation. EKPC emergency rating 1792 MVA.** **Project Type : FAC** **Cost : $0** **Time Estimate : N/A Months**	$39,260,000

ID	Idx	Facility	Upgrade Description	Cost
165693209	2	08MTZION 138.0 kV - 08BUFTN1 138.0 kV Ckt 1	**DEOK** **n6785b (38) : Rebuild the line, replace two switches at Mt. Zion & replace meter at Buffington** **Project Type : FAC** **Cost : $5,625,426** **Time Estimate : 30.0 Months**	$5,625,426
164769106	4	4BOONE CO 138.0 kV - 08LONGBR 138.0 kV Ckt 1	**Not a violation for DEOK portion (40) : Not a violation for DEOK portion** **Project Type : FAC** **Cost : $0** **Time Estimate : 0.0 Months** **EKPC** **r0052 (2289) : Replace the 954 MCM ACSR line conductor in the Boone County-Longbranch 138 kV line with 954 MCM ACSS conductor (2.3 miles)** **Project Type : FAC** **Cost : $2,590,000** **Time Estimate : 14.0 Months** **EKPC** **r0010 (2336) : upgrade jumpers associated with Boone 138kV bus using 2-500 MCM 37 CU conductor or equivalent** **Project Type : FAC** **Cost : $20,000** **Time Estimate : 6 mo Months** **EKPC** **EKPC-r0094a (2365) : Replace the 1200A disconnect switches N15-813 and N15-815 at the Boone County substation with 1600A equipment** **Project Type : FAC** **Cost : $200,000** **Time Estimate : 9.0 Months** **EKPC** **EKPC-r0094b (2366) : Replace the 750 MCM copper substation jumpers at the Boone County substation with bundled 500 MCM copper or equivalent equipment** **Project Type : FAC** **Cost : $15,000** **Time Estimate : 9.0 Months** **EKPC** **EKPC-r0094c (2367) : Replace the 750 MCM copper substation bus and jumpers at the Longbranch substation with bundled 500 MCM copper or equivalent equipment** **Project Type : FAC** **Cost : $190,000** **Time Estimate : 9.0 Months**	$3,015,000
			TOTAL COST	**$51,128,434**

9.6 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".

9.6.1 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
165693189	250054	08LONGBR	DEO&K	250077	08MTZION	DEO&K	1	34541 34553	tower	284.0	123.6	125.74	DC	13.32

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
341200	2BROMLEYEK	0.0326	50/50	0.0326
341584	2GRIFFIN	0.1067	50/50	0.1067
342550	4BAVARIAN LF	0.3476	50/50	0.3476
342957	1SPURLK1G	6.1194	50/50	6.1194
342960	1SPURLK2G	9.6128	50/50	9.6128
342963	1SPURLK3G	5.0515	50/50	5.0515
342966	1SPURLK4G	5.0515	50/50	5.0515
925984	AC1-074 C	9.5698	50/50	9.5698
925985	AC1-074 E	4.1014	50/50	4.1014
932551	AC2-075 C	2.2728	50/50	2.2728
932552	AC2-075 E	1.1450	50/50	1.1450
936381	AD2-048 C	6.3498	50/50	6.3498
936382	AD2-048 E	3.1681	50/50	3.1681
936570	AD2-072_C	3.1125	Adder	3.66
936576	AD2-072_E	1.5258	Adder	1.8
939141	AE1-144 C O1	9.2671	50/50	9.2671
939142	AE1-144 E O1	4.5989	50/50	4.5989
940531	AE2-038 C O1	6.1819	50/50	6.1819
940532	AE2-038 E O1	3.0621	50/50	3.0621
941411	AE2-138 C	14.9666	Adder	17.61
941412	AE2-138 E	5.5356	Adder	6.51
941981	AE2-210 C O1	5.1571	Adder	6.07
941982	AE2-210 E O1	1.9398	Adder	2.28
942411	AE2-254 C O1	1.4657	Adder	1.72
942412	AE2-254 E O1	0.9772	Adder	1.15
942591	AE2-275 C O1	4.2426	Adder	4.99
942592	AE2-275 E O1	1.5959	Adder	1.88
942891	AE2-308 C O1	7.2902	Adder	8.58
942892	AE2-308 E O1	2.6510	Adder	3.12
943111	AE2-339 C	2.1946	Adder	2.58
943112	AE2-339 E	1.0809	Adder	1.27
944621	AF1-127 C O1	4.2562	Adder	5.01
944622	AF1-127 E O1	2.0963	Adder	2.47
945681	AF1-233 C	17.4862	50/50	17.4862
945682	AF1-233 E	8.6386	50/50	8.6386
945861	AF1-251 C	10.4436	Adder	12.29
945862	AF1-251 E	6.9624	Adder	8.19
945911	AF1-256 C	5.6016	50/50	5.6016
945912	AF1-256 E	3.7344	50/50	3.7344
958171	AF2-111 C O1	16.7925	50/50	16.7925
958172	AF2-111 E O1	11.1950	50/50	11.1950
960151	AF2-306	1.7989	Adder	2.12

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960161	AF2-307 C	2.7399	Adder	3.22
960162	AF2-307 E	1.8266	Adder	2.15
960571	AF2-348 C	16.5945	50/50	16.5945
960572	AF2-348 E	11.0630	50/50	11.0630
960641	AF2-355 C O1	8.3458	Adder	9.82
960642	AF2-355 E O1	5.5638	Adder	6.55
963591	AG1-208 C O1	0.7967	Adder	1.77
963592	AG1-208 E O1	0.4766	Adder	1.06
964431	AG1-306 C O1	1.3699	Adder	3.04
964432	AG1-306 E O1	0.9133	Adder	2.03
964881	AG1-352 C	0.7682	Adder	1.71
964882	AG1-352 E	0.5121	Adder	1.14
965161	AG1-381 C O1	0.6281	Adder	1.39
965162	AG1-381 E O1	0.3465	Adder	0.77
966571	AG1-526 C	3.6010	Adder	7.99
966572	AG1-526 E	2.4007	Adder	5.33
WEC	WEC	0.0479	Confirmed LTF	0.0479
LGEE	LGEE	2.0300	Confirmed LTF	2.0300
CPLE	CPLE	0.3058	Confirmed LTF	0.3058
CBM-W2	CBM-W2	7.6698	Confirmed LTF	7.6698
NY	NY	0.0702	Confirmed LTF	0.0702
TVA	TVA	1.7052	Confirmed LTF	1.7052
O-066	O-066	0.7268	Confirmed LTF	0.7268
SIGE	SIGE	0.1527	Confirmed LTF	0.1527
CBM-S2	CBM-S2	6.3997	Confirmed LTF	6.3997
CBM-S1	CBM-S1	0.6015	Confirmed LTF	0.6015
G-007	G-007	0.1123	Confirmed LTF	0.1123
MEC	MEC	0.6404	Confirmed LTF	0.6404
LAGN	LAGN	1.7045	Confirmed LTF	1.7045
CBM-W1	CBM-W1	1.2197	Confirmed LTF	1.2197

9.6.2 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
165693209	250077	08MTZION	DEO&K	249991	08BUFTN1	DEO&K	1	34541 34553	tower	298.0	113.16	115.2	DC	13.32

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
341200	2BROMLEYEK	0.0326	50/50	0.0326
341584	2GRIFFIN	0.1067	50/50	0.1067
342550	4BAVARIAN LF	0.3476	50/50	0.3476
342957	1SPURLK1G	6.1194	50/50	6.1194
342960	1SPURLK2G	9.6128	50/50	9.6128
342963	1SPURLK3G	5.0515	50/50	5.0515
342966	1SPURLK4G	5.0515	50/50	5.0515
925984	AC1-074 C	9.5698	50/50	9.5698
925985	AC1-074 E	4.1014	50/50	4.1014
932551	AC2-075 C	2.2728	50/50	2.2728
932552	AC2-075 E	1.1450	50/50	1.1450
936381	AD2-048 C	6.3498	50/50	6.3498
936382	AD2-048 E	3.1681	50/50	3.1681
936570	AD2-072_C	3.1125	Adder	3.66
936576	AD2-072_E	1.5258	Adder	1.8
939141	AE1-144 C O1	9.2671	50/50	9.2671
939142	AE1-144 E O1	4.5989	50/50	4.5989
940531	AE2-038 C O1	6.1819	50/50	6.1819
940532	AE2-038 E O1	3.0621	50/50	3.0621
941411	AE2-138 C	14.9666	Adder	17.61
941412	AE2-138 E	5.5356	Adder	6.51
941981	AE2-210 C O1	5.1571	Adder	6.07
941982	AE2-210 E O1	1.9398	Adder	2.28
942411	AE2-254 C O1	1.4657	Adder	1.72
942412	AE2-254 E O1	0.9772	Adder	1.15
942591	AE2-275 C O1	4.2426	Adder	4.99
942592	AE2-275 E O1	1.5959	Adder	1.88
942891	AE2-308 C O1	7.2902	Adder	8.58
942892	AE2-308 E O1	2.6510	Adder	3.12
943111	AE2-339 C	2.1946	Adder	2.58
943112	AE2-339 E	1.0809	Adder	1.27
944621	AF1-127 C O1	4.2562	Adder	5.01
944622	AF1-127 E O1	2.0963	Adder	2.47
945681	AF1-233 C	17.4862	50/50	17.4862
945682	AF1-233 E	8.6386	50/50	8.6386
945861	AF1-251 C	10.4436	Adder	12.29
945862	AF1-251 E	6.9624	Adder	8.19
945911	AF1-256 C	5.6016	50/50	5.6016
945912	AF1-256 E	3.7344	50/50	3.7344
958171	AF2-111 C O1	16.7925	50/50	16.7925
958172	AF2-111 E O1	11.1950	50/50	11.1950
960151	AF2-306	1.7989	Adder	2.12

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960161	AF2-307 C	2.7399	Adder	3.22
960162	AF2-307 E	1.8266	Adder	2.15
960571	AF2-348 C	16.5945	50/50	16.5945
960572	AF2-348 E	11.0630	50/50	11.0630
960641	AF2-355 C O1	8.3458	Adder	9.82
960642	AF2-355 E O1	5.5638	Adder	6.55
963591	AG1-208 C O1	0.7967	Adder	1.77
963592	AG1-208 E O1	0.4766	Adder	1.06
964431	AG1-306 C O1	1.3699	Adder	3.04
964432	AG1-306 E O1	0.9133	Adder	2.03
964881	AG1-352 C	0.7682	Adder	1.71
964882	AG1-352 E	0.5121	Adder	1.14
965161	AG1-381 C O1	0.6281	Adder	1.39
965162	AG1-381 E O1	0.3465	Adder	0.77
966571	AG1-526 C	3.6010	Adder	7.99
966572	AG1-526 E	2.4007	Adder	5.33
WEC	WEC	0.0479	Confirmed LTF	0.0479
LGEE	LGEE	2.0300	Confirmed LTF	2.0300
CPLE	CPLE	0.3058	Confirmed LTF	0.3058
CBM-W2	CBM-W2	7.6698	Confirmed LTF	7.6698
NY	NY	0.0702	Confirmed LTF	0.0702
TVA	TVA	1.7052	Confirmed LTF	1.7052
O-066	O-066	0.7268	Confirmed LTF	0.7268
SIGE	SIGE	0.1527	Confirmed LTF	0.1527
CBM-S2	CBM-S2	6.3997	Confirmed LTF	6.3997
CBM-S1	CBM-S1	0.6015	Confirmed LTF	0.6015
G-007	G-007	0.1123	Confirmed LTF	0.1123
MEC	MEC	0.6404	Confirmed LTF	0.6404
LAGN	LAGN	1.7045	Confirmed LTF	1.7045
CBM-W1	CBM-W1	1.2197	Confirmed LTF	1.2197

9.6.3 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
164768517	324010	7TRIMBL REAC	LGEE	248000	06CLIFTY	OVEC	1	AEP_P1-2_#363_1682	single	1451.0	111.58	112.81	DC	17.94

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
243442	05RKG1	13.2041	80/20	13.2041
243443	05RKG2	12.6588	80/20	12.6588
341200	2BROMLEYEK	0.0506	80/20	0.0506
341329	2COLESBURG	0.0871	80/20	0.0871
342070	2PINE GROVE	0.0538	80/20	0.0538
342442	2W GLASGOW	0.0229	80/20	0.0229
342900	1COOPER1 G	2.2188	80/20	2.2188
342903	1COOPER2 G	4.3027	80/20	4.3027
342918	1JKCT 1G	1.7388	80/20	1.7388
342921	1JKCT 2G	1.7388	80/20	1.7388
342924	1JKCT 3G	1.7309	80/20	1.7309
342927	1JKCT 4G	1.1539	80/20	1.1539
342930	1JKCT 5G	1.1476	80/20	1.1476
342933	1JKCT 6G	1.1523	80/20	1.1523
342936	1JKCT 7G	1.1539	80/20	1.1539
342939	1JKCT 9G	1.1826	80/20	1.1826
342942	1JKCT 10G	1.1826	80/20	1.1826
342945	1LAUREL 1G	1.2530	80/20	1.2530
925984	AC1-074 C	4.0320	80/20	4.0320
930461	AB1-087 CT1	18.9263	80/20	18.9263
930462	AB1-087 ST1	15.0472	80/20	15.0472
930471	AB1-088 CT1	18.9263	80/20	18.9263
930472	AB1-088 ST1	15.0472	80/20	15.0472
932551	AC2-075 C	0.9576	80/20	0.9576
933446	AC2-157 1C	2.3473	80/20	2.3473
933447	AC2-157 2C	2.3473	80/20	2.3473
936381	AD2-048 C	3.5473	80/20	3.5473
936570	AD2-072_C	10.2631	80/20	10.2631
939131	AE1-143 C	9.6660	80/20	9.6660
940045	AE1-246 C	12.0074	80/20	12.0074
940831	AE2-071 C	3.0448	80/20	3.0448
941341	AE2-130 C	29.6256	80/20	29.6256
941411	AE2-138 C	15.1954	80/20	15.1954
941981	AE2-210 C O1	5.2359	80/20	5.2359
942411	AE2-254 C O1	4.0707	80/20	4.0707
942591	AE2-275 C O1	6.8735	80/20	6.8735
942601	AE2-276	3.0885	80/20	3.0885
942891	AE2-308 C O1	11.6215	80/20	11.6215
943111	AE2-339 C	2.5940	80/20	2.5940
943701	AF1-038 C	4.6768	80/20	4.6768
943821	AF1-050 C	5.4526	80/20	5.4526
944151	AF1-083 C O1	5.0223	80/20	5.0223

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
944201	AF1-088 FTIR	61.7700	80/20	61.7700
944511	AF1-116 C	10.8403	80/20	10.8403
944621	AF1-127 C O1	4.4563	80/20	4.4563
945381	AF1-203 C	1.7399	80/20	1.7399
945861	AF1-251 C	10.7620	80/20	10.7620
952811	J759	9.0601	PJM External (MISO)	9.0601
952821	J762	29.3080	PJM External (MISO)	29.3080
952861	J783 C	8.8166	PJM External (MISO)	8.8166
953611	J800	13.6175	PJM External (MISO)	13.6175
953931	J856	8.9992	PJM External (MISO)	8.9992
955451	J1027	13.2270	PJM External (MISO)	13.2270
955461	J1028	14.2920	PJM External (MISO)	14.2920
955891	J1074	22.0940	PJM External (MISO)	22.0940
956911	J1189	0.4470	PJM External (MISO)	0.4470
957141	AF2-008 FTIR	30.8850	80/20	30.8850
957961	AF2-090 C	16.7572	80/20	16.7572
959691	AF2-260 C	12.4956	80/20	12.4956
960151	AF2-306	1.6996	80/20	1.6996
960161	AF2-307 C	2.5887	80/20	2.5887
960171	AF2-308	5.8920	80/20	5.8920
960181	AF2-309 C	8.8381	80/20	8.8381
960641	AF2-355 C O1	15.1402	80/20	15.1402
960741	AF2-365 C O1	4.7661	80/20	4.7661
961001	AF2-391 C O1	15.9437	80/20	15.9437
962211	AG1-066 C O1	2.4154	80/20	2.4154
962221	AG1-067 C O1	3.5883	80/20	3.5883
962241	AG1-070 C O1	5.5073	80/20	5.5073
962251	AG1-071 C O1	6.6087	80/20	6.6087
962471	AG1-096 C O1	8.3439	80/20	8.3439
963591	AG1-208 C O1	1.8597	80/20	1.8597
964431	AG1-306 C O1	4.1204	80/20	4.1204
964571	AG1-320 C O1	11.1485	80/20	11.1485
964781	AG1-341 C O1	9.4249	80/20	9.4249
964881	AG1-352 C	4.7808	80/20	4.7808
964891	AG1-353 C	8.9623	80/20	8.9623
964901	AG1-354 C	13.4613	80/20	13.4613
965161	AG1-381 C O1	1.1611	80/20	1.1611
965401	AG1-405 C	4.0168	80/20	4.0168
965411	AG1-406	2.5839	80/20	2.5839
966021	AG1-471 C O1	4.3801	80/20	4.3801
966031	AG1-472 C	7.2091	80/20	7.2091
966191	AG1-488 C O1	6.3407	80/20	6.3407
966221	AG1-491 C O1	9.3005	80/20	9.3005
966531	AG1-522 C	11.1150	80/20	11.1150
966541	AG1-523 C	11.1150	80/20	11.1150
966551	AG1-524 C	11.1150	80/20	11.1150
966561	AG1-525 C	11.1150	80/20	11.1150
966571	AG1-526 C	17.9434	80/20	17.9434
WEC	WEC	0.6565	Confirmed LTF	0.6565
LGEE	LGEE	20.3236	Confirmed LTF	20.3236
CPLE	CPLE	1.2039	Confirmed LTF	1.2039
CBM-W2	CBM-W2	59.7542	Confirmed LTF	59.7542

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
NY	NY	0.1936	Confirmed LTF	0.1936
TVA	TVA	9.2638	Confirmed LTF	9.2638
SIGE	SIGE	1.6502	Confirmed LTF	1.6502
CBM-S2	CBM-S2	26.1835	Confirmed LTF	26.1835
CBM-S1	CBM-S1	4.2906	Confirmed LTF	4.2906
MEC	MEC	5.8285	Confirmed LTF	5.8285
LAGN	LAGN	10.1202	Confirmed LTF	10.1202
CBM-W1	CBM-W1	21.6329	Confirmed LTF	21.6329

9.6.4 Index 4

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
164769106	342559	4BOONE CO	EKPC	250054	08LONGBR	DEO&K	1	34541 34553	tower	284.0	131.21	133.35	DC	13.32

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
341200	2BROMLEYEK	0.0326	50/50	0.0326
341584	2GRIFFIN	0.1067	50/50	0.1067
342550	4BAVARIAN LF	0.3476	50/50	0.3476
342957	1SPURLK1G	6.1194	50/50	6.1194
342960	1SPURLK2G	9.6128	50/50	9.6128
342963	1SPURLK3G	5.0515	50/50	5.0515
342966	1SPURLK4G	5.0515	50/50	5.0515
925984	AC1-074 C	9.5698	50/50	9.5698
925985	AC1-074 E	4.1014	50/50	4.1014
932551	AC2-075 C	2.2728	50/50	2.2728
932552	AC2-075 E	1.1450	50/50	1.1450
936381	AD2-048 C	6.3498	50/50	6.3498
936382	AD2-048 E	3.1681	50/50	3.1681
936570	AD2-072_C	3.1125	Adder	3.66
936576	AD2-072_E	1.5258	Adder	1.8
939141	AE1-144 C O1	9.2671	50/50	9.2671
939142	AE1-144 E O1	4.5989	50/50	4.5989
940531	AE2-038 C O1	6.1819	50/50	6.1819
940532	AE2-038 E O1	3.0621	50/50	3.0621
941411	AE2-138 C	14.9666	Adder	17.61
941412	AE2-138 E	5.5356	Adder	6.51
941981	AE2-210 C O1	5.1571	Adder	6.07
941982	AE2-210 E O1	1.9398	Adder	2.28
942411	AE2-254 C O1	1.4657	Adder	1.72
942412	AE2-254 E O1	0.9772	Adder	1.15
942591	AE2-275 C O1	4.2426	Adder	4.99
942592	AE2-275 E O1	1.5959	Adder	1.88
942891	AE2-308 C O1	7.2902	Adder	8.58
942892	AE2-308 E O1	2.6510	Adder	3.12
943111	AE2-339 C	2.1946	Adder	2.58
943112	AE2-339 E	1.0809	Adder	1.27
944621	AF1-127 C O1	4.2562	Adder	5.01
944622	AF1-127 E O1	2.0963	Adder	2.47
945681	AF1-233 C	17.4862	50/50	17.4862
945682	AF1-233 E	8.6386	50/50	8.6386
945861	AF1-251 C	10.4436	Adder	12.29
945862	AF1-251 E	6.9624	Adder	8.19
945911	AF1-256 C	5.6016	50/50	5.6016
945912	AF1-256 E	3.7344	50/50	3.7344
958171	AF2-111 C O1	16.7925	50/50	16.7925
958172	AF2-111 E O1	11.1950	50/50	11.1950
960151	AF2-306	1.7989	Adder	2.12

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
960161	AF2-307 C	2.7399	Adder	3.22
960162	AF2-307 E	1.8266	Adder	2.15
960571	AF2-348 C	16.5945	50/50	16.5945
960572	AF2-348 E	11.0630	50/50	11.0630
960641	AF2-355 C O1	8.3458	Adder	9.82
960642	AF2-355 E O1	5.5638	Adder	6.55
963591	AG1-208 C O1	0.7967	Adder	1.77
963592	AG1-208 E O1	0.4766	Adder	1.06
964431	AG1-306 C O1	1.3699	Adder	3.04
964432	AG1-306 E O1	0.9133	Adder	2.03
964881	AG1-352 C	0.7682	Adder	1.71
964882	AG1-352 E	0.5121	Adder	1.14
965161	AG1-381 C O1	0.6281	Adder	1.39
965162	AG1-381 E O1	0.3465	Adder	0.77
966571	AG1-526 C	3.6010	Adder	7.99
966572	AG1-526 E	2.4007	Adder	5.33
WEC	WEC	0.0479	Confirmed LTF	0.0479
LGEE	LGEE	2.0300	Confirmed LTF	2.0300
CPLE	CPLE	0.3058	Confirmed LTF	0.3058
CBM-W2	CBM-W2	7.6698	Confirmed LTF	7.6698
NY	NY	0.0702	Confirmed LTF	0.0702
TVA	TVA	1.7052	Confirmed LTF	1.7052
O-066	O-066	0.7268	Confirmed LTF	0.7268
SIGE	SIGE	0.1527	Confirmed LTF	0.1527
CBM-S2	CBM-S2	6.3997	Confirmed LTF	6.3997
CBM-S1	CBM-S1	0.6015	Confirmed LTF	0.6015
G-007	G-007	0.1123	Confirmed LTF	0.1123
MEC	MEC	0.6404	Confirmed LTF	0.6404
LAGN	LAGN	1.7045	Confirmed LTF	1.7045
CBM-W1	CBM-W1	1.2197	Confirmed LTF	1.2197

9.6.5 Index 5

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
164768181	342838	7SPURLOCK	EKPC	253077	09STUART	DAY	1	DEOK_P2-3_1449_ZIMMER	breaker	1532.0	121.92	123.42	DC	49.58

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
251970	08MELDL1	3.7800	50/50	3.7800
251971	08MELDL2	3.7800	50/50	3.7800
251972	08MELDL3	3.7800	50/50	3.7800
253355	AB1-169 CT1	-54.2279	Adder	-63.8
253356	AB1-169 ST1	-38.7439	Adder	-45.58
253357	AB1-169 CT2	-54.2279	Adder	-63.8
253358	AB1-169 ST2	-38.7439	Adder	-45.58
342957	1SPURLK1G	28.6763	50/50	28.6763
342960	1SPURLK2G	54.6122	50/50	54.6122
342963	1SPURLK3G	28.6982	50/50	28.6982
342966	1SPURLK4G	28.6982	50/50	28.6982
925984	AC1-074 C	19.0988	50/50	19.0988
925985	AC1-074 E	8.1852	50/50	8.1852
932551	AC2-075 C	4.5360	50/50	4.5360
932552	AC2-075 E	2.2850	50/50	2.2850
936381	AD2-048 C	13.1506	Adder	15.47
936382	AD2-048 E	6.5612	Adder	7.72
936570	AD2-072_C	10.0756	Adder	11.85
936576	AD2-072_E	4.9390	Adder	5.81
939131	AE1-143 C	7.5034	Adder	8.83
939132	AE1-143 E	3.7166	Adder	4.37
939141	AE1-144 C O1	41.1258	50/50	41.1258
939142	AE1-144 E O1	20.4090	50/50	20.4090
940531	AE2-038 C O1	27.4343	50/50	27.4343
940532	AE2-038 E O1	13.5889	50/50	13.5889
941411	AE2-138 C	78.3058	50/50	78.3058
941412	AE2-138 E	28.9624	50/50	28.9624
941981	AE2-210 C O1	26.9821	50/50	26.9821
941982	AE2-210 E O1	10.1492	50/50	10.1492
942411	AE2-254 C O1	5.0635	Adder	5.96
942412	AE2-254 E O1	3.3757	Adder	3.97
942591	AE2-275 C O1	16.5475	Adder	19.47
942592	AE2-275 E O1	6.2243	Adder	7.32
942891	AE2-308 C O1	27.7031	Adder	32.59
942892	AE2-308 E O1	10.0739	Adder	11.85
943111	AE2-339 C	9.1292	50/50	9.1292
943112	AE2-339 E	4.4964	50/50	4.4964
943701	AF1-038 C	3.8008	Adder	4.47
943702	AF1-038 E	2.5339	Adder	2.98
943821	AF1-050 C	3.3079	Adder	3.89
943822	AF1-050 E	2.2052	Adder	2.59
944151	AF1-083 C O1	3.5034	Adder	4.12

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
944152	AF1-083 E O1	2.3356	Adder	2.75
944511	AF1-116 C	8.4150	Adder	9.9
944512	AF1-116 E	5.6100	Adder	6.6
944621	AF1-127 C O1	21.4046	50/50	21.4046
944622	AF1-127 E O1	10.5426	50/50	10.5426
945681	AF1-233 C	78.9264	50/50	78.9264
945682	AF1-233 E	38.9916	50/50	38.9916
945861	AF1-251 C	53.6276	50/50	53.6276
945862	AF1-251 E	35.7518	50/50	35.7518
945911	AF1-256 C	25.3301	50/50	25.3301
945912	AF1-256 E	16.8867	50/50	16.8867
958171	AF2-111 C O1	91.0185	50/50	91.0185
958172	AF2-111 E O1	60.6790	50/50	60.6790
960151	AF2-306	7.4369	Adder	8.75
960161	AF2-307 C	11.3269	Adder	13.33
960162	AF2-307 E	7.5513	Adder	8.88
960571	AF2-348 C	89.1195	50/50	89.1195
960572	AF2-348 E	59.4130	50/50	59.4130
960641	AF2-355 C O1	34.0371	Adder	40.04
960642	AF2-355 E O1	22.6914	Adder	26.7
962211	AG1-066 C O1	2.4221	Adder	5.38
962212	AG1-066 E O1	1.6147	Adder	3.58
963591	AG1-208 C O1	3.0708	Adder	6.82
963592	AG1-208 E O1	1.8369	Adder	4.08
964431	AG1-306 C O1	5.2057	Adder	11.56
964432	AG1-306 E O1	3.4704	Adder	7.7
964881	AG1-352 C	2.5601	Adder	5.68
964882	AG1-352 E	1.7068	Adder	3.79
964891	AG1-353 C	3.1909	Adder	7.08
964892	AG1-353 E	2.1273	Adder	4.72
965161	AG1-381 C O1	2.5881	Adder	5.74
965162	AG1-381 E O1	1.4279	Adder	3.17
965401	AG1-405 C	2.7928	Adder	6.2
965402	AG1-405 E	1.8619	Adder	4.13
965411	AG1-406	1.7966	Adder	3.99
966191	AG1-488 C O1	2.5413	Adder	5.64
966192	AG1-488 E O1	1.6942	Adder	3.76
966571	AG1-526 C	13.4013	Adder	29.75
966572	AG1-526 E	8.9342	Adder	19.83
WEC	WEC	0.2545	Confirmed LTF	0.2545
LGEE	LGEE	5.3029	Confirmed LTF	5.3029
CPLE	CPLE	0.8524	Confirmed LTF	0.8524
LGE-0012019	LGE-0012019	8.7175	LTF	8.7175
CBM-W2	CBM-W2	27.6147	Confirmed LTF	27.6147
NY	NY	0.5585	Confirmed LTF	0.5585
TVA	TVA	5.9220	Confirmed LTF	5.9220
O-066	O-066	6.2858	Confirmed LTF	6.2858
SIGE	SIGE	0.5821	Confirmed LTF	0.5821
CBM-S2	CBM-S2	19.6690	Confirmed LTF	19.6690
CBM-S1	CBM-S1	1.8981	Confirmed LTF	1.8981
G-007	G-007	0.9765	Confirmed LTF	0.9765
MEC	MEC	2.5996	Confirmed LTF	2.5996

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
LAGN	LAGN	5.9937	Confirmed LTF	5.9937
CBM-W1	CBM-W1	6.7296	Confirmed LTF	6.7296

9.7 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
AB1-087	Sullivan 345kV #1	Active
AB1-088	Sullivan 345kV #2	Active
AB1-169	Stuart 345kV	Engineering and Procurement
AC1-074	Jacksonville-Renaker 138kV I	Engineering and Procurement
AC2-075	Great Blue Heron Solar	Active
AC2-157	Sullivan 345 kV	Active
AD2-048	Cynthia-Headquarters 69 kV	Active
AD2-072	Van Arsdell-Mercer Industrial 69kV	Engineering and Procurement
AE1-143	Marion County 161 kV	Engineering and Procurement
AE1-144	Goddard-Plumville 138 kV	Active
AE1-246	Barren County-Summer Shade 161 kV	Active
AE2-038	Goddard-Plumsville 138 kV II	Active
AE2-071	Patton Rd-Summer Shade 69 kV	Active
AE2-130	Rockport 765 kV	Active
AE2-138	Avon-North Clark 345 kV	Active
AE2-210	Avon-North Clark 345 kV	Active
AE2-254	Garrard County-Tommy-Gooch 69 kV	Active
AE2-275	JK Smith-Fawkes 138 kV	Active
AE2-276	Sullivan 345kV	Active
AE2-308	Three Forks-Dale 138 kV	Active
AE2-339	Avon 138 kV	Active
AF1-038	Sewellton Jct-Webbs Crossroads 69 kV	Active
AF1-050	Summer Shade - Green County 161 kV	Active
AF1-083	Green County-Saloma 161 kV	Active
AF1-088	Sullivan 345 kV	Active
AF1-116	Marion County 161 kV	Active
AF1-127	Avon 345 kV	Active
AF1-203	Patton Rd-Summer Shade 69 kV	Active
AF1-233	Flemingsburg 138 kV	Active
AF1-251	Avon-North Clark 345 kV	Active
AF1-256	Flemingsburg-Spurlock 138 kV	Active
AF2-008	Sullivan 345 kV	Active
AF2-090	Central Hardin 138 kV	Active
AF2-111	North Clark-Spurlock 345 kV	Active
AF2-260	Stephensburg 69 kV	Active
AF2-306	Hope-Blevins Valley Tap 69 kV	Active
AF2-307	Hope-Blevins Valley Tap 69 kV	Active
AF2-308	Central Hardin-Stephensburg 69 kV	Active
AF2-309	Central Hardin-Stephensburg 69 kV	Active

Queue Number	Project Name	Status
AF2-348	North Clark-Spurlock 345 kV	Active
AF2-355	West Gerrard-J.K. Smith 345 nkV	Active
AF2-365	Munfordville KU Tap-Horse Cave Jct. 69 kV	Active
AF2-391	Central Hardin 69 kV	Active
AG1-066	Bonnyman 69 kV	Active
AG1-067	Temple Hill 69 kV	Active
AG1-070	Bon Ayr 69 kV	Active
AG1-071	Bon Ayr 69 kV	Active
AG1-096	Rineyville 69 kV	Active
AG1-208	Sideview-Mt Sterling 69 kV	Active
AG1-306	Fawkes-Dale 138 kV	Active
AG1-320	Glendale-Stephensburg 69 kV	Active
AG1-341	Summer Shade 161 kV	Active
AG1-352	Hunt Farm Junction 69 kV	Active
AG1-353	Greene County-Marion County 161 kV	Active
AG1-354	Summershade-Green County 161 kV	Active
AG1-381	Hope 69 kV	Active
AG1-405	Walnut Grove-Asahi 69 kV	Active
AG1-406	Walnut Grove-Asahi 69 kV	Active
AG1-471	Up Church-Wayne County 69 kV	Active
AG1-472	Seymour-Cave City 69 kV	Active
AG1-488	Marion IP 161 kV	Active
AG1-491	Central Hardin 69 kV	Active
AG1-522	Sullivan-Rockport 765 kV	Active
AG1-523	Sullivan-Rockport 765 kV	Active
AG1-524	Sullivan-Rockport 765 kV	Active
AG1-525	Sullivan-Rockport 765 kV	Active
AG1-526	West Garrard 345 kV	Active
J1027	MISO	MISO
J1028	MISO	MISO
J1074	MISO	MISO
J1189	MISO	MISO
J759	MISO	MISO
J762	MISO	MISO
J783	MISO	MISO
J800	MISO	MISO
J856	MISO	MISO

9.8 Contingency Descriptions

Contingency Name	Contingency Definition
EKPC_P2-2_MELD-SPUR 345	CONTINGENCY 'EKPC_P2-2_MELD-SPUR 345' /* SPURLOCK - MELDAHL 345 TIE OPEN BRANCH FROM BUS 249581 TO BUS 342838 CKT 1 /* 249581 08MELDAL 345.00 342838 7SPURLOCK 345.00 END
34541 34553	CONTINGENCY '34541 34553' OPEN BRANCH FROM BUS 249581 TO BUS 342838 CKT 1 /* 249581 08MELDAL 345.00 342838 7SPURLOCK 345.00 OPEN BRANCH FROM BUS 253077 TO BUS 342838 CKT 1 /* 253077 09STUART 345.00 342838 7SPURLOCK 345.00 END
AEP_P1-2_#363_1682	CONTINGENCY 'AEP_P1-2_#363_1682' OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 / 243208 05JEFRSO 765 243209 05ROCKPT 765 1 END
DEOK_P1_ZIMMER-MELDAHL 34576	CONTINGENCY 'DEOK_P1_ZIMMER-MELDAHL 34576' OPEN BRANCH FROM BUS 249577 TO BUS 249581 CKT 1 END
EKPC_P2-1_7W GARRARDKU345.00 TO 7W GARRARDEK345.00	CONTINGENCY 'EKPC_P2-1_7W GARRARDKU345.00 TO 7W GARRARDEK345.00' OPEN BRANCH FROM BUS 325074 TO BUS 342841 CKT Z1 /*7W GARRARDKU345.007W GARRARDEK345.00 END
AEP_P1-2_#10136	CONTINGENCY 'AEP_P1-2_#10136' OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 / 243208 05JEFRSO 765 243209 05ROCKPT 765 1 OPEN BRANCH FROM BUS 243209 TO BUS 243443 CKT 2 / 243209 05ROCKPT 765 243443 05RKG2 26.0 2 REMOVE UNIT 2H FROM BUS 243443 / 243443 05RKG2 26.0 2H REMOVE UNIT 2L FROM BUS 243443 / 243443 05RKG2 26.0 2L END
DEOK_P2-3_1449_ZIMMER	CONTINGENCY 'DEOK_P2-3_1449_ZIMMER' OPEN BUS 251968 OPEN BUS 251969 OPEN BUS 249580 OPEN BRANCH FROM BUS 249581 TO BUS 249577 CKT 1 END

Contingency Name	Contingency Definition
EKPC_P2-1_7N CLARK 345.00 TO 7SPURLOCK 345.00-C	CONTINGENCY 'EKPC_P2-1_7N CLARK 345.00 TO 7SPURLOCK 345.00-C' OPEN BRANCH FROM BUS 958170 TO BUS 342838 CKT 1 /*7AF2-111 TAP 345.00 7SPURLOCK 345.00 END
Base Case	
DEOK_P2-3_1493_RED BANK	CONTINGENCY 'DEOK_P2-3_1493_RED BANK' OPEN BUS 249573 OPEN BUS 250097 OPEN BRANCH FROM BUS 249571 TO BUS 250092 CKT 1 END

10 Short Circuit Analysis

The following Breakers are overdutied

None.

11 Affected Systems

11.1 TVA

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

11.2 Duke Energy Progress

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

11.3 MISO

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

11.4 LG&E

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