



**Generation Interconnection
Feasibility Study Report
for
Queue Project AG1-306
FAWKES-DALE 138 KV
39 MW Capacity / 65 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.

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 Madison County, Kentucky. The installed facilities will have a total capability of 65 MW with 39 MW of this output being recognized by PJM as Capacity.

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

Queue Number	AG1-306
Project Name	FAWKES-DALE 138 KV
State	Kentucky
County	Madison
Transmission Owner	EKPC
MFO	65
MWE	65
MWC	39
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

AG1-306 will interconnect with the EKPC transmission system along one of the following Points of Interconnection:

Primary POI: Fawkes to Dale 138 kV line (uprate to AE2-308).

Secondary POI: Fawkes to Dale 138 kV line (standalone tap).

5 Cost Summary

The AG1-306 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$0
Total System Network Upgrade Costs	\$50,958,434
Total Costs	\$50,958,434

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
None.	\$0
Total Attachment Facility Costs	\$0

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
None.	\$0
Total Direct Connection Facility Costs	\$0

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 - Primary POI

The Queue Project AG1-306 was evaluated as a 65.0 MW (Capacity 39.0 MW) injection tapping the Fawkes to Dale 138 kV line in the EKPC area. Project AG1-306 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-306 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	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPACT
165594959	250054	08LONGBR	138.0	DEO&K	250077	08MTZION	138.0	DEO&K	1	34541 34553	tower	284.0	121.98	122.8	DC	5.07
165594979	250077	08MTZION	138.0	DEO&K	249991	08BUFTN1	138.0	DEO&K	1	34541 34553	tower	298.0	111.62	112.4	DC	5.07
165336818	342544	4AVON-R	138.0	EKPC	324275	4LOUDON AVE	138.0	LGEE	1	34541 34553	tower	203.0	127.09	128.0	DC	4.07
164499914	342559	4BOONECO	138.0	EKPC	250054	08LONGBR	138.0	DEO&K	1	34541 34553	tower	284.0	129.59	130.4	DC	5.07
164498800	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	EKPC_P2-2_MELD-SPUR345	bus	1532.0	116.95	117.54	DC	19.3
164498989	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	DEOK_P2-3_1449_ZIMMER	breaker	1532.0	119.72	120.3	DC	19.26
164498990	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	DEOK_P2-3_1493_RED BANK	breaker	1532.0	117.69	118.18	DC	16.23

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	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
169411244	342541	4AVON	138.0	EKPC	342631	4PARIST	138.0	EKPC	1	EKPC_P2-1_7N CLARK 345.00 TO 7SPURLOCK 345.00-C	operation	220.0	110.33	111.54	DC	5.93
169411216	342544	4AVON-R	138.0	EKPC	324275	4LOUDON AVE	138.0	LGE	1	EKPC_P2-1_7AVON 345.00 TO 7N CLARK 345.00-C	operation	203.0	120.09	121.04	DC	4.3
169411250	342676	4THREE FK T	138.0	EKPC	342577	4FAWKES EK	138.0	EKPC	1	EKPC_P1-2_AVN-BBN-DLE138	operation	203.0	90.96	111.88	DC	42.47
169411320	342688	4UNION CTY T	138.0	EKPC	324276	4LAKE REBA T	138.0	LGE	1	EKPC_P1-2_FAWK 138 TIE	operation	306.0	100.54	101.51	DC	4.44
164499312	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	Base Case	operation	1240.0	123.54	124.11	DC	15.28
164499313	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	DEOK_P1_ZIMMER-MELDAHL 34576	operation	1532.0	117.71	118.3	DC	19.27
169676434	942890	AE2-308 TAP	138.0	EKPC	342676	4THREE FK T	138.0	EKPC	1	EKPC_P1-2_AVN-BBN-DLE138	operation	203.0	92.29	113.21	DC	42.47
169676477	942890	AE2-308 TAP	138.0	EKPC	342574	4DALE	138.0	EKPC	1	EKPC_P2-1_4DALE 138.00 TO 4THREE FK T 138.00-B	operation	203.0	73.89	105.91	DC	65.0
169676478	942890	AE2-308 TAP	138.0	EKPC	342574	4DALE	138.0	EKPC	1	EKPC_P1-2_DALE-FAWK 138-B	operation	203.0	73.89	105.91	DC	65.0

9.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
165594959	1	08LONGBR 138.0 kV - 08MTZION 138.0 kV Ckt 1	<u>DEOK</u> n30581 (1225) : Rebuild the line & Replace switch at Mt. Zion Project Type : FAC Cost : \$3,228,008 Time Estimate : 30.0 Months	\$3,228,008
165336818	3	4AVON-R 138.0 kV - 4LOUDON AVE 138.0 kV Ckt 1	<u>EKPC</u> r0020 (1821) : LGEE violation (non PJM area). EKPC emergency rating is 281 MVA. Project Type : FAC Cost : \$0 Time Estimate : 0.0 Months <u>LGEE</u> NonPJMArea (1886) : 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

ID	Idx	Facility	Upgrade Description	Cost
164498989,164 498990,164498 800	5	7SPURLOCK 345.0 kV - 09STUART 345.0 kV Ckt 1	<p><u>DAY</u> DAYr190039 (1176) : 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</p> <p>DAYr190040 (1177) : Replace Stuart substation riser conductor with 2500AAC (parallel) Project Type : FAC Cost : \$100,000 Time Estimate : 12.0 Months</p> <p>DAYr190041 (1178) : 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</p> <p>r190017 (1179) : A second new 345kV transmission line between Stuart and Spurlock. According to FENo: 173531 the desired rating of the Stuart to Spurlock line is 2245 MVA. After DAYr190041 the limiting element becomes the newly reconducted 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</p> <p><u>EKPC</u> r0040 (1841) : Replace the 1500A interconnection metering CTs with 2000A equipment. Project Type : FAC Cost : \$150,000 Time Estimate : 9.0 Months</p> <p>r0005 (1895) : No Violation. EKPC emergency rating 1792 MVA. Project Type : FAC Cost : \$0 Time Estimate : N/A Months</p>	\$39,090,000
165594979	2	08MTZION 138.0 kV - 08BUFTN1 138.0 kV Ckt 1	<p><u>DEOK</u> n6785b (1233) : 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</p>	\$5,625,426

ID	Idx	Facility	Upgrade Description	Cost
164499914	4	4BOONE CO 138.0 kV - 08LONGBR 138.0 kV Ckt 1	<p><u>DEOK</u> Not a violation for DEOK portion (1235) : Not a violation for DEOK portion Project Type : FAC Cost : \$0 Time Estimate : 0.0 Months</p> <p><u>EKPC</u> r0052 (1853) : 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</p> <p>r0010 (1900) : 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</p> <p>EKPC-r0094a (1929) : 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</p> <p>EKPC-r0094b (1930) : 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</p> <p>EKPC-r0094c (1931) : 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</p>	\$3,015,000
			TOTAL COST	\$50,958,434

9.6 Flow Gate Details - Primary POI

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
165594959	250054	08LONGBR	DEO&K	250077	08MTZION	DEO&K	1	34541 34553	tower	284.0	121.98	122.8	DC	5.07

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
CPL	CPL	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
165594979	250077	08MTZION	DEO&K	249991	08BUFTN1	DEO&K	1	34541 34553	tower	298.0	111.62	112.4	DC	5.07

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
CPL	CPL	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
165336818	342544	4AVON-R	EKPC	324275	4LOUDON AVE	LGEE	1	34541 34553	tower	203.0	127.09	128.0	DC	4.07

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
925984	AC1-074 C	4.5567	Adder	5.36
925985	AC1-074 E	1.9529	Adder	2.3
932551	AC2-075 C	1.0822	Adder	1.27
932552	AC2-075 E	0.5452	Adder	0.64
939141	AE1-144 C O1	3.6757	Adder	4.32
939142	AE1-144 E O1	1.8241	Adder	2.15
940531	AE2-038 C O1	2.4520	Adder	2.88
940532	AE2-038 E O1	1.2145	Adder	1.43
941411	AE2-138 C	14.8246	Adder	17.44
941412	AE2-138 E	5.4831	Adder	6.45
941981	AE2-210 C O1	5.1082	Adder	6.01
941982	AE2-210 E O1	1.9214	Adder	2.26
942591	AE2-275 C O1	2.8140	Adder	3.31
942592	AE2-275 E O1	1.0585	Adder	1.25
942891	AE2-308 C O1	5.8484	Adder	6.88
942892	AE2-308 E O1	2.1267	Adder	2.5
943111	AE2-339 C	4.8830	50/50	4.8830
943112	AE2-339 E	2.4050	50/50	2.4050
944621	AF1-127 C O1	5.8161	50/50	5.8161
944622	AF1-127 E O1	2.8647	50/50	2.8647
945681	AF1-233 C	7.0393	Adder	8.28
945682	AF1-233 E	3.4776	Adder	4.09
945861	AF1-251 C	11.1976	Adder	13.17
945862	AF1-251 E	7.4650	Adder	8.78
945911	AF1-256 C	2.2571	Adder	2.66
945912	AF1-256 E	1.5047	Adder	1.77
958171	AF2-111 C O1	9.1826	Adder	10.8
958172	AF2-111 E O1	6.1217	Adder	7.2
960571	AF2-348 C	9.2769	Adder	10.91
960572	AF2-348 E	6.1846	Adder	7.28
964431	AG1-306 C O1	1.0990	Adder	2.44
964432	AG1-306 E O1	0.7326	Adder	1.63
NY	NY	0.0227	Confirmed LTF	0.0227
PRAIRIE	PRAIRIE	0.5528	Confirmed LTF	0.5528
O-066	O-066	0.2625	Confirmed LTF	0.2625
COTTONWOOD	COTTONWOOD	0.2520	Confirmed LTF	0.2520
G-007	G-007	0.0410	Confirmed LTF	0.0410
HAMLET	HAMLET	0.0081	Confirmed LTF	0.0081
GIBSON	GIBSON	0.2206	Confirmed LTF	0.2206
BLUEG	BLUEG	1.2638	Confirmed LTF	1.2638
TRIMBLE	TRIMBLE	0.4101	Confirmed LTF	0.4101
CATAWBA	CATAWBA	0.0035	Confirmed LTF	0.0035

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
164499914	342559	4BOONE CO	EKPC	250054	08LONGBR	DEO&K	1	34541 34553	tower	284.0	129.59	130.4	DC	5.07

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

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
958172	AF2-111 E O1	11.1950	50/50	11.1950
960151	AF2-306	1.7989	Adder	2.12
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
CPL	CPL	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
164498989	342838	7SPURLOCK	EKPC	253077	09STUART	DAY	1	DEOK_P2-3_1449_ZIMMER	breaker	1532.0	119.72	120.3	DC	19.26

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
CPL	CPL	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 – Primary POI

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
AB1-169	Stuart 345kV	Engineering and Procurement
AC1-074	Jacksonville-Renaker 138kV I	Engineering and Procurement
AC2-075	Great Blue Heron Solar	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
AE2-038	Goddard-Plumville 138 kV II	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
AE2-308	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
AF1-116	Marion County 161 kV	Active
AF1-127	Avon 345 kV	Active
AF1-233	Flemingsburg 138 kV	Active
AF1-251	Avon-North Clark 345 kV	Active
AF1-256	Flemingsburg-Spurlock 138 kV	Active
AF2-111	North Clark-Spurlock 345 kV	Active
AF2-306	Hope-Blevins Valley Tap 69 kV	Active
AF2-307	Hope-Blevins Valley Tap 69 kV	Active
AF2-348	North Clark-Spurlock 345 kV	Active
AF2-355	West Gerrard-J.K. Smith 345 nkV	Active
AG1-066	Bonnyman 69 kV	Active
AG1-208	Sideview-Mt Sterling 69 kV	Active
AG1-306	Fawkes-Dale 138 kV	Active
AG1-352	Hunt Farm Junction 69 kV	Active
AG1-353	Greene County-Marion 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
AG1-488	Marion IP 161 kV	Active
AG1-526	West Garrard 345 kV	Active

9.8 Contingency Descriptions - Primary POI

Contingency Name	Contingency Definition
EKPC_P2-1_4DALE 138.00 TO 4THREE FK T 138.00-B	CONTINGENCY 'EKPC_P2-1_4DALE 138.00 TO 4THREE FK T 138.00-B' OPEN BRANCH FROM BUS 942890 TO BUS 342676 CKT 1 /*AE2-308 TAP 04THREE FK T 138.00 END
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
DEOK_P1_ZIMMER-MELDAHL 34576	CONTINGENCY 'DEOK_P1_ZIMMER-MELDAHL 34576' OPEN BRANCH FROM BUS 249577 TO BUS 249581 CKT 1 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
EKPC_P1-2_AVN-BBN-DLE138	CONTINGENCY 'EKPC_P1-2_AVN-BBN-DLE138' /* AVON - BOONESBORO NORTH - DALE OPEN BRANCH FROM BUS 342541 TO BUS 342556 CKT 1 /* 342541 4AVON 138.00 342556 4BECKNERV T 138.00 OPEN BRANCH FROM BUS 342553 TO BUS 342556 CKT 1 /* 342553 4BECKNERV 138.00 342556 4BECKNERV T 138.00 OPEN BRANCH FROM BUS 342556 TO BUS 342565 CKT 1 /* 342556 4BECKNERV T 138.00 342565 4BOONESBOR T138.00 OPEN BRANCH FROM BUS 342565 TO BUS 342574 CKT 1 /* 342565 4BOONESBOR T138.00 342574 4DALE 138.00 END
EKPC_P1-2_DALE-FAWK 138-B	CONTINGENCY 'EKPC_P1-2_DALE-FAWK 138-B' /* DALE - FAWKES OPEN BRANCH FROM BUS 942890 TO BUS 342676 CKT 1 /* 942890 AE2-308 TAP 138.00 342676 4THREE FK T 138.00 OPEN BRANCH FROM BUS 342676 TO BUS 342679 CKT 1 /* 342676 4THREE FK T 138.00 342679 4THREE FORKS138.00 OPEN BRANCH FROM BUS 342577 TO BUS 342676 CKT 1 /* 342577 4FAWKES EK 138.00 342676 4THREE FK T 138.00 END

Contingency Name	Contingency Definition
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
EKPC_P2-1_7AVON 345.00 TO 7N CLARK 345.00-C	CONTINGENCY 'EKPC_P2-1_7AVON 345.00 TO 7N CLARK 345.00-C' OPEN BRANCH FROM BUS 941410 TO BUS 342835 CKT 1 /*AE2-138 TAP 345.007N CLARK 345.00 END
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	
EKPC_P1-2_FAWK 138 TIE	CONTINGENCY 'EKPC_P1-2_FAWK 138 TIE' OPEN BUS 342577 /* 342577 4FAWKES EK 138.00 END
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 - Primary POI

The following Breakers are overdutied:

None.

11 Summer Peak - Load Flow Analysis - Secondary POI

The Queue Project AG1-306 was evaluated as a 65.0 MW (Capacity 39.0 MW) injection tapping the Fawkes to Dale 138 kV line in the EKPC area. Project AG1-306 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-306 was studied with a commercial probability of 53.0 %. 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)

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
173861534	942890	AE2-308 TAP	138.0	EKPC	342574	4DALE	138.0	EKPC	1	EKPC_P4-2_FAWKES562-804	breaker	203.0	73.55	105.57	DC	65.0

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	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPACT
165594959	250054	08LONGBR	138.0	DEO&K	250077	08MTZION	138.0	DEO&K	1	34541 34553	tower	284.0	121.98	122.78	DC	4.97
165594979	250077	08MTZION	138.0	DEO&K	249991	08BUFTN1	138.0	DEO&K	1	34541 34553	tower	298.0	111.62	112.38	DC	4.97
165336818	342544	4AVON-R	138.0	EKPC	324275	4LOUDONAVE	138.0	LGEE	1	34541 34553	tower	203.0	127.09	127.87	DC	3.51
174048483	342544	4AVON-R	138.0	EKPC	324275	4LOUDONAVE	138.0	LGEE	1	EKPC_P2-4_NCLKE114-151T_1	breaker	203.0	120.98	121.8	DC	3.71
164499914	342559	4BOONECO	138.0	EKPC	250054	08LONGBR	138.0	DEO&K	1	34541 34553	tower	284.0	129.59	130.39	DC	4.97
173861559	342688	4UNIONCTY T	138.0	EKPC	324276	4LAKE REBAT	138.0	LGEE	1	EKPC_P4-2_FAWKES562-804	breaker	306.0	100.6	101.58	DC	4.44
164498800	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	EKPC_P2-2_MELD-SPUR345	bus	1532.0	116.97	117.54	DC	18.98
164498989	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	DEOK_P2-3_1449_ZIMMER	breaker	1532.0	119.73	120.31	DC	18.94
164498990	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	DEOK_P2-3_1493_RED BANK	breaker	1532.0	117.71	118.19	DC	15.97

11.4 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	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC/D C	MW IMPACT
169411244	342541	4AVON	138.0	EKPC	342631	4PARIST	138.0	EKPC	1	EKPC_P2-1_7N CLARK 345.00 TO 7SPURLOCK 345.00-C	operation	220.0	110.33	111.45	DC	5.49
169411216	342544	4AVON-R	138.0	EKPC	324275	4LOUDON AVE	138.0	LGE	1	EKPC_P2-1_7AVON 345.00 TO 7N CLARK 345.00-C	operation	203.0	120.09	120.85	DC	3.45
169411320	342688	4UNION CTY T	138.0	EKPC	324276	4LAKE REBA T	138.0	LGE	1	EKPC_P1-2_FAWK 138 TIE	operation	306.0	100.54	101.51	DC	4.44
164499312	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	Base Case	operation	1240.0	123.56	124.12	DC	15.03
164499313	342838	7SPURLOCK	345.0	EKPC	253077	09STUART	345.0	DAY	1	DEOK_P1_ZIMMER-MELDAHL 34576	operation	1532.0	117.73	118.3	DC	18.95
174671595	942890	AE2-308 TAP	138.0	EKPC	342574	4DALE	138.0	EKPC	1	EKPC_P2-1_4FAWKES EK 138.00 TO 4THREE FK T 138.00-A	operation	203.0	72.56	104.58	DC	65.0
174671564	964430	AG1-306 TAP	138.0	EKPC	342577	4FAWKES EK	138.0	EKPC	1	EKPC_P1-2_AVN-BBN-DLE138	operation	203.0	90.96	114.82	DC	48.43

11.5 Flow Gate Details - Secondary POI

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".

11.5.1 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
173861534	942890	AE2-308 TAP	EKPC	342574	4DALE	EKPC	1	EKPC_P4-2_FAWKES S62-804	breaker	203.0	73.55	105.57	DC	65.0

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942891	AE2-308 C O1	110.0000	50/50	110.0000
942892	AE2-308 E O1	40.0000	50/50	40.0000
964431	AG1-306 C O2	39.0000	50/50	39.0000
964432	AG1-306 E O2	26.0000	50/50	26.0000

11.5.2 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
165594959	250054	08LONGBR	DEO&K	250077	08MTZION	DEO&K	1	34541 34553	tower	284.0	121.98	122.78	DC	4.97

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 O2	0.7968	Adder	1.77
963592	AG1-208 E O2	0.4766	Adder	1.06
964431	AG1-306 C O2	1.3428	Adder	2.98
964432	AG1-306 E O2	0.8952	Adder	1.99
964881	AG1-352 C	0.7682	Adder	1.71
964882	AG1-352 E	0.5121	Adder	1.14
965161	AG1-381 C O2	0.6347	Adder	1.41
965162	AG1-381 E O2	0.3502	Adder	0.78
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	2.0294	Confirmed LTF	2.0294
CPL	CPL	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

11.5.3 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
165594979	250077	08MTZION	DEO&K	249991	08BUFTN1	DEO&K	1	34541 34553	tower	298.0	111.62	112.38	DC	4.97

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 O2	0.7968	Adder	1.77
963592	AG1-208 E O2	0.4766	Adder	1.06
964431	AG1-306 C O2	1.3428	Adder	2.98
964432	AG1-306 E O2	0.8952	Adder	1.99
964881	AG1-352 C	0.7682	Adder	1.71
964882	AG1-352 E	0.5121	Adder	1.14
965161	AG1-381 C O2	0.6347	Adder	1.41
965162	AG1-381 E O2	0.3502	Adder	0.78
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	2.0294	Confirmed LTF	2.0294
CPL	CPL	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

11.5.4 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
165336818	342544	4AVON-R	EKPC	324275	4LOUDON AVE	LGEE	1	34541 34553	tower	203.0	127.09	127.87	DC	3.51

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
925984	AC1-074 C	4.5567	Adder	5.36
925985	AC1-074 E	1.9529	Adder	2.3
932551	AC2-075 C	1.0822	Adder	1.27
932552	AC2-075 E	0.5452	Adder	0.64
939141	AE1-144 C O1	3.6757	Adder	4.32
939142	AE1-144 E O1	1.8241	Adder	2.15
940531	AE2-038 C O1	2.4520	Adder	2.88
940532	AE2-038 E O1	1.2145	Adder	1.43
941411	AE2-138 C	14.8246	Adder	17.44
941412	AE2-138 E	5.4831	Adder	6.45
941981	AE2-210 C O1	5.1082	Adder	6.01
941982	AE2-210 E O1	1.9214	Adder	2.26
942591	AE2-275 C O1	2.8140	Adder	3.31
942592	AE2-275 E O1	1.0585	Adder	1.25
942891	AE2-308 C O1	5.8484	Adder	6.88
942892	AE2-308 E O1	2.1267	Adder	2.5
943111	AE2-339 C	4.8830	50/50	4.8830
943112	AE2-339 E	2.4050	50/50	2.4050
944621	AF1-127 C O1	5.8161	50/50	5.8161
944622	AF1-127 E O1	2.8647	50/50	2.8647
945681	AF1-233 C	7.0393	Adder	8.28
945682	AF1-233 E	3.4776	Adder	4.09
945861	AF1-251 C	11.1976	Adder	13.17
945862	AF1-251 E	7.4650	Adder	8.78
945911	AF1-256 C	2.2571	Adder	2.66
945912	AF1-256 E	1.5047	Adder	1.77
958171	AF2-111 C O1	9.1826	Adder	10.8
958172	AF2-111 E O1	6.1217	Adder	7.2
960571	AF2-348 C	9.2769	Adder	10.91
960572	AF2-348 E	6.1846	Adder	7.28
964431	AG1-306 C O2	0.9484	Adder	2.11
964432	AG1-306 E O2	0.6323	Adder	1.4
NY	NY	0.0227	Confirmed LTF	0.0227
PRAIRIE	PRAIRIE	0.5528	Confirmed LTF	0.5528
O-066	O-066	0.2625	Confirmed LTF	0.2625
COTTONWOOD	COTTONWOOD	0.2520	Confirmed LTF	0.2520
G-007	G-007	0.0410	Confirmed LTF	0.0410
HAMLET	HAMLET	0.0081	Confirmed LTF	0.0081
GIBSON	GIBSON	0.2206	Confirmed LTF	0.2206
BLUEG	BLUEG	1.2638	Confirmed LTF	1.2638
TRIMBLE	TRIMBLE	0.4101	Confirmed LTF	0.4101
CATAWBA	CATAWBA	0.0035	Confirmed LTF	0.0035

11.5.5 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
164499914	342559	4BOONE CO	EKPC	250054	08LONGBR	DEO&K	1	34541 34553	tower	284.0	129.59	130.39	DC	4.97

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

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
958172	AF2-111 E O1	11.1950	50/50	11.1950
960151	AF2-306	1.7989	Adder	2.12
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 O2	0.7968	Adder	1.77
963592	AG1-208 E O2	0.4766	Adder	1.06
964431	AG1-306 C O2	1.3428	Adder	2.98
964432	AG1-306 E O2	0.8952	Adder	1.99
964881	AG1-352 C	0.7682	Adder	1.71
964882	AG1-352 E	0.5121	Adder	1.14
965161	AG1-381 C O2	0.6347	Adder	1.41
965162	AG1-381 E O2	0.3502	Adder	0.78
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	2.0294	Confirmed LTF	2.0294
CPL	CPL	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

11.5.6 Index 6

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
173861559	342688	4UNION CTY T	EKPC	324276	4LAKE REBA T	LGEE	1	EKPC_P4-2_FAWKES S62-804	breaker	306.0	100.6	101.58	DC	4.44

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
342918	1JKCT 1G	2.3569	50/50	2.3569
342921	1JKCT 2G	2.3569	50/50	2.3569
342924	1JKCT 3G	2.3462	50/50	2.3462
342927	1JKCT 4G	1.5641	50/50	1.5641
342930	1JKCT 5G	1.5556	50/50	1.5556
342933	1JKCT 6G	1.5620	50/50	1.5620
342936	1JKCT 7G	1.5641	50/50	1.5641
941411	AE2-138 C	8.6037	Adder	10.12
941412	AE2-138 E	3.1822	Adder	3.74
941981	AE2-210 C O1	2.9646	Adder	3.49
941982	AE2-210 E O1	1.1151	Adder	1.31
942591	AE2-275 C O1	8.8820	50/50	8.8820
942592	AE2-275 E O1	3.3409	50/50	3.3409
942891	AE2-308 C O1	6.3842	Adder	7.51
942892	AE2-308 E O1	2.3215	Adder	2.73
944621	AF1-127 C O1	2.2939	Adder	2.7
944622	AF1-127 E O1	1.1299	Adder	1.33
945861	AF1-251 C	5.8243	Adder	6.85
945862	AF1-251 E	3.8829	Adder	4.57
960641	AF2-355 C O1	6.3411	Adder	7.46
960642	AF2-355 E O1	4.2274	Adder	4.97
964431	AG1-306 C O2	1.1996	Adder	2.66
964432	AG1-306 E O2	0.7998	Adder	1.78
965412	AG1-404 BAT	0.9733	Merchant Transmission	0.9733
CALDERWOOD	CALDERWOOD	0.2823	Confirmed LTF	0.2823
NY	NY	0.0359	Confirmed LTF	0.0359
PRAIRIE	PRAIRIE	0.6535	Confirmed LTF	0.6535
O-066	O-066	0.4913	Confirmed LTF	0.4913
CHEOAH	CHEOAH	0.2798	Confirmed LTF	0.2798
COTTONWOOD	COTTONWOOD	0.8484	Confirmed LTF	0.8484
G-007	G-007	0.0777	Confirmed LTF	0.0777
HAMLET	HAMLET	0.1744	Confirmed LTF	0.1744
GIBSON	GIBSON	0.0863	Confirmed LTF	0.0863
BLUEG	BLUEG	0.3975	Confirmed LTF	0.3975
TRIMBLE	TRIMBLE	0.1146	Confirmed LTF	0.1146
CATAWBA	CATAWBA	0.1172	Confirmed LTF	0.1172

11.5.7 Index 7

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
164498989	342838	7SPURLOCK	EKPC	253077	09STUART	DAY	1	DEOK_P2-3_1449_ZIMMER	breaker	1532.0	119.73	120.31	DC	18.94

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 O2	2.5897	Adder	5.75
962212	AG1-066 E O2	1.7265	Adder	3.83
963591	AG1-208 C O2	3.0738	Adder	6.82
963592	AG1-208 E O2	1.8387	Adder	4.08
964431	AG1-306 C O2	5.1190	Adder	11.36
964432	AG1-306 E O2	3.4127	Adder	7.58
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 O2	2.6213	Adder	5.82
965162	AG1-381 E O2	1.4462	Adder	3.21
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 O2	2.6016	Adder	5.77
966192	AG1-488 E O2	1.7344	Adder	3.85
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
CPL	CPL	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

11.6 Contingency Descriptions - Secondary POI

Contingency Name	Contingency Definition
EKPC_P1-2_AVN-BBN-DLE138	CONTINGENCY 'EKPC_P1-2_AVN-BBN-DLE138' / 144 OPEN BRANCH FROM BUS 342541 TO BUS 342556 CKT 1 / 342541 4AVON 138 342556 4BECKNERV T 138 1 OPEN BRANCH FROM BUS 342553 TO BUS 342556 CKT 1 / 342553 4BECKNERV 138 342556 4BECKNERV T 138 1 OPEN BRANCH FROM BUS 342556 TO BUS 342565 CKT 1 / 342556 4BECKNERV T 138 342565 4BOONESBOR T 138 1 OPEN BRANCH FROM BUS 342565 TO BUS 342574 CKT 1 / 342565 4BOONESBOR T 138 342574 4DALE 138 1 END
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
DEOK_P1_ZIMMER-MELDAHL 34576	CONTINGENCY 'DEOK_P1_ZIMMER-MELDAHL 34576' OPEN BRANCH FROM BUS 249577 TO BUS 249581 CKT 1 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
EKPC_P4-2_FAWKES S62-804	CONTINGENCY 'EKPC_P4-2_FAWKES S62-804' / 198 OPEN BRANCH FROM BUS 324247 TO BUS 342577 CKT 1 / 324247 4FAWKES TAP 138 342577 4FAWKES EK 138 1 OPEN BRANCH FROM BUS 324248 TO BUS 342577 CKT 1 / 324248 4FAWKES KU 138 342577 4FAWKES EK 138 1 OPEN BRANCH FROM BUS 342577 TO BUS 342691 CKT 1 / 342577 4FAWKES EK 138 342691 4W BERE A 138 1 OPEN BRANCH FROM BUS 342577 TO BUS 942590 CKT 1 / 342577 4FAWKES EK 138 942590 AE2-275 TAP 138 1 OPEN BRANCH FROM BUS 342577 TO BUS 964430 CKT 1 / 342577 4FAWKES EK 138 964430 AG1-306 TAP 138 1 OPEN BRANCH FROM BUS 342676 TO BUS 342679 CKT 1 / 342676 4THREE FK T 138 342679 4THREE FORKS 138 1 END

Contingency Name	Contingency Definition
EKPC_P2-4_NCLK E114-151T_1	CONTINGENCY 'EKPC_P2-4_NCLK E114-151T_1' / 656 OPEN BRANCH FROM BUS 342832 TO BUS 342835 CKT 1 / 342832 7JK SMITH 345 342835 7N CLARK 345 1 OPEN BRANCH FROM BUS 342835 TO BUS 941410 CKT 1 / 342835 7N CLARK 345 941410 AE2-138 TAP 345 1 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
EKPC_P2-1_7AVON 345.00 TO 7N CLARK 345.00-C	CONTINGENCY 'EKPC_P2-1_7AVON 345.00 TO 7N CLARK 345.00-C' / 545 OPEN BRANCH FROM BUS 342835 TO BUS 941410 CKT 1 / 342835 7N CLARK 345 941410 AE2-138 TAP 345 1 END
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' / 1307 OPEN BRANCH FROM BUS 342838 TO BUS 958170 CKT 1 / 342838 7SPURLOCK 345 958170 AF2-111 TAP 345 1 END
Base Case	
EKPC_P2-1_4FAWKES EK 138.00 TO 4THREE FK T 138.00-A	CONTINGENCY 'EKPC_P2-1_4FAWKES EK 138.00 TO 4THREE FK T 138.00-A' / 191 OPEN BRANCH FROM BUS 342577 TO BUS 964430 CKT 1 / 342577 4FAWKES EK 138 964430 AG1-306 TAP 138 1 END
EKPC_P1-2_FAWK 138 TIE	CONTINGENCY 'EKPC_P1-2_FAWK 138 TIE' / 551 OPEN BRANCH FROM BUS 324247 TO BUS 342577 CKT 1 / 324247 4FAWKES TAP 138 342577 4FAWKES EK 138 1 OPEN BRANCH FROM BUS 324248 TO BUS 342577 CKT 1 / 324248 4FAWKES KU 138 342577 4FAWKES EK 138 1 OPEN BRANCH FROM BUS 342577 TO BUS 342691 CKT 1 / 342577 4FAWKES EK 138 342691 4W BERA 138 1 OPEN BRANCH FROM BUS 342577 TO BUS 942590 CKT 1 / 342577 4FAWKES EK 138 942590 AE2-275 TAP 138 1 OPEN BRANCH FROM BUS 342577 TO BUS 964430 CKT 1 / 342577 4FAWKES EK 138 964430 AG1-306 TAP 138 1 END

Contingency Name	Contingency Definition
DEOK_P2-3_1493_RED BANK	CONTINGENCY 'DEOK_P2-3_1493_RED BANK' / 950 OPEN BRANCH FROM BUS 249571 TO BUS 249573 CKT 1 / 249571 08REDBK1 345 249573 08SGROVE 345 1 OPEN BRANCH FROM BUS 249573 TO BUS 249577 CKT 1 / 249573 08SGROVE 345 249577 08ZIMER 345 1 OPEN BRANCH FROM BUS 249573 TO BUS 250097 CKT 1 / 249573 08SGROVE 345 250097 08SGROVE 138 1 OPEN BRANCH FROM BUS 249988 TO BUS 250097 CKT 1 / 249988 08BKJ135 138 250097 08SGROVE 138 1 OPEN BRANCH FROM BUS 250042 TO BUS 250097 CKT 1 / 250042 08HANDS1 138 250097 08SGROVE 138 1 OPEN BRANCH FROM BUS 250052 TO BUS 250097 CKT 1 / 250052 08KYUNIV 138 250097 08SGROVE 138 1 OPEN BRANCH FROM BUS 250053 TO BUS 250097 CKT 1 / 250053 08LAFARG 138 250097 08SGROVE 138 1 OPEN BRANCH FROM BUS 250092 TO BUS 249571 CKT 1 / 250092 08REDBK1 138 249571 08REDBK1 345 1 END

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).