



Generation Interconnection

Feasibility Study Report

for

Queue Project AF2-365

MUNFORDVILLE KU TAP-HORSE CAVE JCT. 69 KV

30 MW Capacity / 50 MW Energy

July 2020

Table of Contents

- 1 Introduction..... 4
- 2 Preface..... 4
- 3 General..... 5
- 4 Point of Interconnection..... 6
- 5 Cost Summary 6
- 6 Transmission Owner Scope of Work..... 7
 - 6.1 Attachment Facilities..... 7
 - 6.2 Direct Connection Cost Estimate..... 7
 - 6.3 Non-Direct Connection Cost Estimate..... 7
- 7 Incremental Capacity Transfer Rights (ICTRs) 8
- 8 Interconnection Customer Requirements..... 8
- 9 Revenue Metering and SCADA Requirements 8
 - 9.1 PJM Requirements..... 8
 - 9.2 Meteorological Data Reporting Requirements..... 8
 - 9.3 Interconnected Transmission Owner Requirements..... 9
- 10 Summer Peak - Load Flow Analysis - Primary POI.....10
 - 10.1 Generation Deliverability11
 - 10.2 Multiple Facility Contingency11
 - 10.3 Contribution to Previously Identified Overloads.....11
 - 10.4 Potential Congestion due to Local Energy Deliverability.....11
 - 10.5 System Reinforcements - Summer Peak Load Flow - Primary POI.....13
 - 10.6 Flow Gate Details - Primary POI15
 - 10.6.1 Index 116
 - 10.6.2 Index 217
 - 10.6.3 Index 318
 - 10.6.4 Index 419
 - 10.6.5 Index 520
 - 10.6.6 Index 621
 - 10.7 Queue Dependencies22
 - 10.8 Contingency Descriptions - Primary POI.....23
- 11 Light Load Analysis.....24

12	Short Circuit Analysis – Primary POI.....	24
13	Stability and Reactive Power Assessment.....	24
14	Affected Systems	24
14.1	LG&E.....	24
14.2	MISO	24
14.3	TVA.....	24
14.4	Duke Energy Progress.....	24
15	Summer Peak - Load Flow Analysis - Secondary POI	25
15.1	Generation Deliverability	26
15.2	Multiple Facility Contingency	26
15.3	Contribution to Previously Identified Overloads.....	26
15.4	Potential Congestion due to Local Energy Deliverability.....	26
15.5	Flow Gate Details - Secondary POI.....	28
15.5.1	Index 1	29
15.5.2	Index 2	30
15.5.3	Index 3	31
15.5.4	Index 4	32
15.5.5	Index 5	33
15.6	Contingency Descriptions - Secondary POI.....	34

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 Hart County, Kentucky. The installed facilities will have a total capability of 50 MW with 30 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is December 31, 2022. This study does not imply a TO commitment to this in-service date.

Queue Number	AF2-365
Project Name	MUNFORDVILLE KU TAP-HORSE CAVE JCT. 69 KV
State	Kentucky
County	Hart
Transmission Owner	EKPC
MFO	50
MWE	50
MWC	30
Fuel	Solar
Basecase Study Year	2023

Any new service customers who can feasibly be commercially operable prior to June 1st of the basecase study year are required to request interim deliverability analysis.

4 Point of Interconnection

AF2-365 will interconnect with the EKPC transmission system along one of the following Points of Interconnection:

Primary POI: Munfordville KU Tap to the Horse Cave Jct. 69 kV line

Secondary POI: Bonnieville 69 kV substation

5 Cost Summary

The AF2-365 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$4,745,000
Total System Network Upgrade Costs	\$1,515,000
Total Costs	\$6,260,000

This cost excludes a Federal Income Tax Gross Up charges. This tax may or may not be charged based on whether this project meets the eligibility requirements of IRS Notice 88-129. If at a future date it is determined that the Federal Income Tax Gross charge is required, the Transmission Owner shall be reimbursed by the Interconnection Customer for such taxes.

Cost allocations for any System Upgrades will be provided in the System Impact Study Report.

6 Transmission Owner Scope of Work

6.1 Attachment Facilities

The total preliminary cost estimate for the Attachment work is given in the table below. These costs do not include CIAC Tax Gross-up.

	Total Cost
Install necessary equipment (a 69 kV isolation switch structure and associated switch, plus interconnection metering, fiber-optic connection and telecommunications equipment, circuit breaker and associated switches, and relay panel) at the new Hart County switching station, to accept the IC generator lead line/bus (Estimated time to implement is 24 months)	\$725,000
Total Attachment Facility Costs	\$725,000

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
Construct a new 69 kV switching station (Hart County Switching) to facilitate connection of the IC solar generation project to the existing Munfordville KU-KU Horse Cave Tap 69 kV line (Estimated time to implement is 24 months)	\$2,765,000
Total Direct Connection Facility Costs	\$2,765,000

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
Construct facilities to loop the existing Munfordville KU-KU Horse Cave Tap 69 kV line into the new Hart County switching station (Estimated time to implement is 24 months)	\$125,000
Modify relays and/or settings at Bonnierville substation for the existing line to the new Hart County switching station (Estimated time to implement is 9 months)	\$45,000
Modify relays and/or settings at Barren County substation for the existing line to the new Hart County switching station (Estimated time to implement is 9 months)	\$45,000
Install OPGW on the Hart County-Barren County 69 kV line (8.5 miles) (Estimated time to implement is 18 months)	\$1,040,000
Total Non-Direct Connection Facility Costs	\$1,255,000

7 Incremental Capacity Transfer Rights (ICTRs)

Will be determined at a later study phase

8 Interconnection Customer Requirements

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

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

1. An Interconnection Customer entering the New Services Queue on or after October 1, 2012 with a proposed new Customer Facility that has a Maximum Facility Output equal to or greater than 100 MW shall install and maintain, at its expense, phasor measurement units (PMUs). See Section 8.5.3 of Appendix 2 to the Interconnection Service Agreement as well as section 4.3 of PJM Manual 14D for additional information.
2. The Interconnection Customer may be required to install and/or pay for metering as necessary to properly track real time output of the facility as well as installing metering which shall be used for billing purposes. See Section 8 of Appendix 2 to the Interconnection Service Agreement as well as Section 4 of PJM Manual 14D for additional information.

9 Revenue Metering and SCADA Requirements

9.1 PJM Requirements

The Interconnection Customer will be required to install equipment necessary to provide Revenue Metering (KWH, KVARH) and real time data (KW, KVAR) for IC's generating Resource. See PJM Manuals M-01 and M-14D, and PJM Tariff Section 8 of Attachment O.

9.2 Meteorological Data Reporting Requirements

Solar generation facilities shall provide the Transmission Provider with site-specific meteorological data including:

- Back Panel temperature (Fahrenheit)
- Irradiance (Watts/meter²)
- Ambient air temperature (Fahrenheit) – (Accepted, not required)
- Wind speed (meters/second) – (Accepted, not required)
- Wind direction (decimal degrees from true north) – (Accepted, not required)

9.3 Interconnected Transmission Owner Requirements

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

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

10 Summer Peak - Load Flow Analysis - Primary POI

The Queue Project AF2-365 was evaluated as a 50.0 MW (Capacity 30.0 MW) injection tapping the Munfordville KU Tap to the Horse Cave Jct. 69 kV line in the EKPC area. Project AF2-365 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-365 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

10.1 Generation Deliverability

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

None

10.2 Multiple Facility Contingency

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

None

10.3 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPACT
102008594	341287	2CENT HARDIN	69.0	EKPC	341713	2KARGLE	69.0	EKPC	1	EKPC_P1 - 2_CHAR D-HARD138	single	98.0	146.59	148.25	DC	1.62
100309877	341713	2KARGLE	69.0	EKPC	324519	2ETOWN KU	69.0	LGEE	1	EKPC_P1 - 2_CHAR D-HARD138	single	76.0	170.48	172.61	DC	1.62
102009557	342286	2SOMERSET	69.0	EKPC	342287	2SOMERSET KU	69.0	EKPC	1	EKPC_P7 -1_COOP 161 DBL 2	tower	115.0	120.17	121.16	DC	2.52
100310716	342287	2SOMERSET KU	69.0	EKPC	324531	2FERGUSON SO	69.0	LGEE	1	EKPC_P7 -1_COOP 161 DBL 2	tower	105.0	133.2	134.52	DC	3.05
100309770	342718	5SCOOPER2	161.0	EKPC	324141	5ELIHU	161.0	LGEE	1	EKPC_P4 - 5_LAURL S50-1024	breaker	277.0	120.4	121.12	DC	4.4
100310775	342718	5SCOOPER2	161.0	EKPC	324141	5ELIHU	161.0	LGEE	1	EKPC_P7 - 1_LAURL 161 DBL	tower	277.0	120.43	121.16	DC	4.4
102008173	960170	AF2-308 TAP	69.0	EKPC	341287	2CENT HARDIN	69.0	EKPC	1	EKPC_P2 -2_KU HODG 69	bus	98.0	112.5	118.24	DC	5.62

10.4 Potential Congestion due to Local Energy Deliverability

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which shall study all overload conditions associated with the overloaded element(s) identified.

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPACT
102008593	341287	2CENT HARDIN	69.0	EKPC	341713	2KARGL E	69.0	EKPC	1	EKPC_P1-2_CHARD - HARD138	operation	98.0	183.46	184.7	DC	2.7
100309876	341713	2KARGLE	69.0	EKPC	324519	2ETOWN KU	69.0	LGEE	1	EKPC_P1-2_CHARD - HARD138	operation	76.0	218.01	219.61	DC	2.7
100310148	342718	5COOPER 2	161.0	EKPC	324141	5ELIHU	161.0	LGEE	1	EKPC_P1-2_LAUR-L DAM161	operation	277.0	120.24	120.97	DC	4.42
100310151	342718	5COOPER 2	161.0	EKPC	324141	5ELIHU	161.0	LGEE	1	Base Case	operation	219.0	104.13	104.91	DC	3.74

10.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
102009557	3	2SOMERSET 69.0 kV - 2SOMERSET KU 69.0 kV Ckt 1	<u>EKPC</u> r0080 (1430) : Replace the 500 MCM copper jumpers at the Somerset substation using 750 MCM copper or equivalent Project Type : FAC Cost : \$10,000 Time Estimate : 6.0 Months	\$10,000
100310716	4	2SOMERSET KU 69.0 kV - 2FERGUSON SO 69.0 kV Ckt 1	<u>LGEE</u> NonPJMArea (1606) : 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 : N/A Months	\$0
102008173	6	AF2-308 TAP 69.0 kV - 2CENT HARDIN 69.0 kV Ckt 1	<u>EKPC</u> EKPC-r0087 (1459) : Increase the maximum operating temperature of the 556 MCM ACSR conductor in the AF2-308 Tap-Central Hardin 69 kV line section to 302 degrees F (4.15 miles) Project Type : FAC Cost : \$280,000 Time Estimate : 9.0 Months	\$280,000
100309770,100 310775	5	SCOOPER2 161.0 kV - 5ELIHU 161.0 kV Ckt 1	<u>EKPC</u> r0076 (1426) : Increase the maximum operating temperature of the 795 MCM ACSR conductor in the Cooper-Elihu 161 kV line section to 275 degrees F (6.7 miles) Project Type : FAC Cost : \$660,000 Time Estimate : 9.0 Months <u>LGEE</u> NonPJMArea (1606) : 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 : N/A Months	\$660,000

ID	Idx	Facility	Upgrade Description	Cost
100309877	2	2KARGLE 69.0 kV - 2ETOWN KU 69.0 kV Ckt 1	<p><u>EKPC</u> EKPC-r0090a (1462) : Increase the maximum operating temperature of the 556 MCM ACSR conductor in the Kargle-KU Elizabethtown 69 kV line section to 302 degrees F (1.45 miles) Project Type : FAC Cost : \$100,000 Time Estimate : 9.0 Months</p> <p><u>LGEE</u> NonPJMArea (1606) : 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 : N/A Months</p>	\$100,000
102008594	1	2CENT HARDIN 69.0 kV - 2KARGLE 69.0 kV Ckt 1	<p><u>EKPC</u> EKPC-r0086b (1454) : Replace the 556 MCM ACSR jumpers at the Central Hardin substation using bundled 500 MCM copper or equivalent Project Type : FAC Cost : \$15,000 Time Estimate : 6.0 Months</p> <p>EKPC-r0086c (1455) : Rebuild the Central Hardin-Kargle 69 kV line section using 954 MCM ACSS conductor at 392 degrees F (0.6 miles) Project Type : FAC Cost : \$450,000 Time Estimate : 12.0 Months</p>	\$465,000
			TOTAL COST	\$1,515,000

10.6 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".

10.6.1 Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
102008594	341287	2CENT HARDIN	EKPC	341713	2KARGLE	EKPC	1	EKPC_P1-2_CHARD-HARD138	single	98.0	146.59	148.25	DC	1.62

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
952821	J762	13.4600	PJM External (MISO)	13.4600
957961	AF2-090 C	29.7580	80/20	29.7580
959691	AF2-260 C O1	19.1730	80/20	19.1730
960171	AF2-308	11.7765	80/20	11.7765
960181	AF2-309 C	17.6648	80/20	17.6648
960741	AF2-365 C O1	1.6191	80/20	1.6191
961001	AF2-391 C O1	40.8773	80/20	40.8773
WEC	WEC	0.0438	Confirmed LTF	0.0438
CPLE	CPLE	0.0814	Confirmed LTF	0.0814
CBM-W2	CBM-W2	3.5708	Confirmed LTF	3.5708
NY	NY	0.0061	Confirmed LTF	0.0061
CBM-W1	CBM-W1	1.5387	Confirmed LTF	1.5387
TVA	TVA	0.7840	Confirmed LTF	0.7840
CBM-S2	CBM-S2	0.9768	Confirmed LTF	0.9768
CBM-S1	CBM-S1	2.8457	Confirmed LTF	2.8457
MADISON	MADISON	0.8588	Confirmed LTF	0.8588
MEC	MEC	0.4147	Confirmed LTF	0.4147
BLUEG	BLUEG	1.1024	Confirmed LTF	1.1024
TRIMBLE	TRIMBLE	0.3066	Confirmed LTF	0.3066

10.6.2 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
100309877	341713	2KARGLE	EKPC	324519	2ETOWN KU	LGEE	1	EKPC_P1- 2_CHAR- HARD138	single	76.0	170.48	172.61	DC	1.62

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
952821	J762	13.4600	PJM External (MISO)	13.4600
957961	AF2-090 C	29.7580	80/20	29.7580
959691	AF2-260 C O1	19.1730	80/20	19.1730
960171	AF2-308	11.7765	80/20	11.7765
960181	AF2-309 C	17.6648	80/20	17.6648
960741	AF2-365 C O1	1.6191	80/20	1.6191
961001	AF2-391 C O1	40.8773	80/20	40.8773
WEC	WEC	0.0438	Confirmed LTF	0.0438
CPLE	CPLE	0.0814	Confirmed LTF	0.0814
CBM-W2	CBM-W2	3.5708	Confirmed LTF	3.5708
NY	NY	0.0061	Confirmed LTF	0.0061
CBM-W1	CBM-W1	1.5387	Confirmed LTF	1.5387
TVA	TVA	0.7840	Confirmed LTF	0.7840
CBM-S2	CBM-S2	0.9768	Confirmed LTF	0.9768
CBM-S1	CBM-S1	2.8457	Confirmed LTF	2.8457
MADISON	MADISON	0.8588	Confirmed LTF	0.8588
MEC	MEC	0.4147	Confirmed LTF	0.4147
BLUEG	BLUEG	1.1024	Confirmed LTF	1.1024
TRIMBLE	TRIMBLE	0.3066	Confirmed LTF	0.3066

10.6.3 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
102009557	342286	2SOMERSET	EKPC	342287	2SOMERSET KU	EKPC	1	EKPC_P7- 1_COOP 161 DBL 2	tower	115.0	120.17	121.16	DC	2.52

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
342900	1COOPER1 G	5.5368	50/50	5.5368
342903	1COOPER2 G	10.7390	50/50	10.7390
939131	AE1-143 C	5.3380	Adder	6.28
939132	AE1-143 E	2.6441	Adder	3.11
940041	AE1-246 C O1	4.2405	Adder	4.99
940042	AE1-246 E O1	2.0651	Adder	2.43
940831	AE2-071 C	1.2982	Adder	1.53
940832	AE2-071 E	0.8655	Adder	1.02
943701	AF1-038 C	6.1949	50/50	6.1949
943702	AF1-038 E	4.1299	50/50	4.1299
943821	AF1-050 C	2.2451	Adder	2.64
943822	AF1-050 E	1.4967	Adder	1.76
944151	AF1-083 C O1	2.3784	Adder	2.8
944152	AF1-083 E O1	1.5856	Adder	1.87
944511	AF1-116 C	5.9866	Adder	7.04
944512	AF1-116 E	3.9911	Adder	4.7
945381	AF1-203 C	0.7418	Adder	0.87
945382	AF1-203 E	0.4946	Adder	0.58
960741	AF2-365 C O1	0.6820	Adder	1.51
960742	AF2-365 E O1	0.4546	Adder	1.01
WEC	WEC	0.0482	Confirmed LTF	0.0482
LGEE	LGEE	0.0131	Confirmed LTF	0.0131
CPL	CPL	0.0318	Confirmed LTF	0.0318
LGE-0012019	LGE-0012019	5.0391	LTF	5.0391
CBM-W2	CBM-W2	3.5872	Confirmed LTF	3.5872
NY	NY	0.0426	Confirmed LTF	0.0426
CBM-W1	CBM-W1	1.7014	Confirmed LTF	1.7014
TVA	TVA	1.0724	Confirmed LTF	1.0724
O-066	O-066	0.5040	Confirmed LTF	0.5040
CBM-S2	CBM-S2	0.6069	Confirmed LTF	0.6069
CBM-S1	CBM-S1	5.3506	Confirmed LTF	5.3506
G-007	G-007	0.0780	Confirmed LTF	0.0780
MADISON	MADISON	0.7560	Confirmed LTF	0.7560
MEC	MEC	0.4513	Confirmed LTF	0.4513

10.6.4 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
100310716	342287	2SOMERSET KU	EKPC	324531	2FERGUSON SO	LGEE	1	EKPC_P7- 1_COOP 161 DBL 2	tower	105.0	133.2	134.52	DC	3.05

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
342900	1COOPER1 G	5.4187	50/50	5.4187
342903	1COOPER2 G	10.5096	50/50	10.5096
939131	AE1-143 C	6.4733	50/50	6.4733
939132	AE1-143 E	3.2064	50/50	3.2064
940041	AE1-246 C O1	5.3436	Adder	6.29
940042	AE1-246 E O1	2.6022	Adder	3.06
940831	AE2-071 C	1.6422	Adder	1.93
940832	AE2-071 E	1.0948	Adder	1.29
943701	AF1-038 C	8.4539	50/50	8.4539
943702	AF1-038 E	5.6359	50/50	5.6359
943821	AF1-050 C	2.5933	Adder	3.05
943822	AF1-050 E	1.7289	Adder	2.03
944151	AF1-083 C O1	2.5632	Adder	3.02
944152	AF1-083 E O1	1.7088	Adder	2.01
944511	AF1-116 C	7.2598	50/50	7.2598
944512	AF1-116 E	4.8398	50/50	4.8398
945381	AF1-203 C	0.9384	Adder	1.1
945382	AF1-203 E	0.6256	Adder	0.74
960741	AF2-365 C O1	0.8247	Adder	1.83
960742	AF2-365 E O1	0.5498	Adder	1.22
WEC	WEC	0.0621	Confirmed LTF	0.0621
CPL	CPL	0.0648	Confirmed LTF	0.0648
LGE-0012019	LGE-0012019	5.1436	LTF	5.1436
CBM-W2	CBM-W2	4.6437	Confirmed LTF	4.6437
NY	NY	0.0431	Confirmed LTF	0.0431
CBM-W1	CBM-W1	2.2018	Confirmed LTF	2.2018
TVA	TVA	1.4154	Confirmed LTF	1.4154
O-066	O-066	0.5107	Confirmed LTF	0.5107
CBM-S2	CBM-S2	1.0115	Confirmed LTF	1.0115
CBM-S1	CBM-S1	6.9864	Confirmed LTF	6.9864
G-007	G-007	0.0790	Confirmed LTF	0.0790
MADISON	MADISON	0.9959	Confirmed LTF	0.9959
MEC	MEC	0.5816	Confirmed LTF	0.5816

10.6.5 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
100310775	342718	SCOOPER2	EKPC	324141	SELIHU	LGEE	1	EKPC_P7-1_LAURL 161 DBL	tower	277.0	120.43	121.16	DC	4.4

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
342900	1COOPER1 G	11.1177	50/50	11.1177
342903	1COOPER2 G	21.6286	50/50	21.6286
342945	1LAUREL 1G	6.7288	50/50	6.7288
939131	AE1-143 C	10.0871	50/50	10.0871
939132	AE1-143 E	4.9964	50/50	4.9964
940041	AE1-246 C O1	9.0997	50/50	9.0997
940042	AE1-246 E O1	4.4315	50/50	4.4315
940831	AE2-071 C	2.5761	50/50	2.5761
940832	AE2-071 E	1.7174	50/50	1.7174
943701	AF1-038 C	6.6874	50/50	6.6874
943702	AF1-038 E	4.4582	50/50	4.4582
943821	AF1-050 C	4.5515	50/50	4.5515
943822	AF1-050 E	3.0343	50/50	3.0343
944151	AF1-083 C O1	4.6091	50/50	4.6091
944152	AF1-083 E O1	3.0727	50/50	3.0727
944511	AF1-116 C	11.3126	50/50	11.3126
944512	AF1-116 E	7.5418	50/50	7.5418
945381	AF1-203 C	1.4720	50/50	1.4720
945382	AF1-203 E	0.9814	50/50	0.9814
960741	AF2-365 C O1	1.1905	Adder	2.64
960742	AF2-365 E O1	0.7937	Adder	1.76
WEC	WEC	0.0734	Confirmed LTF	0.0734
CPL	CPL	0.0906	Confirmed LTF	0.0906
LGE-0012019	LGE-0012019	7.9453	LTF	7.9453
CBM-W2	CBM-W2	6.6175	Confirmed LTF	6.6175
NY	NY	0.0879	Confirmed LTF	0.0879
CBM-W1	CBM-W1	2.5520	Confirmed LTF	2.5520
TVA	TVA	2.1140	Confirmed LTF	2.1140
O-066	O-066	1.0349	Confirmed LTF	1.0349
CBM-S2	CBM-S2	1.5086	Confirmed LTF	1.5086
CBM-S1	CBM-S1	10.2666	Confirmed LTF	10.2666
G-007	G-007	0.1602	Confirmed LTF	0.1602
MADISON	MADISON	1.5785	Confirmed LTF	1.5785
MEC	MEC	0.7850	Confirmed LTF	0.7850

10.6.6 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
102008173	960170	AF2-308 TAP	EKPC	341287	2CENT HARDIN	EKPC	1	EKPC_P2-2_KU HODG 69	bus	98.0	112.5	118.24	DC	5.62

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959691	AF2-260 C O1	36.8184	50/50	36.8184
959692	AF2-260 E O1	18.4092	50/50	18.4092
960171	AF2-308	20.0096	50/50	20.0096
960181	AF2-309 C	30.0145	50/50	30.0145
960182	AF2-309 E	20.0096	50/50	20.0096
960741	AF2-365 C O1	3.3723	50/50	3.3723
960742	AF2-365 E O1	2.2482	50/50	2.2482
WEC	WEC	0.0079	Confirmed LTF	0.0079
CPLE	CPLE	0.0880	Confirmed LTF	0.0880
G-007A	G-007A	0.0240	Confirmed LTF	0.0240
VFT	VFT	0.0645	Confirmed LTF	0.0645
CBM-W2	CBM-W2	1.8018	Confirmed LTF	1.8018
CBM-W1	CBM-W1	0.3378	Confirmed LTF	0.3378
TVA	TVA	0.6342	Confirmed LTF	0.6342
CBM-S2	CBM-S2	1.0057	Confirmed LTF	1.0057
CBM-S1	CBM-S1	2.4623	Confirmed LTF	2.4623
TILTON	TILTON	0.0189	Confirmed LTF	0.0189
MADISON	MADISON	0.4778	Confirmed LTF	0.4778
MEC	MEC	0.1891	Confirmed LTF	0.1891
GIBSON	GIBSON	0.0513	Confirmed LTF	0.0513
BLUEG	BLUEG	0.8802	Confirmed LTF	0.8802
TRIMBLE	TRIMBLE	0.2460	Confirmed LTF	0.2460

10.7 Queue Dependencies

The Queue Projects below are listed in one or more indices for the overloads identified in your report. These projects contribute to the loading of the overloaded facilities identified in your report. The percent overload of a facility and cost allocation you may have towards a particular reinforcement could vary depending on the action of these earlier projects. The status of each project at the time of the analysis is presented in the table. This list may change as earlier projects withdraw or modify their requests.

Queue Number	Project Name	Status
AE1-143	Marion County 161 kV	Active
AE1-246	Barren County-Summer Shade 161 kV	Active
AE2-071	Patton Rd-Summer Shade 69 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
AF1-203	Patton Rd-Summer Shade 69 kV	Active
AF2-090	Central Hardin 138 kV	Active
AF2-260	Stephensburg 69 kV	Active
AF2-308	Central Hardin-Stephensburg 69 kV	Active
AF2-309	Central Hardin-Stephensburg 69 kV	Active
AF2-365	Munfordville KU Tap-Horse Cave Jct. 69 kV	Active
AF2-391	Central Hardin 69 kV	Active
J762	MISO	MISO

10.8 Contingency Descriptions - Primary POI

Contingency Name	Contingency Definition
EKPC_P1-2_LAUR-L DAM161	CONTINGENCY 'EKPC_P1-2_LAUR-L DAM161' /* LAUREL CO - LAUREL DAM OPEN BRANCH FROM BUS 342754 TO BUS 342757 CKT 1 /* 342754 5LAUREL CO 161.00 342757 5LAUREL DAM 161.00 END
EKPC_P1-2_CHARD-HARD138	CONTINGENCY 'EKPC_P1-2_CHARD-HARD138' /* CENTRAL HARDIN - KU HARDIN /* 324261 4HARDN 138.00 OPEN BRANCH FROM BUS 324261 TO BUS 342568 CKT 1 342568 4CENT HARDIN138.00 END
EKPC_P7-1_COOP 161 DBL 2	CONTINGENCY 'EKPC_P7-1_COOP 161 DBL 2' /* COOPER - ELIHU 161 & COOPER - LAUREL DAM 161 /* 324141 5ELIHU 161.00 OPEN BRANCH FROM BUS 324141 TO BUS 342718 CKT 1 342718 5COOPER2 161.00 /* 342718 5COOPER2 OPEN BRANCH FROM BUS 342718 TO BUS 342757 CKT 1 161.00 342757 5LAUREL DAM 161.00 END
EKPC_P7-1_LAURL 161 DBL	CONTINGENCY 'EKPC_P7-1_LAURL 161 DBL' /* LAUREL CO - LAUREL DAM 161 & LAUREL CO - TYNER 161 /* 342754 5LAUREL CO OPEN BRANCH FROM BUS 342754 TO BUS 342757 CKT 1 /* 342754 5LAUREL CO 161.00 342757 5LAUREL DAM 161.00 /* 342754 5LAUREL CO OPEN BRANCH FROM BUS 342754 TO BUS 342781 CKT 1 /* 342781 5PITTSBURG 161.00 342781 5PITTSBURG 161.00 /* 342781 5PITTSBURG OPEN BRANCH FROM BUS 342781 TO BUS 342820 CKT 1 161.00 342820 5TYNER 161.00 END
Base Case	
EKPC_P4-5_LAURL S50-1024	CONTINGENCY 'EKPC_P4-5_LAURL S50-1024' /* LAUREL CO OPEN BUS 342754 /* 5LAUREL CO DROPS BUS OPEN BRANCH FROM BUS 324688 TO BUS 342781 CKT 1 /* 324688 2PITTSKU 69.000 342781 5PITTSBURG 161.00 /* 342781 5PITTSBURG OPEN BRANCH FROM BUS 342781 TO BUS 342820 CKT 1 161.00 342820 5TYNER 161.00 END
EKPC_P2-2_KU HODG 69	CONTINGENCY 'EKPC_P2-2_KU HODG 69' /* KU HODGENVILLE 69 TIE OPEN BUS 341632 /* 2HODGENVILLE END

11 Light Load Analysis

Light Load Studies (As applicable)

To be determined during later study phases.

12 Short Circuit Analysis – Primary POI

The following Breakers are overdutied:

To be determined during later study phases.

13 Stability and Reactive Power Assessment

(Summary of the VAR requirements based upon the results of the dynamic studies)

To be determined during later study phases.

14 Affected Systems

14.1 LG&E

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

14.2 MISO

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

14.3 TVA

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

14.4 Duke Energy Progress

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

15 Summer Peak - Load Flow Analysis - Secondary POI

The Queue Project AF2-365 was evaluated as a 50.0 MW (Capacity 30.0 MW) injection at the Bonnieville 69 kV substation in the EKPC area. Project AF2-365 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-365 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

15.1 Generation Deliverability

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

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
100309882	341713	2KARGLE	69.0	EKPC	324519	2ETOWN KU	69.0	LGEE	1	Base Case	single	66.0	99.73	102.66	DC	1.93

15.2 Multiple Facility Contingency

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

None

15.3 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
102008594	341287	2CENT HARDIN	69.0	EKPC	341713	2KARGL E	69.0	EKPC	1	EKPC_P1-2_CHARD - HARD138	single	98.0	151.87	154.74	DC	2.81
153085078	341287	2CENT HARDIN	69.0	EKPC	341713	2KARGL E	69.0	EKPC	1	EKPC_P2-4_CHARD W124-91T	bus	98.0	182.38	189.42	DC	6.9
100309877	341713	2KARGLE	69.0	EKPC	324519	2ETOWN KU	69.0	LGEE	1	EKPC_P1-2_CHARD - HARD138	single	76.0	177.27	180.98	DC	2.81
100309770	342718	5COOPER 2	161.0	EKPC	324141	5ELIHU	161.0	LGEE	1	EKPC_P4-5_LAURL S50-1024	breaker	277.0	120.39	120.94	DC	3.31
100310775	342718	5COOPER 2	161.0	EKPC	324141	5ELIHU	161.0	LGEE	1	EKPC_P7-1_LAURL 161 DBL	tower	277.0	120.43	120.98	DC	3.31
153085101	960170	AF2-308 TAP	69.0	EKPC	961000	AF2-391 TAP	69.0	EKPC	1	EKPC_P2-2_KU HODG 69	bus	98.0	120.4	130.43	DC	9.82
153085059	961000	AF2-391 TAP	69.0	EKPC	341287	2CENT HARDIN	69.0	EKPC	1	EKPC_P2-2_KU HODG 69	bus	98.0	120.3	130.32	DC	9.82

15.4 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	FRO M BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Ratin g MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPAC T
102008593	341287	2CENT HARDIN	69.0	EKPC	341713	2KARGL E	69.0	EKPC	1	EKPC_P1-2_CHARD - HARD138	operatio n	98.0	191.37	193.52	DC	4.69
102008595	341287	2CENT HARDIN	69.0	EKPC	341713	2KARGL E	69.0	EKPC	1	Base Case	operatio n	89.0	109.68	111.31	DC	3.22
100309876	341713	2KARGLE	69.0	EKPC	324519	2ETOW N KU	69.0	LGEE	1	EKPC_P1-2_CHARD - HARD138	operatio n	76.0	228.21	230.99	DC	4.69
100309878	341713	2KARGLE	69.0	EKPC	324519	2ETOW N KU	69.0	LGEE	1	Base Case	operatio n	66.0	126.54	128.74	DC	3.22
100310148	342718	5COOPER 2	161.0	EKPC	324141	5ELIHU	161.0	LGEE	1	EKPC_P1-2_LAUR-L DAM161	operatio n	277.0	120.24	120.79	DC	3.32
100310151	342718	5COOPER 2	161.0	EKPC	324141	5ELIHU	161.0	LGEE	1	Base Case	operatio n	219.0	104.13	104.72	DC	2.8
153552898	960170	AF2-308 TAP	69.0	EKPC	961000	AF2-391 TAP	69.0	EKPC	1	Base Case	operatio n	89.0	106.67	115.62	DC	7.97
153552899	960170	AF2-308 TAP	69.0	EKPC	961000	AF2-391 TAP	69.0	EKPC	1	EKPC_P1-2_STEPH-KUEAST69	operatio n	98.0	100.23	108.49	DC	8.1
153552494	961000	AF2-391 TAP	69.0	EKPC	341287	2CENT HARDIN	69.0	EKPC	1	Base Case	operatio n	89.0	106.56	115.51	DC	7.97
153552495	961000	AF2-391 TAP	69.0	EKPC	341287	2CENT HARDIN	69.0	EKPC	1	EKPC_P1-2_STEPH-KUEAST69	operatio n	98.0	100.12	108.39	DC	8.1

15.5 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".

15.5.1 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
100309877	341713	2KARGLE	EKPC	324519	2ETOWN KU	LGEE	1	EKPC_P1- 2_CHAR- HARD138	single	76.0	177.27	180.98	DC	2.81

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
952821	J762	13.4600	PJM External (MISO)	13.4600
957961	AF2-090 C	29.7580	80/20	29.7580
959691	AF2-260 C O2	24.3390	80/20	24.3390
960171	AF2-308	11.7765	80/20	11.7765
960181	AF2-309 C	17.6648	80/20	17.6648
960741	AF2-365 C O2	2.8143	80/20	2.8143
961001	AF2-391 C O2	35.2620	80/20	35.2620
WEC	WEC	0.0438	Confirmed LTF	0.0438
CPLE	CPLE	0.0814	Confirmed LTF	0.0814
CBM-W2	CBM-W2	3.5708	Confirmed LTF	3.5708
NY	NY	0.0061	Confirmed LTF	0.0061
CBM-W1	CBM-W1	1.5387	Confirmed LTF	1.5387
TVA	TVA	0.7840	Confirmed LTF	0.7840
CBM-S2	CBM-S2	0.9768	Confirmed LTF	0.9768
CBM-S1	CBM-S1	2.8457	Confirmed LTF	2.8457
MADISON	MADISON	0.8588	Confirmed LTF	0.8588
MEC	MEC	0.4147	Confirmed LTF	0.4147
BLUEG	BLUEG	1.1024	Confirmed LTF	1.1024
TRIMBLE	TRIMBLE	0.3066	Confirmed LTF	0.3066

15.5.2 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
153085078	341287	2CENT HARDIN	EKPC	341713	2KARGLE	EKPC	1	EKPC_P2-4_CHAR W124-91T	bus	98.0	182.38	189.42	DC	6.9

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957961	AF2-090 C	54.8614	50/50	54.8614
957962	AF2-090 E	27.1326	50/50	27.1326
959691	AF2-260 C O2	32.5398	50/50	32.5398
959692	AF2-260 E O2	16.2699	50/50	16.2699
960171	AF2-308	15.7094	50/50	15.7094
960181	AF2-309 C	23.5641	50/50	23.5641
960182	AF2-309 E	15.7094	50/50	15.7094
960741	AF2-365 C O2	4.1397	50/50	4.1397
960742	AF2-365 E O2	2.7598	50/50	2.7598
961001	AF2-391 C O2	46.6337	50/50	46.6337
961002	AF2-391 E O2	31.0891	50/50	31.0891
WEC	WEC	0.0069	Confirmed LTF	0.0069
CPLE	CPLE	0.0728	Confirmed LTF	0.0728
G-007A	G-007A	0.0192	Confirmed LTF	0.0192
VFT	VFT	0.0516	Confirmed LTF	0.0516
CBM-W2	CBM-W2	1.5315	Confirmed LTF	1.5315
CBM-W1	CBM-W1	0.3002	Confirmed LTF	0.3002
TVA	TVA	0.5264	Confirmed LTF	0.5264
CBM-S2	CBM-S2	0.8323	Confirmed LTF	0.8323
CBM-S1	CBM-S1	2.0192	Confirmed LTF	2.0192
TILTON	TILTON	0.0132	Confirmed LTF	0.0132
MADISON	MADISON	0.4012	Confirmed LTF	0.4012
MEC	MEC	0.1589	Confirmed LTF	0.1589
GIBSON	GIBSON	0.0349	Confirmed LTF	0.0349
BLUEG	BLUEG	0.7673	Confirmed LTF	0.7673
TRIMBLE	TRIMBLE	0.2137	Confirmed LTF	0.2137

15.5.3 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
100310775	342718	SCOOPER2	EKPC	324141	SELIHU	LGEE	1	EKPC_P7-1_LAURL 161 DBL	tower	277.0	120.43	120.98	DC	3.31

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
342900	1COOPER1 G	11.1177	50/50	11.1177
342903	1COOPER2 G	21.6286	50/50	21.6286
342945	1LAUREL 1G	6.7288	50/50	6.7288
939131	AE1-143 C	10.0871	50/50	10.0871
939132	AE1-143 E	4.9964	50/50	4.9964
940041	AE1-246 C O1	9.0997	50/50	9.0997
940042	AE1-246 E O1	4.4315	50/50	4.4315
940831	AE2-071 C	2.5761	50/50	2.5761
940832	AE2-071 E	1.7174	50/50	1.7174
943701	AF1-038 C	6.6874	50/50	6.6874
943702	AF1-038 E	4.4582	50/50	4.4582
943821	AF1-050 C	4.5515	50/50	4.5515
943822	AF1-050 E	3.0343	50/50	3.0343
944151	AF1-083 C O1	4.6091	50/50	4.6091
944152	AF1-083 E O1	3.0727	50/50	3.0727
944511	AF1-116 C	11.3126	50/50	11.3126
944512	AF1-116 E	7.5418	50/50	7.5418
945381	AF1-203 C	1.4720	50/50	1.4720
945382	AF1-203 E	0.9814	50/50	0.9814
960741	AF2-365 C O2	0.8935	Adder	1.98
960742	AF2-365 E O2	0.5957	Adder	1.32
WEC	WEC	0.0734	Confirmed LTF	0.0734
CPL	CPL	0.0906	Confirmed LTF	0.0906
LGE-0012019	LGE-0012019	7.9453	LTF	7.9453
CBM-W2	CBM-W2	6.6175	Confirmed LTF	6.6175
NY	NY	0.0879	Confirmed LTF	0.0879
CBM-W1	CBM-W1	2.5520	Confirmed LTF	2.5520
TVA	TVA	2.1140	Confirmed LTF	2.1140
O-066	O-066	1.0349	Confirmed LTF	1.0349
CBM-S2	CBM-S2	1.5086	Confirmed LTF	1.5086
CBM-S1	CBM-S1	10.2581	Confirmed LTF	10.2581
G-007	G-007	0.1602	Confirmed LTF	0.1602
MADISON	MADISON	1.5785	Confirmed LTF	1.5785
MEC	MEC	0.7850	Confirmed LTF	0.7850

15.5.4 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
153085101	960170	AF2-308 TAP	EKPC	961000	AF2-391 TAP	EKPC	1	EKPC_P2-2_KU HODG 69	bus	98.0	120.4	130.43	DC	9.82

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959691	AF2-260 C O2	41.9814	50/50	41.9814
959692	AF2-260 E O2	20.9907	50/50	20.9907
960171	AF2-308	20.0096	50/50	20.0096
960181	AF2-309 C	30.0145	50/50	30.0145
960182	AF2-309 E	20.0096	50/50	20.0096
960741	AF2-365 C O2	5.8938	50/50	5.8938
960742	AF2-365 E O2	3.9292	50/50	3.9292
WEC	WEC	0.0079	Confirmed LTF	0.0079
CPLE	CPLE	0.0880	Confirmed LTF	0.0880
G-007A	G-007A	0.0240	Confirmed LTF	0.0240
VFT	VFT	0.0645	Confirmed LTF	0.0645
CBM-W2	CBM-W2	1.8018	Confirmed LTF	1.8018
CBM-W1	CBM-W1	0.3378	Confirmed LTF	0.3378
TVA	TVA	0.6342	Confirmed LTF	0.6342
CBM-S2	CBM-S2	1.0057	Confirmed LTF	1.0057
CBM-S1	CBM-S1	2.4623	Confirmed LTF	2.4623
TILTON	TILTON	0.0189	Confirmed LTF	0.0189
MADISON	MADISON	0.4778	Confirmed LTF	0.4778
MEC	MEC	0.1891	Confirmed LTF	0.1891
GIBSON	GIBSON	0.0513	Confirmed LTF	0.0513
BLUEG	BLUEG	0.8802	Confirmed LTF	0.8802
TRIMBLE	TRIMBLE	0.2460	Confirmed LTF	0.2460

15.5.5 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
153085059	961000	AF2-391 TAP	EKPC	341287	2CENT HARDIN	EKPC	1	EKPC_P2-2_KU HODG 69	bus	98.0	120.3	130.32	DC	9.82

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959691	AF2-260 C O2	41.9814	50/50	41.9814
959692	AF2-260 E O2	20.9907	50/50	20.9907
960171	AF2-308	20.0096	50/50	20.0096
960181	AF2-309 C	30.0145	50/50	30.0145
960182	AF2-309 E	20.0096	50/50	20.0096
960741	AF2-365 C O2	5.8938	50/50	5.8938
960742	AF2-365 E O2	3.9292	50/50	3.9292
961001	AF2-391 C O2	56.4307	50/50	56.4307
961002	AF2-391 E O2	37.6205	50/50	37.6205
WEC	WEC	0.0079	Confirmed LTF	0.0079
CPLE	CPLE	0.0880	Confirmed LTF	0.0880
G-007A	G-007A	0.0240	Confirmed LTF	0.0240
VFT	VFT	0.0645	Confirmed LTF	0.0645
CBM-W2	CBM-W2	1.8018	Confirmed LTF	1.8018
CBM-W1	CBM-W1	0.3378	Confirmed LTF	0.3378
TVA	TVA	0.6342	Confirmed LTF	0.6342
CBM-S2	CBM-S2	1.0057	Confirmed LTF	1.0057
CBM-S1	CBM-S1	2.4623	Confirmed LTF	2.4623
TILTON	TILTON	0.0189	Confirmed LTF	0.0189
MADISON	MADISON	0.4778	Confirmed LTF	0.4778
MEC	MEC	0.1891	Confirmed LTF	0.1891
GIBSON	GIBSON	0.0513	Confirmed LTF	0.0513
BLUEG	BLUEG	0.8802	Confirmed LTF	0.8802
TRIMBLE	TRIMBLE	0.2460	Confirmed LTF	0.2460

15.6 Contingency Descriptions - Secondary POI

Contingency Name	Contingency Definition
EKPC_P2-4_CHARD W124-91T	CONTINGENCY 'EKPC_P2-4_CHARD W124-91T' /* CENTRAL HARDIN OPEN BRANCH FROM BUS 324047 TO BUS 342568 CKT 1 /* 324047 4BLACKBRNCH 138.00 342568 4CENT HARDIN138.00 OPEN BRANCH FROM BUS 324047 TO BUS 324260 CKT 1 /* 324047 4BLACKBRNCH 138.00 324260 4HARDBG 138.00 OPEN BRANCH FROM BUS 324261 TO BUS 342568 CKT 1 /* 324261 4HARDN 138.00 342568 4CENT HARDIN138.00 END
EKPC_P1-2_STEPH-KUEAST69	CONTINGENCY 'EKPC_P1-2_STEPH-KUEAST69' /* STEPHENSBURG - KU EASTVIEW OPEN BRANCH FROM BUS 324509 TO BUS 342307 CKT 1 /* 324509 2EASTVW 69.000 342307 2STEPHENSBRG69.000 END
EKPC_P1-2_LAUR-L DAM161	CONTINGENCY 'EKPC_P1-2_LAUR-L DAM161' /* LAUREL CO - LAUREL DAM OPEN BRANCH FROM BUS 342754 TO BUS 342757 CKT 1 /* 342754 5LAUREL CO 161.00 342757 5LAUREL DAM 161.00 END
EKPC_P1-2_CHARD-HARD138	CONTINGENCY 'EKPC_P1-2_CHARD-HARD138' /* CENTRAL HARDIN - KU HARDIN OPEN BRANCH FROM BUS 324261 TO BUS 342568 CKT 1 /* 324261 4HARDN 138.00 342568 4CENT HARDIN138.00 END
EKPC_P7-1_LAURL 161 DBL	CONTINGENCY 'EKPC_P7-1_LAURL 161 DBL' /* LAUREL CO - LAUREL DAM 161 & LAUREL CO - TYNER 161 OPEN BRANCH FROM BUS 342754 TO BUS 342757 CKT 1 /* 342754 5LAUREL CO 161.00 342757 5LAUREL DAM 161.00 OPEN BRANCH FROM BUS 342754 TO BUS 342781 CKT 1 /* 342754 5LAUREL CO 161.00 342781 5PITTSBURG 161.00 OPEN BRANCH FROM BUS 342781 TO BUS 342820 CKT 1 /* 342781 5PITTSBURG 161.00 342820 5TYNER 161.00 END
Base Case	
EKPC_P4-5_LAURL S50-1024	CONTINGENCY 'EKPC_P4-5_LAURL S50-1024' /* LAUREL CO OPEN BUS 342754 /* 5LAUREL CO DROPS BUS OPEN BRANCH FROM BUS 324688 TO BUS 342781 CKT 1 /* 324688 2PITTSKU 69.000 342781 5PITTSBURG 161.00 OPEN BRANCH FROM BUS 342781 TO BUS 342820 CKT 1 /* 342781 5PITTSBURG 161.00 342820 5TYNER 161.00 END

