



Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-381

HOPE 69 KV

17.4 MW Capacity / 27 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 Undetermined County, Undetermined. The installed facilities will have a total capability of 27 MW with 17.4 MW of this output being recognized by PJM as Capacity.

The proposed in-service date for this project is December 31, 2023. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-381
Project Name	HOPE 69 KV
State	Undetermined
County	Undetermined
Transmission Owner	EKPC
MFO	27
MWE	27
MWC	17.4
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

AG1-381 will interconnect with the EKPC transmission system along one of the following Points of Interconnection:

Primary POI: Hope 69 kV Substation.

Secondary POI: Hope to Blevins Valley Tap 69 kV line.

5 Cost Summary

The AG1-381 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$2,905,000
Total System Network Upgrade Costs	\$16,010,000
Total Costs	\$18,915,000

This cost excludes a Federal Income Tax Gross Up charges. This tax may or may not be charged based on whether this project meets the eligibility requirements of IRS Notice 2016-36, 2016-25 I.R.B. (6/20/2016). If at a future date it is determined that the Federal Income Tax Gross charge is required, the Transmission Owner shall be reimbursed by the Interconnection Customer for such taxes.

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

6 Transmission Owner Scope of Work

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

6.1 Attachment Facilities

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

Description	Total Cost
Install necessary equipment (a 69 kV isolation switch structure and associated switch, plus interconnection metering, fiber-optic connection and telecommunications equipment, circuit breaker and associated switches, and relay panels) at Hope substation, to accept the IC generator lead line/bus (Estimated time to implement is 12 months)	\$1,610,000
Total Attachment Facility Costs	\$1,610,000

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
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
Reterminate the Hope-Frenchburg 69 kV line for the Hope substation expansion.	\$185,000
Connect existing OPGW infrastructure on the Hope-Hillsboro 69 kV line into the Hope switching station (Estimated time to implement is 9 months)	\$210,000
Install OPGW on the Hillsboro-Goddard 69 kV line (6.2 miles) (Estimated time to implement is 21 months)	\$900,000
Total Non-Direct Connection Facility Costs	\$1,295,000

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 AG1-381 was evaluated as a 27.0 MW (Capacity 17.4 MW) injection at the Hope 69 kV substation in the EKPC area. Project AG1-381 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-381 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)

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
164594016	942090	AE2-221 TAP	345.0	DAY	253014	09CLINTO	345.0	DAY	1	34569 34598 34524	tower	1374.0	99.96	100.01	DC	1.53

9.3 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
166792591	939140	AE1-144 TAP	138.0	EKPC	342634	4PLUMVILLE	138.0	EKPC	1	EKPC_P2-2_ROWAN CO 138	bus	186.0	110.92	112.54	DC	3.01

9.4 Potential Congestion due to Local Energy Deliverability

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

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
169720398	939140	AE1-144 TAP	138.0	EKPC	342634	4PLUMVILLE	138.0	EKPC	1	EKPC_P1 - 2_GODD - ROW138	operation	186.0	109.95	110.58	DC	2.59

9.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
164594016	1	AE2-221 TAP 345.0 kV - 09CLINTO 345.0 kV Ckt 1	<p><u>DAY</u> DAYr190046 (1184) : Replace Clinton 2000A wave trap with 3000A Project Type : FAC Cost : \$100,000 Time Estimate : 12.0 Months</p> <p>DAYr190047 (1185) : Reconductor AE2-221 Tap to Clinton line with twin bundle 1351 ACSR Project Type : FAC Cost : \$15,000,000 Time Estimate : 18.0 Months</p> <p>DAYr190048 (1186) : Replace Clinton substation riser conductor with 2500AAC (parallel) Project Type : FAC Cost : \$100,000 Time Estimate : 12.0 Months</p> <p>r190005 (1195) : Replace Clinton 2000A wave trap with 3000A Project Type : FAC Cost : \$100,000 Time Estimate : 12.0 Months</p>	\$15,300,000
166792591	2	AE1-144 TAP 138.0 kV - 4PLUMVILLE 138.0 kV Ckt 1	<p><u>EKPC</u> EKPC-r0119a (1977) : Increase the maximum operating temperature of the 795 MCM ACSR conductor in the AE1-144 Tap-Plumville 138 kV line section to 212 degrees F (9.5 miles) Project Type : FAC Cost : \$710,000 Time Estimate : 23.0 Months</p>	\$710,000
			TOTAL COST	\$16,010,000

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
164594016	942090	AE2-221 TAP	DAY	253014	09CLINTO	DAY	1	34569 34598 34524	tower	1374.0	99.96	100.01	DC	1.53

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
250164	08BKJDB1	0.0942	Adder	0.11
250165	08BKJDB2	0.1014	Adder	0.12
250166	HLCRST AB114	1.3061	50/50	1.3061
253313	AC1-085 A_C (Suspended)	25.3209	50/50	25.3209
253314	AC1-085 A_E (Suspended)	41.3131	50/50	41.3131
253316	AC1-085 B_C (Suspended)	25.3209	50/50	25.3209
253317	AC1-085 B_E (Suspended)	41.3131	50/50	41.3131
253349	AC2-067 C	-2.8888	Adder	-3.4
253355	AB1-169 CT1	45.3355	50/50	45.3355
253356	AB1-169 ST1	32.3905	50/50	32.3905
253357	AB1-169 CT2	45.3355	50/50	45.3355
253358	AB1-169 ST2	32.3905	50/50	32.3905
342960	1SPURLK2G	8.6231	50/50	8.6231
342963	1SPURLK3G	4.5314	50/50	4.5314
342966	1SPURLK4G	4.5314	50/50	4.5314
925984	AC1-074 C	2.9403	Adder	3.46
925985	AC1-074 E	1.2601	Adder	1.48
927185	AC1-212 BAT (Withdrawn : 12/16/2020)	1.5349	Merchant Transmission	1.5349
930062	AB1-014 E	8.4421	50/50	8.4421
932551	AC2-075 C	0.6983	Adder	0.82
932552	AC2-075 E	0.3518	Adder	0.41
932661	AC2-088 C O1	2.4878	Adder	2.93
932662	AC2-088 E O1	2.0473	Adder	2.41
935031	AD1-136 C	0.3498	Adder	0.41
935032	AD1-136 E	0.2980	Adder	0.35
936381	AD2-048 C	2.3337	Adder	2.75
936382	AD2-048 E	1.1643	Adder	1.37
938921	AE1-120	0.7563	50/50	0.7563
939141	AE1-144 C O1	5.6567	Adder	6.65
939142	AE1-144 E O1	2.8072	Adder	3.3
940531	AE2-038 C O1	3.7735	Adder	4.44
940532	AE2-038 E O1	1.8691	Adder	2.2
941411	AE2-138 C	11.2221	Adder	13.2
941412	AE2-138 E	4.1506	Adder	4.88
941981	AE2-210 C O1	3.8668	Adder	4.55
941982	AE2-210 E O1	1.4545	Adder	1.71
942091	AE2-221 C	94.5594	50/50	94.5594
942092	AE2-221 E	63.0396	50/50	63.0396
942591	AE2-275 C O1	2.9490	Adder	3.47
942592	AE2-275 E O1	1.1093	Adder	1.31
942891	AE2-308 C O1	4.9480	Adder	5.82

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942892	AE2-308 E O1	1.7993	Adder	2.12
943111	AE2-339 C	1.3613	Adder	1.6
943112	AE2-339 E	0.6705	Adder	0.79
943201	AE2-318 C	4.0390	Adder	4.75
943202	AE2-318 E	1.9714	Adder	2.32
943771	AF1-045 C	1.8812	Adder	2.21
943772	AF1-045 E	1.2562	Adder	1.48
943853	AF1-053 BAT	3.3272	Merchant Transmission	3.3272
944621	AF1-127 C O1	3.0871	Adder	3.63
944622	AF1-127 E O1	1.5205	Adder	1.79
945681	AF1-233 C	10.8373	Adder	12.75
945682	AF1-233 E	5.3539	Adder	6.3
945861	AF1-251 C	7.7093	Adder	9.07
945862	AF1-251 E	5.1395	Adder	6.05
945911	AF1-256 C	3.4762	Adder	4.09
945912	AF1-256 E	2.3174	Adder	2.73
946171	AF1-282 C	19.9902	50/50	19.9902
946172	AF1-282 E	13.3268	50/50	13.3268
946181	AF1-283 C	25.9873	50/50	25.9873
946182	AF1-283 E	17.3248	50/50	17.3248
958171	AF2-111 C O1	12.3662	Adder	14.55
958172	AF2-111 E O1	8.2441	Adder	9.7
960151	AF2-306	1.2743	Adder	1.5
960161	AF2-307 C	1.9408	Adder	2.28
960162	AF2-307 E	1.2939	Adder	1.52
960571	AF2-348 C	12.1380	Adder	14.28
960572	AF2-348 E	8.0920	Adder	9.52
960641	AF2-355 C O1	6.0772	Adder	7.15
960642	AF2-355 E O1	4.0514	Adder	4.77
963582	AG1-207 BAT	12.0385	50/50	12.0385
963591	AG1-208 C O1	0.5358	Adder	1.19
963592	AG1-208 E O1	0.3205	Adder	0.71
964431	AG1-306 C O1	0.9298	Adder	2.06
964432	AG1-306 E O1	0.6199	Adder	1.38
965161	AG1-381 C O1	0.4450	Adder	0.99
965162	AG1-381 E O1	0.2455	Adder	0.54
WEC	WEC	0.0617	Confirmed LTF	0.0617
LGEE	LGEE	1.5500	Confirmed LTF	1.5500
CPL	CPL	0.4075	Confirmed LTF	0.4075
CBM-W2	CBM-W2	8.9242	Confirmed LTF	8.9242
NY	NY	0.1930	Confirmed LTF	0.1930
TVA	TVA	1.7164	Confirmed LTF	1.7164
O-066	O-066	1.9719	Confirmed LTF	1.9719
SIGE	SIGE	0.1894	Confirmed LTF	0.1894
CBM-S2	CBM-S2	7.9448	Confirmed LTF	7.9448
CBM-S1	CBM-S1	0.5514	Confirmed LTF	0.5514
G-007	G-007	0.3045	Confirmed LTF	0.3045
MEC	MEC	0.7754	Confirmed LTF	0.7754
LAGN	LAGN	1.8025	Confirmed LTF	1.8025

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
166792591	939140	AE1-144 TAP	EKPC	342634	4PLUMVILLE	EKPC	1	EKPC_P2-2_ROWAN CO 138	bus	186.0	110.92	112.54	DC	3.01

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939141	AE1-144 C O1	52.7371	50/50	52.7371
939142	AE1-144 E O1	26.1713	50/50	26.1713
940531	AE2-038 C O1	35.1800	50/50	35.1800
940532	AE2-038 E O1	17.4256	50/50	17.4256
945681	AF1-233 C	44.9827	50/50	44.9827
945682	AF1-233 E	22.2225	50/50	22.2225
945911	AF1-256 C	13.6968	50/50	13.6968
945912	AF1-256 E	9.1312	50/50	9.1312
960151	AF2-306	3.1964	50/50	3.1964
960161	AF2-307 C	4.8684	50/50	4.8684
960162	AF2-307 E	3.2456	50/50	3.2456
965161	AG1-381 C O1	1.9427	50/50	1.9427
965162	AG1-381 E O1	1.0718	50/50	1.0718
CPL	CPL	0.0171	Confirmed LTF	0.0171
G-007A	G-007A	0.0096	Confirmed LTF	0.0096
VFT	VFT	0.0258	Confirmed LTF	0.0258
CBM-W2	CBM-W2	0.1344	Confirmed LTF	0.1344
TVA	TVA	0.0518	Confirmed LTF	0.0518
CBM-S2	CBM-S2	0.3132	Confirmed LTF	0.3132
CBM-S1	CBM-S1	0.0106	Confirmed LTF	0.0106
CBM-N	CBM-N	0.0048	Confirmed LTF	0.0048
MEC	MEC	0.0016	Confirmed LTF	0.0016
GIBSON	GIBSON	0.0038	Confirmed LTF	0.0038
BLUEG	BLUEG	0.0226	Confirmed LTF	0.0226
TRIMBLE	TRIMBLE	0.0089	Confirmed LTF	0.0089
LAGN	LAGN	0.0472	Confirmed LTF	0.0472

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
AB1-014	Hillcrest 138kV	Under Construction
AB1-169	Stuart 345kV	Engineering and Procurement
AC1-074	Jacksonville-Renaker 138kV I	Engineering and Procurement
AC1-085	Stuart-Clinton 345kV	Suspended
AC1-212	Minster 69kV	Withdrawn
AC2-067	Camden-Crystal I 69kV	Engineering and Procurement
AC2-075	Great Blue Heron Solar	Active
AC2-088	S. Bethel-Brown 69kV	Engineering and Procurement
AD1-136	South Bethel-Brown 69 kV	Engineering and Procurement
AD2-048	Cynthia-Headquarters 69 kV	Active
AE1-120	Hillcrest 138 kV	Under Construction
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
AE2-221	Clinton-Stuart 345 kV	Active
AE2-275	JK Smith-Fawkes 138 kV	Active
AE2-308	Three Forks-Dale 138 kV	Active
AE2-318	Ford-Cedarville 138 kV	Active
AE2-339	Avon 138 kV	Active
AF1-045	Cedarville-Ford 138 kV	Active
AF1-053	Givens-Mechanicsburg 138 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
AF1-282	Stuart-Clinton 345 kV	Active
AF1-283	Stuart-Clinton 345 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
AG1-207	Northridge 138 kV	Active
AG1-208	Sideview-Mt Sterling 69 kV	Active
AG1-306	Fawkes-Dale 138 kV	Active
AG1-381	Hope 69 kV	Active

9.8 Contingency Descriptions - Primary POI

Contingency Name	Contingency Definition
34569 34598 34524	CONTINGENCY '34569 34598 34524' OPEN BRANCH FROM BUS 249566 TO BUS 249578 CKT 1 / OPEN BRANCH FROM BUS 249566 TO BUS 253006 CKT 1 / 249566 08FOSTER 345 253006 09BATH 345 1 OPEN BRANCH FROM BUS 249566 TO BUS 253079 CKT 1 / 249566 08FOSTER 345 253079 09SUGRCK 345 1 END
EKPC_P1-2_GODD - ROW138	CONTINGENCY 'EKPC_P1-2_GODD - ROW138' /* GODDARD - ROWAN OPEN BRANCH FROM BUS 342589 TO BUS 342571 CKT 1 /* 342589 4GODDARD 138.00 342571 4CRANSTON 138.00 OPEN BRANCH FROM BUS 342571 TO BUS 342649 CKT 1 /* 342571 4CRANSTON 138.00 342649 4ROWAN CO 138.00 END
EKPC_P2-2_ROWAN CO 138	CONTINGENCY 'EKPC_P2-2_ROWAN CO 138' /* ROWAN 138 BUS OPEN BUS 342649 /* 4ROWAN CO END

10 Short Circuit Analysis - Primary POI

The following Breakers are overdutied:

None.

11 Summer Peak - Load Flow Analysis - Secondary POI

The Queue Project AG1-381 was evaluated as a 27.0 MW (Capacity 17.4 MW) injection tapping the Hope to Blevins Valley Tap 69 kV line in the EKPC area. Project AG1-381 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-381 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
174075685	341644	2HOP E	69.0	EKPC	341683	2JEFFERSVIL	69.0	EKPC	1	EKPC_P2-4_SPURN39-92T	breaker	63.0	81.81	102.8	DC	13.22
164594016	942090	AE2-221 TAP	345.0	DAY	253014	09CLINTO	345.0	DAY	1	345693459834524	tower	1374.0	99.99	100.04	DC	1.55
172337150	965160	AG1-381 TAP	69.0	EKPC	341644	2HOPE	69.0	EKPC	1	EKPC_P2-2_ROWAN CO 138	bus	98.0	88.31	107.29	DC	18.6
173887285	965160	AG1-381 TAP	69.0	EKPC	341644	2HOPE	69.0	EKPC	1	EKPC_P2-3_ROWAN E83-814	breaker	98.0	89.53	108.51	DC	18.6

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
173887069	342091	2PLUMVILLE	69.0	EKPC	341923	2MURPHYSVIL	69.0	EKPC	1	EKPC_P2-4_SPURN39-92T	breaker	63.0	170.62	172.44	DC	2.55
174075650	342571	4CRANSTON	138.0	EKPC	342649	4ROWAN CO	138.0	EKPC	1	EKPC_P2-4_SPURN39-92T	breaker	255.0	104.87	106.29	DC	3.61
174075613	342589	4GODDARD	138.0	EKPC	342571	4CRANSTON	138.0	EKPC	1	EKPC_P2-4_SPURN39-92T	breaker	255.0	111.11	112.52	DC	3.61
174075592	342649	4ROWAN CO	138.0	EKPC	324302	4RODBURN	138.0	LGEE	1	EKPC_P2-4_SPURN39-92T	breaker	191.0	115.07	117.7	DC	5.03
166792591	939140	AE1-144 TAP	138.0	EKPC	342634	4PLUMVILLE	138.0	EKPC	1	EKPC_P2-2_ROWAN CO 138	bus	186.0	110.92	112.65	DC	3.22

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 LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPAC T
169720398	939140	AE1-144 TAP	138.0	EKPC	342634	4PLUMVILLE	138.0	EKPC	1	EKPC_P1 - 2_GODD - ROW138	operation	186.0	109.95	111.43	DC	2.76

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
174075685	341644	2HOPE	EKPC	341683	2JEFFERSNVIL	EKPC	1	EKPC_P2-4_SPUR N39-92T	breaker	63.0	81.81	102.8	DC	13.22

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939141	AE1-144 C O1	6.3473	Adder	7.47
939142	AE1-144 E O1	3.1499	Adder	3.71
940531	AE2-038 C O1	4.2342	Adder	4.98
940532	AE2-038 E O1	2.0973	Adder	2.47
945681	AF1-233 C	12.6192	Adder	14.85
945682	AF1-233 E	6.2342	Adder	7.33
945911	AF1-256 C	4.0221	Adder	4.73
945912	AF1-256 E	2.6814	Adder	3.15
960151	AF2-306	12.5642	50/50	12.5642
960161	AF2-307 C	19.1363	50/50	19.1363
960162	AF2-307 E	12.7575	50/50	12.7575
965161	AG1-381 C O2	8.5211	50/50	8.5211
965162	AG1-381 E O2	4.7013	50/50	4.7013
G-007A	G-007A	0.0384	Confirmed LTF	0.0384
VFT	VFT	0.1032	Confirmed LTF	0.1032
CALDERWOOD	CALDERWOOD	0.0606	Confirmed LTF	0.0606
PRAIRIE	PRAIRIE	0.2170	Confirmed LTF	0.2170
CHEOAH	CHEOAH	0.0596	Confirmed LTF	0.0596
CBM-N	CBM-N	0.0192	Confirmed LTF	0.0192
COTTONWOOD	COTTONWOOD	0.2121	Confirmed LTF	0.2121
HAMLET	HAMLET	0.0185	Confirmed LTF	0.0185
GIBSON	GIBSON	0.0541	Confirmed LTF	0.0541
BLUEG	BLUEG	0.2326	Confirmed LTF	0.2326
TRIMBLE	TRIMBLE	0.0690	Confirmed LTF	0.0690
CATAWBA	CATAWBA	0.0144	Confirmed LTF	0.0144

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
164594016	942090	AE2-221 TAP	DAY	253014	09CLINTO	DAY	1	34569 34598 34524	tower	1374.0	99.99	100.04	DC	1.55

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
250164	08BKJDB1	0.0942	Adder	0.11
250165	08BKJDB2	0.1014	Adder	0.12
250166	HLCRST AB114	1.3061	50/50	1.3061
253313	AC1-085 A_C (Suspended)	25.3209	50/50	25.3209
253314	AC1-085 A_E (Suspended)	41.3131	50/50	41.3131
253316	AC1-085 B_C (Suspended)	25.3209	50/50	25.3209
253317	AC1-085 B_E (Suspended)	41.3131	50/50	41.3131
253349	AC2-067 C	-2.8888	Adder	-3.4
253355	AB1-169 CT1	45.3355	50/50	45.3355
253356	AB1-169 ST1	32.3905	50/50	32.3905
253357	AB1-169 CT2	45.3355	50/50	45.3355
253358	AB1-169 ST2	32.3905	50/50	32.3905
342960	1SPURLK2G	8.6231	50/50	8.6231
342963	1SPURLK3G	4.5314	50/50	4.5314
342966	1SPURLK4G	4.5314	50/50	4.5314
925984	AC1-074 C	2.9403	Adder	3.46
925985	AC1-074 E	1.2601	Adder	1.48
927185	AC1-212 BAT (Withdrawn : 12/16/2020)	1.5349	Merchant Transmission	1.5349
930062	AB1-014 E	8.4421	50/50	8.4421
932551	AC2-075 C	0.6983	Adder	0.82
932552	AC2-075 E	0.3518	Adder	0.41
932661	AC2-088 C O1	2.4878	Adder	2.93
932662	AC2-088 E O1	2.0473	Adder	2.41
935031	AD1-136 C	0.3498	Adder	0.41
935032	AD1-136 E	0.2980	Adder	0.35
936381	AD2-048 C	2.3337	Adder	2.75
936382	AD2-048 E	1.1643	Adder	1.37
938921	AE1-120	0.7563	50/50	0.7563
939141	AE1-144 C O1	5.6567	Adder	6.65
939142	AE1-144 E O1	2.8072	Adder	3.3
940531	AE2-038 C O1	3.7735	Adder	4.44
940532	AE2-038 E O1	1.8691	Adder	2.2
941411	AE2-138 C	11.2221	Adder	13.2
941412	AE2-138 E	4.1506	Adder	4.88
941981	AE2-210 C O1	3.8668	Adder	4.55
941982	AE2-210 E O1	1.4545	Adder	1.71
942091	AE2-221 C	94.5594	50/50	94.5594
942092	AE2-221 E	63.0396	50/50	63.0396
942591	AE2-275 C O1	2.9490	Adder	3.47
942592	AE2-275 E O1	1.1093	Adder	1.31
942891	AE2-308 C O1	4.9480	Adder	5.82

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942892	AE2-308 E O1	1.7993	Adder	2.12
943111	AE2-339 C	1.3613	Adder	1.6
943112	AE2-339 E	0.6705	Adder	0.79
943201	AE2-318 C	4.0390	Adder	4.75
943202	AE2-318 E	1.9714	Adder	2.32
943771	AF1-045 C	1.8812	Adder	2.21
943772	AF1-045 E	1.2562	Adder	1.48
943853	AF1-053 BAT	3.3272	Merchant Transmission	3.3272
944621	AF1-127 C O1	3.0871	Adder	3.63
944622	AF1-127 E O1	1.5205	Adder	1.79
945681	AF1-233 C	10.8373	Adder	12.75
945682	AF1-233 E	5.3539	Adder	6.3
945861	AF1-251 C	7.7093	Adder	9.07
945862	AF1-251 E	5.1395	Adder	6.05
945911	AF1-256 C	3.4762	Adder	4.09
945912	AF1-256 E	2.3174	Adder	2.73
946171	AF1-282 C	19.9902	50/50	19.9902
946172	AF1-282 E	13.3268	50/50	13.3268
946181	AF1-283 C	25.9873	50/50	25.9873
946182	AF1-283 E	17.3248	50/50	17.3248
958171	AF2-111 C O1	12.3662	Adder	14.55
958172	AF2-111 E O1	8.2441	Adder	9.7
960151	AF2-306	1.2743	Adder	1.5
960161	AF2-307 C	1.9408	Adder	2.28
960162	AF2-307 E	1.2939	Adder	1.52
960571	AF2-348 C	12.1380	Adder	14.28
960572	AF2-348 E	8.0920	Adder	9.52
960641	AF2-355 C O1	6.0772	Adder	7.15
960642	AF2-355 E O1	4.0514	Adder	4.77
963582	AG1-207 BAT	11.3373	50/50	11.3373
963591	AG1-208 C O2	0.5361	Adder	1.19
963592	AG1-208 E O2	0.3207	Adder	0.71
964431	AG1-306 C O2	0.9166	Adder	2.03
964432	AG1-306 E O2	0.6111	Adder	1.36
964602	AG1-323 BAT	1.0827	Merchant Transmission	1.0827
965161	AG1-381 C O2	0.4497	Adder	1.0
965162	AG1-381 E O2	0.2481	Adder	0.55
WEC	WEC	0.0617	Confirmed LTF	0.0617
LGEE	LGEE	1.5500	Confirmed LTF	1.5500
CPL	CPL	0.4075	Confirmed LTF	0.4075
CBM-W2	CBM-W2	8.9242	Confirmed LTF	8.9242
NY	NY	0.1930	Confirmed LTF	0.1930
TVA	TVA	1.7164	Confirmed LTF	1.7164
O-066	O-066	1.9719	Confirmed LTF	1.9719
SIGE	SIGE	0.1894	Confirmed LTF	0.1894
CBM-S2	CBM-S2	7.9448	Confirmed LTF	7.9448
CBM-S1	CBM-S1	0.5514	Confirmed LTF	0.5514
G-007	G-007	0.3045	Confirmed LTF	0.3045
MEC	MEC	0.7754	Confirmed LTF	0.7754
LAGN	LAGN	1.8025	Confirmed LTF	1.8025

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
173887285	965160	AG1-381 TAP	EKPC	341644	2HOPE	EKPC	1	EKPC_P2-3_ROWAN E83-814	breaker	98.0	89.53	108.51	DC	18.6

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939141	AE1-144 C O1	3.8980	Adder	4.59
939142	AE1-144 E O1	1.9344	Adder	2.28
940531	AE2-038 C O1	2.6003	Adder	3.06
940532	AE2-038 E O1	1.2880	Adder	1.52
945681	AF1-233 C	7.1660	Adder	8.43
945682	AF1-233 E	3.5402	Adder	4.16
945911	AF1-256 C	2.2081	Adder	2.6
945912	AF1-256 E	1.4721	Adder	1.73
960151	AF2-306	17.6592	50/50	17.6592
960161	AF2-307 C	26.8963	50/50	26.8963
960162	AF2-307 E	17.9309	50/50	17.9309
965161	AG1-381 C O2	11.9869	50/50	11.9869
965162	AG1-381 E O2	6.6134	50/50	6.6134
CALDERWOOD	CALDERWOOD	0.0914	Confirmed LTF	0.0914
NY	NY	0.0044	Confirmed LTF	0.0044
PRAIRIE	PRAIRIE	0.1550	Confirmed LTF	0.1550
O-066	O-066	0.0740	Confirmed LTF	0.0740
CHEOAH	CHEOAH	0.0906	Confirmed LTF	0.0906
COTTONWOOD	COTTONWOOD	0.2457	Confirmed LTF	0.2457
G-007	G-007	0.0116	Confirmed LTF	0.0116
HAMLET	HAMLET	0.0560	Confirmed LTF	0.0560
GIBSON	GIBSON	0.0180	Confirmed LTF	0.0180
BLUEG	BLUEG	0.0990	Confirmed LTF	0.0990
TRIMBLE	TRIMBLE	0.0250	Confirmed LTF	0.0250
CATAWBA	CATAWBA	0.0382	Confirmed LTF	0.0382
CBM-W1	CBM-W1	0.0421	Confirmed LTF	0.0421

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
173887069	342091	2PLUMVILLE	EKPC	341923	2MURPHYSVIL	EKPC	1	EKPC_P2-4_SPUR N39-92T	breaker	63.0	170.62	172.44	DC	2.55

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939141	AE1-144 C O1	23.8763	50/50	23.8763
939142	AE1-144 E O1	11.8489	50/50	11.8489
940531	AE2-038 C O1	15.9275	50/50	15.9275
940532	AE2-038 E O1	7.8893	50/50	7.8893
945681	AF1-233 C	35.0823	50/50	35.0823
945682	AF1-233 E	17.3315	50/50	17.3315
945911	AF1-256 C	11.1816	50/50	11.1816
945912	AF1-256 E	7.4544	50/50	7.4544
960151	AF2-306	2.1368	Adder	2.51
960161	AF2-307 C	3.2546	Adder	3.83
960162	AF2-307 E	2.1697	Adder	2.55
965161	AG1-381 C O2	0.7393	Adder	1.64
965162	AG1-381 E O2	0.4079	Adder	0.91
CPLE	CPLE	0.0348	Confirmed LTF	0.0348
G-007A	G-007A	0.0432	Confirmed LTF	0.0432
VFT	VFT	0.1096	Confirmed LTF	0.1096
PRAIRIE	PRAIRIE	0.0646	Confirmed LTF	0.0646
TVA	TVA	0.0476	Confirmed LTF	0.0476
CBM-S2	CBM-S2	0.5742	Confirmed LTF	0.5742
CBM-S1	CBM-S1	0.0011	Confirmed LTF	0.0011
CBM-N	CBM-N	0.0204	Confirmed LTF	0.0204
GIBSON	GIBSON	0.0409	Confirmed LTF	0.0409
BLUEG	BLUEG	0.2014	Confirmed LTF	0.2014
TRIMBLE	TRIMBLE	0.0679	Confirmed LTF	0.0679
LAGN	LAGN	0.0315	Confirmed LTF	0.0315

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
174075650	342571	4CRANSTON	EKPC	342649	4ROWAN CO	EKPC	1	EKPC_P2-4_SPUR N39-92T	breaker	255.0	104.87	106.29	DC	3.61

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
936381	AD2-048 C	2.2928	Adder	2.7
936382	AD2-048 E	1.1439	Adder	1.35
939141	AE1-144 C O1	42.6175	50/50	42.6175
939142	AE1-144 E O1	21.1493	50/50	21.1493
940531	AE2-038 C O1	28.4294	50/50	28.4294
940532	AE2-038 E O1	14.0818	50/50	14.0818
945681	AF1-233 C	88.9685	50/50	88.9685
945682	AF1-233 E	43.9525	50/50	43.9525
945911	AF1-256 C	28.3565	50/50	28.3565
945912	AF1-256 E	18.9043	50/50	18.9043
960151	AF2-306	3.6083	50/50	3.6083
960161	AF2-307 C	5.4957	50/50	5.4957
960162	AF2-307 E	3.6638	50/50	3.6638
965161	AG1-381 C O2	2.3273	50/50	2.3273
965162	AG1-381 E O2	1.2840	50/50	1.2840
WEC	WEC	0.0135	Confirmed LTF	0.0135
LGEE	LGEE	0.0880	Confirmed LTF	0.0880
CBM-W2	CBM-W2	0.3853	Confirmed LTF	0.3853
NY	NY	0.0083	Confirmed LTF	0.0083
TVA	TVA	0.0406	Confirmed LTF	0.0406
O-066	O-066	0.1077	Confirmed LTF	0.1077
SIGE	SIGE	0.0107	Confirmed LTF	0.0107
CBM-S1	CBM-S1	0.0186	Confirmed LTF	0.0186
G-007	G-007	0.0168	Confirmed LTF	0.0168
HAMLET	HAMLET	0.0087	Confirmed LTF	0.0087
MEC	MEC	0.0667	Confirmed LTF	0.0667
LAGN	LAGN	0.0525	Confirmed LTF	0.0525
CATAWBA	CATAWBA	0.0049	Confirmed LTF	0.0049
CBM-W1	CBM-W1	0.5328	Confirmed LTF	0.5328

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
174075613	342589	4GODDARD	EKPC	342571	4CRANSTON	EKPC	1	EKPC_P2-4_SPUR N39-92T	breaker	255.0	111.11	112.52	DC	3.61

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
936381	AD2-048 C	2.2928	Adder	2.7
936382	AD2-048 E	1.1439	Adder	1.35
939141	AE1-144 C O1	42.6175	50/50	42.6175
939142	AE1-144 E O1	21.1493	50/50	21.1493
940531	AE2-038 C O1	28.4294	50/50	28.4294
940532	AE2-038 E O1	14.0818	50/50	14.0818
945681	AF1-233 C	88.9685	50/50	88.9685
945682	AF1-233 E	43.9525	50/50	43.9525
945911	AF1-256 C	28.3565	50/50	28.3565
945912	AF1-256 E	18.9043	50/50	18.9043
960151	AF2-306	3.6083	50/50	3.6083
960161	AF2-307 C	5.4957	50/50	5.4957
960162	AF2-307 E	3.6638	50/50	3.6638
965161	AG1-381 C O2	2.3273	50/50	2.3273
965162	AG1-381 E O2	1.2840	50/50	1.2840
WEC	WEC	0.0135	Confirmed LTF	0.0135
LGEE	LGEE	0.0880	Confirmed LTF	0.0880
CBM-W2	CBM-W2	0.3853	Confirmed LTF	0.3853
NY	NY	0.0083	Confirmed LTF	0.0083
TVA	TVA	0.0406	Confirmed LTF	0.0406
O-066	O-066	0.1077	Confirmed LTF	0.1077
SIGE	SIGE	0.0107	Confirmed LTF	0.0107
CBM-S1	CBM-S1	0.0186	Confirmed LTF	0.0186
G-007	G-007	0.0168	Confirmed LTF	0.0168
HAMLET	HAMLET	0.0087	Confirmed LTF	0.0087
MEC	MEC	0.0667	Confirmed LTF	0.0667
LAGN	LAGN	0.0525	Confirmed LTF	0.0525
CATAWBA	CATAWBA	0.0049	Confirmed LTF	0.0049
CBM-W1	CBM-W1	0.5328	Confirmed LTF	0.5328

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
174075592	342649	4ROWAN CO	EKPC	324302	4RODBURN	LGEE	1	EKPC_P2-4_SPUR N39-92T	breaker	191.0	115.07	117.7	DC	5.03

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939141	AE1-144 C O1	38.0653	50/50	38.0653
939142	AE1-144 E O1	18.8903	50/50	18.8903
940531	AE2-038 C O1	25.3927	50/50	25.3927
940532	AE2-038 E O1	12.5777	50/50	12.5777
945681	AF1-233 C	79.0274	50/50	79.0274
945682	AF1-233 E	39.0414	50/50	39.0414
945911	AF1-256 C	25.1880	50/50	25.1880
945912	AF1-256 E	16.7920	50/50	16.7920
960151	AF2-306	4.9837	50/50	4.9837
960161	AF2-307 C	7.5905	50/50	7.5905
960162	AF2-307 E	5.0604	50/50	5.0604
965161	AG1-381 C O2	3.2388	50/50	3.2388
965162	AG1-381 E O2	1.7869	50/50	1.7869
CPLE	CPLE	0.0526	Confirmed LTF	0.0526
G-007A	G-007A	0.0911	Confirmed LTF	0.0911
VFT	VFT	0.2451	Confirmed LTF	0.2451
PRAIRIE	PRAIRIE	0.2247	Confirmed LTF	0.2247
CBM-S2	CBM-S2	0.7621	Confirmed LTF	0.7621
CBM-N	CBM-N	0.0456	Confirmed LTF	0.0456
COTTONWOOD	COTTONWOOD	0.0567	Confirmed LTF	0.0567
GIBSON	GIBSON	0.0977	Confirmed LTF	0.0977
BLUEG	BLUEG	0.4531	Confirmed LTF	0.4531
TRIMBLE	TRIMBLE	0.1447	Confirmed LTF	0.1447

11.5.8 Index 8

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
166792591	939140	AE1-144 TAP	EKPC	342634	4PLUMVILLE	EKPC	1	EKPC_P2-2_ROWAN CO 138	bus	186.0	110.92	112.65	DC	3.22

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939141	AE1-144 C O1	52.7371	50/50	52.7371
939142	AE1-144 E O1	26.1713	50/50	26.1713
940531	AE2-038 C O1	35.1800	50/50	35.1800
940532	AE2-038 E O1	17.4256	50/50	17.4256
945681	AF1-233 C	44.9827	50/50	44.9827
945682	AF1-233 E	22.2225	50/50	22.2225
945911	AF1-256 C	13.6968	50/50	13.6968
945912	AF1-256 E	9.1312	50/50	9.1312
960151	AF2-306	3.1964	50/50	3.1964
960161	AF2-307 C	4.8684	50/50	4.8684
960162	AF2-307 E	3.2456	50/50	3.2456
965161	AG1-381 C O2	2.0737	50/50	2.0737
965162	AG1-381 E O2	1.1441	50/50	1.1441
CPL	CPL	0.0171	Confirmed LTF	0.0171
G-007A	G-007A	0.0096	Confirmed LTF	0.0096
VFT	VFT	0.0258	Confirmed LTF	0.0258
CBM-W2	CBM-W2	0.1344	Confirmed LTF	0.1344
TVA	TVA	0.0518	Confirmed LTF	0.0518
CBM-S2	CBM-S2	0.3132	Confirmed LTF	0.3132
CBM-S1	CBM-S1	0.0106	Confirmed LTF	0.0106
CBM-N	CBM-N	0.0048	Confirmed LTF	0.0048
MEC	MEC	0.0016	Confirmed LTF	0.0016
GIBSON	GIBSON	0.0038	Confirmed LTF	0.0038
BLUEG	BLUEG	0.0226	Confirmed LTF	0.0226
TRIMBLE	TRIMBLE	0.0089	Confirmed LTF	0.0089
LAGN	LAGN	0.0472	Confirmed LTF	0.0472

11.6 Contingency Descriptions - Secondary POI

Contingency Name	Contingency Definition
EKPC_P1-2_GODD - ROW138	CONTINGENCY 'EKPC_P1-2_GODD - ROW138' / 365 OPEN BRANCH FROM BUS 342571 TO BUS 342589 CKT 1 / 342571 4CRANSTON 138 342589 4GODDARD 138 1 OPEN BRANCH FROM BUS 342571 TO BUS 342649 CKT 1 / 342571 4CRANSTON 138 342649 4ROWAN CO 138 1 END
34569 34598 34524	CONTINGENCY '34569 34598 34524' OPEN BRANCH FROM BUS 249566 TO BUS 249578 CKT 1 / OPEN BRANCH FROM BUS 249566 TO BUS 253006 CKT 1 / 249566 08FOSTER 345 253006 09BATH 345 1 OPEN BRANCH FROM BUS 249566 TO BUS 253079 CKT 1 / 249566 08FOSTER 345 253079 09SUGRCK 345 1 END
EKPC_P2-4_SPUR N39-92T	CONTINGENCY 'EKPC_P2-4_SPUR N39-92T' / 237 OPEN BRANCH FROM BUS 342622 TO BUS 342664 CKT 1 / 342622 4MAYSVIL I T 138 342664 4SPURLOCK 138 1 OPEN BRANCH FROM BUS 342622 TO BUS 342625 CKT 1 / 342622 4MAYSVIL I T 138 342625 4MAYSVIL IND 138 1 OPEN BRANCH FROM BUS 342622 TO BUS 342634 CKT 1 / 342622 4MAYSVIL I T 138 342634 4PLUMVILLE 138 1 OPEN BRANCH FROM BUS 342664 TO BUS 945910 CKT 1 / 342664 4SPURLOCK 138 945910 AF1-256 TAP 138 1 END
EKPC_P2-3_ROWAN E83-814	CONTINGENCY 'EKPC_P2-3_ROWAN E83-814' / 294 OPEN BRANCH FROM BUS 324302 TO BUS 342649 CKT 1 / 324302 4RODBURN 138 342649 4ROWAN CO 138 1 OPEN BRANCH FROM BUS 342571 TO BUS 342649 CKT 1 / 342571 4CRANSTON 138 342649 4ROWAN CO 138 1 OPEN BRANCH FROM BUS 342649 TO BUS 342658 CKT 1 / 342649 4ROWAN CO 138 342658 4SKAGGS 138 1 OPEN BRANCH FROM BUS 342649 TO BUS 342163 CKT 1 / 342649 4ROWAN CO 138 342163 2ROWAN CO 69.0 1 OPEN BRANCH FROM BUS 342571 TO BUS 342589 CKT 1 / 342571 4CRANSTON 138 342589 4GODDARD 138 1 END
EKPC_P2-2_ROWAN CO 138	CONTINGENCY 'EKPC_P2-2_ROWAN CO 138' /* ROWAN 138 BUS OPEN BUS 342649 /* 4ROWAN CO 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).