



**Generation Interconnection
Feasibility Study Report
for
Queue Project AF2-307
HOPE-BLEVINS VALLEY TAP 69 KV
39.6 MW Capacity / 66 MW Energy**

July 2020

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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 Bath County, Virginia. The installed facilities will have a total capability of 66 MW with 39.6 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is September 01, 2023. This study does not imply a TO commitment to this in-service date.

Queue Number	AF2-307
Project Name	HOPE-BLEVINS VALLEY TAP 69 KV
State	Virginia
County	Bath
Transmission Owner	EKPC
MFO	66
MWE	66
MWC	39.6
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

AF2-307 will interconnect with the EKPC transmission system tapping the Hope to Blevins Valley Tap 69 kV line.

5 Cost Summary

The AF2-307 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$0
Total System Network Upgrade Costs	\$108,041,478
Total Costs	\$108,041,478

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

None needed (utilizes Attachment, Direct Connection, and Non Direct Connection Facilities needed for AF2-419)

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

The Queue Project AF2-307 was evaluated as a 66.0 MW (Capacity 39.6 MW) injection tapping the Hope to Blevins Valley Tap 69 kV line in the EKPC area. Project AF2-307 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-307 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	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJE CT LOADI NG %	POST PROJE CT LOADI NG %	AC DC	MW IMPA CT
95883755	246800		138.0	AEP	247034	05EMERS S	138.0	AEP	1	DAY_P734541 34553	tower	185.0	125.82	126.85	DC	4.24
95883719	246946	05WLDCA T	138.0	AEP	243019	05HILLSB	138.0	AEP	1	DAY_P734541 34553	tower	185.0	178.57	179.6	DC	4.24
95883763	247034	05EMERS S	138.0	AEP	246946	05WLDCA T	138.0	AEP	1	DAY_P734541 34553	tower	185.0	124.58	125.61	DC	4.24
100734247	250054	08LONGB R	138.0	DEO &K	250077	08MTZIO N	138.0	DEO &K	1	DAY_P734541 34553	tower	284.0	136.57	137.38	DC	5.09
100734248	250077	08MTZIO N	138.0	DEO &K	249991	08BUFTN 1	138.0	DEO &K	1	DAY_P734541 34553	tower	298.0	125.86	126.63	DC	5.09
95453084	324267	4KENTON	138.0	LGEE	246800		138.0	AEP	1	DAY_P734541 34553	tower	185.0	128.85	129.88	DC	4.24
100233142	341923	2MURPH YSVIL	69.0	EKPC	325019	2KENTON -6	69.0	LGEE	1	EKPC_P4-6_SPUR N39-92T	breaker	66.0	117.81	120.48	DC	3.91
101929023	342091	2PLUMVI LLE	69.0	EKPC	341923	2MURPH YSVIL	69.0	EKPC	1	EKPC_P4-6_SPUR N39-92T	breaker	63.0	214.44	219.02	DC	6.4
98862733	342559	4BOONE CO	138.0	EKPC	250054	08LONGB R	138.0	DEO &K	1	DAY_P734541 34553	tower	284.0	143.93	144.74	DC	5.09
101929122	342571	4CRANST ON	138.0	EKPC	342649	4ROWAN CO	138.0	EKPC	1	EKPC_P4-6_SPUR N39-92T	breaker	255.0	137.7	141.29	DC	9.15
101929120	342589	4GODDA RD	138.0	EKPC	342571	4CRANST ON	138.0	EKPC	1	EKPC_P4-6_SPUR N39-92T	breaker	255.0	137.78	141.37	DC	9.15
100232889	342649	4ROWAN CO	138.0	EKPC	324302	4RODBUR N	138.0	LGEE	1	EKPC_P2-3_SPUR N39-844-A	bus	191.0	104.33	108.06	DC	7.13
100232988	342649	4ROWAN CO	138.0	EKPC	324302	4RODBUR N	138.0	LGEE	1	EKPC_P4-6_SPUR N39-92T	breaker	191.0	150.98	157.64	DC	12.72
100232989	342649	4ROWAN CO	138.0	EKPC	324302	4RODBUR N	138.0	LGEE	1	EKPC_P4-2_SPUR N39-844	breaker	191.0	104.33	108.06	DC	7.13
98861961	342838	7SPURLO CK	345.0	EKPC	253077	09STUAR T	345.0	DAY	1	DEOK_P2-2_C1 SILVER GROVE 345 BUS	bus	153.2.0	140.99	141.52	DC	17.9
98862078	342838	7SPURLO CK	345.0	EKPC	253077	09STUAR T	345.0	DAY	1	DEOK_P2-3_C2 816 SILVERGROVE	breaker	153.2.0	141.17	141.7	DC	17.91
98862079	342838	7SPURLO CK	345.0	EKPC	253077	09STUAR T	345.0	DAY	1	DEOK_P2-3_C2 1493_RED BANK	breaker	153.2.0	141.05	141.58	DC	17.9
98862739	342838	7SPURLO CK	345.0	EKPC	253077	09STUAR T	345.0	DAY	1	DEOK_P7-1_C5 CIRCUIT1883&4545REDBANKS LGRVZIMMER	tower	153.2.0	141.0	141.53	DC	17.9

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	FRO M BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Ratin g MVA	PRE PROJEC T LOADIN G %	POST PROJEC T LOADIN G %	AC D C	MW IMPAC T
95452782	243454	05BIXBY	345.0	AEP	243459	05KIRK	345.0	AEP	1	AEP_P1-2_#10137	operatio n	1409.0	99.99	100.15	DC	4.9
100233567	342649	4ROWAN CO	138.0	EKPC	324302	4RODBUR N	138.0	LGEE	1	EKPC_P1 - 2_SPUR-GODD 138-B	operatio n	191.0	104.0	107.71	DC	7.09
98862292	342838	7SPURLOC K	345.0	EKPC	253077	09STUART	345.0	DAY	1	Base Case	operatio n	1240.0	146.71	148.04	DC	16.68
98862293	342838	7SPURLOC K	345.0	EKPC	253077	09STUART	345.0	DAY	1	DEOK_P 1-3_B3 SILVER GROVE 345/138 TB23*	operatio n	1532.0	140.95	141.48	DC	17.9
101929505	939140	AE1-144 TAP	138.0	EKPC	342634	4PLUMVIL LE	138.0	EKP C	1	EKPC_P1 - 2_SPUR-GODD 138-B	operatio n	186.0	152.42	158.18	DC	10.72
101929451	959540	AF2-245 TAP	138.0	EKPC	342664	4SPURLOC K	138.0	EKP C	1	Base Case	operatio n	229.0	111.16	114.45	DC	7.54
101929702	960150	AF2-306 TAP	69.0	EKPC	341644	2HOPE	69.0	EKP C	1	Base Case	operatio n	53.0	21.73	104.89	DC	44.07

10.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
98862733	9	4BOONE CO 138.0 kV - 08LONGBR 138.0 kV Ckt 1	<u>DEOK</u> r0052 (1420) : 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 r0010 (1467) : 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 Months <u>EKPC</u> EKPC-r0094a (1487) : Replace the 1200A disconnect switches N15-813 and N15-815 at the Boone County substation with 1600A equipment Project Type : FAC Cost : \$200,000 Time Estimate : 9.0 Months EKPC-r0094b (1488) : Replace the 750 MCM copper substation jumpers at the Boone County substation with bundled 500 MCM copper or equivalent equipment Project Type : FAC Cost : \$15,000 Time Estimate : 9.0 Months EKPC-r0094c (1489) : Replace the 750 MCM copper substation bus and jumpers at the Longbranch substation with bundled 500 MCM copper or equivalent equipment Project Type : FAC Cost : \$190,000 Time Estimate : 9.0 Months	\$3,015,000

ID	Idx	Facility	Upgrade Description	Cost
101929122	10	4CRANSTON 138.0 kV - 4ROWAN CO 138.0 kV Ckt 1	<u>EKPC</u> EKPC-r0096a (1498) : Replace the 750 MCM copper bus and jumpers at the Rowan County substation with bundled 500 MCM copper or equivalent equipment Project Type : FAC Cost : \$190,000 Time Estimate : 9.0 Months EKPC-r0096b (1499) : Replace the 1200A wave trap at Rowan County substation with 1600A equipment. Project Type : FAC Cost : \$110,000 Time Estimate : 9.0 Months EKPC-r0096c (1500) : Replace the 795 MCM ACSR line conductor in the Cranston-Rowan County 138 kV line with 954 MCM ACSS conductor (7.5 miles) Project Type : FAC Cost : \$8,575,000 Time Estimate : 32.0 Months EKPC-r0096d (1501) : Replace the 795 MCM ACSR jumpers at the Goddard substation with bundled 500 MCM copper or equivalent equipment Project Type : FAC Cost : \$10,000 Time Estimate : 9.0 Months	\$8,885,000
95883719	2	05WLDCAT 138.0 kV - 05HILLSB 138.0 kV Ckt 1	<u>AEP</u> N5857 (516) : Rebuild / reconductor 10 miles of ACSR ~ 477 ~ 26/7 ~ HAWK- Conductor Section 1. Estimated cost: \$15 million. Project Type : FAC Cost : \$15,040,000 Time Estimate : 24-36 Months	\$15,040,000
100734248	5	08MTZION 138.0 kV - 08BUFTN1 138.0 kV Ckt 1	<u>DEOK</u> n6785b (1005) : Rebuild the line, replace switch at Mt. Zion Project Type : FAC Cost : \$5,369,948 Time Estimate : 30.0 Months	\$5,369,948

ID	Idx	Facility	Upgrade Description	Cost
95883763	3	05EMERSS 138.0 kV - 05WLDCAT 138.0 kV Ckt 1	<u>AEP</u> AEPO0006a (401) : Perform sag study on AEP's portion of Wildcat-Kenton 138kV circuit, , 1.3 miles of 477 ACSR 26/7 Hawk conductor to mitigate the overload. The new ratings after sag study will be: S/N: 185 MVA, S/E 257MVA: MVA, Depending on the sag study results, the cost for this upgrade is expected to be between \$20,000 (no remediation required, just sag study) and \$1.95 million (complete line Reconductor/rebuild). Time Estimate: a) Sag Study: 6-12 months b) Rebuild: The standard time required for construction differs from state to state. An approximate construction time would be 24 to 36 months after signing an interconnection agreement. Project Type : FAC Cost : \$20,000 Time Estimate : 6-12 Months	\$20,000
101929120	11	4GODDARD 138.0 kV - 4CRANSTON 138.0 kV Ckt 1	<u>EKPC</u> EKPC-r0095a (1494) : Replace the 750 MCM copper substation bus at the Goddard substation with bundled 500 MCM copper or equivalent equipment Project Type : FAC Cost : \$170,000 Time Estimate : 9.0 Months EKPC-r0095b (1495) : Replace the 1200A wave trap at Goddard substation with 1600A equipment. Project Type : FAC Cost : \$110,000 Time Estimate : 9.0 Months EKPC-r0095c (1496) : Replace the 795 MCM ACSR line conductor in the Goddard-Cranston 138 kV line with 954 MCM ACSS conductor (12.7 miles) Project Type : FAC Cost : \$14,520,000 Time Estimate : 42.0 Months EKPC-r0095d (1497) : Replace the 795 MCM ACSR jumpers at the Goddard substation with bundled 500 MCM copper or equivalent equipment Project Type : FAC Cost : \$20,000 Time Estimate : 9.0 Months	\$14,820,000

ID	Idx	Facility	Upgrade Description	Cost
100233142	7	2MURPHYSVIL 69.0 kV - 2KENTON-6 69.0 kV Ckt 1	<u>EKPC</u> EKPC-r0105a (1515) : Replace the 4/0 copper bus and jumpers at the Murphysville substation with 500 MCM copper or equivalent equipment Project Type : FAC Cost : \$130,000 Time Estimate : 9.0 Months EKPC-r0105b (1516) : Change the Zone 3 relay setting at Murphysville substation associated with the line protection to at least 89 MVA LTE rating. Project Type : FAC Cost : \$0 Time Estimate : 6.0 Months <u>LGEE</u> NonPJMArea (1625) : 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	\$130,000

ID	Idx	Facility	Upgrade Description	Cost
101929023	8	2PLUMVILLE 69.0 kV - 2MURPHYSVIL 69.0 kV Ckt 1	<u>EKPC</u> r0061 (1429) : Replace the 4/0 copper bus and jumpers at the Murphysville substation using 750 MCM copper or equivalent Project Type : FAC Cost : \$120,000 Time Estimate : 6.0 Months r0062 (1430) : Replace the 4/0 copper bus and jumpers at the Plumville substation using 750 MCM copper or equivalent Project Type : FAC Cost : \$120,000 Time Estimate : 6.0 Months r0063 (1431) : Replace the 600A disconnect switches N34-613 and N34-615 at the Plumville substation with 1200A equipment Project Type : FAC Cost : \$100,000 Time Estimate : 9.0 Months r0064 (1432) : Change the Zone 3 relay setting at Murphysville associated with the line protection to at least 108 MVA LTE rating. Project Type : FAC Cost : \$0 Time Estimate : 6.0 Months EKPC-r0097b (1503) : Change the current transformer setting at Murphysville substation associated with circuit breaker N4-604 from 600A to 800A. Project Type : FAC Cost : \$0 Time Estimate : 6.0 Months EKPC-r0097c (1504) : Change the current transformer setting at Plumville substation associated with circuit breaker N34-614 from 600A to 800A. Project Type : FAC Cost : \$0 Time Estimate : 6.0 Months EKPC-r0097d (1505) : Rebuild the Plumville-Murphysville 69 kV line section using 954 MCM ACSR conductor at 212 degrees F (9.9 miles) Project Type : FAC Cost : \$9,090,000 Time Estimate : 20.0 Months	\$9,430,000

ID	Idx	Facility	Upgrade Description	Cost
95883755	1	138.0 kV - 05EMERSS 138.0 kV Ckt 1	<u>AEP</u> AEPO0039a (494) : A Sag Study will be required on the 4.5 miles of ACSR ~ 477 ~ 26/7 ~ HAWK- Conductor to mitigate the overload. Depending on the sag study results, the cost for this upgrade is expected to be between \$18,000 (no remediations required, just sag study) and \$6.75 million (complete line reconductor/rebuild). New rating after sag study: S/N: 185 S/E: 257. Time Estimate: a) Sag Study: 6-12 months b) Rebuild: The standard time required for construction differs from state to state. An approximate construction time would be 24 to 36 months after signing an interconnection agreement. Project Type : FAC Cost : \$18,000 Time Estimate : Sag Study : 6 - 12 Months	\$18,000

ID	Idx	Facility	Upgrade Description	Cost
100232988,100 232889,100232 989	12	4ROWAN CO 138.0 kV - 4RODBURN 138.0 kV Ckt 1	<u>EKPC</u> r0045 (1413) : Replace the 800A wave trap at Rodburn substation with 1200A equipment. Project Type : FAC Cost : \$90,000 Time Estimate : 9.0 Months r0046 (1414) : LGEE violation (non PJM area). EKPC emergency rating at 255 MVA 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 : 9.0 Months EKPC-r0093a (1484) : Increase the maximum operating temperature of the 795 MCM ACSR conductor in the Rowan County-Rodburn 138 kV line section to 275 degrees F (1.45 miles) Project Type : FAC Cost : \$130,000 Time Estimate : 9.0 Months EKPC-r0093b (1485) : Replace the 750 MCM copper bus and jumpers at the Rowan County substation using bundled 500 MCM copper or equivalent Project Type : FAC Cost : \$190,000 Time Estimate : 9.0 Months EKPC-r0093c (1486) : Replace the 1200A wave trap at Rowan County substation with 1600A equipment. Project Type : FAC Cost : \$110,000 Time Estimate : 9.0 Months <u>LGEE</u> NonPJMArea (1625) : 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	\$520,000

ID	Idx	Facility	Upgrade Description	Cost
98862739,98861961,98862078,98862079	13	7SPURLOCK 345.0 kV - 09STUART 345.0 kV Ckt 1	<u>DAY</u> DAYr190039 (953) : Reconductor Stuart-Spurlock line with twin bundle 1033 Curlew ACCR conductor Project Type : FAC Cost : \$17,000,000 Time Estimate : 18.0 Months DAYr190040 (954) : Replace Stuart substation riser conductor with 2500AAC (parallel) Project Type : FAC Cost : \$100,000 Time Estimate : 12.0 Months DAYr190041 (955) : Reconductor Stuart substation conductor with twin bundle 1033 Curlew ACCR conductor Project Type : FAC Cost : \$250,000 Time Estimate : 12.0 Months DAYr20011 (989) : Replace wavetrapp on Stuart-Spurlock line Project Type : FAC Cost : \$300,000 Time Estimate : 18.0 Months <u>EKPC</u> r0042 (1410) : Construct a new 345 kV circuit (Id 2) between the EKPC Spurlock and DP&L Stuart substations (circuit length approximately 8.5 miles) Project Type : CON Cost : \$30,000,000 Time Estimate : 48.0 Months	\$47,650,000
100734247	4	08LONGBR 138.0 kV - 08MTZION 138.0 kV Ckt 1	<u>DEOK</u> n30581 (997) : Rebuild the line Project Type : FAC Cost : \$3,047,530 Time Estimate : 30.0 Months	\$3,047,530

ID	Idx	Facility	Upgrade Description	Cost
95453084	6	4KENTON 138.0 kV - 138.0 kV Ckt 1	<u>AEP</u> AEPO0040a (495) : A Sag Study will be required on the 24 miles of ACSR ~ 477 ~ 26/7 ~ HAWK- Conductor section 1 to mitigate the overload. Depending on the sag study results, the cost for this upgrade is expected to be between \$96,000 (no remediations required, just sag study) and \$36 million (complete line reconductor/rebuild). New rating after sag study: S/N: 185 S/E: 257. Time Estimate: a) Sag Study: 6-12 months b) Rebuild: The standard time required for construction differs from state to state. An approximate construction time would be 24 to 36 months after signing an interconnection agreement. Project Type : FAC Cost : \$96,000 Time Estimate : Sag Study : 6 - 12 Months <u>LGEE</u> NonPJMArea (1625) : 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	\$96,000
			TOTAL COST	\$108,041,478

10.6 Flow Gate Details

The following indices contain additional information about each facility presented in the body of the report. For each index, a description of the flowgate and its contingency was included for convenience. The intent of the indices is to provide more details on which projects/generators have contributions to the flowgate in question. All New Service Queue Requests, through the end of the Queue under study, that are contributors to a flowgate will be listed in the indices. Please note that there may be contributors that are subsequently queued after the queue under study that are not listed in the indices. Although this information is not used "as is" for cost allocation purposes, it can be used to gage the impact of other projects/generators. It should be noted the project/generator MW contributions presented in the body of the report are Full MW Impact contributions which are also noted in the indices column named "Full MW Impact", whereas the loading percentages reported in the body of the report, take into consideration the PJM Generator Deliverability Test rules such as commercial probability of each project as well as the ramping impact of "Adder" contributions. The MW Impact found and used in the analysis is shown in the indices column named "Gendeliv MW Impact".

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
95883755	246800		AEP	247034	05EMERSS	AEP	1	DAY_P734541 34553	tower	185.0	125.82	126.85	DC	4.24

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
251831	Z1-080 BAT	0.5184	Merchant Transmission	0.5184
918803	AA1-099 BAT	0.3456	Merchant Transmission	0.3456
925981	AC1-074 C O1	2.6689	Adder	3.14
925982	AC1-074 E O1	1.1438	Adder	1.35
932551	AC2-075 C	0.6339	Adder	0.75
932552	AC2-075 E	0.3193	Adder	0.38
936381	AD2-048 C	3.0978	Adder	3.64
936382	AD2-048 E	1.5456	Adder	1.82
939141	AE1-144 C O1	6.3821	Adder	7.51
939142	AE1-144 E O1	3.1672	Adder	3.73
940531	AE2-038 C O1	4.2574	Adder	5.01
940532	AE2-038 E O1	2.1088	Adder	2.48
941411	AE2-138 C	8.9441	Adder	10.52
941412	AE2-138 E	3.3081	Adder	3.89
941981	AE2-210 C O1	3.0819	Adder	3.63
941982	AE2-210 E O1	1.1593	Adder	1.36
943111	AE2-339 C	1.1511	Adder	1.35
943112	AE2-339 E	0.5669	Adder	0.67
944621	AF1-127 C O1	2.4848	Adder	2.92
944622	AF1-127 E O1	1.2239	Adder	1.44
945681	AF1-233 C	11.7219	Adder	13.79
945682	AF1-233 E	5.7909	Adder	6.81
945861	AF1-251 C	6.1721	Adder	7.26
945862	AF1-251 E	4.1147	Adder	4.84
945911	AF1-256 C	3.7320	Adder	4.39
945912	AF1-256 E	2.4880	Adder	2.93
958171	AF2-111 C	4.9735	Adder	11.04
958172	AF2-111 E	3.3157	Adder	7.36
959541	AF2-245 C	3.2133	Adder	7.13
959542	AF2-245 E	2.1422	Adder	4.76
960151	AF2-306	0.7520	Adder	1.67
960161	AF2-307 C	1.1453	Adder	2.54
960162	AF2-307 E	0.7635	Adder	1.69
960571	AF2-348 C	4.8924	Adder	10.86
960572	AF2-348 E	3.2616	Adder	7.24
WEC	WEC	0.0627	Confirmed LTF	0.0627
LGEE	LGEE	0.9242	Confirmed LTF	0.9242
CPL	CPL	0.1402	Confirmed LTF	0.1402
CBM-W2	CBM-W2	4.5045	Confirmed LTF	4.5045
NY	NY	0.0769	Confirmed LTF	0.0769
CBM-W1	CBM-W1	1.7639	Confirmed LTF	1.7639
TVA	TVA	1.0150	Confirmed LTF	1.0150

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
O-066	O-066	0.8669	Confirmed LTF	0.8669
CBM-S2	CBM-S2	1.8091	Confirmed LTF	1.8091
CBM-S1	CBM-S1	7.5913	Confirmed LTF	7.5913
G-007	G-007	0.1342	Confirmed LTF	0.1342
MADISON	MADISON	1.9233	Confirmed LTF	1.9233
MEC	MEC	0.5291	Confirmed LTF	0.5291

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
95883719	246946	05WLDCAT	AEP	243019	05HILLSB	AEP	1	DAY_P734541 34553	tower	185.0	178.57	179.6	DC	4.24

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
251831	Z1-080 BAT	0.5184	Merchant Transmission	0.5184
918803	AA1-099 BAT	0.3456	Merchant Transmission	0.3456
925981	AC1-074 C O1	2.6689	Adder	3.14
925982	AC1-074 E O1	1.1438	Adder	1.35
926101	AC1-089 C O1 (Suspended)	40.2722	50/50	40.2722
926102	AC1-089 E O1 (Suspended)	65.7073	50/50	65.7073
932551	AC2-075 C	0.6339	Adder	0.75
932552	AC2-075 E	0.3193	Adder	0.38
936381	AD2-048 C	3.0978	Adder	3.64
936382	AD2-048 E	1.5456	Adder	1.82
939141	AE1-144 C O1	6.3821	Adder	7.51
939142	AE1-144 E O1	3.1672	Adder	3.73
940531	AE2-038 C O1	4.2574	Adder	5.01
940532	AE2-038 E O1	2.1088	Adder	2.48
941411	AE2-138 C	8.9441	Adder	10.52
941412	AE2-138 E	3.3081	Adder	3.89
941981	AE2-210 C O1	3.0819	Adder	3.63
941982	AE2-210 E O1	1.1593	Adder	1.36
943111	AE2-339 C	1.1511	Adder	1.35
943112	AE2-339 E	0.5669	Adder	0.67
944621	AF1-127 C O1	2.4848	Adder	2.92
944622	AF1-127 E O1	1.2239	Adder	1.44
945681	AF1-233 C	11.7219	Adder	13.79
945682	AF1-233 E	5.7909	Adder	6.81
945861	AF1-251 C	6.1721	Adder	7.26
945862	AF1-251 E	4.1147	Adder	4.84
945911	AF1-256 C	3.7320	Adder	4.39
945912	AF1-256 E	2.4880	Adder	2.93
958171	AF2-111 C	4.9735	Adder	11.04
958172	AF2-111 E	3.3157	Adder	7.36
959541	AF2-245 C	3.2133	Adder	7.13
959542	AF2-245 E	2.1422	Adder	4.76
960151	AF2-306	0.7520	Adder	1.67
960161	AF2-307 C	1.1453	Adder	2.54
960162	AF2-307 E	0.7635	Adder	1.69
960571	AF2-348 C	4.8924	Adder	10.86
960572	AF2-348 E	3.2616	Adder	7.24
WEC	WEC	0.0627	Confirmed LTF	0.0627
LGEE	LGEE	0.9242	Confirmed LTF	0.9242
CPL	CPL	0.1402	Confirmed LTF	0.1402

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CBM-W2	CBM-W2	4.5045	Confirmed LTF	4.5045
NY	NY	0.0769	Confirmed LTF	0.0769
CBM-W1	CBM-W1	1.7639	Confirmed LTF	1.7639
TVA	TVA	1.0150	Confirmed LTF	1.0150
O-066	O-066	0.8669	Confirmed LTF	0.8669
CBM-S2	CBM-S2	1.8091	Confirmed LTF	1.8091
CBM-S1	CBM-S1	7.5913	Confirmed LTF	7.5913
G-007	G-007	0.1342	Confirmed LTF	0.1342
MADISON	MADISON	1.9233	Confirmed LTF	1.9233
MEC	MEC	0.5291	Confirmed LTF	0.5291

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
95883763	247034	05EMERSS	AEP	246946	05WLDCAT	AEP	1	DAY_P734541 34553	tower	185.0	124.58	125.61	DC	4.24

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
251831	Z1-080 BAT	0.5184	Merchant Transmission	0.5184
918803	AA1-099 BAT	0.3456	Merchant Transmission	0.3456
925981	AC1-074 C O1	2.6689	Adder	3.14
925982	AC1-074 E O1	1.1438	Adder	1.35
932551	AC2-075 C	0.6339	Adder	0.75
932552	AC2-075 E	0.3193	Adder	0.38
936381	AD2-048 C	3.0978	Adder	3.64
936382	AD2-048 E	1.5456	Adder	1.82
939141	AE1-144 C O1	6.3821	Adder	7.51
939142	AE1-144 E O1	3.1672	Adder	3.73
940531	AE2-038 C O1	4.2574	Adder	5.01
940532	AE2-038 E O1	2.1088	Adder	2.48
941411	AE2-138 C	8.9441	Adder	10.52
941412	AE2-138 E	3.3081	Adder	3.89
941981	AE2-210 C O1	3.0819	Adder	3.63
941982	AE2-210 E O1	1.1593	Adder	1.36
943111	AE2-339 C	1.1511	Adder	1.35
943112	AE2-339 E	0.5669	Adder	0.67
944621	AF1-127 C O1	2.4848	Adder	2.92
944622	AF1-127 E O1	1.2239	Adder	1.44
945681	AF1-233 C	11.7219	Adder	13.79
945682	AF1-233 E	5.7909	Adder	6.81
945861	AF1-251 C	6.1721	Adder	7.26
945862	AF1-251 E	4.1147	Adder	4.84
945911	AF1-256 C	3.7320	Adder	4.39
945912	AF1-256 E	2.4880	Adder	2.93
958171	AF2-111 C	4.9735	Adder	11.04
958172	AF2-111 E	3.3157	Adder	7.36
959541	AF2-245 C	3.2133	Adder	7.13
959542	AF2-245 E	2.1422	Adder	4.76
960151	AF2-306	0.7520	Adder	1.67
960161	AF2-307 C	1.1453	Adder	2.54
960162	AF2-307 E	0.7635	Adder	1.69
960571	AF2-348 C	4.8924	Adder	10.86
960572	AF2-348 E	3.2616	Adder	7.24
WEC	WEC	0.0627	Confirmed LTF	0.0627
LGEE	LGEE	0.9242	Confirmed LTF	0.9242
CPL	CPL	0.1402	Confirmed LTF	0.1402
CBM-W2	CBM-W2	4.5045	Confirmed LTF	4.5045
NY	NY	0.0769	Confirmed LTF	0.0769
CBM-W1	CBM-W1	1.7639	Confirmed LTF	1.7639
TVA	TVA	1.0150	Confirmed LTF	1.0150

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
O-066	O-066	0.8669	Confirmed LTF	0.8669
CBM-S2	CBM-S2	1.8091	Confirmed LTF	1.8091
CBM-S1	CBM-S1	7.5913	Confirmed LTF	7.5913
G-007	G-007	0.1342	Confirmed LTF	0.1342
MADISON	MADISON	1.9233	Confirmed LTF	1.9233
MEC	MEC	0.5291	Confirmed LTF	0.5291

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
100734247	250054	08LONGBR	DEO&K	250077	08MTZION	DEO&K	1	DAY_P734541 34553	tower	284.0	136.57	137.38	DC	5.09

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
342957	1SPURLK1G	6.3712	50/50	6.3712
342960	1SPURLK2G	10.0059	50/50	10.0059
342963	1SPURLK3G	5.2580	50/50	5.2580
342966	1SPURLK4G	5.2580	50/50	5.2580
925981	AC1-074 C O1	9.2590	50/50	9.2590
925982	AC1-074 E O1	3.9682	50/50	3.9682
932551	AC2-075 C	2.1990	50/50	2.1990
932552	AC2-075 E	1.1078	50/50	1.1078
936381	AD2-048 C	6.0757	50/50	6.0757
936382	AD2-048 E	3.0313	50/50	3.0313
936571	AD2-072 C O1	2.9492	Adder	3.47
936572	AD2-072 E O1	1.4460	Adder	1.7
939141	AE1-144 C O1	8.7939	50/50	8.7939
939142	AE1-144 E O1	4.3641	50/50	4.3641
940531	AE2-038 C O1	5.8663	50/50	5.8663
940532	AE2-038 E O1	2.9057	50/50	2.9057
941411	AE2-138 C	14.2422	Adder	16.76
941412	AE2-138 E	5.2677	Adder	6.2
941981	AE2-210 C O1	4.9075	Adder	5.77
941982	AE2-210 E O1	1.8459	Adder	2.17
942411	AE2-254 C O1	1.4107	Adder	1.66
942412	AE2-254 E O1	0.9404	Adder	1.11
942591	AE2-275 C O1	4.0281	Adder	4.74
942592	AE2-275 E O1	1.5151	Adder	1.78
942891	AE2-308 C O1	6.9293	Adder	8.15
942892	AE2-308 E O1	2.5197	Adder	2.96
943111	AE2-339 C	2.1010	Adder	2.47
943112	AE2-339 E	1.0348	Adder	1.22
944621	AF1-127 C O1	4.0548	Adder	4.77
944622	AF1-127 E O1	1.9972	Adder	2.35
945541	AF1-219 C O1	0.9336	Adder	1.1
945542	AF1-219 E O1	0.4393	Adder	0.52
945681	AF1-233 C	16.6052	50/50	16.6052
945682	AF1-233 E	8.2033	50/50	8.2033
945861	AF1-251 C	9.9432	Adder	11.7
945862	AF1-251 E	6.6288	Adder	7.8
945911	AF1-256 C	5.3198	50/50	5.3198
945912	AF1-256 E	3.5466	50/50	3.5466
946021	AF1-267 C	2.2204	Adder	2.61
946022	AF1-267 E	1.0202	Adder	1.2
958171	AF2-111 C	15.9840	50/50	15.9840
958172	AF2-111 E	10.6560	50/50	10.6560

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959541	AF2-245 C	9.4050	50/50	9.4050
959542	AF2-245 E	6.2700	50/50	6.2700
960151	AF2-306	0.9028	Adder	2.0
960161	AF2-307 C	1.3751	Adder	3.05
960162	AF2-307 E	0.9167	Adder	2.03
960571	AF2-348 C	15.7935	50/50	15.7935
960572	AF2-348 E	10.5290	50/50	10.5290
960641	AF2-355 C O1	4.1776	Adder	9.27
960642	AF2-355 E O1	3.7134	Adder	8.24
961281	AF2-419 C	0.3026	Adder	0.67
961282	AF2-419 E	0.2017	Adder	0.45
961291	AF2-420 C	0.3026	Adder	0.67
961292	AF2-420 E	0.2017	Adder	0.45
WEC	WEC	0.0362	Confirmed LTF	0.0362
LGEE	LGEE	1.7092	Confirmed LTF	1.7092
CPL	CPL	0.2831	Confirmed LTF	0.2831
CBM-W2	CBM-W2	6.3063	Confirmed LTF	6.3063
NY	NY	0.0658	Confirmed LTF	0.0658
CBM-W1	CBM-W1	0.7381	Confirmed LTF	0.7381
TVA	TVA	1.6226	Confirmed LTF	1.6226
O-066	O-066	0.6250	Confirmed LTF	0.6250
CBM-S2	CBM-S2	3.3408	Confirmed LTF	3.3408
CBM-S1	CBM-S1	12.7885	Confirmed LTF	12.7885
G-007	G-007	0.0957	Confirmed LTF	0.0957
MADISON	MADISON	3.7780	Confirmed LTF	3.7780
MEC	MEC	0.5752	Confirmed LTF	0.5752

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
100734248	250077	08MTZION	DEO&K	249991	08BUFTN1	DEO&K	1	DAY_P734541 34553	tower	298.0	125.86	126.63	DC	5.09

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
342957	1SPURLK1G	6.3712	50/50	6.3712
342960	1SPURLK2G	10.0059	50/50	10.0059
342963	1SPURLK3G	5.2580	50/50	5.2580
342966	1SPURLK4G	5.2580	50/50	5.2580
925981	AC1-074 C O1	9.2590	50/50	9.2590
925982	AC1-074 E O1	3.9682	50/50	3.9682
932551	AC2-075 C	2.1990	50/50	2.1990
932552	AC2-075 E	1.1078	50/50	1.1078
936381	AD2-048 C	6.0757	50/50	6.0757
936382	AD2-048 E	3.0313	50/50	3.0313
936571	AD2-072 C O1	2.9492	Adder	3.47
936572	AD2-072 E O1	1.4460	Adder	1.7
939141	AE1-144 C O1	8.7939	50/50	8.7939
939142	AE1-144 E O1	4.3641	50/50	4.3641
940531	AE2-038 C O1	5.8663	50/50	5.8663
940532	AE2-038 E O1	2.9057	50/50	2.9057
941411	AE2-138 C	14.2422	Adder	16.76
941412	AE2-138 E	5.2677	Adder	6.2
941981	AE2-210 C O1	4.9075	Adder	5.77
941982	AE2-210 E O1	1.8459	Adder	2.17
942411	AE2-254 C O1	1.4107	Adder	1.66
942412	AE2-254 E O1	0.9404	Adder	1.11
942591	AE2-275 C O1	4.0281	Adder	4.74
942592	AE2-275 E O1	1.5151	Adder	1.78
942891	AE2-308 C O1	6.9293	Adder	8.15
942892	AE2-308 E O1	2.5197	Adder	2.96
943111	AE2-339 C	2.1010	Adder	2.47
943112	AE2-339 E	1.0348	Adder	1.22
944621	AF1-127 C O1	4.0548	Adder	4.77
944622	AF1-127 E O1	1.9972	Adder	2.35
945541	AF1-219 C O1	0.9336	Adder	1.1
945542	AF1-219 E O1	0.4393	Adder	0.52
945681	AF1-233 C	16.6052	50/50	16.6052
945682	AF1-233 E	8.2033	50/50	8.2033
945861	AF1-251 C	9.9432	Adder	11.7
945862	AF1-251 E	6.6288	Adder	7.8
945911	AF1-256 C	5.3198	50/50	5.3198
945912	AF1-256 E	3.5466	50/50	3.5466
946021	AF1-267 C	2.2204	Adder	2.61
946022	AF1-267 E	1.0202	Adder	1.2
958171	AF2-111 C	15.9840	50/50	15.9840
958172	AF2-111 E	10.6560	50/50	10.6560

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959541	AF2-245 C	9.4050	50/50	9.4050
959542	AF2-245 E	6.2700	50/50	6.2700
960151	AF2-306	0.9028	Adder	2.0
960161	AF2-307 C	1.3751	Adder	3.05
960162	AF2-307 E	0.9167	Adder	2.03
960571	AF2-348 C	15.7935	50/50	15.7935
960572	AF2-348 E	10.5290	50/50	10.5290
960641	AF2-355 C O1	4.1776	Adder	9.27
960642	AF2-355 E O1	3.7134	Adder	8.24
961281	AF2-419 C	0.3026	Adder	0.67
961282	AF2-419 E	0.2017	Adder	0.45
961291	AF2-420 C	0.3026	Adder	0.67
961292	AF2-420 E	0.2017	Adder	0.45
WEC	WEC	0.0362	Confirmed LTF	0.0362
LGEE	LGEE	1.7092	Confirmed LTF	1.7092
CPL	CPL	0.2831	Confirmed LTF	0.2831
CBM-W2	CBM-W2	6.3063	Confirmed LTF	6.3063
NY	NY	0.0658	Confirmed LTF	0.0658
CBM-W1	CBM-W1	0.7381	Confirmed LTF	0.7381
TVA	TVA	1.6226	Confirmed LTF	1.6226
O-066	O-066	0.6250	Confirmed LTF	0.6250
CBM-S2	CBM-S2	3.3408	Confirmed LTF	3.3408
CBM-S1	CBM-S1	12.7885	Confirmed LTF	12.7885
G-007	G-007	0.0957	Confirmed LTF	0.0957
MADISON	MADISON	3.7780	Confirmed LTF	3.7780
MEC	MEC	0.5752	Confirmed LTF	0.5752

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
95453084	324267	4KENTON	LGEE	246800		AEP	1	DAY_P734541 34553	tower	185.0	128.85	129.88	DC	4.24

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
251831	Z1-080 BAT	0.5184	Merchant Transmission	0.5184
918803	AA1-099 BAT	0.3456	Merchant Transmission	0.3456
925981	AC1-074 C O1	2.6689	Adder	3.14
925982	AC1-074 E O1	1.1438	Adder	1.35
932551	AC2-075 C	0.6339	Adder	0.75
932552	AC2-075 E	0.3193	Adder	0.38
936381	AD2-048 C	3.0978	Adder	3.64
936382	AD2-048 E	1.5456	Adder	1.82
939141	AE1-144 C O1	6.3821	Adder	7.51
939142	AE1-144 E O1	3.1672	Adder	3.73
940531	AE2-038 C O1	4.2574	Adder	5.01
940532	AE2-038 E O1	2.1088	Adder	2.48
941411	AE2-138 C	8.9441	Adder	10.52
941412	AE2-138 E	3.3081	Adder	3.89
941981	AE2-210 C O1	3.0819	Adder	3.63
941982	AE2-210 E O1	1.1593	Adder	1.36
943111	AE2-339 C	1.1511	Adder	1.35
943112	AE2-339 E	0.5669	Adder	0.67
944621	AF1-127 C O1	2.4848	Adder	2.92
944622	AF1-127 E O1	1.2239	Adder	1.44
945681	AF1-233 C	11.7219	Adder	13.79
945682	AF1-233 E	5.7909	Adder	6.81
945861	AF1-251 C	6.1721	Adder	7.26
945862	AF1-251 E	4.1147	Adder	4.84
945911	AF1-256 C	3.7320	Adder	4.39
945912	AF1-256 E	2.4880	Adder	2.93
958171	AF2-111 C	4.9735	Adder	11.04
958172	AF2-111 E	3.3157	Adder	7.36
959541	AF2-245 C	3.2133	Adder	7.13
959542	AF2-245 E	2.1422	Adder	4.76
960151	AF2-306	0.7520	Adder	1.67
960161	AF2-307 C	1.1453	Adder	2.54
960162	AF2-307 E	0.7635	Adder	1.69
960571	AF2-348 C	4.8924	Adder	10.86
960572	AF2-348 E	3.2616	Adder	7.24
WEC	WEC	0.0627	Confirmed LTF	0.0627
LGEE	LGEE	0.9242	Confirmed LTF	0.9242
CPL	CPL	0.1402	Confirmed LTF	0.1402
CBM-W2	CBM-W2	4.5045	Confirmed LTF	4.5045
NY	NY	0.0769	Confirmed LTF	0.0769
CBM-W1	CBM-W1	1.7639	Confirmed LTF	1.7639
TVA	TVA	1.0150	Confirmed LTF	1.0150

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
O-066	O-066	0.8669	Confirmed LTF	0.8669
CBM-S2	CBM-S2	1.8091	Confirmed LTF	1.8091
CBM-S1	CBM-S1	7.5913	Confirmed LTF	7.5913
G-007	G-007	0.1342	Confirmed LTF	0.1342
MADISON	MADISON	1.9233	Confirmed LTF	1.9233
MEC	MEC	0.5291	Confirmed LTF	0.5291

10.6.7 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
100233142	341923	2MURPHYSVIL	EKPC	325019	2KENTON-6	LGEE	1	EKPC_P4-6_SPUR N39-92T	breaker	66.0	117.81	120.48	DC	3.91

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
936381	AD2-048 C	6.0472	50/50	6.0472
936382	AD2-048 E	3.0171	50/50	3.0171
939141	AE1-144 C O1	13.5851	50/50	13.5851
939142	AE1-144 E O1	6.7417	50/50	6.7417
940531	AE2-038 C O1	9.0624	50/50	9.0624
940532	AE2-038 E O1	4.4888	50/50	4.4888
945681	AF1-233 C	19.4003	50/50	19.4003
945682	AF1-233 E	9.5842	50/50	9.5842
945911	AF1-256 C	6.1834	50/50	6.1834
945912	AF1-256 E	4.1222	50/50	4.1222
959541	AF2-245 C	10.2025	50/50	10.2025
959542	AF2-245 E	6.8017	50/50	6.8017
960151	AF2-306	0.6947	Adder	1.54
960161	AF2-307 C	1.0581	Adder	2.35
960162	AF2-307 E	0.7054	Adder	1.57
WEC	WEC	0.0044	Confirmed LTF	0.0044
LGEE	LGEE	0.1198	Confirmed LTF	0.1198
CPLE	CPLE	0.0556	Confirmed LTF	0.0556
G-007A	G-007A	0.0072	Confirmed LTF	0.0072
VFT	VFT	0.0193	Confirmed LTF	0.0193
CBM-W2	CBM-W2	0.8354	Confirmed LTF	0.8354
NY	NY	0.0006	Confirmed LTF	0.0006
CBM-W1	CBM-W1	0.1001	Confirmed LTF	0.1001
TVA	TVA	0.2450	Confirmed LTF	0.2450
CBM-S2	CBM-S2	0.6127	Confirmed LTF	0.6127
CBM-S1	CBM-S1	1.5506	Confirmed LTF	1.5506
MADISON	MADISON	0.4939	Confirmed LTF	0.4939
MEC	MEC	0.0779	Confirmed LTF	0.0779

10.6.8 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
101929023	342091	2PLUMVILLE	EKPC	341923	2MURPHYSVIL	EKPC	1	EKPC_P4-6_SPUR N39-92T	breaker	63.0	214.44	219.02	DC	6.4

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939141	AE1-144 C O1	23.9269	50/50	23.9269
939142	AE1-144 E O1	11.8739	50/50	11.8739
940531	AE2-038 C O1	15.9612	50/50	15.9612
940532	AE2-038 E O1	7.9060	50/50	7.9060
945681	AF1-233 C	35.1787	50/50	35.1787
945682	AF1-233 E	17.3791	50/50	17.3791
945911	AF1-256 C	11.2123	50/50	11.2123
945912	AF1-256 E	7.4749	50/50	7.4749
959541	AF2-245 C	18.5003	50/50	18.5003
959542	AF2-245 E	12.3336	50/50	12.3336
960151	AF2-306	1.1365	Adder	2.52
960161	AF2-307 C	1.7310	Adder	3.84
960162	AF2-307 E	1.1540	Adder	2.56
NEWTON	NEWTON	0.0505	Confirmed LTF	0.0505
CPLE	CPLE	0.0351	Confirmed LTF	0.0351
FARMERCITY	FARMERCITY	0.0014	Confirmed LTF	0.0014
G-007A	G-007A	0.0456	Confirmed LTF	0.0456
VFT	VFT	0.1226	Confirmed LTF	0.1226
TVA	TVA	0.0560	Confirmed LTF	0.0560
PRAIRIE	PRAIRIE	0.0672	Confirmed LTF	0.0672
EDWARDS	EDWARDS	0.0161	Confirmed LTF	0.0161
CBM-S2	CBM-S2	0.3295	Confirmed LTF	0.3295
CBM-S1	CBM-S1	0.0767	Confirmed LTF	0.0767
TILTON	TILTON	0.0378	Confirmed LTF	0.0378
MADISON	MADISON	0.2782	Confirmed LTF	0.2782
GIBSON	GIBSON	0.0399	Confirmed LTF	0.0399
BLUEG	BLUEG	0.1927	Confirmed LTF	0.1927
TRIMBLE	TRIMBLE	0.0646	Confirmed LTF	0.0646

10.6.9 Index 9

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
98862733	342559	4BOONE CO	EKPC	250054	08LONGBR	DEO&K	1	DAY_P734541 34553	tower	284.0	143.93	144.74	DC	5.09

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
342957	1SPURLK1G	6.3712	50/50	6.3712
342960	1SPURLK2G	10.0059	50/50	10.0059
342963	1SPURLK3G	5.2580	50/50	5.2580
342966	1SPURLK4G	5.2580	50/50	5.2580
925981	AC1-074 C O1	9.2590	50/50	9.2590
925982	AC1-074 E O1	3.9682	50/50	3.9682
932551	AC2-075 C	2.1990	50/50	2.1990
932552	AC2-075 E	1.1078	50/50	1.1078
936381	AD2-048 C	6.0757	50/50	6.0757
936382	AD2-048 E	3.0313	50/50	3.0313
936571	AD2-072 C O1	2.9492	Adder	3.47
936572	AD2-072 E O1	1.4460	Adder	1.7
939141	AE1-144 C O1	8.7939	50/50	8.7939
939142	AE1-144 E O1	4.3641	50/50	4.3641
940531	AE2-038 C O1	5.8663	50/50	5.8663
940532	AE2-038 E O1	2.9057	50/50	2.9057
941411	AE2-138 C	14.2422	Adder	16.76
941412	AE2-138 E	5.2677	Adder	6.2
941981	AE2-210 C O1	4.9075	Adder	5.77
941982	AE2-210 E O1	1.8459	Adder	2.17
942411	AE2-254 C O1	1.4107	Adder	1.66
942412	AE2-254 E O1	0.9404	Adder	1.11
942591	AE2-275 C O1	4.0281	Adder	4.74
942592	AE2-275 E O1	1.5151	Adder	1.78
942891	AE2-308 C O1	6.9293	Adder	8.15
942892	AE2-308 E O1	2.5197	Adder	2.96
943111	AE2-339 C	2.1010	Adder	2.47
943112	AE2-339 E	1.0348	Adder	1.22
944621	AF1-127 C O1	4.0548	Adder	4.77
944622	AF1-127 E O1	1.9972	Adder	2.35
945541	AF1-219 C O1	0.9336	Adder	1.1
945542	AF1-219 E O1	0.4393	Adder	0.52
945681	AF1-233 C	16.6052	50/50	16.6052
945682	AF1-233 E	8.2033	50/50	8.2033
945861	AF1-251 C	9.9432	Adder	11.7
945862	AF1-251 E	6.6288	Adder	7.8
945911	AF1-256 C	5.3198	50/50	5.3198
945912	AF1-256 E	3.5466	50/50	3.5466
946021	AF1-267 C	2.2204	Adder	2.61
946022	AF1-267 E	1.0202	Adder	1.2
958171	AF2-111 C	15.9840	50/50	15.9840
958172	AF2-111 E	10.6560	50/50	10.6560

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959541	AF2-245 C	9.4050	50/50	9.4050
959542	AF2-245 E	6.2700	50/50	6.2700
960151	AF2-306	0.9028	Adder	2.0
960161	AF2-307 C	1.3751	Adder	3.05
960162	AF2-307 E	0.9167	Adder	2.03
960571	AF2-348 C	15.7935	50/50	15.7935
960572	AF2-348 E	10.5290	50/50	10.5290
960641	AF2-355 C O1	4.1776	Adder	9.27
960642	AF2-355 E O1	3.7134	Adder	8.24
961281	AF2-419 C	0.3026	Adder	0.67
961282	AF2-419 E	0.2017	Adder	0.45
961291	AF2-420 C	0.3026	Adder	0.67
961292	AF2-420 E	0.2017	Adder	0.45
WEC	WEC	0.0362	Confirmed LTF	0.0362
LGEE	LGEE	1.7092	Confirmed LTF	1.7092
CPL	CPL	0.2831	Confirmed LTF	0.2831
CBM-W2	CBM-W2	6.3063	Confirmed LTF	6.3063
NY	NY	0.0658	Confirmed LTF	0.0658
CBM-W1	CBM-W1	0.7381	Confirmed LTF	0.7381
TVA	TVA	1.6226	Confirmed LTF	1.6226
O-066	O-066	0.6250	Confirmed LTF	0.6250
CBM-S2	CBM-S2	3.3408	Confirmed LTF	3.3408
CBM-S1	CBM-S1	12.7885	Confirmed LTF	12.7885
G-007	G-007	0.0957	Confirmed LTF	0.0957
MADISON	MADISON	3.7780	Confirmed LTF	3.7780
MEC	MEC	0.5752	Confirmed LTF	0.5752

10.6.10 Index 10

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
101929122	342571	4CRANSTON	EKPC	342649	4ROWAN CO	EKPC	1	EKPC_P4-6_SPUR N39-92T	breaker	255.0	137.7	141.29	DC	9.15

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
936381	AD2-048 C	2.2900	Adder	2.69
936382	AD2-048 E	1.1426	Adder	1.34
939141	AE1-144 C O1	42.5958	50/50	42.5958
939142	AE1-144 E O1	21.1386	50/50	21.1386
940531	AE2-038 C O1	28.4149	50/50	28.4149
940532	AE2-038 E O1	14.0747	50/50	14.0747
945681	AF1-233 C	88.9248	50/50	88.9248
945682	AF1-233 E	43.9310	50/50	43.9310
945911	AF1-256 C	28.3426	50/50	28.3426
945912	AF1-256 E	18.8950	50/50	18.8950
959541	AF2-245 C	46.7652	50/50	46.7652
959542	AF2-245 E	31.1768	50/50	31.1768
960151	AF2-306	3.6044	50/50	3.6044
960161	AF2-307 C	5.4897	50/50	5.4897
960162	AF2-307 E	3.6598	50/50	3.6598
WEC	WEC	0.0132	Confirmed LTF	0.0132
LGEE	LGEE	0.0770	Confirmed LTF	0.0770
CBM-W2	CBM-W2	0.3440	Confirmed LTF	0.3440
NY	NY	0.0083	Confirmed LTF	0.0083
CBM-W1	CBM-W1	0.4629	Confirmed LTF	0.4629
TVA	TVA	0.0364	Confirmed LTF	0.0364
O-066	O-066	0.1142	Confirmed LTF	0.1142
CBM-S1	CBM-S1	0.3919	Confirmed LTF	0.3919
G-007	G-007	0.0177	Confirmed LTF	0.0177
MEC	MEC	0.0651	Confirmed LTF	0.0651
CATAWBA	CATAWBA	0.0056	Confirmed LTF	0.0056

10.6.11 Index 11

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
101929120	342589	4GODDARD	EKPC	342571	4CRANSTON	EKPC	1	EKPC_P4-6_SPUR N39-92T	breaker	255.0	137.78	141.37	DC	9.15

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
936381	AD2-048 C	2.2900	Adder	2.69
936382	AD2-048 E	1.1426	Adder	1.34
939141	AE1-144 C O1	42.5958	50/50	42.5958
939142	AE1-144 E O1	21.1386	50/50	21.1386
940531	AE2-038 C O1	28.4149	50/50	28.4149
940532	AE2-038 E O1	14.0747	50/50	14.0747
945681	AF1-233 C	88.9248	50/50	88.9248
945682	AF1-233 E	43.9310	50/50	43.9310
945911	AF1-256 C	28.3426	50/50	28.3426
945912	AF1-256 E	18.8950	50/50	18.8950
959541	AF2-245 C	46.7652	50/50	46.7652
959542	AF2-245 E	31.1768	50/50	31.1768
960151	AF2-306	3.6044	50/50	3.6044
960161	AF2-307 C	5.4897	50/50	5.4897
960162	AF2-307 E	3.6598	50/50	3.6598
WEC	WEC	0.0132	Confirmed LTF	0.0132
LGEE	LGEE	0.0770	Confirmed LTF	0.0770
CBM-W2	CBM-W2	0.3440	Confirmed LTF	0.3440
NY	NY	0.0083	Confirmed LTF	0.0083
CBM-W1	CBM-W1	0.4629	Confirmed LTF	0.4629
TVA	TVA	0.0364	Confirmed LTF	0.0364
O-066	O-066	0.1142	Confirmed LTF	0.1142
CBM-S1	CBM-S1	0.3919	Confirmed LTF	0.3919
G-007	G-007	0.0177	Confirmed LTF	0.0177
MEC	MEC	0.0651	Confirmed LTF	0.0651
CATAWBA	CATAWBA	0.0056	Confirmed LTF	0.0056

10.6.12 Index 12

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
100232988	342649	4ROWAN CO	EKPC	324302	4RODBURN	LGEE	1	EKPC_P4-6_SPUR N39-92T	breaker	191.0	150.98	157.64	DC	12.72

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939141	AE1-144 C O1	38.4006	50/50	38.4006
939142	AE1-144 E O1	19.0566	50/50	19.0566
940531	AE2-038 C O1	25.6163	50/50	25.6163
940532	AE2-038 E O1	12.6885	50/50	12.6885
945681	AF1-233 C	79.6915	50/50	79.6915
945682	AF1-233 E	39.3695	50/50	39.3695
945911	AF1-256 C	25.3997	50/50	25.3997
945912	AF1-256 E	16.9331	50/50	16.9331
959541	AF2-245 C	41.9095	50/50	41.9095
959542	AF2-245 E	27.9396	50/50	27.9396
960151	AF2-306	5.0099	50/50	5.0099
960161	AF2-307 C	7.6305	50/50	7.6305
960162	AF2-307 E	5.0870	50/50	5.0870
NEWTON	NEWTON	0.1160	Confirmed LTF	0.1160
CPLE	CPLE	0.0509	Confirmed LTF	0.0509
FARMERCITY	FARMERCITY	0.0042	Confirmed LTF	0.0042
G-007A	G-007A	0.0911	Confirmed LTF	0.0911
VFT	VFT	0.2451	Confirmed LTF	0.2451
PRAIRIE	PRAIRIE	0.2170	Confirmed LTF	0.2170
EDWARDS	EDWARDS	0.0329	Confirmed LTF	0.0329
CBM-S2	CBM-S2	0.4335	Confirmed LTF	0.4335
TILTON	TILTON	0.0750	Confirmed LTF	0.0750
MADISON	MADISON	0.3488	Confirmed LTF	0.3488
GIBSON	GIBSON	0.0923	Confirmed LTF	0.0923
BLUEG	BLUEG	0.4184	Confirmed LTF	0.4184
TRIMBLE	TRIMBLE	0.1336	Confirmed LTF	0.1336

10.6.13 Index 13

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPACT
98862739	342838	7SPURLOCK	EKPC	253077	09STUART	DAY	1	DEOK_P7-1_C5 CIRCUIT1883&4545REDBANKSILGRVZIMMER	tower	1532.0	141.0	141.53	DC	17.9

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
251968	08ZIMRHP	48.5861	50/50	48.5861
251969	08ZIMRLP	26.6066	50/50	26.6066
251970	08MELDL1	2.4608	50/50	2.4608
251971	08MELDL2	2.4608	50/50	2.4608
251972	08MELDL3	2.4674	50/50	2.4674
342942	1JKCT 10G	3.6195	50/50	3.6195
342957	1SPURLK1G	24.9695	50/50	24.9695
342960	1SPURLK2G	47.5091	50/50	47.5091
342963	1SPURLK3G	24.9656	50/50	24.9656
342966	1SPURLK4G	24.9656	50/50	24.9656
925921	AC1-068 C	-3.5310	Adder	-4.15
925931	AC1-069 C	-3.5310	Adder	-4.15
925981	AC1-074 C O1	15.7242	50/50	15.7242
925982	AC1-074 E O1	6.7390	50/50	6.7390
926061	AC1-085 C	-25.3878	Adder	-29.87
926791	AC1-165 C	-3.4895	Adder	-4.11
926801	AC1-166 C	-3.4895	Adder	-4.11
926951	AC1-182	1.1568	50/50	1.1568
932551	AC2-075 C	3.7345	50/50	3.7345
932552	AC2-075 E	1.8813	50/50	1.8813
932661	AC2-088 C O1	-5.5654	Adder	-6.55
935031	AD1-136 C	-0.7826	Adder	-0.92
936381	AD2-048 C	10.8026	Adder	12.71
936382	AD2-048 E	5.3897	Adder	6.34
936571	AD2-072 C O1	8.5360	Adder	10.04
936572	AD2-072 E O1	4.1853	Adder	4.92
939131	AE1-143 C	6.3918	Adder	7.52
939132	AE1-143 E	3.1660	Adder	3.72
939141	AE1-144 C O1	32.8780	50/50	32.8780
939142	AE1-144 E O1	16.3160	50/50	16.3160
940531	AE2-038 C O1	21.9323	50/50	21.9323
940532	AE2-038 E O1	10.8637	50/50	10.8637
941411	AE2-138 C	63.1597	50/50	63.1597
941412	AE2-138 E	23.3605	50/50	23.3605
941981	AE2-210 C O1	21.7632	50/50	21.7632
941982	AE2-210 E O1	8.1861	50/50	8.1861
942411	AE2-254 C O1	4.2886	Adder	5.05
942412	AE2-254 E O1	2.8591	Adder	3.36
942591	AE2-275 C O1	13.4973	Adder	15.88
942592	AE2-275 E O1	5.0769	Adder	5.97
942891	AE2-308 C O1	22.6214	Adder	26.61

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
942892	AE2-308 E O1	8.2260	Adder	9.68
943111	AE2-339 C	7.4483	50/50	7.4483
943112	AE2-339 E	3.6685	50/50	3.6685
943701	AF1-038 C	3.2099	Adder	3.78
943702	AF1-038 E	2.1400	Adder	2.52
943772	AF1-045 BAT	4.6834	Merchant Transmission	4.6834
943821	AF1-050 C	2.8525	Adder	3.36
943822	AF1-050 E	1.9017	Adder	2.24
944151	AF1-083 C O1	2.9977	Adder	3.53
944152	AF1-083 E O1	1.9985	Adder	2.35
944511	AF1-116 C	7.1684	Adder	8.43
944512	AF1-116 E	4.7789	Adder	5.62
944621	AF1-127 C O1	17.2956	50/50	17.2956
944622	AF1-127 E O1	8.5188	50/50	8.5188
945541	AF1-219 C O1	2.7718	Adder	3.26
945542	AF1-219 E O1	1.3044	Adder	1.53
945681	AF1-233 C	63.0397	50/50	63.0397
945682	AF1-233 E	31.1431	50/50	31.1431
945861	AF1-251 C	43.2920	50/50	43.2920
945862	AF1-251 E	28.8614	50/50	28.8614
945911	AF1-256 C	20.2286	50/50	20.2286
945912	AF1-256 E	13.4858	50/50	13.4858
946021	AF1-267 C	7.4386	Adder	8.75
946022	AF1-267 E	3.4177	Adder	4.02
957961	AF2-090 C	2.8982	Adder	6.43
957962	AF2-090 E	1.4334	Adder	3.18
958171	AF2-111 C	72.5985	50/50	72.5985
958172	AF2-111 E	48.3990	50/50	48.3990
959541	AF2-245 C	36.4922	50/50	36.4922
959542	AF2-245 E	24.3281	50/50	24.3281
959691	AF2-260 C O1	2.4086	Adder	5.35
959692	AF2-260 E O1	1.2043	Adder	2.67
960151	AF2-306	3.1761	Adder	7.05
960161	AF2-307 C	4.8374	Adder	10.74
960162	AF2-307 E	3.2250	Adder	7.16
960171	AF2-308	1.1243	Adder	2.5
960181	AF2-309 C	1.6864	Adder	3.74
960182	AF2-309 E	1.1243	Adder	2.5
960571	AF2-348 C	71.1180	50/50	71.1180
960572	AF2-348 E	47.4120	50/50	47.4120
960641	AF2-355 C O1	14.6899	Adder	32.61
960642	AF2-355 E O1	13.0577	Adder	28.98
961001	AF2-391 C O1	2.8917	Adder	6.42
961002	AF2-391 E O1	1.9278	Adder	4.28
961281	AF2-419 C	0.9087	Adder	2.02
961282	AF2-419 E	0.6058	Adder	1.34
961291	AF2-420 C	0.9087	Adder	2.02
961292	AF2-420 E	0.6058	Adder	1.34
WEC	WEC	0.3692	Confirmed LTF	0.3692
LGEE	LGEE	4.6598	Confirmed LTF	4.6598
CPL	CPL	0.4776	Confirmed LTF	0.4776
LGE-0012019	LGE-0012019	6.2975	LTF	6.2975

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CBM-W2	CBM-W2	24.6437	Confirmed LTF	24.6437
NY	NY	0.7537	Confirmed LTF	0.7537
CBM-W1	CBM-W1	9.4951	Confirmed LTF	9.4951
TVA	TVA	5.2388	Confirmed LTF	5.2388
O-066	O-066	8.7562	Confirmed LTF	8.7562
CBM-S2	CBM-S2	7.5487	Confirmed LTF	7.5487
CBM-S1	CBM-S1	38.8938	Confirmed LTF	38.8938
G-007	G-007	1.3510	Confirmed LTF	1.3510
MADISON	MADISON	3.2639	Confirmed LTF	3.2639
MEC	MEC	2.9683	Confirmed LTF	2.9683

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
AA1-099	Clinton Co. 34.5kV	In Service
AC1-068	Atlanta 69kV I	Engineering and Procurement
AC1-069	Atlanta 69kV II	Engineering and Procurement
AC1-074	Jacksonville-Renaker 138kV I	Active
AC1-085	Stuart-Clinton 345kV	Engineering and Procurement
AC1-089	Hillsboro-Wildcat 138kV	Suspended
AC1-165	Atlanta 69kV III	Engineering and Procurement
AC1-166	Atlanta 69kV IV	Engineering and Procurement
AC1-182	W.H. Zimmer Station 345kV	In Service
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
AD2-072	Van Arsdell-Mercer Industrial 69kV	Active
AE1-143	Marion County 161 kV	Active
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
AF1-045	Cedarville-Ford 138 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
AF1-219	Hunt Farm 69 kV	Active
AF1-233	Flemingsburg 138 kV	Active
AF1-251	Avon-North Clark 345 kV	Active
AF1-256	Flemingsburg-Spurlock 138 kV	Active
AF1-267	Union City Tap 138 kV	Active
AF2-090	Central Hardin 138 kV	Active
AF2-111	North Clark-Spurlock 345 kV	Active
AF2-245	Spurlock-Flemingsburg 345 kV	Active
AF2-260	Stephensburg 69 kV	Active
AF2-306	Hope-Blevins Valley Tap 69 kV	Active

Queue Number	Project Name	Status
AF2-307	Hope-Blevins Valley Tap 69 kV	Active
AF2-308	Central Hardin-Stephensburg 69 kV	Active
AF2-309	Central Hardin-Stephensburg 69 kV	Active
AF2-348	North Clark-Spurlock 345 kV	Active
AF2-355	West Gerrard-J.K. Smith 345 nkV	Active
AF2-391	Central Hardin 69 kV	Active
AF2-419	Hunt Farm-Ballard 69 kV	Active
AF2-420	Hunt Farm-Ballard 69 kV	Active
Z1-080	Clinton County 34.5kV	In Service

10.8 Contingency Descriptions

Contingency Name	Contingency Definition
DEOK_P2-3_C2 1493_RED BANK	CONTINGENCY 'DEOK_P2-3_C2 1493_RED BANK' OPEN BRANCH FROM BUS 249571 TO BUS 249573 CKT 1 / 249571 08REDBK1 345 249573 08SGROVE 345 1 OPEN BRANCH FROM BUS 249573 TO BUS 250097 CKT 1 / 249573 08SGROVE 345 250097 08SGROVE 138 1 OPEN BRANCH FROM BUS 249573 TO BUS 249577 CKT 1 / 249573 08SGROVE 345 249577 08ZIMER 345 1 OPEN BRANCH FROM BUS 249571 TO BUS 250092 CKT 1 / 249571 08REDBK1 345 250092 08REDBK1 138 1 END
EKPC_P4-6_SPUR N39-92T	CONTINGENCY 'EKPC_P4-6_SPUR N39-92T' /* SPURLOCK OPEN BRANCH FROM BUS 342622 TO BUS 342664 CKT 1 /* 342622 4MAYSVIL I T138.00 342664 4SPURLOCK 138.00 OPEN BRANCH FROM BUS 342622 TO BUS 342625 CKT 1 /* 342622 4MAYSVIL I T138.00 342625 4MAYSVIL IND138.00 OPEN BRANCH FROM BUS 342622 TO BUS 342634 CKT 1 /* 342622 4MAYSVIL I T138.00 342634 4PLUMVILLE 138.00 OPEN BRANCH FROM BUS 959540 TO BUS 342664 CKT 1 /* 945910 AF1-256 TAP 138.00 342664 4SPURLOCK 138.00 END
DEOK_P2-3_C2 816_SILVERGROVE	CONTINGENCY 'DEOK_P2-3_C2 816_SILVERGROVE' 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 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 END

Contingency Name	Contingency Definition
DEOK_P7-1_C5 CIRCUIT1883&4545REDBANKSILGR VZIMMER	CONTINGENCY 'DEOK_P7-1_C5 CIRCUIT1883&4545REDBANKSILGRVZIMMER' OPEN BRANCH FROM BUS 249989 TO BUS 250080 CKT 1 / 249989 08BKJ246 138 250080 08NWTWN2 138 1 OPEN BRANCH FROM BUS 250079 TO BUS 250080 CKT Z1 / 250079 08NWTWN1 138 250080 08NWTWN2 138 Z1 OPEN BRANCH FROM BUS 250079 TO BUS 250092 CKT 1 / 250079 08NWTWN1 138 250092 08REDBK1 138 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 249571 TO BUS 249573 CKT 1 / 249571 08REDBK1 345 249573 08SGROVE 345 1 END
DEOK_P1-3_B3 SILVER GROVE 345/138 TB23*	CONTINGENCY 'DEOK_P1-3_B3 SILVER GROVE 345/138 TB23*' OPEN BRANCH FROM BUS 249573 TO BUS 250097 CKT 1 / 249573 08SGROVE 345 250097 08SGROVE 138 1 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 END
DAY_P734541 34553	CONTINGENCY 'DAY_P734541 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_P2-3_SPUR N39-844-A	CONTINGENCY 'EKPC_P2-3_SPUR N39-844-A' /* SPURLOCK OPEN BRANCH FROM BUS 342664 TO BUS 342838 CKT 2 /* 342664 4SPURLOCK 138.00 342838 7SPURLOCK 345.00 OPEN BRANCH FROM BUS 959540 TO BUS 342664 CKT 1 /* 959540 AF2-245 TAP138.00 342664 4SPURLOCK 138.00 END
EKPC_P1-2_SPUR-GODD 138-B	CONTINGENCY 'EKPC_P1-2_SPUR-GODD 138-B' /* SPURLOCK - GODDARD OPEN BRANCH FROM BUS 959540 TO BUS 342664 CKT 1 /* 945910 AF1-256 TAP 138.00 342664 4SPURLOCK 138.00 END
EKPC_P4-2_SPUR N39-844	CONTINGENCY 'EKPC_P4-2_SPUR N39-844' /* SPURLOCK OPEN BRANCH FROM BUS 342664 TO BUS 342838 CKT 2 /* 342664 4SPURLOCK 138.00 342838 7SPURLOCK 345.00 OPEN BRANCH FROM BUS 959540 TO BUS 342664 CKT 1 /* 945910 AF1-256 TAP 138.00 342664 4SPURLOCK 138.00 END

Contingency Name	Contingency Definition
Base Case	
AEP_P1-2_#10137	CONTINGENCY 'AEP_P1-2_#10137' OPEN BRANCH FROM BUS 243453 TO BUS 244022 CKT 1 / 243453 05BEATTY 345 244022 05COLE 345 1 END
DEOK_P2-2_C1 SILVER GROVE 345 BUS	CONTINGENCY 'DEOK_P2-2_C1 SILVER GROVE 345 BUS' 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 249571 TO BUS 249573 CKT 1 / 249571 08REDBK1 345 249573 08SGROVE 345 1 END

11 Light Load Analysis

Light Load Studies (As applicable)

To be determined during later study phases.

12 Short Circuit Analysis

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).