



**Generation Interconnection
Feasibility Study Report
for
Queue Project AF1-316
KATYDID ROAD 345 KV
52.8 MW Capacity / 132 MW Energy**

January, 2020

1 General

The Interconnection Customer (IC) has proposed a solar generating facility located in Grundy County, Illinois. The installed facilities will have a total capability of 132 MW with 52.8 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is October 1, 2022. This study does not imply a TO commitment to this in-service date. The Interconnection Customer requested a Primary and Secondary Point of Interconnection be evaluated for the AF1-316 project.

Queue Number	AF1-316
Project Name	KATYDID ROAD 345 KV
State	Illinois
County	Grundy
Transmission Owner	ComEd
MFO	132
MWE	132
MWC	52.8
Fuel	Solar
Basecase Study Year	2023

1.1 Primary Point of Interconnection

Queue Position AF1-316, a 132 MW solar facility proposes to interconnect with the ComEd transmission system by connecting to 138kV bus at Kickapoo Creek TSS 105.

1.2 Cost Summary

AF1-316 will be responsible for the following costs associated with the physical interconnection of the project:

Description	Total Cost
Attachment Facilities	\$1,000,000
Direct Connection Network Upgrade	\$6,000,000
Non Direct Connection Network Upgrades	\$0
Total Costs	\$7,000,000

In addition, the AF1-316 project may be responsible for a contribution to the following costs associated with network upgrades (See Section 16):

Description	Total Cost
System Upgrades	\$119,362,560

Cost allocations for these upgrades will be provided in the System Impact Study Report.

2 Transmission Owner Scope of Work

Attachment Facilities

The AF1-316 generator lead would interconnect to 138kV bus at Kickapoo Creek TSS 105 (see details in Direct Connection section below). The required Attachment Facilities are one 138kV line MOD, a dead-end structure and revenue metering.

Direct Connection Network Upgrades

Queue Position AF1-316 has chosen to interconnect at 138kV Kickapoo Creek TSS 105. Presently, there is no bus position at this substation to interconnect the generator lead. To accommodate interconnection of AF1-316, Kickapoo Creek TSS 105 needs to be expanded to create a 138kV bus position for this interconnection. The scope of work includes installation of two 138kV circuit breakers and reconfiguration of bus connections, as shown in the one-line diagram.

The Interconnection Customer ("IC") is responsible for constructing all of the facilities on the IC side of the Point of Interconnection ("POI").

ComEd would design, engineer and install the two 138kV circuit breakers and reconfigure 138kV bus at Kickapoo Creek TSS 105 to create a new 138kV bus position for this interconnection.

Non-Direct Connection Network Upgrades

None

3 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
Installation of one 138kV line MOD, one dead-end structure and one set of revenue metering (see notes below on cost estimate)	\$1,000,000
Total Attachment Facility Costs	\$1,000,000

4 Direct Connection Cost Estimate

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

Description	Total Cost
Install two 138kV circuit breakers and reconfigure 138kV bus at Kickapoo Creek TSS 105.	\$6,000,000
Total Direct Connection Facility Costs	\$6,000,000

5 Non-Direct Connection Cost Estimate

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

Description	Total Cost
None	\$0
Total Non-Direct Connection Facility Costs	\$0

Notes on Cost Estimate:

- 1) These estimates are Order-of-Magnitude estimates of the costs that ComEd would bill to the customer for this interconnection. These estimates are based on a one-line electrical diagram of the project and the information provided by the IC.
- 2) There were no site visits performed for these estimates. There may be costs related to specific site related issues that are not identified in these estimates. The site reviews will be performed during the Facilities Study or during detailed engineering.
- 3) These estimates are not a guarantee of the maximum amount payable by the IC and the actual costs of ComEd's work may differ significantly from these estimates. IC will be responsible for paying actual costs of ComEd's work in accordance with Sections 212.1 and 217 of the PJM Open Access Transmission Tariff.
- 4) The IC is responsible for all engineering, procurement, testing and construction of all equipment on the IC's side of the POI.
- 5) These cost estimates do not include cost of acquiring right-of-way for the transmission line and purchasing any additional land, if needed, for the line terminations. The need and cost of acquiring property and associated legal costs will be investigated during Facilities Study for this project.

6 Schedule

ComEd would take approximately 24-months to install two 138kV circuit breakers and reconfigure 138kV bus at Kickapoo Creek TSS 105 after the ISA / ICSA are signed.

7 Transmission Owner Analysis

See Section 3.

8 Interconnection Customer Requirements

ComEd interconnection requirements can be found at <https://www.pjm.com/planning/design-engineering/to-tech-standards/private-comed.aspx>

To the extent that these Applicable Technical Requirements and Standards may conflict with the terms and conditions of the Tariff, the Tariff shall control.

ComEd distribution line drops to move customer cranes and heavy equipment is not part of PJM process. The customer should directly contact ComEd New Business Group to arrange for line drops, if needed.

9 Revenue Metering and SCADA Requirements

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.

10 Network Impacts

The Queue Project AF1-316 was evaluated as a 132.0 MW (Capacity 52.8 MW) injection at the Kickapoo Creek 138 kV substation in the ComEd area. Project AF1-316 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF1-316 was studied with a commercial probability of 0.53. Potential network impacts were as follows:

Summer Peak Load Flow

11 Generation Deliverability

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

None

12 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
44516644	348935	4CORBIN	138.0	AMIL	936510	AD2-066 TAP	138.0	CE	1	COMED_P2-2_001_LA-138B__1	bus	223.0	96.55	106.97	DC	23.25
44516960	348935	4CORBIN	138.0	AMIL	936510	AD2-066 TAP	138.0	CE	1	COMED_P4_001-38-L0108__	breaker	223.0	96.55	106.97	DC	23.25
44516961	348935	4CORBIN	138.0	AMIL	936510	AD2-066 TAP	138.0	CE	1	COMED_P4_001-38-TR81__	breaker	223.0	96.55	106.97	DC	23.25

13 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
44516975	255112	17STJOHN	345.0	NIPS	270886	ST JOHN ; T	345.0	CE	1	AEP_P4_#2978_05DUMONT_NON_FSA	breaker	1091.0	125.42	125.46	DC	12.57
44516976	255112	17STJOHN	345.0	NIPS	270886	ST JOHN ; T	345.0	CE	1	AEP_P4_#2978_05DUMONT_FSA	breaker	1091.0	125.43	125.46	DC	12.57
44516977	255112	17STJOHN	345.0	NIPS	270886	ST JOHN ; T	345.0	CE	1	COMED_P4_023-65-BT2-3__	breaker	1091.0	124.92	124.96	DC	12.7
44516978	255112	17STJOHN	345.0	NIPS	270886	ST JOHN ; T	345.0	CE	1	COMED_P4_112-65-BT4-5__	breaker	1091.0	124.86	124.89	DC	12.67
44516979	255112	17STJOHN	345.0	NIPS	270886	ST JOHN ; T	345.0	CE	1	COMED_P4_112-65-BT3-4__	breaker	1091.0	124.85	124.89	DC	12.67
43627855	255113	17STILLWELL	345.0	NIPS	243219	05DUMONT	345.0	AEP	1	AEP_P4_#2978_05DUMONT_NON_FSA	breaker	1409.0	134.19	134.24	DC	19.22
43627856	255113	17STILLWELL	345.0	NIPS	243219	05DUMONT	345.0	AEP	1	AEP_P4_#2978_05DUMONT_FSA	breaker	1409.0	134.19	134.23	DC	19.22
43628000	270771	GREENACRE; T	345.0	CE	243229	05OLIVE	345.0	AEP	1	AEP_P4_#2978_05DUMONT_FSA	breaker	971.0	102.74	102.78	DC	11.2
43628001	270771	GREENACRE; T	345.0	CE	243229	05OLIVE	345.0	AEP	1	AEP_P4_#2978_05DUMONT_NON_FSA	breaker	971.0	102.74	102.78	DC	11.2
44517057	270802	LASCO STA; B	345.0	CE	270846	PLANO ; B	345.0	CE	1	COMED_P4_167-45-BT2-5__	breaker	1528.0	119.14	120.95	DC	27.8
45878882	270802	LASCO STA; B	345.0	CE	270846	PLANO ; B	345.0	CE	1	COMED_P4_167-45-BT5-6__	breaker	1528.0	117.82	119.55	DC	26.44
44517085	270847	PLANO ; R	345.0	CE	275208	PLANO ;4M	345.0	CE	1	COMED_P4_167-45-BT8-12__	breaker	1379.0	112.41	113.7	DC	18.97
44517086	270847	PLANO ; R	345.0	CE	275208	PLANO ;4M	345.0	CE	1	COMED_P4_167-45-BT8-9__	breaker	1379.0	112.0	113.11	DC	15.42
44517087	270847	PLANO ; R	345.0	CE	275208	PLANO ;4M	345.0	CE	1	COMED_P4_167-45-BT9-12__	breaker	1379.0	111.92	113.03	DC	15.41
45878710	270847	PLANO ; R	345.0	CE	275208	PLANO ;4M	345.0	CE	1	COMED_P4_167-45-BT1-9__	breaker	1379.0	140.12	141.64	DC	21.0
44516980	270886	ST JOHN ; T	345.0	CE	255104	17GREEN_A CRE	345.0	NIPS	1	AEP_P4_#2978_05DUMONT_FSA	breaker	1091.0	125.42	125.46	DC	12.57
44516981	270886	ST JOHN ; T	345.0	CE	255104	17GREEN_A CRE	345.0	NIPS	1	AEP_P4_#2978_05DUMONT_NON_FSA	breaker	1091.0	125.42	125.46	DC	12.57
44516982	270886	ST JOHN ; T	345.0	CE	255104	17GREEN_A CRE	345.0	NIPS	1	COMED_P4_023-65-BT2-3__	breaker	1091.0	124.92	124.96	DC	12.7
44516983	270886	ST JOHN ; T	345.0	CE	255104	17GREEN_A CRE	345.0	NIPS	1	COMED_P4_112-65-BT4-5__	breaker	1091.0	124.85	124.88	DC	12.67
44516984	270886	ST JOHN ; T	345.0	CE	255104	17GREEN_A CRE	345.0	NIPS	1	COMED_P4_112-65-BT3-4__	breaker	1091.0	124.84	124.88	DC	12.67
44517045	270926	WILTON ; B	345.0	CE	275232	WILTON ;3M	345.0	CE	1	COMED_P4_112-65-BT5-6__	breaker	1379.0	118.83	118.89	DC	21.28
44517020	270927	WILTON ; R	345.0	CE	275233	WILTON ;4M	345.0	CE	1	COMED_P4_112-65-BT2-3__	breaker	1379.0	121.32	121.38	DC	21.73
44516875	274750	CRETE EC ;BP	345.0	CE	255112	17STJOHN	345.0	NIPS	1	AEP_P4_#2978_05DUMONT_NON_FSA	breaker	1399.0	154.35	154.39	DC	17.76
44516876	274750	CRETE EC ;BP	345.0	CE	255112	17STJOHN	345.0	NIPS	1	AEP_P4_#2978_05DUMONT_FSA	breaker	1399.0	154.35	154.39	DC	17.76
44516877	274750	CRETE EC ;BP	345.0	CE	255112	17STJOHN	345.0	NIPS	1	COMED_P4_112-65-BT4-5__	breaker	1399.0	153.94	153.99	DC	17.86
44516878	274750	CRETE EC ;BP	345.0	CE	255112	17STJOHN	345.0	NIPS	1	COMED_P4_112-65-BT3-4__	breaker	1399.0	153.93	153.98	DC	17.86
44517088	275208	PLANO ;4M	345.0	CE	270630	PLANO ;	765.0	CE	1	COMED_P4_167-45-BT8-12__	breaker	1379.0	112.41	113.7	DC	18.97
44517089	275208	PLANO ;4M	345.0	CE	270630	PLANO ;	765.0	CE	1	COMED_P4_167-45-BT8-9__	breaker	1379.0	112.0	113.11	DC	15.42
44517090	275208	PLANO ;4M	345.0	CE	270630	PLANO ;	765.0	CE	1	COMED_P4_167-45-BT9-12__	breaker	1379.0	111.92	113.03	DC	15.41

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 LOADING %	POST PROJE CT LOADING %	AC DC	MW IMPACT
45878715	275208	PLANO ;4M	345.0	CE	270630	PLANO ;	765.0	CE	1	COMED_P4_167-45-BT1-9__	breaker	1379.0	140.12	141.64	DC	21.0
44517044	275232	WILTON ;3M	345.0	CE	270644	WILTON ;	765.0	CE	1	COMED_P4_112-65-BT5-6__	breaker	1379.0	118.83	118.89	DC	21.28
44517021	275233	WILTON ;4M	345.0	CE	270644	WILTON ;	765.0	CE	1	COMED_P4_112-65-BT2-3__	breaker	1379.0	121.32	121.38	DC	21.73
44516590	936510	AD2-066 TAP	138.0	CE	271987	MAZON ;R	138.0	CE	1	COMED_P2-2_001_LA-138B__1	bus	223.0	129.74	140.16	DC	23.25

14 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 PROJE CT LOADING %	POST PROJE CT LOADING %	AC DC	MW IMPACT
44517579	255112	17STJOHN	345.0	NIPS	270886	ST JOHN ; T	345.0	CE	1	COMED_P1-2_695_B2	operation	1091.0	124.84	124.88	DC	12.66
43628199	255113	17STILLWELL	345.0	NIPS	243219	05DUMONT	345.0	AEP	1	COMED_P1-2_695_B2	operation	1409.0	132.31	132.36	DC	19.76
44517477	270670	BRAIDWOOD; B	345.0	CE	934730	AD1-100 TAP	345.0	CE	1	COMED_P1-2_345-L2004_AR-S-B	operation	1341.0	139.72	141.77	DC	27.38
43628356	270771	GREENACRE; T	345.0	CE	243229	05OLIVE	345.0	AEP	1	COMED_P1-2_695_B2	operation	971.0	101.82	101.86	DC	11.33
44517688	270802	LASCO STA; B	345.0	CE	270846	PLANO ; B	345.0	CE	1	COMED_P1-2_345-L0102_R-S	operation	1528.0	115.11	117.01	DC	28.98
44517672	270803	LASCO STA; R	345.0	CE	270847	PLANO ; R	345.0	CE	1	COMED_P1-2_345-L0101_B-S	operation	1528.0	117.02	118.71	DC	25.78
44517714	270846	PLANO ; B	345.0	CE	275207	PLANO ;3M	345.0	CE	1	COMED_P1-3_TR94_PLANO_R-S	operation	1379.0	108.43	108.88	DC	15.82
45879584	270847	PLANO ; R	345.0	CE	275208	PLANO ;4M	345.0	CE	1	COMED_P1-2_345-L16703_R-S	operation	1379.0	112.5	113.64	DC	15.75
44517584	270886	ST JOHN ; T	345.0	CE	255104	17GREENACRE	345.0	NIPS	1	COMED_P1-2_695_B2	operation	1091.0	124.84	124.88	DC	12.66
45879669	271655	HENNEEPIN ; T	138.0	CE	348918	4HENNEEPIN S	138.0	AMIL	1	COMED_P1-2_138-L0112_B-S	operation	305.0	82.06	104.44	DC	68.26
44517680	271844	KICKAPOO ; B	138.0	CE	271908	LASCO STA; B	138.0	CE	1	Base Case	operation	351.0	99.29	132.4	DC	116.24
45879352	271844	KICKAPOO ; B	138.0	CE	271977	MARSEILLE; T	138.0	CE	1	COMED_P1-2_138-L0112_B-S	operation	317.0	107.32	148.95	DC	131.95

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
45879366	271844	KICKAPOO ; B	138.0	CE	271908	LASCO STA; B	138.0	CE	1	COMED_P1-1_LA-1U____-S	operation	442.0	84.23	110.53	DC	116.24
44517589	271908	LASCO STA; B	138.0	CE	271986	MAZON ; B	138.0	CE	1	COMED_P1-3_TR81_LASCO_B-S	operation	223.0	118.63	153.87	DC	78.57
44517914	271908	LASCO STA; B	138.0	CE	270802	LASCO STA; B	345.0	CE	1	COMED_P1-2_138-L0108_B-S	operation	449.0	75.05	100.42	DC	113.91
45879510	271977	MARSEILLE; T	138.0	CE	348931	4MARSEILLES	138.0	AMIL	1	COMED_P1-2_138-L0112_B-S	operation	143.0	95.57	122.54	DC	38.57
45879583	271977	MARSEILLE; T	138.0	CE	272521	STREATOR ;	138.0	CE	1	COMED_P1-2_138-L0112_B-S	operation	264.0	78.61	113.98	DC	93.38
44517489	271987	MAZON ; R	138.0	CE	271187	CHANNAHON; R	138.0	CE	1	COMED_P1-2_138-L0112_B-S	operation	223.0	109.1	118.3	DC	20.51
44517808	272124	ESS J339 ; B	138.0	CE	271336	DRESDEN ; B	138.0	CE	1	COMED_P1-3_TR81_LASCO_B-S	operation	268.0	92.76	119.05	DC	70.41
44517667	272125	ESS J339 ; R	138.0	CE	271337	DRESDEN ; R	138.0	CE	1	COMED_P1-2_138-L0112_B-S	operation	268.0	93.64	101.27	DC	20.45
45879364	272521	STREATOR ;	138.0	CE	926820	AC1-168 TAP	138.0	CE	1	COMED_P1-2_138-L0112_B-S	operation	184.0	94.62	145.37	DC	93.37
44517447	274750	CRETE EC ;BP	345.0	CE	255112	17STJOHN	345.0	NIPS	1	Base Case	operation	1091.0	155.02	155.05	DC	11.45
44517448	274750	CRETE EC ;BP	345.0	CE	255112	17STJOHN	345.0	NIPS	1	COMED_P1-2_695_B2	operation	1399.0	153.89	153.93	DC	17.84
43628345	274804	UNIV PK N;RP	345.0	CE	243229	05OLIVE	345.0	AEP	1	COMED_P1-2_695_B2	operation	971.0	104.56	104.64	DC	14.04
44517716	275207	PLANO ;3M	345.0	CE	270630	PLANO ;	765.0	CE	1	COMED_P1-3_TR94_PLANO_R-S	operation	1379.0	108.43	108.88	DC	15.82
45879588	275208	PLANO ;4M	345.0	CE	270630	PLANO ;	765.0	CE	1	COMED_P1-2_345-L16703_R-S	operation	1379.0	112.5	113.64	DC	15.75
44517570	348935	4CORBIN	138.0	AMIL	936510	AD2-066 TAP	138.0	CE	1	COMED_P1-2_138-L0112_B-S	operation	223.0	95.07	105.53	DC	23.33
45879278	926820	AC1-168 TAP	138.0	CE	271655	HENNEEPIN; T	138.0	CE	1	COMED_P1-2_138-L0112_B-S	operation	184.0	134.96	185.71	DC	93.37
44517437	936510	AD2-066 TAP	138.0	CE	271987	MAZON ; R	138.0	CE	1	COMED_P1-2_138-L0112_B-S	operation	223.0	128.35	138.81	DC	23.33
45879698	941560	AE2-153 TAP	345.0	CE	270711	DAVIS CRK; R	345.0	CE	1	270670 BRAIDWOOD; B 345 934730 AD1-100 TAP 345 1	operation	1341.0	99.32	100.61	DC	16.66

15 System Reinforcements

ID	Index	Facility	Upgrade Description	Cost
44517087,44517086, 44517085,45878710	7	PLANO ; R 345.0 kV - PLANO ;4M 345.0 kV Ckt 1	<u>ComEd</u> CE_NUN_TSS 167-345KV_BT 10-12 (2353) : ComEd Tr. 94 at TSS 167 Plano SSTE rating is 1469 MVA. The contingency name should be BT 10-12 rather than BT 9-12. The upgrade will be to install a new 345kV bus tie circuit breaker at TSS 167 Plano, BT CB 9-10. The purpose is to reduce the impact of the current contingency impact. There will not be a rating change. A preliminary estimate for the upgrade is \$4M with an estimated construction timeline of 30 months contingent upon line relocation issues. PJM to confirm this proposed solution. Project Type : CON Cost : \$4,000,000 Time Estimate : 30.0 Months	\$4,000,000
44516984,44516981, 44516980,44516983, 44516982	8	ST JOHN ; T 345.0 kV - 17GREEN_ACRE 345.0 kV Ckt 1	<u>ComEd</u> N5834 (2243) : L6617 SSTE is 1134 MVA. The post contingency flow for this event exceeds the rating therefore an upgrade is required. The upgrade is sag mitigation of the line. A preliminary estimate is \$3.1 M with a estimated construction timeline of 30 months. Upon completion of this upgrade the new ratings will be 1091/1399/1483/1674 MVA (SN/SLTE/SSTE/SLD). Project Type : FAC Cost : \$3,100,000 Time Estimate : 30.0 Months <u>NIPS</u> NonPJMArea (446) : The external (i.e. Non-PJM) Transmission Owner, NIPS, will not evaluate this violation until the impact study phase. Project Type : FAC Cost : \$0 Time Estimate : 0.0 Months	\$3,100,000
44517044	13	WILTON ;3M 345.0 kV - WILTON ; 765.0 kV Ckt 1	<u>ComEd</u> n5145 (2237) : PJM Network Upgrade (n5145): Reconfigure Wilton 765kV bus thereby allowing for 765kV L11216 (currently on Bus 6) to be relocated to Bus 8. Along with this line relocation, installation of 2-765kV BT CBs (6-8 & 8-2). Project Type : CON Cost : \$11,000,000 Time Estimate : 36-40 Months	\$11,000,000
44517045	9	WILTON ; B 345.0 kV - WILTON ;3M 345.0 kV Ckt 1	<u>ComEd</u> n5145 (2237) : PJM Network Upgrade (n5145): Reconfigure Wilton 765kV bus thereby allowing for 765kV L11216 (currently on Bus 6) to be relocated to Bus 8. Along with this line relocation, installation of 2-765kV BT CBs (6-8 & 8-2). Project Type : CON Cost : \$11,000,000 Time Estimate : 36-40 Months	\$11,000,000

ID	Index	Facility	Upgrade Description	Cost
44517020	10	WILTON ; R 345.0 kV - WILTON ; 4M 345.0 kV Ckt 1	<u>ComEd</u> n5145 (2237) : PJM Network Upgrade (n5145): Reconfigure Wilton 765kV bus thereby allowing for 765kV L11216 (currently on Bus 6) to be relocated to Bus 8. Along with this line relocation, installation of 2-765kV BT CBs (6-8 & 8-2). Project Type : CON Cost : \$11,000,000 Time Estimate : 36-40 Months	\$11,000,000
44517021	14	WILTON ; 4M 345.0 kV - WILTON ; 765.0 kV Ckt 1	<u>ComEd</u> n5145 (2237) : PJM Network Upgrade (n5145): Reconfigure Wilton 765kV bus thereby allowing for 765kV L11216 (currently on Bus 6) to be relocated to Bus 8. Along with this line relocation, installation of 2-765kV BT CBs (6-8 & 8-2). Project Type : CON Cost : \$11,000,000 Time Estimate : 36-40 Months	\$11,000,000
44516590	15	AD2-066 TAP 138.0 kV - MAZON ; R 138.0 kV Ckt 1	<u>ComEd</u> CE_NUN_L7713_1 : ComEd 138kV L7713 ALDR rating is 265 MVA. The upgrade will be to mitigate sag on a portion of the line and re-conductor as well. A preliminary estimate for the upgrade is \$32.2M with an estimated construction timeline of 24-30 months. Upon completion of the upgrade the ratings will be 292/321/367/280/433 MVA SN/SLTE/SSTE/SLD. Project Type : FAC Cost : \$32,200,000 Time Estimate : 24-30 Months	\$32,200,000
44516878,44516875, 44516877,44516876	11	CRETE EC ;BP 345.0 kV - 17STJOHN 345.0 kV Ckt 1	<u>ComEd</u> N5253 (2239) : L94507 SSTE rating is 1483 MVA. The post contingency flow for this event exceeds the rating therefore an upgrade is required. The upgrade will be to reconductor the line, upgrade station conductor and upgrade a relay package. A preliminary cost estimate is \$14.9 M with an estimated construction timeline of 30 months. Upon completion of this upgrade the new ratings will be 1754/2246/2297/2488 MVA (SN/SLTE/SSTE/SLD). Project Type : FAC Cost : \$14,900,000 Time Estimate : 30.0 Months NonPJMArea (2318) : Project Type : FAC Cost : \$0 Time Estimate : 0.0 Months	\$14,900,000
44516644,44516960, 44516961	1	4CORBIN 138.0 kV - AD2- 066 TAP 138.0 kV Ckt 1	<u>ComEd</u> CE_NUN_L7713 : ComEd 138kV L7713 ALDR rating is 265 MVA. The upgrade will be to mitigate sag on a portion of the line and re-conductor as well. A preliminary estimate for the upgrade is \$22.4M with an estimated construction timeline of 24 months. Upon completion of the upgrade the ratings will be 210/268/269/280/322 MVA SN/SLTE/SSTE/SLD/ALDR. Project Type : FAC Cost : \$22,400,000 Time Estimate : 24 Months	\$22,400,000

ID	Index	Facility	Upgrade Description	Cost
45878715,44517090, 44517089,44517088	12	PLANO ;4M 345.0 kV - PLANO ; 765.0 kV Ckt 1	<u>ComEd</u> CE_NUN_TSS 167-345KV_BT 8-9 (2358) : ComEd Tr. 94 at TSS 167 Plano SSTE rating is 1469 MVA. The upgrade will be to install a new 345kV bus tie circuit breaker at TSS 167 Plano,BT CB 8-14 and relocate 345kV L0101 to newly designated 345kV Bus 14 on the Blue Bus. The purpose is to reduce the impact of the current contingency impact. There will not be a rating change. A preliminary estimate for the upgrade is \$10M with a estimated construction timeline of 30 months contingent upon line relocation issues. PJM to confirm this proposed solution. Project Type : CON Cost : \$10,000,000 Time Estimate : 30.0 Months	\$10,000,000
43627855,43627856	3	17STILLWELL 345.0 kV - 05DUMONT 345.0 kV Ckt 1	<u>AEP</u> n4790 (245) : PJM Network Upgrade n4790. Replace Dumont substation 2500A wavetrap. Project Type : FAC Cost : \$200,000 Time Estimate : 12-18 Months n5769.1 (246) : PJM Network Upgrade n5769.1. Perform engineering study for CT limits, and relay compliance trip limits at Dumont substation. Project Type : FAC Cost : \$25,000 Time Estimate : 12-18 Months n5769.2 (247) : PJM Network Upgrade n5769.2. Replace two Dumont 3000A Non-Oil breakers. Project Type : FAC Cost : \$2,000,000 Time Estimate : 12-18 Months n5769.3 (248) : PJM Network Upgrade n5769.3. Replace 11 jumpers/risers at Dumont substation. Project Type : FAC Cost : \$275,000 Time Estimate : 12-18 Months <u>NIPS</u> NonPJM Area (446) : The external (i.e. Non-PJM) Transmission Owner, NIPS, will not evaluate this violation until the impact study phase. Project Type : FAC Cost : \$0 Time Estimate : 0.0 Months	\$2,500,000

ID	Index	Facility	Upgrade Description	Cost
45878882,44517057	6	LASCO STA; B 345.0 kV - PLANO ; B 345.0 kV Ckt 1	<u>ComEd</u> CE_NUN_L0101 (2350) : ComEd 345kV L0101 SSTE rating is 1702 MVA. The upgrade will be to upgrade the line relaying scheme at both line terminals. A preliminary estimate for this upgrade is \$2.1M with an estimated construction timeline of 30 months based on outage scheduling at LaSalle Station. Upon completion of the upgrade the rating limits will be 1334/1726/1837/2084 MVA (SN/SLTE/SSTE/SLD). Project Type : FAC Cost : \$2,100,000 Time Estimate : 30.0 Months	\$2,100,000
44516978,44516979,44516975,44516976,44516977	2	17STJOHN 345.0 kV - ST JOHN ; T 345.0 kV Ckt 1	<u>ComEd</u> N5833 (2242) : L6617 SSTE is 1134 MVA. The post contingency flow for this event exceeds the rating therefore an upgrade is required. The upgrade is sag mitigation of the line. A preliminary estimate is \$3.1 M with a estimated construction timeline of 30 months. Upon completion of this upgrade the new ratings will be 1091/1399/1483/1674 MVA (SN/SLTE/SSTE/SLD). Project Type : FAC Cost : \$3,100,000 Time Estimate : 30.0 Months <u>NIPS</u> NonPJMArea (446) : The external (i.e. Non-PJM) Transmission Owner, NIPS, will not evaluate this violation until the impact study phase. Project Type : FAC Cost : \$0 Time Estimate : 0.0 Months	\$3,100,000

ID	Index	Facility	Upgrade Description	Cost
43628001,43628000	5	GREENACRE; T 345.0 kV - 05OLIVE 345.0 kV Ckt 1	<u>AEP</u> AEP_AE1_REF_r0005 (718) : Replace ACSR/PE 1414 62/19 - Conductor Section 1. A Sag Study will be required on the 40.64 miles of conductor to mitigate the overload. The new ratings after sag study will be: S/N: 971 MVA, S/E: 1419 MVA, Depending on the sag study results, the cost for this upgrade is expected to be between \$162,560 (no remediation required, just sag study) and \$81.28 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 : \$162,560 Time Estimate : 6-12 Months <u>ComEd</u> ce-002 (2229) : AEP owns limit on L6615. CE and NIPSCO have a sag limit as well that would need to be addressed. CE SSTE rating is 1134 MVA. A preliminary estimate for sag mitigation is \$13.9M with an estimated construction timeline of 30 months. Upon completion of the sag mitigation the new ratings will become 1091/1399/1483/1674 MVA SN/SLTE/SSTE/SLD. Project Type : FAC Cost : \$13,900,000 Time Estimate : 30.0 Months	\$14,062,560
			TOTAL COST	\$119,362,560

16 Flow Gate Details

The following indices contain additional information about each flowgate presented in the body of the report. For each index, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gauge other generators impact. It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

16.1 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
44516961	348935	4CORBIN	AMIL	936510	AD2-066 TAP	CE	1	COMED_P4_001-38-TR81____	breaker	223.0	96.55	106.97	DC	23.25

Bus #	Bus	MW Impact
274847	GR RIDGE ;BU	0.7377
274849	CRESCENT ;1U	0.1749
274851	PROVIDENC;RU	0.2669
274871	GR RIDGE ;2U	0.9368
276173	Z2-081	0.3187
293061	N-015 E	21.1392
293771	O-035 E	7.6492
294392	P-010 E	26.8468
294401	BSHIL;1U E	5.7746
294410	BSHIL;2U E	5.7746
919621	AA2-039 C	1.4075
919622	AA2-039 E	9.4198
925581	AC1-033 C	0.9459
925582	AC1-033 E	6.3326
926821	AC1-168 C O1	1.6738
926822	AC1-168 E O1	11.2326
927201	AC1-214 C O1	2.4550
927202	AC1-214 E O1	7.8043
934051	AD1-031 C O1	1.9200
934052	AD1-031 E O1	3.1327
946521	AF1-316 C O1	9.3012
946522	AF1-316 E O1	13.9519
946541	AF1-318 C O1	10.0855
946542	AF1-318 E O1	47.2237
953201	J715 C	3.3289
953202	J715 E	18.0101
990901	L-005 E	7.6214
LGEE	LGEE	0.0576
CPL	CPL	0.0655
G-007A	G-007A	0.0336
VFT	VFT	0.0903
CBM-W2	CBM-W2	4.1114
CBM-W1	CBM-W1	3.1025
TVA	TVA	0.3836
CBM-S2	CBM-S2	0.7225
CBM-S1	CBM-S1	2.0618
MADISON	MADISON	1.4717
MEC	MEC	1.3761

16.2 Index 2

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 IMPAC T
44516976	255112	17STJOHN	NIPS	270886	ST JOH N ;T	CE	1	AEP_P4_#2978_05DUMONT_FS A	breaker	1091.0	125.43	125.46	DC	12.57

Bus #	Bus	MW Impact
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Bus #	Bus	MW Impact
274654	BRAIDWOOD;1U	16.7851
274655	BRAIDWOOD;2U	16.3398
274687	WILL CNTY;4U	7.1707
274751	CRETE EC ;1U	3.0488
274752	CRETE EC ;2U	3.0488
274753	CRETE EC ;3U	3.0488
274754	CRETE EC ;4U	3.0488
274861	TOP CROP ;1U	0.2936
274862	TOP CROP ;2U	0.5700
274881	PILOT HIL;1E	10.6969
275149	KELLYCK ;1E	10.6969
276161	W4-086	0.1479
276167	Z1-106 E2	0.7885
276168	Z1-106 E1	0.7885
276169	Z1-107 E	1.5492
276170	Z1-108 E	1.5564
290021	O50 E	12.2373
290108	LEEDK;1U E	12.6717
293061	N-015 E	9.7155
293644	O22 E1	8.4146
293645	O22 E2	16.3342
294392	P-010 E	12.3387
914321	Y2-103 (Withdrawn : 12/24/2019)	28.1918
915011	Y3-013 1	2.3493
915021	Y3-013 2	2.3493
915031	Y3-013 3	2.3493
920272	AA2-123 E	1.5268
926311	AC1-109 1	1.1891
926321	AC1-109 2	1.1891
926331	AC1-110 1	1.1860
926341	AC1-110 2	1.1860
926351	AC1-111 1	0.4751
926361	AC1-111 2	0.4751
926371	AC1-111 3	0.4751
926381	AC1-111 4	0.4751
926391	AC1-111 5	0.4751
926401	AC1-111 6	0.4751
927091	AC1-204 1	46.1927
927101	AC1-204 2	46.1263
927451	AC1-142A 1	2.6781
927461	AC1-142A 2	2.6795
930501	AB1-091 O1	42.2667
930741	AB1-122 1O1	44.3834
930751	AB1-122 2O1	47.0471
933411	AC2-154 C	1.4517
933412	AC2-154 E	2.3686
933431	AC2-156 C O1	0.5937
933432	AC2-156 E O1	0.9686
933931	AD1-016 C	0.5802
933932	AD1-016 E	0.9466
934101	AD1-039 1	4.3496
934111	AD1-039 2	4.6106

Bus #	Bus	MW Impact
934721	AD1-100 C	11.9416
934722	AD1-100 E	55.7277
936371	AD2-047 C O1	2.5978
936372	AD2-047 E O1	12.6835
936461	AD2-060	0.8099
937321	AD2-175 C (Withdrawn : 12/10/2019)	9.4534
937322	AD2-175 E (Withdrawn : 12/10/2019)	6.3023
937401	AD2-194 1	4.9674
937411	AD2-194 2	4.9603
938511	AE1-070 1	5.8367
938521	AE1-070 2	5.3323
938851	AE1-113 C	5.0479
938852	AE1-113 E	17.8970
939351	AE1-166 C O1	3.3709
939352	AE1-166 E O1	3.1116
939631	AE1-193 C	18.8793
939632	AE1-193 E	126.3458
939641	AE1-194 C	18.8793
939642	AE1-194 E	126.3458
939651	AE1-195 C	18.8793
939652	AE1-195 E	126.3458
939681	AE1-198 C	56.0569
939682	AE1-198 E	47.6338
939732	AE1-204 E (Withdrawn : 11/18/2019)	0.3465
940621	AE2-049 C O1	2.8069
940622	AE2-049 E O1	1.8713
940631	AE2-050 C O1	9.7263
940632	AE2-050 E O1	6.4842
940752	AE2-062 E	0.0449
940762	AE2-063 E (Withdrawn : 01/14/2020)	0.0449
941131	AE2-107 C	2.4143
941132	AE2-107 E	1.6095
941551	AE2-152 C O1	3.8895
941552	AE2-152 E O1	2.5930
941561	AE2-153 C O1	2.9229
941562	AE2-153 E O1	13.6844
942421	AE2-255 C O1	1.9121
942422	AE2-255 E O1	5.7362
942881	AE2-307 C O1	17.8316
942882	AE2-307 E O1	6.4842
942911	AE2-310 C O1	2.7256
942912	AE2-310 E O1	0.7322
942991	AE2-321 C	5.1073
942992	AE2-321 E	2.5155
943121	AE2-341 C	7.9199
943122	AE2-341 E	3.8891
943591	AF1-030 C O1	2.7998
943592	AF1-030 E O1	1.3728
943801	AF1-048 C	1.2654
943802	AF1-048 E	0.8436
944041	AF1-072	0.7137
944911	AF1-156 C	3.9608

Bus #	Bus	MW Impact
944912	AF1-156 E	2.6406
945351	AF1-200 FTIR	101.9445
946521	AF1-316 C O1	2.2657
946522	AF1-316 E O1	3.3985
946661	AF1-330 C	0.6635
946662	AF1-330 E	0.1457
955741	J1058	50.1750
WEC	WEC	2.7619
CBM-W2	CBM-W2	14.1523
NY	NY	0.8411
CBM-W1	CBM-W1	40.4824
TVA	TVA	0.9016
O-066	O-066	9.9456
CHEOAH	CHEOAH	0.0420
CBM-S1	CBM-S1	3.3654
G-007	G-007	1.5371
MADISON	MADISON	14.1684
MEC	MEC	9.4450
GIBSON	GIBSON	0.0568
CALDERWOOD	CALDERWOOD	0.0338
BLUEG	BLUEG	1.2603
TRIMBLE	TRIMBLE	0.4302
CATAWBA	CATAWBA	0.2013

16.3 Index 3

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJE CT LOADIN G %	POST PROJE CT LOADIN G %	AC D C	MW IMPAC T
43627856	255113	17STILLWEL L	NIPS	243219	05DUMONT	AEP	1	AEP_P4_#2978_05DUMONT_F SA	breaker	1409.0	134.19	134.23	DC	19.22

Bus #	Bus	MW Impact
274724	RIVER EC ;11	4.3131
274788	SE CHICAG;5U (Deactivation : 06/01/20)	7.2749
274789	SE CHICAG;6U (Deactivation : 06/01/20)	7.2941
274790	SE CHICAG;7U (Deactivation : 06/01/20)	7.3901
274791	SE CHICAG;8U (Deactivation : 06/01/20)	7.3901
274792	SE CHICAG;9U (Deactivation : 06/01/20)	6.2047
274793	SE CHICAG;0U (Deactivation : 06/01/20)	6.2047
274794	SE CHICAG;1U (Deactivation : 06/01/20)	7.2996
274795	SE CHICAG;2U (Deactivation : 06/01/20)	7.2996
274830	U3-021 1	5.9351
274831	U3-021 2	5.9351
274881	PILOT HIL;1E	18.8591
275149	KELLYCK ;1E	18.8591
276161	W4-086	0.2359
276167	Z1-106 E2	1.2273

Bus #	Bus	MW Impact
276168	Z1-106 E1	1.2272
276169	Z1-107 E	2.5648
276170	Z1-108 E	2.4191
290021	O50 E	18.8333
290051	GSG-6; E	3.3074
290108	LEEDK;1U E	23.6810
293061	N-015 E	14.8492
293644	O22 E1	10.1030
293645	O22 E2	19.6117
294392	P-010 E	18.8584
910542	X3-005 E	0.8451
914321	Y2-103 (Withdrawn : 12/24/2019)	43.7243
915011	Y3-013 1	3.6437
915021	Y3-013 2	3.6437
915031	Y3-013 3	3.6437
918052	AA1-018 E OP	15.8157
920272	AA2-123 E	2.3780
924471	AB2-096	41.2156
926311	AC1-109 1	1.8513
926321	AC1-109 2	1.8513
926331	AC1-110 1	1.8457
926341	AC1-110 2	1.8457
926351	AC1-111 1	0.7409
926361	AC1-111 2	0.7409
926371	AC1-111 3	0.7409
926381	AC1-111 4	0.7409
926391	AC1-111 5	0.7409
926401	AC1-111 6	0.7409
927091	AC1-204 1	70.3798
927101	AC1-204 2	70.3561
927451	AC1-142A 1	4.0890
927461	AC1-142A 2	4.0892
930501	AB1-091 O1	74.6224
930741	AB1-122 1O1	69.6078
930751	AB1-122 2O1	71.8071
933411	AC2-154 C	2.5595
933412	AC2-154 E	4.1759
933431	AC2-156 C O1	0.9283
933432	AC2-156 E O1	1.5146
933911	AD1-013 C	1.8083
933912	AD1-013 E	2.8885
933931	AD1-016 C	0.9036
933932	AD1-016 E	1.4743
934101	AD1-039 1	6.8216
934111	AD1-039 2	7.0371
934431	AD1-067 C	0.1286
934432	AD1-067 E	0.5407
934721	AD1-100 C	18.9656
934722	AD1-100 E	88.5063
934871	AD1-116 C	0.9211
934872	AD1-116 E	1.5028
934971	AD1-129 C	0.8798

Bus #	Bus	MW Impact
934972	AD1-129 E	0.5865
936371	AD2-047 C O1	4.5801
936372	AD2-047 E O1	22.3615
936461	AD2-060	1.4279
936511	AD2-066 C O1	8.1954
936512	AD2-066 E O1	5.4636
937001	AD2-134 C	2.6772
937002	AD2-134 E	11.0596
937321	AD2-175 C (Withdrawn : 12/10/2019)	16.6862
937322	AD2-175 E (Withdrawn : 12/10/2019)	11.1241
937401	AD2-194 1	7.5684
937411	AD2-194 2	7.5659
938511	AE1-070 1	8.8929
938521	AE1-070 2	8.1333
938851	AE1-113 C	7.7687
938852	AE1-113 E	27.5437
939351	AE1-166 C O1	5.2839
939352	AE1-166 E O1	4.8774
939631	AE1-193 C	8.6820
939632	AE1-193 E	58.1025
939641	AE1-194 C	8.6820
939642	AE1-194 E	58.1025
939651	AE1-195 C	8.6820
939652	AE1-195 E	58.1025
939681	AE1-198 C	25.7788
939682	AE1-198 E	21.9053
939732	AE1-204 E (Withdrawn : 11/18/2019)	0.5371
940621	AE2-049 C O1	4.8871
940622	AE2-049 E O1	3.2581
940631	AE2-050 C O1	6.1122
940632	AE2-050 E O1	4.0748
940752	AE2-062 E	0.0687
940762	AE2-063 E (Withdrawn : 01/14/2020)	0.0687
941131	AE2-107 C	3.7742
941132	AE2-107 E	2.5161
941551	AE2-152 C O1	6.0968
941552	AE2-152 E O1	4.0645
941561	AE2-153 C O1	4.5912
941562	AE2-153 E O1	21.4953
942421	AE2-255 C O1	2.9427
942422	AE2-255 E O1	8.8281
942881	AE2-307 C O1	11.2056
942882	AE2-307 E O1	4.0748
942911	AE2-310 C O1	4.7454
942912	AE2-310 E O1	1.2749
942991	AE2-321 C	7.9553
942992	AE2-321 E	3.9183
943121	AE2-341 C	12.3870
943122	AE2-341 E	6.0827
943591	AF1-030 C O1	4.3789
943592	AF1-030 E O1	2.1470
943801	AF1-048 C	1.9710

Bus #	Bus	MW Impact
943802	AF1-048 E	1.3140
944041	AF1-072	1.1094
944911	AF1-156 C	6.2216
944912	AF1-156 E	4.1478
945351	AF1-200 FTIR	158.8704
946521	AF1-316 C O1	3.4628
946522	AF1-316 E O1	5.1942
946661	AF1-330 C	1.0335
946662	AF1-330 E	0.2269
946671	AF1-331	1.2446
951721	J643	25.9805
953871	J847	13.2318
954751	J351	435.5561
955741	J1058	36.5370
WEC	WEC	4.3038
CBM-W2	CBM-W2	29.4185
NY	NY	1.3477
CBM-W1	CBM-W1	73.8716
TVA	TVA	2.3114
O-066	O-066	15.9264
CBM-S1	CBM-S1	11.3231
G-007	G-007	2.4606
MADISON	MADISON	22.0167
MEC	MEC	15.3609
BLUEG	BLUEG	0.0972
TRIMBLE	TRIMBLE	0.0723
CATAWBA	CATAWBA	0.2034

16.4 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
44518001	270670	BRAIDWOOD; B	CE	934730	AD1-100 TAP	CE	1	COMED_P7_345-L2001_B-S+_345-L2003_R-S-B	tower	1915.0	111.56	113.34	DC	34.0

Bus #	Bus	MW Impact
274654	BRAIDWOOD;1U	79.5415
274655	BRAIDWOOD;2U	76.8958
274660	LASCO STA;1U	52.1104
274661	LASCO STA;2U	52.3242
274847	GR RIDGE ;BU	1.0787
274871	GR RIDGE ;2U	1.3699
276153	W2-048 E	-0.5694
276173	Z2-081	0.3141
293061	N-015 E	30.9108
294392	P-010 E	39.2567

Bus #	Bus	MW Impact
909052	X2-022 E	-8.2345
926311	AC1-109 1	0.6441
926321	AC1-109 2	0.6441
926821	AC1-168 C O1	0.6715
926822	AC1-168 E O1	4.5062
933431	AC2-156 C O1	0.4100
933432	AC2-156 E O1	0.6689
940631	AE2-050 C O1	43.3503
940632	AE2-050 E O1	28.9002
941561	AE2-153 C O1	11.2732
941562	AE2-153 E O1	52.7788
941732	AE2-173 BAT	4.6330
942881	AE2-307 C O1	79.4755
942882	AE2-307 E O1	28.9002
943121	AE2-341 C	5.8155
943122	AE2-341 E	2.8557
943591	AF1-030 C O1	2.0558
943592	AF1-030 E O1	1.0080
944911	AF1-156 C	28.8234
944912	AF1-156 E	19.2156
945351	AF1-200 FTIR	247.8426
946521	AF1-316 C O1	13.6008
946522	AF1-316 E O1	20.4011
DUCKCREEK	DUCKCREEK	0.3593
NEWTON	NEWTON	2.4327
WEC	WEC	0.9497
NY	NY	0.7659
CBM-W1	CBM-W1	6.6553
PRAIRIE	PRAIRIE	4.4453
O-066	O-066	9.2064
COFFEEN	COFFEEN	1.4587
CHEOAH	CHEOAH	0.7067
TILTON	TILTON	1.8333
G-007	G-007	1.4248
MADISON	MADISON	3.9695
MEC	MEC	1.1822
GIBSON	GIBSON	1.0041
CALDERWOOD	CALDERWOOD	0.7023
BLUEG	BLUEG	2.7654
TRIMBLE	TRIMBLE	0.8815
CATAWBA	CATAWBA	0.4876

16.5 Index 5

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJE CT LOADIN G %	POST PROJE CT LOADIN G %	AC D C	MW IMPAC T
4362800 1	27077 1	GREENACR E; T	CE	24322 9	05OLIV E	AEP	1	AEP_P4_#2978_05DUMONT_NON_ FSA	break er	971.0	102.74	102.78	DC	11.2

Bus #	Bus	MW Impact
274751	CRETE EC ;1U	1.7551
274752	CRETE EC ;2U	1.7551
274753	CRETE EC ;3U	1.7551
274754	CRETE EC ;4U	1.7551
274788	SE CHICAG;5U (Deactivation : 06/01/20)	3.0011
274789	SE CHICAG;6U (Deactivation : 06/01/20)	3.0091
274790	SE CHICAG;7U (Deactivation : 06/01/20)	3.0487
274791	SE CHICAG;8U (Deactivation : 06/01/20)	3.0487
274792	SE CHICAG;9U (Deactivation : 06/01/20)	3.0948
274793	SE CHICAG;0U (Deactivation : 06/01/20)	3.0948
274794	SE CHICAG;1U (Deactivation : 06/01/20)	3.0948
274795	SE CHICAG;2U (Deactivation : 06/01/20)	3.0948
274830	U3-021 1	3.4285
274831	U3-021 2	3.4285
274881	PILOT HIL;1E	10.4613
275149	KELLYCK ;1E	10.4613
276161	W4-086	0.1351
276167	Z1-106 E2	0.7104
276168	Z1-106 E1	0.7104
276169	Z1-107 E	1.4472
276170	Z1-108 E	1.4005
290021	O50 E	10.9303
290108	LEEDK;1U E	13.6646
293061	N-015 E	8.6537
293644	O22 E1	6.1217
293645	O22 E2	11.8833
294392	P-010 E	10.9902
910542	X3-005 E	0.4382
914321	Y2-103 (Withdrawn : 12/24/2019)	25.3429
915011	Y3-013 1	2.1119
915021	Y3-013 2	2.1119
915031	Y3-013 3	2.1119
918052	AA1-018 E OP	8.9217
920272	AA2-123 E	1.3746
924471	AB2-096	23.8089
926311	AC1-109 1	1.0716
926321	AC1-109 2	1.0716
926331	AC1-110 1	1.0687
926341	AC1-110 2	1.0687
926351	AC1-111 1	0.4286
926361	AC1-111 2	0.4286
926371	AC1-111 3	0.4286
926381	AC1-111 4	0.4286
926391	AC1-111 5	0.4286
926401	AC1-111 6	0.4286
927091	AC1-204 1	41.1371
927101	AC1-204 2	41.0992
927451	AC1-142A 1	2.3892
927461	AC1-142A 2	2.3898
930501	AB1-091 O1	41.4766

Bus #	Bus	MW Impact
930741	AB1-122 1O1	40.1068
930751	AB1-122 2O1	41.9445
933411	AC2-154 C	1.4197
933412	AC2-154 E	2.3164
933431	AC2-156 C O1	0.5363
933432	AC2-156 E O1	0.8750
933931	AD1-016 C	0.5224
933932	AD1-016 E	0.8523
934101	AD1-039 1	3.9305
934111	AD1-039 2	4.1106
934721	AD1-100 C	10.9102
934722	AD1-100 E	50.9142
934871	AD1-116 C	0.5196
934872	AD1-116 E	0.8477
934971	AD1-129 C	0.4611
934972	AD1-129 E	0.3074
936371	AD2-047 C O1	2.5406
936372	AD2-047 E O1	12.4041
936461	AD2-060	0.7921
937321	AD2-175 C (Withdrawn : 12/10/2019)	9.2736
937322	AD2-175 E (Withdrawn : 12/10/2019)	6.1824
937401	AD2-194 1	4.4237
937411	AD2-194 2	4.4197
938511	AE1-070 1	5.1979
938521	AE1-070 2	4.7511
938851	AE1-113 C	4.5088
938852	AE1-113 E	15.9856
939351	AE1-166 C O1	3.0564
939352	AE1-166 E O1	2.8213
939631	AE1-193 C	10.8686
939632	AE1-193 E	72.7363
939641	AE1-194 C	10.8686
939642	AE1-194 E	72.7363
939651	AE1-195 C	10.8686
939652	AE1-195 E	72.7363
939681	AE1-198 C	32.2715
939682	AE1-198 E	27.4224
939732	AE1-204 E (Withdrawn : 11/18/2019)	0.3114
940621	AE2-049 C O1	2.7218
940622	AE2-049 E O1	1.8145
940631	AE2-050 C O1	3.7164
940632	AE2-050 E O1	2.4776
940752	AE2-062 E	0.0402
940762	AE2-063 E (Withdrawn : 01/14/2020)	0.0402
941131	AE2-107 C	2.1783
941132	AE2-107 E	1.4522
941551	AE2-152 C O1	3.5266
941552	AE2-152 E O1	2.3511
941561	AE2-153 C O1	2.6560
941562	AE2-153 E O1	12.4349
942421	AE2-255 C O1	1.7079
942422	AE2-255 E O1	5.1236

Bus #	Bus	MW Impact
942881	AE2-307 C O1	6.8133
942882	AE2-307 E O1	2.4776
942911	AE2-310 C O1	2.6429
942912	AE2-310 E O1	0.7100
942991	AE2-321 C	4.5981
942992	AE2-321 E	2.2648
943121	AE2-341 C	7.1572
943122	AE2-341 E	3.5146
943591	AF1-030 C O1	2.5301
943592	AF1-030 E O1	1.2406
943801	AF1-048 C	1.1392
943802	AF1-048 E	0.7595
944041	AF1-072	0.6424
944911	AF1-156 C	3.5992
944912	AF1-156 E	2.3995
945351	AF1-200 FTIR	92.0111
946521	AF1-316 C O1	2.0180
946522	AF1-316 E O1	3.0271
946661	AF1-330 C	0.5974
946662	AF1-330 E	0.1311
951721	J643	15.6310
953871	J847	8.4483
955741	J1058	43.9140
WEC	WEC	2.4860
CBM-W2	CBM-W2	13.9230
NY	NY	0.7388
CBM-W1	CBM-W1	41.2830
TVA	TVA	0.9800
O-066	O-066	8.7226
CBM-S1	CBM-S1	4.1492
G-007	G-007	1.3478
MADISON	MADISON	12.6242
MEC	MEC	8.5981
BLUEG	BLUEG	0.8090
TRIMBLE	TRIMBLE	0.2827
CATAWBA	CATAWBA	0.1515

16.6 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
44517057	270802	LASCO STA; B	CE	270846	PLANO ; B	CE	1	COMED_P4_167-45-BT2-5__	breaker	1528.0	119.14	120.95	DC	27.8

Bus #	Bus	MW Impact
274654	BRAIDWOOD;1U	20.6227
274655	BRAIDWOOD;2U	20.1622
274660	LASCO STA;1U	43.4445

Bus #	Bus	MW Impact
274661	LASCO STA;2U	43.4200
274847	GR RIDGE ;BU	0.8821
274871	GR RIDGE ;2U	1.1202
274881	PILOT HIL;1E	7.6898
275149	KELLYCK ;1E	7.6898
276165	Z1-106 BAT2	0.7262
276166	Z1-106 BAT1	0.7262
276172	Z1-108 BAT	1.2046
276173	Z2-081	0.2461
293061	N-015 E	25.2768
294392	P-010 E	32.1015
920273	AA2-123 BAT	1.1802
926821	AC1-168 C O1	0.4450
926822	AC1-168 E O1	2.9865
930501	AB1-091 O1	34.8615
933411	AC2-154 C	1.0438
933412	AC2-154 E	1.7030
934721	AD1-100 C	9.8379
934722	AD1-100 E	45.9102
936371	AD2-047 C O1	1.8678
936372	AD2-047 E O1	9.1193
936461	AD2-060	0.5823
937321	AD2-175 C (Withdrawn : 12/10/2019)	7.7837
937322	AD2-175 E (Withdrawn : 12/10/2019)	5.1892
939351	AE1-166 C O1	3.2482
939352	AE1-166 E O1	2.9984
940621	AE2-049 C O1	1.7715
940622	AE2-049 E O1	1.1810
940631	AE2-050 C O1	10.4886
940632	AE2-050 E O1	6.9924
941551	AE2-152 C O1	3.7480
941552	AE2-152 E O1	2.4987
941561	AE2-153 C O1	3.8005
941562	AE2-153 E O1	17.7935
942881	AE2-307 C O1	19.2291
942882	AE2-307 E O1	6.9924
942911	AE2-310 C O1	1.7202
942912	AE2-310 E O1	0.4621
943383	AF1-009 BAT	1.6748
943423	AF1-013 BAT	1.6748
943803	AF1-048 BAT	3.0746
943922	AF1-060 BAT	0.6400
944911	AF1-156 C	9.7173
944912	AF1-156 E	6.4782
945352	AF1-200 NFW	404.6280
946521	AF1-316 C O1	11.1218
946522	AF1-316 E O1	16.6827
946533	AF1-317 BAT	2.6235
946683	AF1-332 BAT	2.6235
DUCKCREEK	DUCKCREEK	0.9937
NEWTON	NEWTON	0.1558
FARMERCITY	FARMERCITY	0.1161

Bus #	Bus	MW Impact
NY	NY	0.1360
PRAIRIE	PRAIRIE	1.4904
O-066	O-066	1.6666
COFFEEN	COFFEEN	0.0476
EDWARDS	EDWARDS	0.1953
CHEOAH	CHEOAH	0.2017
G-007	G-007	0.2579
GIBSON	GIBSON	0.0764
CALDERWOOD	CALDERWOOD	0.2008
BLUEG	BLUEG	0.3489
TRIMBLE	TRIMBLE	0.1113
CATAWBA	CATAWBA	0.1232

16.7 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
45878710	270847	PLANO	CE	275208	PLANO	CE	1	COMED_P4_167-45-BT1-9__	breaker	1379.0	140.12	141.64	DC	21.0

Bus #	Bus	MW Impact
274660	LASCO STA;1U	31.7468
274661	LASCO STA;2U	32.0216
274847	GR RIDGE ;BU	0.6661
274871	GR RIDGE ;2U	0.8460
274881	PILOT HIL;1E	6.7699
275149	KELLYCK ;1E	6.7699
276173	Z2-081	0.2015
293061	N-015 E	19.0884
294392	P-010 E	24.2423
926821	AC1-168 C O1	0.4856
926822	AC1-168 E O1	3.2588
930501	AB1-091 O1	29.1393
933411	AC2-154 C	0.9189
933412	AC2-154 E	1.4993
934721	AD1-100 C	7.7035
934722	AD1-100 E	35.9499
936371	AD2-047 C O1	1.6444
936372	AD2-047 E O1	8.0286
936461	AD2-060	0.5127
937321	AD2-175 C (Withdrawn : 12/10/2019)	6.5072
937322	AD2-175 E (Withdrawn : 12/10/2019)	4.3381
939351	AE1-166 C O1	2.5483
939352	AE1-166 E O1	2.3523
940621	AE2-049 C O1	1.6478
940622	AE2-049 E O1	1.0985
940631	AE2-050 C O1	3.7095
940632	AE2-050 E O1	2.4730

Bus #	Bus	MW Impact
941551	AE2-152 C O1	2.9403
941552	AE2-152 E O1	1.9602
941561	AE2-153 C O1	2.5534
941562	AE2-153 E O1	11.9544
942881	AE2-307 C O1	6.8007
942882	AE2-307 E O1	2.4730
942911	AE2-310 C O1	1.6000
942912	AE2-310 E O1	0.4299
944911	AF1-156 C	3.4601
944912	AF1-156 E	2.3067
945351	AF1-200 FTIR	1158.4033
946521	AF1-316 C O1	8.3989
946522	AF1-316 E O1	12.5983
WEC	WEC	0.1934
CBM-W2	CBM-W2	1.3104
NY	NY	0.3340
CBM-W1	CBM-W1	2.2768
O-066	O-066	3.9917
CHEOAH	CHEOAH	0.1461
G-007	G-007	0.6167
MADISON	MADISON	2.3244
MEC	MEC	0.9772
GIBSON	GIBSON	0.1010
CALDERWOOD	CALDERWOOD	0.1436
BLUEG	BLUEG	0.7031
TRIMBLE	TRIMBLE	0.2337
CATAWBA	CATAWBA	0.1418

16.8 Index 8

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJE CT LOADIN G %	POST PROJE CT LOADIN G %	AC DC	MW IMPAC T
4451698 1	27088 6	ST JOHN ;T	CE	25510 4	17GREEN_AC RE	NIPS	1	AEP_P4_#2978_05DUMONT_NON_FSA	breaker	1091.0	125.42	125.46	DC	12.57

Bus #	Bus	MW Impact
274654	BRAIDWOOD;1U	16.7851
274655	BRAIDWOOD;2U	16.3398
274687	WILL CNTY;4U	7.1707
274751	CRETE EC ;1U	3.0488
274752	CRETE EC ;2U	3.0488
274753	CRETE EC ;3U	3.0488
274754	CRETE EC ;4U	3.0488
274861	TOP CROP ;1U	0.2936
274862	TOP CROP ;2U	0.5700
274881	PILOT HIL;1E	10.6969

Bus #	Bus	MW Impact
275149	KELLYCK ;1E	10.6969
276161	W4-086	0.1479
276167	Z1-106 E2	0.7885
276168	Z1-106 E1	0.7885
276169	Z1-107 E	1.5492
276170	Z1-108 E	1.5564
290021	O50 E	12.2373
290108	LEEDK;1U E	12.6717
293061	N-015 E	9.7155
293644	O22 E1	8.4146
293645	O22 E2	16.3342
294392	P-010 E	12.3387
914321	Y2-103 (Withdrawn : 12/24/2019)	28.1918
915011	Y3-013 1	2.3493
915021	Y3-013 2	2.3493
915031	Y3-013 3	2.3493
920272	AA2-123 E	1.5268
926311	AC1-109 1	1.1891
926321	AC1-109 2	1.1891
926331	AC1-110 1	1.1860
926341	AC1-110 2	1.1860
926351	AC1-111 1	0.4751
926361	AC1-111 2	0.4751
926371	AC1-111 3	0.4751
926381	AC1-111 4	0.4751
926391	AC1-111 5	0.4751
926401	AC1-111 6	0.4751
927091	AC1-204 1	46.1927
927101	AC1-204 2	46.1263
927451	AC1-142A 1	2.6781
927461	AC1-142A 2	2.6795
930501	AB1-091 O1	42.2667
930741	AB1-122 1O1	44.3834
930751	AB1-122 2O1	47.0471
933411	AC2-154 C	1.4517
933412	AC2-154 E	2.3686
933431	AC2-156 C O1	0.5937
933432	AC2-156 E O1	0.9686
933931	AD1-016 C	0.5802
933932	AD1-016 E	0.9466
934101	AD1-039 1	4.3496
934111	AD1-039 2	4.6106
934721	AD1-100 C	11.9416
934722	AD1-100 E	55.7277
936371	AD2-047 C O1	2.5978
936372	AD2-047 E O1	12.6835
936461	AD2-060	0.8099
937321	AD2-175 C (Withdrawn : 12/10/2019)	9.4534
937322	AD2-175 E (Withdrawn : 12/10/2019)	6.3023
937401	AD2-194 1	4.9674
937411	AD2-194 2	4.9603
938511	AE1-070 1	5.8367

Bus #	Bus	MW Impact
938521	AE1-070 2	5.3323
938851	AE1-113 C	5.0479
938852	AE1-113 E	17.8970
939351	AE1-166 C O1	3.3709
939352	AE1-166 E O1	3.1116
939631	AE1-193 C	18.8793
939632	AE1-193 E	126.3458
939641	AE1-194 C	18.8793
939642	AE1-194 E	126.3458
939651	AE1-195 C	18.8793
939652	AE1-195 E	126.3458
939681	AE1-198 C	56.0569
939682	AE1-198 E	47.6338
939732	AE1-204 E (Withdrawn : 11/18/2019)	0.3465
940621	AE2-049 C O1	2.8069
940622	AE2-049 E O1	1.8713
940631	AE2-050 C O1	9.7263
940632	AE2-050 E O1	6.4842
940752	AE2-062 E	0.0449
940762	AE2-063 E (Withdrawn : 01/14/2020)	0.0449
941131	AE2-107 C	2.4143
941132	AE2-107 E	1.6095
941551	AE2-152 C O1	3.8895
941552	AE2-152 E O1	2.5930
941561	AE2-153 C O1	2.9229
941562	AE2-153 E O1	13.6844
942421	AE2-255 C O1	1.9121
942422	AE2-255 E O1	5.7362
942881	AE2-307 C O1	17.8316
942882	AE2-307 E O1	6.4842
942911	AE2-310 C O1	2.7256
942912	AE2-310 E O1	0.7322
942991	AE2-321 C	5.1073
942992	AE2-321 E	2.5155
943121	AE2-341 C	7.9199
943122	AE2-341 E	3.8891
943591	AF1-030 C O1	2.7998
943592	AF1-030 E O1	1.3728
943801	AF1-048 C	1.2654
943802	AF1-048 E	0.8436
944041	AF1-072	0.7137
944911	AF1-156 C	3.9608
944912	AF1-156 E	2.6406
945351	AF1-200 FTIR	101.9445
946521	AF1-316 C O1	2.2657
946522	AF1-316 E O1	3.3985
946661	AF1-330 C	0.6635
946662	AF1-330 E	0.1457
955741	J1058	50.1750
WEC	WEC	2.7619
CBM-W2	CBM-W2	14.1523
NY	NY	0.8411

Bus #	Bus	MW Impact
CBM-W1	CBM-W1	40.4824
TVA	TVA	0.9016
O-066	O-066	9.9456
CHEOAH	CHEOAH	0.0420
CBM-S1	CBM-S1	3.3654
G-007	G-007	1.5371
MADISON	MADISON	14.1684
MEC	MEC	9.4450
GIBSON	GIBSON	0.0568
CALDERWOOD	CALDERWOOD	0.0338
BLUEG	BLUEG	1.2603
TRIMBLE	TRIMBLE	0.4302
CATAWBA	CATAWBA	0.2013

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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
44517045	270926	WILTON ; B	CE	275232	WILTON ;3M	CE	1	COMED_P4_112-65-BT5-6__	breaker	1379.0	118.83	118.89	DC	21.28

Bus #	Bus	MW Impact
274771	LINCOLN ;2U	3.0480
274772	LINCOLN ;3U	3.0480
274773	LINCOLN ;4U	3.0480
274774	LINCOLN ;5U	3.0480
274775	LINCOLN ;6U	3.0480
274776	LINCOLN ;7U	3.0480
274777	LINCOLN ;8U	3.0480
274830	U3-021 1	6.3043
274831	U3-021 2	6.3043
274881	PILOT HIL;1E	19.9420
274890	CAYUG;1U E	17.0075
274891	CAYUG;2U E	17.0075
275149	KELLYCK ;1E	19.9420
276161	W4-086	0.2521
276167	Z1-106 E2	1.3064
276168	Z1-106 E1	1.3064
276169	Z1-107 E	2.6741
276170	Z1-108 E	2.5706
290021	O50 E	20.0287
290051	GSG-6; E	10.8928
290108	LEEDK;1U E	25.1957
293061	N-015 E	16.4444
293644	O22 E1	10.5927
293645	O22 E2	20.5622
294392	P-010 E	20.8844
910542	X3-005 E	0.7563

Bus #	Bus	MW Impact
914321	Y2-103 (Withdrawn : 12/24/2019)	46.3651
915011	Y3-013 1	3.8638
915021	Y3-013 2	3.8638
915031	Y3-013 3	3.8638
918052	AA1-018 E OP	16.9848
920272	AA2-123 E	2.5264
924041	AB2-047 C O1	0.5855
924042	AB2-047 E O1	3.9182
924471	AB2-096	43.7801
926311	AC1-109 1	1.9768
926321	AC1-109 2	1.9768
926331	AC1-110 1	1.9636
926341	AC1-110 2	1.9636
926351	AC1-111 1	0.7895
926361	AC1-111 2	0.7895
926371	AC1-111 3	0.7895
926381	AC1-111 4	0.7895
926391	AC1-111 5	0.7895
926401	AC1-111 6	0.7895
927091	AC1-204 1	75.0465
927101	AC1-204 2	75.0465
927451	AC1-142A 1	4.3262
927461	AC1-142A 2	4.3259
930501	AB1-091 O1	79.3488
930741	AB1-122 1O1	75.3115
930751	AB1-122 2O1	76.2401
933411	AC2-154 C	2.7064
933412	AC2-154 E	4.4157
933431	AC2-156 C O1	0.9894
933432	AC2-156 E O1	1.6143
933911	AD1-013 C	1.9234
933912	AD1-013 E	3.0725
933931	AD1-016 C	0.9600
933932	AD1-016 E	1.5663
934101	AD1-039 1	7.3805
934111	AD1-039 2	7.4715
934431	AD1-067 C	0.1368
934432	AD1-067 E	0.5751
934701	AD1-098 C O1	7.1671
934702	AD1-098 E O1	5.2327
934721	AD1-100 C	24.8549
934722	AD1-100 E	115.9893
934871	AD1-116 C	0.9892
934872	AD1-116 E	1.6139
934971	AD1-129 C	0.9346
934972	AD1-129 E	0.6230
935001	AD1-133 C O1	23.0265
935002	AD1-133 E O1	15.3510
936291	AD2-038 C O1	2.4304
936292	AD2-038 E O1	16.2649
936371	AD2-047 C O1	4.8431
936372	AD2-047 E O1	23.6455

Bus #	Bus	MW Impact
936461	AD2-060	1.5099
936511	AD2-066 C O1	8.7651
936512	AD2-066 E O1	5.8434
937001	AD2-134 C	2.8475
937002	AD2-134 E	11.7632
937321	AD2-175 C (Withdrawn : 12/10/2019)	17.7568
937322	AD2-175 E (Withdrawn : 12/10/2019)	11.8378
937401	AD2-194 1	8.0702
937411	AD2-194 2	8.0702
938511	AE1-070 1	9.4825
938521	AE1-070 2	8.6755
938851	AE1-113 C	8.2618
938852	AE1-113 E	29.2920
939321	AE1-163 C O1	6.1071
939322	AE1-163 E O1	37.5153
939351	AE1-166 C O1	6.4997
939352	AE1-166 E O1	5.9997
939401	AE1-172 C O1	6.7954
939402	AE1-172 E O1	31.8837
939732	AE1-204 E (Withdrawn : 11/18/2019)	0.5696
939741	AE1-205 C O1	10.4001
939742	AE1-205 E O1	14.3621
940101	AE1-252 C O1	13.6514
940102	AE1-252 E O1	9.1010
940621	AE2-049 C O1	5.1697
940622	AE2-049 E O1	3.4464
940631	AE2-050 C O1	6.8967
940632	AE2-050 E O1	4.5978
940752	AE2-062 E	0.0716
940762	AE2-063 E (Withdrawn : 01/14/2020)	0.0716
941131	AE2-107 C	4.0158
941132	AE2-107 E	2.6772
941551	AE2-152 C O1	7.4996
941552	AE2-152 E O1	4.9997
941561	AE2-153 C O1	5.1253
941562	AE2-153 E O1	23.9957
941731	AE2-173 O1	6.1905
942111	AE2-223 C	2.4143
942112	AE2-223 E	16.1573
942421	AE2-255 C O1	3.1295
942422	AE2-255 E O1	9.3885
942651	AE2-281 C O1	0.8724
942652	AE2-281 E O1	5.3593
942881	AE2-307 C O1	12.6440
942882	AE2-307 E O1	4.5978
942911	AE2-310 C O1	5.0198
942912	AE2-310 E O1	1.3486
942991	AE2-321 C	8.4519
942992	AE2-321 E	4.1629
943121	AE2-341 C	13.2096
943122	AE2-341 E	6.4866
943381	AF1-009 C	0.3286

Bus #	Bus	MW Impact
943382	AF1-009 E	1.3144
943422	AF1-013 E	1.6430
943591	AF1-030 C O1	4.6697
943592	AF1-030 E O1	2.2896
943801	AF1-048 C	2.0940
943802	AF1-048 E	1.3960
944041	AF1-072	1.1799
944911	AF1-156 C	6.9454
944912	AF1-156 E	4.6302
945351	AF1-200 FTIR	171.0257
946521	AF1-316 C O1	3.8348
946522	AF1-316 E O1	5.7523
946661	AF1-330 C	1.0980
946662	AF1-330 E	0.2410
946671	AF1-331	1.3239
WEC	WEC	4.5593
CBM-W2	CBM-W2	25.8886
NY	NY	1.4400
CBM-W1	CBM-W1	77.6746
TVA	TVA	1.6184
O-066	O-066	17.0957
CHEOAH	CHEOAH	0.0776
CBM-S1	CBM-S1	6.0492
G-007	G-007	2.6426
MADISON	MADISON	24.2726
MEC	MEC	16.0219
CALDERWOOD	CALDERWOOD	0.0636
BLUEG	BLUEG	2.3054
TRIMBLE	TRIMBLE	0.7964
CATAWBA	CATAWBA	0.3626

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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
44517020	270927	WILTON	CE ; R	275233	WILTON	CE ; 4M	1	COMED_P4_112-65-BT2-3__	breaker	1379.0	121.32	121.38	DC	21.73

Bus #	Bus	MW Impact
274771	LINCOLN ;2U	3.1304
274772	LINCOLN ;3U	3.1304
274773	LINCOLN ;4U	3.1304
274774	LINCOLN ;5U	3.1304
274775	LINCOLN ;6U	3.1304
274776	LINCOLN ;7U	3.1304
274777	LINCOLN ;8U	3.1304
274830	U3-021 1	6.4384
274831	U3-021 2	6.4384

Bus #	Bus	MW Impact
274881	PILOT HIL;1E	20.3585
274890	CAYUG;1U E	17.3471
274891	CAYUG;2U E	17.3471
275149	KELLYCK ;1E	20.3585
276161	W4-086	0.2575
276167	Z1-106 E2	1.3343
276168	Z1-106 E1	1.3342
276169	Z1-107 E	2.7312
276170	Z1-108 E	2.6255
290021	O50 E	20.4558
290051	GSG-6; E	11.1243
290108	LEEDK;1U E	25.7329
293061	N-015 E	16.7882
293644	O22 E1	10.8167
293645	O22 E2	20.9971
294392	P-010 E	21.3210
910542	X3-005 E	0.7728
914321	Y2-103 (Withdrawn : 12/24/2019)	47.3566
915011	Y3-013 1	3.9464
915021	Y3-013 2	3.9464
915031	Y3-013 3	3.9464
918052	AA1-018 E OP	17.3564
920272	AA2-123 E	2.5803
924041	AB2-047 C O1	0.5973
924042	AB2-047 E O1	3.9976
924471	AB2-096	44.7113
926311	AC1-109 1	2.0188
926321	AC1-109 2	2.0188
926331	AC1-110 1	2.0054
926341	AC1-110 2	2.0054
926351	AC1-111 1	0.8064
926361	AC1-111 2	0.8064
926371	AC1-111 3	0.8064
926381	AC1-111 4	0.8064
926391	AC1-111 5	0.8064
926401	AC1-111 6	0.8064
927091	AC1-204 1	76.6590
927101	AC1-204 2	76.6542
927451	AC1-142A 1	4.4192
927461	AC1-142A 2	4.4192
930501	AB1-091 O1	80.9991
930741	AB1-122 1O1	76.9097
930751	AB1-122 2O1	77.8676
933411	AC2-154 C	2.7629
933412	AC2-154 E	4.5080
933431	AC2-156 C O1	1.0105
933432	AC2-156 E O1	1.6487
933911	AD1-013 C	1.9643
933912	AD1-013 E	3.1378
933931	AD1-016 C	0.9805
933932	AD1-016 E	1.5998
934101	AD1-039 1	7.5372

Bus #	Bus	MW Impact
934111	AD1-039 2	7.6310
934431	AD1-067 C	0.1397
934432	AD1-067 E	0.5873
934701	AD1-098 C O1	7.3194
934702	AD1-098 E O1	5.3439
934721	AD1-100 C	25.3483
934722	AD1-100 E	118.2919
934871	AD1-116 C	1.0108
934872	AD1-116 E	1.6492
934971	AD1-129 C	0.9545
934972	AD1-129 E	0.6363
935001	AD1-133 C O1	23.5039
935002	AD1-133 E O1	15.6692
936291	AD2-038 C O1	2.4828
936292	AD2-038 E O1	16.6155
936371	AD2-047 C O1	4.9442
936372	AD2-047 E O1	24.1394
936461	AD2-060	1.5414
936511	AD2-066 C O1	8.9509
936512	AD2-066 E O1	5.9673
937001	AD2-134 C	2.9081
937002	AD2-134 E	12.0133
937321	AD2-175 C (Withdrawn : 12/10/2019)	18.1248
937322	AD2-175 E (Withdrawn : 12/10/2019)	12.0832
937401	AD2-194 1	8.2436
937411	AD2-194 2	8.2431
938511	AE1-070 1	9.6863
938521	AE1-070 2	8.8614
938851	AE1-113 C	8.4380
938852	AE1-113 E	29.9165
939321	AE1-163 C O1	6.2388
939322	AE1-163 E O1	38.3238
939351	AE1-166 C O1	6.6307
939352	AE1-166 E O1	6.1207
939401	AE1-172 C O1	6.9298
939402	AE1-172 E O1	32.5144
939732	AE1-204 E (Withdrawn : 11/18/2019)	0.5818
939741	AE1-205 C O1	10.6108
939742	AE1-205 E O1	14.6529
940101	AE1-252 C O1	13.9215
940102	AE1-252 E O1	9.2810
940621	AE2-049 C O1	5.2778
940622	AE2-049 E O1	3.5186
940631	AE2-050 C O1	7.0386
940632	AE2-050 E O1	4.6924
940752	AE2-062 E	0.0731
940762	AE2-063 E (Withdrawn : 01/14/2020)	0.0731
941131	AE2-107 C	4.1013
941132	AE2-107 E	2.7342
941551	AE2-152 C O1	7.6508
941552	AE2-152 E O1	5.1006
941561	AE2-153 C O1	5.2309

Bus #	Bus	MW Impact
941562	AE2-153 E O1	24.4902
941731	AE2-173 O1	6.3159
942111	AE2-223 C	2.4632
942112	AE2-223 E	16.4846
942421	AE2-255 C O1	3.1962
942422	AE2-255 E O1	9.5886
942651	AE2-281 C O1	0.8913
942652	AE2-281 E O1	5.4748
942881	AE2-307 C O1	12.9041
942882	AE2-307 E O1	4.6924
942911	AE2-310 C O1	5.1249
942912	AE2-310 E O1	1.3768
942991	AE2-321 C	8.6325
942992	AE2-321 E	4.2518
943121	AE2-341 C	13.4901
943122	AE2-341 E	6.6243
943381	AF1-009 C	0.3356
943382	AF1-009 E	1.3423
943422	AF1-013 E	1.6779
943591	AF1-030 C O1	4.7689
943592	AF1-030 E O1	2.3382
943801	AF1-048 C	2.1387
943802	AF1-048 E	1.4258
944041	AF1-072	1.2051
944911	AF1-156 C	7.0885
944912	AF1-156 E	4.7257
945351	AF1-200 FTIR	174.6388
946521	AF1-316 C O1	3.9150
946522	AF1-316 E O1	5.8725
946661	AF1-330 C	1.1214
946662	AF1-330 E	0.2462
946671	AF1-331	1.3520
WEC	WEC	4.6566
CBM-W2	CBM-W2	26.4209
NY	NY	1.4710
CBM-W1	CBM-W1	79.3384
TVA	TVA	1.6506
O-066	O-066	17.4586
CHEOAH	CHEOAH	0.0796
CBM-S1	CBM-S1	6.1685
G-007	G-007	2.6988
MADISON	MADISON	24.7867
MEC	MEC	16.3603
CALDERWOOD	CALDERWOOD	0.0651
BLUEG	BLUEG	2.3558
TRIMBLE	TRIMBLE	0.8136
CATAWBA	CATAWBA	0.3707

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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 IMPAC T
44516876	274750	CRETE EC ;BP	CE	255112	17STJOHN	NIPS	1	AEP_P4_#2978_05DUMONT_FSA	breaker	1399.0	154.35	154.39	DC	17.76

Bus #	Bus	MW Impact
274654	BRAIDWOOD;1U	23.9615
274655	BRAIDWOOD;2U	23.3097
274660	LASCO STA;1U	22.0266
274661	LASCO STA;2U	22.1098
274687	WILL CNTY;4U	10.1107
274704	KENDALL ;1C	3.5538
274705	KENDALL ;1S	2.3763
274706	KENDALL ;2C	3.5538
274707	KENDALL ;2S	2.3763
274751	CRETE EC ;1U	5.2285
274752	CRETE EC ;2U	5.2285
274753	CRETE EC ;3U	5.2285
274754	CRETE EC ;4U	5.2285
274830	U3-021 1	5.3426
274831	U3-021 2	5.3426
274861	TOP CROP ;1U	0.4249
274862	TOP CROP ;2U	0.8248
276161	W4-086	0.2058
276167	Z1-106 E2	1.1059
276168	Z1-106 E1	1.1059
276169	Z1-107 E	2.1252
276170	Z1-108 E	2.1847
290021	O50 E	17.2584
290051	GSG-6; E	6.7300
290108	LEEDK;1U E	21.2313
293061	N-015 E	13.7210
293644	O22 E1	12.1764
293645	O22 E2	23.6364
294392	P-010 E	17.4257
914321	Y2-103 (Withdrawn : 12/24/2019)	39.6056
915011	Y3-013 1	3.3005
915021	Y3-013 2	3.3005
915031	Y3-013 3	3.3005
920272	AA2-123 E	2.1427
924471	AB2-096	37.1012
926311	AC1-109 1	1.6676
926321	AC1-109 2	1.6676
926331	AC1-110 1	1.6635
926341	AC1-110 2	1.6635
926351	AC1-111 1	0.6658
926361	AC1-111 2	0.6658
926371	AC1-111 3	0.6658
926381	AC1-111 4	0.6658
926391	AC1-111 5	0.6658
926401	AC1-111 6	0.6658

Bus #	Bus	MW Impact
927091	AC1-204 1	65.2484
927101	AC1-204 2	65.1345
927451	AC1-142A 1	3.7789
927461	AC1-142A 2	3.7813
930741	AB1-122 1O1	62.1446
930751	AB1-122 2O1	66.4260
933431	AC2-156 C O1	0.8314
933432	AC2-156 E O1	1.3565
933911	AD1-013 C	1.6205
933912	AD1-013 E	2.5887
933931	AD1-016 C	0.8142
933932	AD1-016 E	1.3285
934101	AD1-039 1	6.0902
934111	AD1-039 2	6.5097
934431	AD1-067 C	0.1152
934432	AD1-067 E	0.4844
934721	AD1-100 C	16.6043
934722	AD1-100 E	77.4868
934971	AD1-129 C	0.7915
934972	AD1-129 E	0.5277
937001	AD2-134 C	2.3985
937002	AD2-134 E	9.9081
937401	AD2-194 1	7.0166
937411	AD2-194 2	7.0043
938511	AE1-070 1	8.2445
938521	AE1-070 2	7.5297
938851	AE1-113 C	7.1191
938852	AE1-113 E	25.2404
939351	AE1-166 C O1	4.7090
939352	AE1-166 E O1	4.3467
939631	AE1-193 C	32.3771
939632	AE1-193 E	216.6778
939641	AE1-194 C	32.3771
939642	AE1-194 E	216.6778
939651	AE1-195 C	32.3771
939652	AE1-195 E	216.6778
939681	AE1-198 C	96.1352
939682	AE1-198 E	81.6900
939732	AE1-204 E (Withdrawn : 11/18/2019)	0.4869
940631	AE2-050 C O1	14.1318
940632	AE2-050 E O1	9.4212
940752	AE2-062 E	0.1405
940762	AE2-063 E (Withdrawn : 01/14/2020)	0.1405
941131	AE2-107 C	3.3842
941132	AE2-107 E	2.2561
941551	AE2-152 C O1	5.4334
941552	AE2-152 E O1	3.6223
941561	AE2-153 C O1	4.0766
941562	AE2-153 E O1	19.0859
942421	AE2-255 C O1	2.6966
942422	AE2-255 E O1	8.0899
942881	AE2-307 C O1	25.9083

Bus #	Bus	MW Impact
942882	AE2-307 E O1	9.4212
942991	AE2-321 C	7.1672
942992	AE2-321 E	3.5301
943121	AE2-341 C	11.0889
943122	AE2-341 E	5.4453
943591	AF1-030 C O1	3.9200
943592	AF1-030 E O1	1.9220
943801	AF1-048 C	1.7757
943802	AF1-048 E	1.1838
944041	AF1-072	1.0018
944911	AF1-156 C	5.5243
944912	AF1-156 E	3.6828
945351	AF1-200 FTIR	142.8324
946521	AF1-316 C O1	3.1997
946522	AF1-316 E O1	4.7996
946661	AF1-330 C	0.9312
946662	AF1-330 E	0.2044
946671	AF1-331	1.1154
WEC	WEC	3.8773
CBM-W2	CBM-W2	18.8534
NY	NY	1.1972
CBM-W1	CBM-W1	52.7046
TVA	TVA	1.1214
O-066	O-066	14.1658
CHEOAH	CHEOAH	0.1041
CBM-S1	CBM-S1	3.7658
G-007	G-007	2.1892
MADISON	MADISON	19.9987
MEC	MEC	13.1776
GIBSON	GIBSON	0.1818
CALDERWOOD	CALDERWOOD	0.0929
BLUEG	BLUEG	2.0433
TRIMBLE	TRIMBLE	0.6917
CATAWBA	CATAWBA	0.3080

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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
45878715	275208	PLANO ;4M	CE	270630	PLANO ;	CE	1	COMED_P4_167-45-BT1-9__	breaker	1379.0	140.12	141.64	DC	21.0

Bus #	Bus	MW Impact
274660	LASCO STA;1U	31.7468
274661	LASCO STA;2U	32.0216
274847	GR RIDGE ;BU	0.6661
274871	GR RIDGE ;2U	0.8460
274881	PILOT HIL;1E	6.7699

Bus #	Bus	MW Impact
275149	KELLYCK ;1E	6.7699
276173	Z2-081	0.2015
293061	N-015 E	19.0884
294392	P-010 E	24.2423
926821	AC1-168 C O1	0.4856
926822	AC1-168 E O1	3.2588
930501	AB1-091 O1	29.1393
933411	AC2-154 C	0.9189
933412	AC2-154 E	1.4993
934721	AD1-100 C	7.7035
934722	AD1-100 E	35.9499
936371	AD2-047 C O1	1.6444
936372	AD2-047 E O1	8.0286
936461	AD2-060	0.5127
937321	AD2-175 C (Withdrawn : 12/10/2019)	6.5072
937322	AD2-175 E (Withdrawn : 12/10/2019)	4.3381
939351	AE1-166 C O1	2.5483
939352	AE1-166 E O1	2.3523
940621	AE2-049 C O1	1.6478
940622	AE2-049 E O1	1.0985
940631	AE2-050 C O1	3.7095
940632	AE2-050 E O1	2.4730
941551	AE2-152 C O1	2.9403
941552	AE2-152 E O1	1.9602
941561	AE2-153 C O1	2.5534
941562	AE2-153 E O1	11.9544
942881	AE2-307 C O1	6.8007
942882	AE2-307 E O1	2.4730
942911	AE2-310 C O1	1.6000
942912	AE2-310 E O1	0.4299
944911	AF1-156 C	3.4601
944912	AF1-156 E	2.3067
945351	AF1-200 FTIR	1158.4033
946521	AF1-316 C O1	8.3989
946522	AF1-316 E O1	12.5983
WEC	WEC	0.1934
CBM-W2	CBM-W2	1.3104
NY	NY	0.3340
CBM-W1	CBM-W1	2.2768
O-066	O-066	3.9917
CHEOAH	CHEOAH	0.1461
G-007	G-007	0.6167
MADISON	MADISON	2.3244
MEC	MEC	0.9772
GIBSON	GIBSON	0.1010
CALDERWOOD	CALDERWOOD	0.1436
BLUEG	BLUEG	0.7031
TRIMBLE	TRIMBLE	0.2337
CATAWBA	CATAWBA	0.1418

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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
44517044	275232	WILTON ;3M	CE	270644	WILTON ;	CE	1	COMED_P4_112-65-BT5-6	breaker	1379.0	118.83	118.89	DC	21.28

Bus #	Bus	MW Impact
274771	LINCOLN ;2U	3.0480
274772	LINCOLN ;3U	3.0480
274773	LINCOLN ;4U	3.0480
274774	LINCOLN ;5U	3.0480
274775	LINCOLN ;6U	3.0480
274776	LINCOLN ;7U	3.0480
274777	LINCOLN ;8U	3.0480
274830	U3-021 1	6.3043
274831	U3-021 2	6.3043
274881	PILOT HIL;1E	19.9420
274890	CAYUG;1U E	17.0075
274891	CAYUG;2U E	17.0075
275149	KELLYCK ;1E	19.9420
276161	W4-086	0.2521
276167	Z1-106 E2	1.3064
276168	Z1-106 E1	1.3064
276169	Z1-107 E	2.6741
276170	Z1-108 E	2.5706
290021	O50 E	20.0287
290051	GSG-6; E	10.8928
290108	LEEDK;1U E	25.1957
293061	N-015 E	16.4444
293644	O22 E1	10.5927
293645	O22 E2	20.5622
294392	P-010 E	20.8844
910542	X3-005 E	0.7563
914321	Y2-103 (Withdrawn : 12/24/2019)	46.3651
915011	Y3-013 1	3.8638
915021	Y3-013 2	3.8638
915031	Y3-013 3	3.8638
918052	AA1-018 E OP	16.9848
920272	AA2-123 E	2.5264
924041	AB2-047 C O1	0.5855
924042	AB2-047 E O1	3.9182
924471	AB2-096	43.7801
926311	AC1-109 1	1.9768
926321	AC1-109 2	1.9768
926331	AC1-110 1	1.9636
926341	AC1-110 2	1.9636
926351	AC1-111 1	0.7895
926361	AC1-111 2	0.7895
926371	AC1-111 3	0.7895

Bus #	Bus	MW Impact
926381	AC1-111 4	0.7895
926391	AC1-111 5	0.7895
926401	AC1-111 6	0.7895
927091	AC1-204 1	75.0465
927101	AC1-204 2	75.0465
927451	AC1-142A 1	4.3262
927461	AC1-142A 2	4.3259
930501	AB1-091 O1	79.3488
930741	AB1-122 1O1	75.3115
930751	AB1-122 2O1	76.2401
933411	AC2-154 C	2.7064
933412	AC2-154 E	4.4157
933431	AC2-156 C O1	0.9894
933432	AC2-156 E O1	1.6143
933911	AD1-013 C	1.9234
933912	AD1-013 E	3.0725
933931	AD1-016 C	0.9600
933932	AD1-016 E	1.5663
934101	AD1-039 1	7.3805
934111	AD1-039 2	7.4715
934431	AD1-067 C	0.1368
934432	AD1-067 E	0.5751
934701	AD1-098 C O1	7.1671
934702	AD1-098 E O1	5.2327
934721	AD1-100 C	24.8549
934722	AD1-100 E	115.9893
934871	AD1-116 C	0.9892
934872	AD1-116 E	1.6139
934971	AD1-129 C	0.9346
934972	AD1-129 E	0.6230
935001	AD1-133 C O1	23.0265
935002	AD1-133 E O1	15.3510
936291	AD2-038 C O1	2.4304
936292	AD2-038 E O1	16.2649
936371	AD2-047 C O1	4.8431
936372	AD2-047 E O1	23.6455
936461	AD2-060	1.5099
936511	AD2-066 C O1	8.7651
936512	AD2-066 E O1	5.8434
937001	AD2-134 C	2.8475
937002	AD2-134 E	11.7632
937321	AD2-175 C (Withdrawn : 12/10/2019)	17.7568
937322	AD2-175 E (Withdrawn : 12/10/2019)	11.8378
937401	AD2-194 1	8.0702
937411	AD2-194 2	8.0702
938511	AE1-070 1	9.4825
938521	AE1-070 2	8.6755
938851	AE1-113 C	8.2618
938852	AE1-113 E	29.2920
939321	AE1-163 C O1	6.1071
939322	AE1-163 E O1	37.5153
939351	AE1-166 C O1	6.4997

Bus #	Bus	MW Impact
939352	AE1-166 E O1	5.9997
939401	AE1-172 C O1	6.7954
939402	AE1-172 E O1	31.8837
939732	AE1-204 E (Withdrawn : 11/18/2019)	0.5696
939741	AE1-205 C O1	10.4001
939742	AE1-205 E O1	14.3621
940101	AE1-252 C O1	13.6514
940102	AE1-252 E O1	9.1010
940621	AE2-049 C O1	5.1697
940622	AE2-049 E O1	3.4464
940631	AE2-050 C O1	6.8967
940632	AE2-050 E O1	4.5978
940752	AE2-062 E	0.0716
940762	AE2-063 E (Withdrawn : 01/14/2020)	0.0716
941131	AE2-107 C	4.0158
941132	AE2-107 E	2.6772
941551	AE2-152 C O1	7.4996
941552	AE2-152 E O1	4.9997
941561	AE2-153 C O1	5.1253
941562	AE2-153 E O1	23.9957
941731	AE2-173 O1	6.1905
942111	AE2-223 C	2.4143
942112	AE2-223 E	16.1573
942421	AE2-255 C O1	3.1295
942422	AE2-255 E O1	9.3885
942651	AE2-281 C O1	0.8724
942652	AE2-281 E O1	5.3593
942881	AE2-307 C O1	12.6440
942882	AE2-307 E O1	4.5978
942911	AE2-310 C O1	5.0198
942912	AE2-310 E O1	1.3486
942991	AE2-321 C	8.4519
942992	AE2-321 E	4.1629
943121	AE2-341 C	13.2096
943122	AE2-341 E	6.4866
943381	AF1-009 C	0.3286
943382	AF1-009 E	1.3144
943422	AF1-013 E	1.6430
943591	AF1-030 C O1	4.6697
943592	AF1-030 E O1	2.2896
943801	AF1-048 C	2.0940
943802	AF1-048 E	1.3960
944041	AF1-072	1.1799
944911	AF1-156 C	6.9454
944912	AF1-156 E	4.6302
945351	AF1-200 FTIR	171.0257
946521	AF1-316 C O1	3.8348
946522	AF1-316 E O1	5.7523
946661	AF1-330 C	1.0980
946662	AF1-330 E	0.2410
946671	AF1-331	1.3239
WEC	WEC	4.5593

Bus #	Bus	MW Impact
CBM-W2	CBM-W2	25.8886
NY	NY	1.4400
CBM-W1	CBM-W1	77.6746
TVA	TVA	1.6184
O-066	O-066	17.0957
CHEOAH	CHEOAH	0.0776
CBM-S1	CBM-S1	6.0492
G-007	G-007	2.6426
MADISON	MADISON	24.2726
MEC	MEC	16.0219
CALDERWOOD	CALDERWOOD	0.0636
BLUEG	BLUEG	2.3054
TRIMBLE	TRIMBLE	0.7964
CATAWBA	CATAWBA	0.3626

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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
44517021	275233	WILTON ;4M	CE	270644	WILTON ;	CE	1	COMED_P4_112-65-BT2-3__	breaker	1379.0	121.32	121.38	DC	21.73

Bus #	Bus	MW Impact
274771	LINCOLN ;2U	3.1304
274772	LINCOLN ;3U	3.1304
274773	LINCOLN ;4U	3.1304
274774	LINCOLN ;5U	3.1304
274775	LINCOLN ;6U	3.1304
274776	LINCOLN ;7U	3.1304
274777	LINCOLN ;8U	3.1304
274830	U3-021 1	6.4384
274831	U3-021 2	6.4384
274881	PILOT HIL;1E	20.3585
274890	CAYUG;1U E	17.3471
274891	CAYUG;2U E	17.3471
275149	KELLYCK ;1E	20.3585
276161	W4-086	0.2575
276167	Z1-106 E2	1.3343
276168	Z1-106 E1	1.3342
276169	Z1-107 E	2.7312
276170	Z1-108 E	2.6255
290021	O50 E	20.4558
290051	GSG-6; E	11.1243
290108	LEEDK;1U E	25.7329
293061	N-015 E	16.7882
293644	O22 E1	10.8167
293645	O22 E2	20.9971
294392	P-010 E	21.3210

Bus #	Bus	MW Impact
910542	X3-005 E	0.7728
914321	Y2-103 (Withdrawn : 12/24/2019)	47.3566
915011	Y3-013 1	3.9464
915021	Y3-013 2	3.9464
915031	Y3-013 3	3.9464
918052	AA1-018 E OP	17.3564
920272	AA2-123 E	2.5803
924041	AB2-047 C O1	0.5973
924042	AB2-047 E O1	3.9976
924471	AB2-096	44.7113
926311	AC1-109 1	2.0188
926321	AC1-109 2	2.0188
926331	AC1-110 1	2.0054
926341	AC1-110 2	2.0054
926351	AC1-111 1	0.8064
926361	AC1-111 2	0.8064
926371	AC1-111 3	0.8064
926381	AC1-111 4	0.8064
926391	AC1-111 5	0.8064
926401	AC1-111 6	0.8064
927091	AC1-204 1	76.6590
927101	AC1-204 2	76.6542
927451	AC1-142A 1	4.4192
927461	AC1-142A 2	4.4192
930501	AB1-091 O1	80.9991
930741	AB1-122 1O1	76.9097
930751	AB1-122 2O1	77.8676
933411	AC2-154 C	2.7629
933412	AC2-154 E	4.5080
933431	AC2-156 C O1	1.0105
933432	AC2-156 E O1	1.6487
933911	AD1-013 C	1.9643
933912	AD1-013 E	3.1378
933931	AD1-016 C	0.9805
933932	AD1-016 E	1.5998
934101	AD1-039 1	7.5372
934111	AD1-039 2	7.6310
934431	AD1-067 C	0.1397
934432	AD1-067 E	0.5873
934701	AD1-098 C O1	7.3194
934702	AD1-098 E O1	5.3439
934721	AD1-100 C	25.3483
934722	AD1-100 E	118.2919
934871	AD1-116 C	1.0108
934872	AD1-116 E	1.6492
934971	AD1-129 C	0.9545
934972	AD1-129 E	0.6363
935001	AD1-133 C O1	23.5039
935002	AD1-133 E O1	15.6692
936291	AD2-038 C O1	2.4828
936292	AD2-038 E O1	16.6155
936371	AD2-047 C O1	4.9442

Bus #	Bus	MW Impact
936372	AD2-047 E O1	24.1394
936461	AD2-060	1.5414
936511	AD2-066 C O1	8.9509
936512	AD2-066 E O1	5.9673
937001	AD2-134 C	2.9081
937002	AD2-134 E	12.0133
937321	AD2-175 C (Withdrawn : 12/10/2019)	18.1248
937322	AD2-175 E (Withdrawn : 12/10/2019)	12.0832
937401	AD2-194 1	8.2436
937411	AD2-194 2	8.2431
938511	AE1-070 1	9.6863
938521	AE1-070 2	8.8614
938851	AE1-113 C	8.4380
938852	AE1-113 E	29.9165
939321	AE1-163 C O1	6.2388
939322	AE1-163 E O1	38.3238
939351	AE1-166 C O1	6.6307
939352	AE1-166 E O1	6.1207
939401	AE1-172 C O1	6.9298
939402	AE1-172 E O1	32.5144
939732	AE1-204 E (Withdrawn : 11/18/2019)	0.5818
939741	AE1-205 C O1	10.6108
939742	AE1-205 E O1	14.6529
940101	AE1-252 C O1	13.9215
940102	AE1-252 E O1	9.2810
940621	AE2-049 C O1	5.2778
940622	AE2-049 E O1	3.5186
940631	AE2-050 C O1	7.0386
940632	AE2-050 E O1	4.6924
940752	AE2-062 E	0.0731
940762	AE2-063 E (Withdrawn : 01/14/2020)	0.0731
941131	AE2-107 C	4.1013
941132	AE2-107 E	2.7342
941551	AE2-152 C O1	7.6508
941552	AE2-152 E O1	5.1006
941561	AE2-153 C O1	5.2309
941562	AE2-153 E O1	24.4902
941731	AE2-173 O1	6.3159
942111	AE2-223 C	2.4632
942112	AE2-223 E	16.4846
942421	AE2-255 C O1	3.1962
942422	AE2-255 E O1	9.5886
942651	AE2-281 C O1	0.8913
942652	AE2-281 E O1	5.4748
942881	AE2-307 C O1	12.9041
942882	AE2-307 E O1	4.6924
942911	AE2-310 C O1	5.1249
942912	AE2-310 E O1	1.3768
942991	AE2-321 C	8.6325
942992	AE2-321 E	4.2518
943121	AE2-341 C	13.4901
943122	AE2-341 E	6.6243

Bus #	Bus	MW Impact
943381	AF1-009 C	0.3356
943382	AF1-009 E	1.3423
943422	AF1-013 E	1.6779
943591	AF1-030 C O1	4.7689
943592	AF1-030 E O1	2.3382
943801	AF1-048 C	2.1387
943802	AF1-048 E	1.4258
944041	AF1-072	1.2051
944911	AF1-156 C	7.0885
944912	AF1-156 E	4.7257
945351	AF1-200 FTIR	174.6388
946521	AF1-316 C O1	3.9150
946522	AF1-316 E O1	5.8725
946661	AF1-330 C	1.1214
946662	AF1-330 E	0.2462
946671	AF1-331	1.3520
WEC	WEC	4.6566
CBM-W2	CBM-W2	26.4209
NY	NY	1.4710
CBM-W1	CBM-W1	79.3384
TVA	TVA	1.6506
O-066	O-066	17.4586
CHEOAH	CHEOAH	0.0796
CBM-S1	CBM-S1	6.1685
G-007	G-007	2.6988
MADISON	MADISON	24.7867
MEC	MEC	16.3603
CALDERWOOD	CALDERWOOD	0.0651
BLUEG	BLUEG	2.3558
TRIMBLE	TRIMBLE	0.8136
CATAWBA	CATAWBA	0.3707

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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
44516590	936510	AD2-066 TAP	CE	271987	MAZON ; R	CE	1	COMED_P2-2_001_LA-138B__1	bus	223.0	129.74	140.16	DC	23.25

Bus #	Bus	MW Impact
274847	GR RIDGE ;BU	0.7377
274849	CRESCENT ;1U	0.1749
274851	PROVIDENC;RU	0.2669
274871	GR RIDGE ;2U	0.9368
276173	Z2-081	0.3187
293061	N-015 E	21.1392
293771	O-035 E	7.6492

Bus #	Bus	MW Impact
294392	P-010 E	26.8468
294401	BSHIL;1U E	5.7746
294410	BSHIL;2U E	5.7746
919621	AA2-039 C	1.4075
919622	AA2-039 E	9.4198
925581	AC1-033 C	0.9459
925582	AC1-033 E	6.3326
926821	AC1-168 C O1	1.6738
926822	AC1-168 E O1	11.2326
927201	AC1-214 C O1	2.4550
927202	AC1-214 E O1	7.8043
934051	AD1-031 C O1	1.9200
934052	AD1-031 E O1	3.1327
936511	AD2-066 C O1	44.5287
936512	AD2-066 E O1	29.6858
946521	AF1-316 C O1	9.3012
946522	AF1-316 E O1	13.9519
946541	AF1-318 C O1	10.0855
946542	AF1-318 E O1	47.2237
953201	J715 C	3.3289
953202	J715 E	18.0101
990901	L-005 E	7.6214
LGEE	LGEE	0.0576
CPL	CPL	0.0655
G-007A	G-007A	0.0336
VFT	VFT	0.0903
CBM-W2	CBM-W2	4.1114
CBM-W1	CBM-W1	3.1025
TVA	TVA	0.3836
CBM-S2	CBM-S2	0.7225
CBM-S1	CBM-S1	2.0618
MADISON	MADISON	1.4717
MEC	MEC	1.3761

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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
44517176	940630	AE2-050 TAP	CE	270728	E FRANKFO; B	CE	1	COMED_P4_020-45-BT7-11_	breaker	1528.0	102.54	104.06	DC	21.76

Bus #	Bus	MW Impact
274654	BRAIDWOOD;1U	79.5563
274655	BRAIDWOOD;2U	21.1980
274660	LASCO STA;1U	33.3813
274661	LASCO STA;2U	33.3052
274847	GR RIDGE ;BU	0.6903

Bus #	Bus	MW Impact
274871	GR RIDGE ;2U	0.8767
276173	Z2-081	0.2024
293061	N-015 E	19.7832
294392	P-010 E	25.1247
926821	AC1-168 C O1	0.4429
926822	AC1-168 E O1	2.9720
939683	AE1-198 BAT	9.1981
940631	AE2-050 C O1	46.3734
940632	AE2-050 E O1	30.9156
942881	AE2-307 C O1	85.0179
942882	AE2-307 E O1	30.9156
945351	AF1-200 FTIR	82.5630
946521	AF1-316 C O1	8.7046
946522	AF1-316 E O1	13.0569
NEWTON	NEWTON	0.5340
WEC	WEC	0.3235
NY	NY	0.4501
PRAIRIE	PRAIRIE	0.6948
O-066	O-066	5.3760
COFFEEN	COFFEEN	0.1665
CHEOAH	CHEOAH	0.3088
TILTON	TILTON	0.3849
G-007	G-007	0.8320
MADISON	MADISON	2.5946
MEC	MEC	0.8867
GIBSON	GIBSON	0.3866
CALDERWOOD	CALDERWOOD	0.3057
BLUEG	BLUEG	1.3072
TRIMBLE	TRIMBLE	0.4218
CATAWBA	CATAWBA	0.2380

Affected Systems

17 Affected Systems

17.1 LG&E

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

17.2 MISO

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

17.3 TVA

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

17.4 Duke Energy Progress

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

17.5 NYISO

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

Contingency Name	Contingency Definition
COMED_P7_345-L2001__B-S+_345-L2003__R-S-B	CONTINGENCY 'COMED_P7_345-L2001__B-S+_345-L2003__R-S-B' TRIP BRANCH FROM BUS 940630 TO BUS 270728 CKT 1 / AE2-050 TAP 345 E FRA; B 345 TRIP BRANCH FROM BUS 270728 TO BUS 270766 CKT 1 / E FRA; B 345 GOODI;3B 345 TRIP BRANCH FROM BUS 270728 TO BUS 274750 CKT 1 / E FRA; B 345 CRETE;BP 345 TRIP BRANCH FROM BUS 270671 TO BUS 270729 CKT 1 / BRAID; R 345 E FRA; R 345 END
COMED_P7_345-L2001__B-S+_345-L2003__R-S-A	CONTINGENCY 'COMED_P7_345-L2001__B-S+_345-L2003__R-S-A' TRIP BRANCH FROM BUS 270670 TO BUS 940630 CKT 1 / BRAID; B 345 AE2-050 TAP 345 TRIP BRANCH FROM BUS 270671 TO BUS 270729 CKT 1 / BRAID; R 345 E FRA; R 345 END
COMED_P2-2_001_LA-138B__1	CONTINGENCY 'COMED_P2-2_001_LA-138B__1' DISCONNECT BUS 271908 / LASCO STA; B 138 END
COMED_P4_020-45-BT7-11__	CONTINGENCY 'COMED_P4_020-45-BT7-11__' TRIP BRANCH FROM BUS 270670 TO BUS 270671 CKT 1 / BRAID; B 345 BRAID; R 345 TRIP BRANCH FROM BUS 270670 TO BUS 934730 CKT 1 / BRAID; B 345 AD1-100 TAP 345 CLOSE BRANCH FROM BUS 270710 TO BUS 270711 CKT 1 / DAVIS; B 345 DAVIS; R 345 TRIP BRANCH FROM BUS 270671 TO BUS 941560 CKT 1 / BRAID; R 345 AE2-153 TAP 345 END
COMED_P1-2_345-L0101__B-S	CONTINGENCY 'COMED_P1-2_345-L0101__B-S' TRIP BRANCH FROM BUS 270802 TO BUS 270846 CKT 1 / LASCO STA; B 345 PLANO ; B 345 TRIP BRANCH FROM BUS 270846 TO BUS 270847 CKT 1 / PLANO ; B 345 PLANO ; R 345 END
COMED_P4_167-45-BT5-6__	CONTINGENCY 'COMED_P4_167-45-BT5-6__' TRIP BRANCH FROM BUS 270846 TO BUS 270847 CKT 1 / PLANO ; B 345 PLANO ; R 345 TRIP BRANCH FROM BUS 270847 TO BUS 270733 CKT 1 / PLANO ; R 345 ELEC JUNC;3R 345 TRIP BRANCH FROM BUS 275208 TO BUS 270630 CKT 1 / PLANO ;4M 345 PLANO ; 765 TRIP BRANCH FROM BUS 275208 TO BUS 270847 CKT 1 / PLANO ;4M 345 PLANO ; R 345 TRIP BRANCH FROM BUS 275208 TO BUS 275308 CKT 1 / PLANO ;4M 345 PLANO ;4C 33 END
COMED_P1-2_695_B2	CONTINGENCY 'COMED_P1-2_695_B2' OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTO; 765 1 END
COMED_P4_112-65-BT3-4__	CONTINGENCY 'COMED_P4_112-65-BT3-4__' TRIP BRANCH FROM BUS 270644 TO BUS 243206 CKT 1 / WILTO; 765 05DUMONT 765 TRIP BRANCH FROM BUS 275232 TO BUS 270644 CKT 1 / WILTO;3M 345 WILTO; 765 TRIP BRANCH FROM BUS 275232 TO BUS 270926 CKT 1 / WILTO;3M 345 WILTO; B 345 TRIP BRANCH FROM BUS 275232 TO BUS 275332 CKT 1 / WILTO;3M 345 WILTO;3C 33 END
COMED_P4_023-65-BT2-3__	CONTINGENCY 'COMED_P4_023-65-BT2-3__' TRIP BRANCH FROM BUS 270644 TO BUS 243206 CKT 1 / WILTO; 765 05DUMONT 765 TRIP BRANCH FROM BUS 270607 TO BUS 270630 CKT 1 / COLLI; 765 PLANO; 765 END

Contingency Name	Contingency Definition
COMED_P4_001-38-TR81__	CONTINGENCY 'COMED_P4_001-38-TR81__' TRIP BRANCH FROM BUS 270802 TO BUS 270803 CKT 1 / LASCO STA; B 345 LASCO STA; R 345 TRIP BRANCH FROM BUS 270802 TO BUS 271908 CKT 1 / LASCO STA; B 345 LASCO STA; B 138 DISCONNECT BUS 271908 / LASCO STA; B 138 TRIP BRANCH FROM BUS 270802 TO BUS 270803 CKT 1 / LASCO STA; B 345 LASCO STA; R 345 END
COMED_P1-2_345-L2004_AR-S-B	CONTINGENCY 'COMED_P1-2_345-L2004_AR-S-B' TRIP BRANCH FROM BUS 941560 TO BUS 270711 CKT 1 / AE2-153 TAP 345 DAVIS; R 345 END
COMED_P4_167-45-BT8-9__	CONTINGENCY 'COMED_P4_167-45-BT8-9__' TRIP BRANCH FROM BUS 270802 TO BUS 270846 CKT 1 / LASCO STA; B 345 PLANO ; B 345 TRIP BRANCH FROM BUS 270846 TO BUS 270847 CKT 1 / PLANO ; B 345 PLANO ; R 345 TRIP BRANCH FROM BUS 270846 TO BUS 270730 CKT 1 / PLANO ; B 345 ELEC JUNC; B 345 TRIP BRANCH FROM BUS 272250 TO BUS 272278 CKT 1 / PLANO ; B 138 PLANO;1I 138 TRIP BRANCH FROM BUS 272250 TO BUS 272278 CKT 2 / PLANO ; B 138 PLANO;1I 138 TRIP BRANCH FROM BUS 270846 TO BUS 272278 TO BUS 275354 CKT 1 / PLANO ; B 345 PLANO;1I 138 PLANO;1C 34.5 END
270670 BRAIDWOOD; B 345 934730 AD1-100 TAP 345 1	CONTINGENCY '270670 BRAIDWOOD; B 345 934730 AD1-100 TAP 345 1' OPEN BRANCH FROM BUS 270670 TO BUS 934730 CKT 1 END
COMED_P4_167-45-BT9-12__	CONTINGENCY 'COMED_P4_167-45-BT9-12__' TRIP BRANCH FROM BUS 270802 TO BUS 270846 CKT 1 / LASCO STA; B 345 PLANO ; B 345 TRIP BRANCH FROM BUS 270846 TO BUS 270847 CKT 1 / PLANO ; B 345 PLANO ; R 345 TRIP BRANCH FROM BUS 275207 TO BUS 270630 CKT 1 / PLANO ;3M 345 PLANO ; 765 TRIP BRANCH FROM BUS 275207 TO BUS 270846 CKT 1 / PLANO ;3M 345 PLANO ; B 345 TRIP BRANCH FROM BUS 275207 TO BUS 275307 CKT 1 / PLANO ;3M 345 PLANO ;3C 33 END
COMED_P1-1_LA-1U____-S	CONTINGENCY 'COMED_P1-1_LA-1U____-S' REMOVE UNIT 1 FROM BUS 274660 / LASCO;1U 25 END
COMED_P4_001-38-L0108__	CONTINGENCY 'COMED_P4_001-38-L0108__' TRIP BRANCH FROM BUS 271908 TO BUS 271986 CKT 1 / LASCO; B 138 MAZON; B 138 DISCONNECT BUS 271908 / LASCO; B 138 END
COMED_P4_167-45-BT1-9__	CONTINGENCY 'COMED_P4_167-45-BT1-9__' TRIP BRANCH FROM BUS 270802 TO BUS 270846 CKT 1 / LASCO STA; B 345 PLANO ; B 345 TRIP BRANCH FROM BUS 270846 TO BUS 270847 CKT 1 / PLANO ; B 345 PLANO ; R 345 TRIP BRANCH FROM BUS 270847 TO BUS 270733 CKT 1 / PLANO ; R 345 ELEC JUNC;3R 345 END

Contingency Name	Contingency Definition
COMED_P4_167-45-BT2-5__	CONTINGENCY 'COMED_P4_167-45-BT2-5__' TRIP BRANCH FROM BUS 275208 TO BUS 270630 CKT 1 / PLANO;4M 345 PLANO; 765 TRIP BRANCH FROM BUS 275208 TO BUS 270847 CKT 1 / PLANO;4M 345 PLANO; R 345 TRIP BRANCH FROM BUS 275208 TO BUS 275308 CKT 1 / PLANO;4M 345 PLANO;4C 33 TRIP BRANCH FROM BUS 270803 TO BUS 270847 CKT 1 / LASCO; R 345 PLANO; R 345 END
COMED_P4_167-45-BT8-12__	CONTINGENCY 'COMED_P4_167-45-BT8-12__' TRIP BRANCH FROM BUS 275207 TO BUS 270630 CKT 1 / PLANO ;3M 345 PLANO ; 765 TRIP BRANCH FROM BUS 275207 TO BUS 270846 CKT 1 / PLANO ;3M 345 PLANO ; B 345 TRIP BRANCH FROM BUS 275207 TO BUS 275307 CKT 1 / PLANO ;3M 345 PLANO ;3C 33 TRIP BRANCH FROM BUS 270846 TO BUS 270730 CKT 1 / PLANO ; B 345 ELEC JUNC; B 345 TRIP BRANCH FROM BUS 272250 TO BUS 272278 CKT 1 / PLANO ; B 138 PLANO;1I 138 TRIP BRANCH FROM BUS 272250 TO BUS 272278 CKT 2 / PLANO ; B 138 PLANO;1I 138 TRIP BRANCH FROM BUS 270846 TO BUS 272278 TO BUS 275354 CKT 1 / PLANO ; B 345 PLANO;1I 138 PLANO;1C 34.5 END
AEP_P4_#2978_05DUMONT_FSA	CONTINGENCY 'AEP_P4_#2978_05DUMONT_FSA' OPEN BRANCH FROM BUS 243206 TO BUS 907040 CKT 1 / 243206 05DUMONT 765 X1-020 OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTON ; 765 1 END
COMED_P1-2_345-L16703_R-S	CONTINGENCY 'COMED_P1-2_345-L16703_R-S' TRIP BRANCH FROM BUS 270846 TO BUS 270847 CKT 1 / PLANO ; B 345 PLANO ; R 345 TRIP BRANCH FROM BUS 270847 TO BUS 270733 CKT 1 / PLANO ; R 345 ELEC JUNC;3R 345 END
Base Case	
AEP_P4_#2978_05DUMONT_NON_FSA	CONTINGENCY 'AEP_P4_#2978_05DUMONT_NON_FSA' OPEN BRANCH FROM BUS 243206 TO BUS 907040 CKT 1 / 243206 05DUMONT 765 X1-020 OPEN BRANCH FROM BUS 243207 TO BUS 907040 CKT 1 OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTON ; 765 1 END
COMED_P1-3_TR94_PLANO_R-S	CONTINGENCY 'COMED_P1-3_TR94_PLANO_R-S' TRIP BRANCH FROM BUS 275208 TO BUS 270630 CKT 1 / PLANO;4M 345 PLANO; 765 TRIP BRANCH FROM BUS 275208 TO BUS 270847 CKT 1 / PLANO;4M 345 PLANO; R 345 TRIP BRANCH FROM BUS 275208 TO BUS 275308 CKT 1 / PLANO;4M 345 PLANO;4C 33 END
COMED_P1-2_345-L0102__R-S	CONTINGENCY 'COMED_P1-2_345-L0102__R-S' TRIP BRANCH FROM BUS 270803 TO BUS 270847 CKT 1 / LASCO; R 345 PLANO; R 345 END
COMED_P1-2_138-L0112__B-S	CONTINGENCY 'COMED_P1-2_138-L0112__B-S' TRIP BRANCH FROM BUS 271844 TO BUS 271908 CKT 1 / KICKA; B 138 LASCO; B 138 END

Contingency Name	Contingency Definition
COMED_P1-3_TR81_LASCO_B-S	CONTINGENCY 'COMED_P1-3_TR81_LASCO_B-S' TRIP BRANCH FROM BUS 270802 TO BUS 270803 CKT 1 / LASCO STA; B 345 LASCO STA; R 345 TRIP BRANCH FROM BUS 270802 TO BUS 271908 CKT 1 / LASCO STA; B 345 LASCO STA; B 138 END
COMED_P4_112-65-BT2-3__	CONTINGENCY 'COMED_P4_112-65-BT2-3__' TRIP BRANCH FROM BUS 270644 TO BUS 270607 CKT 1 / WILTO; 765 COLLI; 765 TRIP BRANCH FROM BUS 275232 TO BUS 270644 CKT 1 / WILTO;3M 345 WILTO; 765 TRIP BRANCH FROM BUS 275232 TO BUS 270926 CKT 1 / WILTO;3M 345 WILTO; B 345 TRIP BRANCH FROM BUS 275232 TO BUS 275332 CKT 1 / WILTO;3M 345 WILTO;3C 33 END
COMED_P4_112-65-BT4-5__	CONTINGENCY 'COMED_P4_112-65-BT4-5__' TRIP BRANCH FROM BUS 270644 TO BUS 243206 CKT 1 / WILTO; 765 05DUMONT 765 TRIP BRANCH FROM BUS 275233 TO BUS 270644 CKT 1 / WILTO;4M 345 WILTO; 765 TRIP BRANCH FROM BUS 275233 TO BUS 270927 CKT 1 / WILTO;4M 345 WILTO; R 345 TRIP BRANCH FROM BUS 275233 TO BUS 275333 CKT 1 / WILTO;4M 345 WILTO;4C 33 END
COMED_P1-2_138-L0108__B-S	CONTINGENCY 'COMED_P1-2_138-L0108__B-S' TRIP BRANCH FROM BUS 271908 TO BUS 271986 CKT 1 / LASCO; B 138 MAZON; B 138 END
COMED_P4_112-65-BT5-6__	CONTINGENCY 'COMED_P4_112-65-BT5-6__' TRIP BRANCH FROM BUS 270644 TO BUS 270607 CKT 1 / WILTO; 765 COLLI; 765 TRIP BRANCH FROM BUS 275233 TO BUS 270644 CKT 1 / WILTO;4M 345 WILTO; 765 TRIP BRANCH FROM BUS 275233 TO BUS 270927 CKT 1 / WILTO;4M 345 WILTO; R 345 TRIP BRANCH FROM BUS 275233 TO BUS 275333 CKT 1 / WILTO;4M 345 WILTO;4C 33 END

Short Circuit

18 Short Circuit

The following Breakers are overdutied:

None

20 Secondary Point of Interconnection

The Queue Project AF1-316 was evaluated as a 132.0 MW (Capacity 52.8 MW) injection at the Mazon 138 kV substation in the ComEd area. Project AF1-316 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF1-316 was studied with a commercial probability of 0.53. Potential network impacts were as follows:

Summer Peak Load Flow

21 Generation Deliverability

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

None

22 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 PROJE CT LOADIN G %	POST PROJE CT LOADIN G %	AC D C	MW IMPAC T
44516629	271987	MAZON ; R	138.0	CE	271187	CHANNAHO N; R	138.0	CE	1	COMED_P2-2_012_DR-138B_1	bus	230.0	85.5	122.52	DC	85.16
44517082	271987	MAZON ; R	138.0	CE	271187	CHANNAHO N; R	138.0	CE	1	COMED_P4_012-45-BT4-5	breaker	223.0	89.09	126.62	DC	83.71
44517984	271987	MAZON ; R	138.0	CE	271187	CHANNAHO N; R	138.0	CE	1	COMED_P7_345-L1202__B-S_+ 345-L1227__R-S-B	tower	230.0	90.16	126.84	DC	84.36
44517985	271987	MAZON ; R	138.0	CE	271187	CHANNAHO N; R	138.0	CE	1	COMED_P7_345-L1202__B-S_+ 345-L1227__R-S-A	tower	230.0	90.16	126.84	DC	84.36
44517986	271987	MAZON ; R	138.0	CE	271187	CHANNAHO N; R	138.0	CE	1	COMED_P7_345-L0302__B-S_+ 345-L1227__B-S-B	tower	230.0	89.7	126.38	DC	84.36
44517987	271987	MAZON ; R	138.0	CE	271187	CHANNAHO N; R	138.0	CE	1	COMED_P7_345-L0302__B-S_+ 345-L1227__B-S-A	tower	230.0	89.7	126.38	DC	84.36
44518021	272124	ESS J339; B	138.0	CE	271336	DRESDEN ; B	138.0	CE	1	COMED_P7_138-L0903__R-S_+ 138-L1206__R-S	tower	280.0	93.9	114.55	DC	57.79
44518022	272124	ESS J339; B	138.0	CE	271336	DRESDEN ; B	138.0	CE	1	COMED_P7_138-L1206__R-S_+ 345-L2310__S	tower	280.0	80.68	101.48	DC	58.25
44516675	272125	ESS J339; R	138.0	CE	271337	DRESDEN ; R	138.0	CE	1	COMED_P2-2_001_LA-138B_1	bus	268.0	91.31	123.33	DC	85.8
44518060	272125	ESS J339; R	138.0	CE	271337	DRESDEN ; R	138.0	CE	1	COMED_P7_138-L6101__S_+ 138-L7413__R-S-A	tower	280.0	75.08	105.71	DC	85.77
44518063	272125	ESS J339; R	138.0	CE	271337	DRESDEN ; R	138.0	CE	1	COMED_P7_345-L1202__B-S_+ 345-L1227__R-S-B	tower	280.0	76.84	106.94	DC	84.3
44518064	272125	ESS J339; R	138.0	CE	271337	DRESDEN ; R	138.0	CE	1	COMED_P7_345-L1202__B-S_+ 345-L1227__R-S-A	tower	280.0	76.84	106.94	DC	84.3

23 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
44516975	255112	17STJOHN	345.0	NIPS	270886	ST JOHN ; T	345.0	CE	1	AEP_P4_#2978_05DUMONT_NON_FSA	breaker	1091.0	124.77	124.8	DC	11.82
44516976	255112	17STJOHN	345.0	NIPS	270886	ST JOHN ; T	345.0	CE	1	AEP_P4_#2978_05DUMONT_FSA	breaker	1091.0	124.77	124.8	DC	11.82
44516977	255112	17STJOHN	345.0	NIPS	270886	ST JOHN ; T	345.0	CE	1	COMED_P4_023-65-BT2-3__	breaker	1091.0	124.2	124.23	DC	11.91
43627855	255113	17STILLWELL	345.0	NIPS	243219	05DUMONT	345.0	AEP	1	AEP_P4_#2978_05DUMONT_NON_FSA	breaker	1409.0	133.4	133.44	DC	18.63
43627856	255113	17STILLWELL	345.0	NIPS	243219	05DUMONT	345.0	AEP	1	AEP_P4_#2978_05DUMONT_FSA	breaker	1409.0	133.39	133.43	DC	18.63
44517187	270716	DRESDEN ; B	345.0	CE	270928	WOLFS ; B	345.0	CE	1	COMED_P4_012-45-BT5-6__	breaker	1479.0	101.8	104.14	DC	34.22
44517998	270716	DRESDEN ; B	345.0	CE	274702	KENDALL ; BU	345.0	CE	1	COMED_P7_345-L11620-B-S + 345-L11622_R-S	tower	1284.0	109.93	110.63	DC	19.64
43628000	270771	GREENACRE; T	345.0	CE	243229	05OLIVE	345.0	AEP	1	AEP_P4_#2978_05DUMONT_FSA	breaker	971.0	102.06	102.06	DC	10.7
43628001	270771	GREENACRE; T	345.0	CE	243229	05OLIVE	345.0	AEP	1	AEP_P4_#2978_05DUMONT_NON_FSA	breaker	971.0	102.06	102.06	DC	10.7
44516980	270886	ST JOHN ; T	345.0	CE	255104	17GREEN_A CRE	345.0	NIPS	1	AEP_P4_#2978_05DUMONT_FSA	breaker	1091.0	124.77	124.8	DC	11.82
44516981	270886	ST JOHN ; T	345.0	CE	255104	17GREEN_A CRE	345.0	NIPS	1	AEP_P4_#2978_05DUMONT_NON_FSA	breaker	1091.0	124.76	124.79	DC	11.82
44516982	270886	ST JOHN ; T	345.0	CE	255104	17GREEN_A CRE	345.0	NIPS	1	COMED_P4_023-65-BT2-3__	breaker	1091.0	124.19	124.22	DC	11.91
44516983	270886	ST JOHN ; T	345.0	CE	255104	17GREEN_A CRE	345.0	NIPS	1	COMED_P4_112-65-BT4-5__	breaker	1091.0	124.18	124.21	DC	11.9
44516984	270886	ST JOHN ; T	345.0	CE	255104	17GREEN_A CRE	345.0	NIPS	1	COMED_P4_112-65-BT3-4__	breaker	1091.0	124.18	124.21	DC	11.9
44517045	270926	WILTON ; B	345.0	CE	275232	WILTON ; 3M	345.0	CE	1	COMED_P4_112-65-BT5-6__	breaker	1379.0	117.81	117.82	DC	19.89
44517020	270927	WILTON ; R	345.0	CE	275233	WILTON ; 4M	345.0	CE	1	COMED_P4_112-65-BT2-3__	breaker	1379.0	120.26	120.28	DC	20.31
44518006	274702	KENDALL ; BU	345.0	CE	270810	LOCKPORT ; B	345.0	CE	1	COMED_P7_345-L11620-B-S + _345-L11622_R-S	tower	1768.0	110.28	110.78	DC	19.2
52956663	274702	KENDALL ; BU	345.0	CE	270810	LOCKPORT ; B	345.0	CE	1	COMED_P2-2_111_EJ-345B_2	bus	1479.0	112.12	113.44	DC	19.59
52957063	274702	KENDALL ; BU	345.0	CE	270810	LOCKPORT ; B	345.0	CE	1	COMED_P4_111-45-L16704T	breaker	1479.0	112.41	113.73	DC	19.57
52957064	274702	KENDALL ; BU	345.0	CE	270810	LOCKPORT ; B	345.0	CE	1	COMED_P4_111-45-L11126_	breaker	1479.0	112.19	113.52	DC	19.59
52958005	274702	KENDALL ; BU	345.0	CE	270810	LOCKPORT ; B	345.0	CE	1	COMED_P7_345-L1221_B-S + _345-L1223_TR-S	tower	1768.0	100.32	101.44	DC	19.82
44516875	274750	CRETE EC ; BP	345.0	CE	255112	17STJOHN	345.0	NIPS	1	AEP_P4_#2978_05DUMONT_NON_FSA	breaker	1399.0	153.59	153.6	DC	16.53
44516876	274750	CRETE EC ; BP	345.0	CE	255112	17STJOHN	345.0	NIPS	1	AEP_P4_#2978_05DUMONT_FSA	breaker	1399.0	153.6	153.61	DC	16.53
44516877	274750	CRETE EC ; BP	345.0	CE	255112	17STJOHN	345.0	NIPS	1	COMED_P4_112-65-BT4-5__	breaker	1399.0	153.16	153.17	DC	16.61
44516878	274750	CRETE EC ; BP	345.0	CE	255112	17STJOHN	345.0	NIPS	1	COMED_P4_112-65-BT3-4__	breaker	1399.0	153.15	153.16	DC	16.61
43627983	274804	UNIV PK N; RP	345.0	CE	243229	05OLIVE	345.0	AEP	1	AEP_P4_#2978_05DUMONT_FSA	breaker	971.0	104.57	104.6	DC	13.31
43627984	274804	UNIV PK N; RP	345.0	CE	243229	05OLIVE	345.0	AEP	1	AEP_P4_#2978_05DUMONT_NON_FSA	breaker	971.0	104.57	104.6	DC	13.31
43627985	274804	UNIV PK N; RP	345.0	CE	243229	05OLIVE	345.0	AEP	1	COMED_P4_023-65-BT2-3__	breaker	971.0	103.6	103.64	DC	13.42
43627986	274804	UNIV PK N; RP	345.0	CE	243229	05OLIVE	345.0	AEP	1	COMED_P4_112-65-BT4-5__	breaker	971.0	103.59	103.62	DC	13.41

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 LOADING %	POST PROJE CT LOADING %	AC DC	MW IMPACT
436279 87	2748 04	UNIV PK N;RP	345 .0	CE	2432 29	05OLIVE	345 .0	AEP	1	COMED_P4_112-65-BT3-4__	breaker	971. 0	103.59	103.62	DC	13.41
445170 44	2752 32	WILTON ;3M	345 .0	CE	2706 44	WILTON ;	765 .0	CE	1	COMED_P4_112-65-BT5-6__	breaker	1379 .0	117.81	117.82	DC	19.89
445170 21	2752 33	WILTON ;4M	345 .0	CE	2706 44	WILTON ;	765 .0	CE	1	COMED_P4_112-65-BT2-3__	breaker	1379 .0	120.26	120.28	DC	20.31

24 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 PROJE CT LOADING %	POST PROJE CT LOADING %	AC DC	MW IMPACT
4451757 9	25511 2	17STJOHN	345. 0	NIPS	27088 6	ST JOHN ; T	345. 0	CE	1	COMED_P 1- 2_695_B2	operation	1091. 0	124.18	124.21	DC	11.9
4362819 9	25511 3	17STILLWELL	345. 0	NIPS	24321 9	05DUMONT	345. 0	AEP	1	COMED_P 1- 2_695_B2	operation	1409. 0	131.45	131.49	DC	19.11
4362835 6	27077 1	GREENACRE ; T	345. 0	CE	24322 9	05OLIVE	345. 0	AEP	1	COMED_P 1- 2_695_B2	operation	971.0	101.08	101.11	DC	10.82
4451758 4	27088 6	ST JOHN ; T	345. 0	CE	25510 4	17GREEN_AC RE	345. 0	NIPS	1	COMED_P 1- 2_695_B2	operation	1091. 0	124.17	124.2	DC	11.9
4451749 0	27198 7	MAZON ; R	138. 0	CE	27118 7	CHANNAHON ; R	138. 0	CE	1	Base Case	operation	173.0	104.61	153.45	DC	84.48
5295738 7	27198 7	MAZON ; R	138. 0	CE	27118 7	CHANNAHON ; R	138. 0	CE	1	COMED_P 2-1_012- L1205__	operation	223.0	87.77	125.96	DC	85.17
4451780 7	27212 4	ESS J339 ; B	138. 0	CE	27133 6	DRESDEN ; B	138. 0	CE	1	COMED_P 1-2_138- L1206__R- S	operation	268.0	82.84	104.58	DC	58.27
4451766 8	27212 5	ESS J339 ; R	138. 0	CE	27133 7	DRESDEN ; R	138. 0	CE	1	Base Case	operation	210.0	89.93	130.13	DC	84.42
5295745 2	27212 5	ESS J339 ; R	138. 0	CE	27133 7	DRESDEN ; R	138. 0	CE	1	COMED_P 2-1_012- L1205__	operation	268.0	75.96	107.72	DC	85.11
5295766 4	27470 2	KENDALL ; BU	345. 0	CE	27081 0	LOCKPORT ; B	345. 0	CE	1	COMED_P 1-2_345- L1221__B- S	operation	1479. 0	111.29	112.62	DC	19.67
5295766 6	27470 2	KENDALL ; BU	345. 0	CE	27081 0	LOCKPORT ; B	345. 0	CE	1	Base Case	operation	1201. 0	110.92	112.21	DC	15.42

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 DC	MW IMPACT
44517448	274750	CRETE EC ;BP	345.0	CE	255112	17STJOHN	345.0	NIPS	1	COMED_P1-2_695_B2	operation	1399.0	153.12	153.13	DC	16.6
43628345	274804	UNIV PK N;RP	345.0	CE	243229	05OLIVE	345.0	AEP	1	COMED_P1-2_695_B2	operation	971.0	103.57	103.6	DC	13.41