



**Generation Interconnection
Feasibility Study Report
for
Queue Project AE2-255
MOLE CREEK 345 KV
25 MW Capacity / 100 MW Energy**

July, 2019

Table of Contents

1	Preface.....	4
2	General.....	6
2.1	Primary Point of Interconnection	7
2.2	Cost Summary.....	7
3	Transmission Owner Scope of Work.....	8
4	Attachment Facilities	8
5	Direct Connection Cost Estimate.....	8
6	Non-Direct Connection Cost Estimate.....	8
7	Schedule.....	8
8	Transmission Owner Analysis.....	9
9	Interconnection Customer Requirements.....	10
10	Revenue Metering and SCADA Requirements	11
11	Network Impacts for Primary Point of Interconnection	12
12	Generation Deliverability	14
13	Multiple Facility Contingency	14
14	Contribution to Previously Identified Overloads	14
15	Potential Congestion due to Local Energy Deliverability.....	15
16	System Reinforcements.....	17
17	Flow Gate Details	22
17.1	Index 1	23
17.2	Index 2	24
17.3	Index 3	25
17.4	Index 4	27
17.5	Index 5	29
17.6	Index 6	34
17.7	Index 7	39
17.8	Index 8	41
17.9	Index 9	46
17.10	Index 10.....	47
17.11	Index 11.....	52
17.12	Index 12.....	57

17.13	Index 13.....	59
17.14	Index 14.....	61
17.15	Index 15.....	62
18	Affected Systems	65
18.1	LG&E.....	65
18.2	MISO	65
18.3	TVA.....	65
18.4	Duke Energy Progress.....	65
18.5	NYISO	65
19	Short Circuit.....	70
20	Secondary Point of Interconnection General	71
20.1	Secondary Point of Interconnection.....	71
20.2	Cost Summary.....	71
21	Network Impacts for Secondary Point of Interconnection.....	72
22	Generation Deliverability	74
23	Multiple Facility Contingency	74
24	Contribution to Previously Identified Overloads	74
25	Potential Congestion due to Local Energy Deliverability.....	74
26	Flow Gate Details	76
26.1	Index 1	77
26.2	Index 2	82
26.3	Index 3	87
26.4	Index 4	92
26.5	Index 5	97
26.6	Index 6	102
26.7	Index 7	104
26.8	Index 8	106
26.9	Index 9	107
27	Short Circuit.....	112

1 Preface

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, may also contribute to the need for the same network reinforcement. Cost allocation rules for network upgrades can be found in PJM Manual 14A, Attachment B. The possibility of sharing the reinforcement costs with other projects may be identified in the feasibility study, but the actual allocation will be deferred until the impact study is performed.

The Interconnection Customer seeking to interconnect a wind or solar generation facility shall maintain meteorological data facilities as well as provide that meteorological data which is required per Schedule H to the Interconnection Service Agreement and Section 8 of Manual 14D.

An Interconnection Customer with a proposed new Customer Facility that has a Maximum Facility Output equal to or greater than 100 MW shall install and maintain, at its expense, phasor measurement units (PMUs). See Section 8.5.3 of Appendix 2 to the Interconnection Service Agreement as well as section 4.3 of PJM Manual 14D for additional information.

PJM utilizes manufacturer models to ensure the performance of turbines and inverters is properly captured during the simulations performed for stability verification and, where applicable, for compliance with low voltage ride through requirements. Turbine manufacturers provide such models to their customers. The list of manufacturer models PJM has already validated is contained in Attachment B of Manual 14G. Manufacturer models may be updated from time to time, for various reasons such as to reflect changes to the control systems or to more accurately represent the capabilities turbines or inverters and controls which are currently available in the field. Additionally, as new turbine models are developed, turbine manufacturers provide such new models which must be used in the conduct of these studies. PJM needs adequate time to evaluate the new models in order to reduce delays to the System Impact Study process timeline for the Interconnection Customer as well as other Interconnection Customers in the study group. Therefore, PJM will require that any Interconnection Customer with a new manufacturer model must supply that model to PJM, along with a \$10,000 fully refundable deposit, no later than three (3) months prior to the starting date of the System Impact Study (See Section 4.3 for starting dates) for the Interconnection Request which shall specify the use of the new model. The Interconnection Customer will be required to submit a completed dynamic model study request form (Attachment B-1 of Manual 14G) in order to document the request for the study.

The Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

2 General

The Interconnection Customer (IC), has proposed a Wind generating facility located in Woodford County, Illinois. This is an uprate of the proposed AE1-113 queue request and the installed facilities will have a total capability of 400 MW, an increase of 100 MW with 25 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is December 31, 2021. This study does not imply a TO commitment to this in-service date.

Queue Number	AE2-255
Project Name	MOLECREEK 345 KV
State	Illinois
County	Woodford
Transmission Owner	ComEd
MFO	400
MWE	100
MWC	25
Fuel	Wind
Basecase Study Year	2022

2.1 Primary Point of Interconnection

Queue Position AE2-255, a 100 MW wind farm proposes to interconnect with the ComEd transmission system by tying to the 300 MW wind farm to be interconnected to TSS 908 Mole Creek as Primary POI for PJM queue position AE1-113.

2.2 Cost Summary

The AE2-255 project will be responsible for the following costs:

Description	Total Cost
Attachment Facilities	\$200,000
Direct Connection Network Upgrade	none
Non Direct Connection Network Upgrades	none
Total Costs	\$200,000

In addition, the AE2-255 project may be responsible for a contribution to the following costs

Description	Total Cost
System Upgrades	\$249,537,560

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

3 Transmission Owner Scope of Work

4 Attachment Facilities

To accommodate interconnection of AE2-255, the relaying, SCADA, Communication and metering between the proposed AE1-113 wind farm and TSS 908 Mole Creek would be reviewed and upgraded if needed. The preliminary cost estimate for the Attachment Facilities is estimated at \$ 200,000.

5 Direct Connection Cost Estimate

None

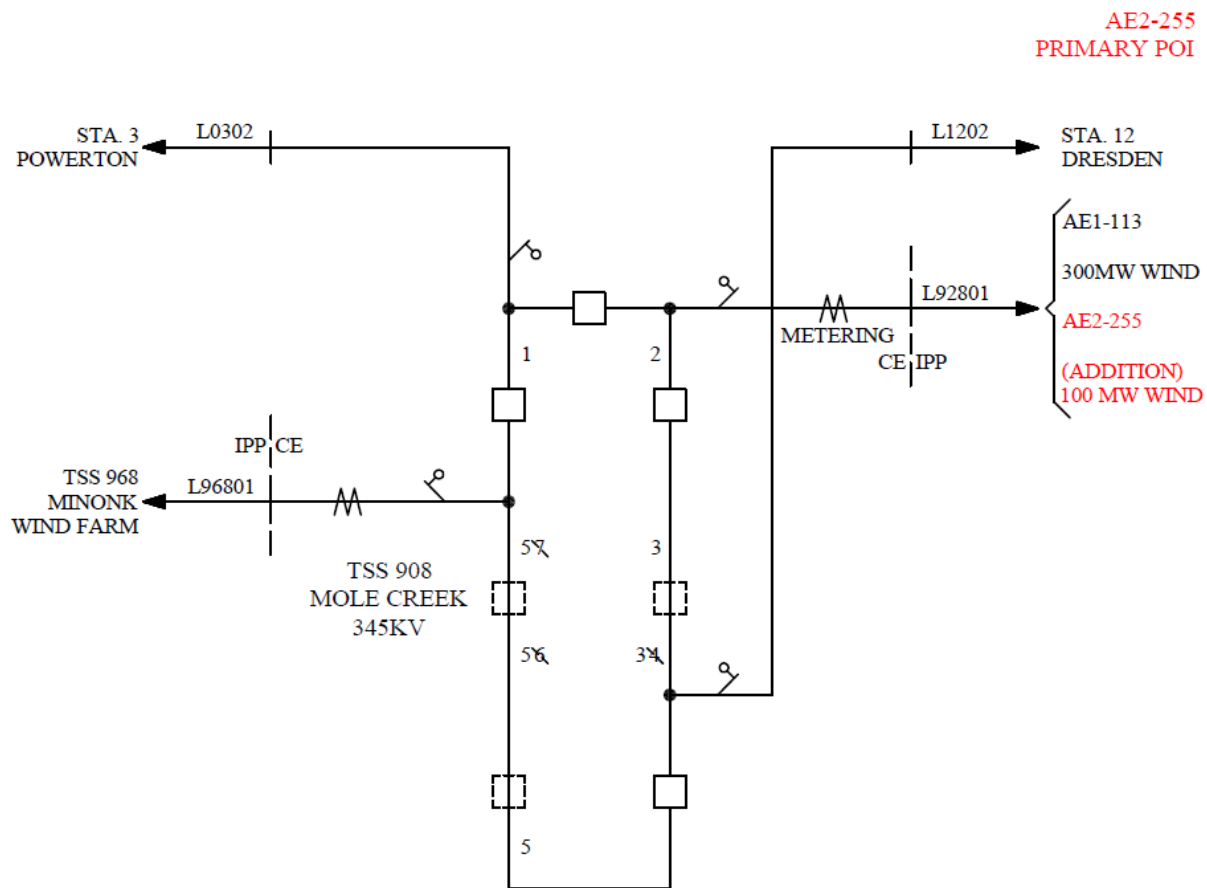
6 Non-Direct Connection Cost Estimate

None.

7 Schedule

To be determined

8 Transmission Owner Analysis



9 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.

10 Revenue Metering and SCADA 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.

11 Network Impacts for Primary Point of Interconnection

The Queue Project AE2-255 was evaluated as a 100.0 MW (Capacity 25.0 MW) injection at the Molecreek 345kV substation in the ComEd area. Project AE2-255 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE2-255 was studied with a commercial probability of 0.53. Potential network impacts were as follows:

Summer Peak Load Flow

12 Generation Deliverability

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

None

13 Multiple Facility Contingency

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

None

14 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	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
8899837	270716	DRESDEN ; B	CE	274702	KENDALL ;BU	CE	1	COMED_P2-2_111_EJ-345B_2	bus	1195.0	104.88	106.35	DC	17.58
8899933	270716	DRESDEN ; B	CE	275179	DRESDEN ;1M	CE	1	COMED_P4_012-45-BT5-6	breaker	442.0	160.44	163.19	DC	12.2
8900114	270716	DRESDEN ; B	CE	270928	WOLFS ; B	CE	1	COMED_P4_012-45-BT5-6	breaker	1479.0	119.01	121.11	DC	30.8
8900265	270716	DRESDEN ; B	CE	274702	KENDALL ;BU	CE	1	COMED_P4_111-45-L11126	breaker	1195.0	104.94	106.41	DC	17.58
8900266	270716	DRESDEN ; B	CE	274702	KENDALL ;BU	CE	1	COMED_P4_111-45-L14321T	breaker	1195.0	104.88	106.35	DC	17.58
8900990	270716	DRESDEN ; B	CE	274702	KENDALL ;BU	CE	1	COMED_P7_345-L11620_B-S+_345-L11622_R-S	tower	1195.0	129.75	130.39	DC	16.68
8900991	270716	DRESDEN ; B	CE	274702	KENDALL ;BU	CE	1	COMED_P7_345-L1221_B-S+_345-L1223_TR-S	tower	1195.0	110.38	111.89	DC	17.97
8901134	270716	DRESDEN ; B	CE	275179	DRESDEN ;1M	CE	1	COMED_P7_345-L1223_TR-S+_345-L14321TB-N	tower	530.0	102.91	103.42	DC	5.96
8901135	270716	DRESDEN ; B	CE	275179	DRESDEN ;1M	CE	1	COMED_P7_345-L1221_B-S+_345-L1223_TR-S	tower	530.0	102.39	102.9	DC	5.96
8900503	270855	POWER TO N ; R	CE	349662	7TAZEWEL L	AMIL	1	COMED_P1-2_345-L1202_B-S-A	single	1479.0	107.15	108.2	DC	15.54
8899930	270926	WILTON ; B	CE	275232	WILTON ;3M	CE	1	COMED_P4_112-65-BT5-6	breaker	1379.0	163.22	163.3	DC	14.81
8899939	270927	WILTON ; R	CE	275233	WILTON ;4M	CE	1	COMED_P4_112-65-BT2-3	breaker	1379.0	162.98	163.07	DC	15.13
8899780	274702	KENDALL ;BU	CE	270810	LOCKPORT ; B	CE	1	COMED_P2-2_111_EJ-345B_2	bus	1479.0	120.87	122.04	DC	17.25
8900109	274702	KENDALL ;BU	CE	270810	LOCKPORT ; B	CE	1	COMED_P4_111-45-L16704T	breaker	1479.0	121.17	122.33	DC	17.23
8900110	274702	KENDALL ;BU	CE	270810	LOCKPORT ; B	CE	1	COMED_P4_111-45-L11126	breaker	1479.0	120.91	122.07	DC	17.25
8900111	274702	KENDALL ;BU	CE	270810	LOCKPORT ; B	CE	1	COMED_P4_111-45-L14321T	breaker	1479.0	120.87	122.04	DC	17.25
7290249	274804	UNIV PK N;RP	CE	243229	05OLIVE	AEP	1	AEP_P4_#2978_05DUMONT 765_B	breaker	971.0	138.75	138.84	DC	9.74
7290250	274804	UNIV PK N;RP	CE	243229	05OLIVE	AEP	1	COMED_P4_023-65-BT2-3	breaker	971.0	137.63	137.73	DC	9.81

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC DC	MW IMPACT
729025 1	27480 4	UNIV PK N;RP	CE	24322 9	05OLIVE	AEP	1	COMED_P4_112-65-BT4-5	breaker	971.0	137.63	137.73	DC	9.81
729025 2	27480 4	UNIV PK N;RP	CE	24322 9	05OLIVE	AEP	1	COMED_P4_112-65-BT3-4	breaker	971.0	137.63	137.73	DC	9.81
729025 3	27480 4	UNIV PK N;RP	CE	24322 9	05OLIVE	AEP	1	COMED_P4_023-65-BT4-5	breaker	971.0	137.62	137.72	DC	9.81
889994 1	27517 9	DRESDEN ;1M	CE	27133 7	DRESDEN ; R	CE	1	COMED_P4_012-45-BT5-6	breaker	442.0	160.39	163.15	DC	12.2
890113 7	27517 9	DRESDEN ;1M	CE	27133 7	DRESDEN ; R	CE	1	COMED_P7_345-L1223_TR-S+_345-L14321TB-N	tower	530.0	102.87	103.38	DC	5.96
890113 8	27517 9	DRESDEN ;1M	CE	27133 7	DRESDEN ; R	CE	1	COMED_P7_345-L1221_B-S+_345-L1223_TR-S	tower	530.0	102.37	102.88	DC	5.96
889993 2	27523 2	WILTON ;3M	CE	27064 4	WILTON ;	CE	1	COMED_P4_112-65-BT5-6	breaker	1379.0	163.22	163.3	DC	14.81
889993 8	27523 3	WILTON ;4M	CE	27064 4	WILTON ;	CE	1	COMED_P4_112-65-BT2-3	breaker	1379.0	162.98	163.07	DC	15.13
890107 0	91805 0	AA1-018 TAP	CE	27076 9	GOODINGS ;2R	CE	1	COMED_P7_345-L1202_B-S+_345-L1227_R-S-A	tower	1494.0	107.62	109.03	DC	21.04
890094 2	93074 0	AB1-122 TAP	CE	27071 7	DRESDEN ; R	CE	1	COMED_P7_345-L19601_B-S+_345-L9801_R-S_FSA	tower	1195.0	178.23	179.25	DC	12.14
890094 3	93074 0	AB1-122 TAP	CE	27071 7	DRESDEN ; R	CE	1	COMED_P7_345-L0301_B-S+_345-L9801_R-S_FSA	tower	1195.0	172.64	173.65	DC	12.15
890049 5	93075 0	AB1-122 TAP	CE	27071 6	DRESDEN ; B	CE	1	Base Case	single	1201.0	134.64	135.68	DC	12.52
890049 6	93075 0	AB1-122 TAP	CE	27071 6	DRESDEN ; B	CE	1	COMED_P1-2_345-L0304_R-S	single	1479.0	119.94	120.99	DC	15.56
890098 3	93075 0	AB1-122 TAP	CE	27071 6	DRESDEN ; B	CE	1	COMED_P7_345-L19601_B-S+_345-L9801_R-S_FSA	tower	1768.0	132.19	135.3	DC	54.99
890098 4	93075 0	AB1-122 TAP	CE	27071 6	DRESDEN ; B	CE	1	COMED_P7_345-L0301_B-S+_345-L9801_R-S_FSA	tower	1768.0	127.73	130.84	DC	55.0
890113 3	93629 0	AD2-038 TAP	CE	91805 0	AA1-018 TAP	CE	1	COMED_P7_345-L1202_B-S+_345-L1227_R-S-A	tower	1494.0	101.82	103.23	DC	21.05

15 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	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
----	-----------	----------	---------------	---------	--------	-------------	--------	-----------	------	------------	-----------------------	------------------------	-------	-----------

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
7290972	255113	17STILLWELL	NIPS	243219	05DUMONT	AEP	1	AEP_P1-2_#695A	operation	1409.0	170.39	170.47	DC	14.27
8900682	270716	DRESDEN ; B	CE	275179	DRESDEN ;1M	CE	1	COMED_P1-2_345-L10805_B-S	operation	442.0	118.73	119.34	DC	5.99
8900856	270716	DRESDEN ; B	CE	274702	KENDALL ;BU	CE	1	COMED_P1-2_345-L1221__B-S	operation	1195.0	104.05	105.53	DC	17.71
8900632	270822	MOLECREEK; B	CE	270854	POWERTON ; B	CE	1	COMED_P1-2_345-L1202__B-S-A	operation	1479.0	119.26	126.02	DC	99.98
8900502	270855	POWERTON ; R	CE	349662	7TAZEWELL	AMIL	1	COMED_P1-2_345-L1202__B-S-A	operation	1479.0	145.09	149.29	DC	62.14
8900668	274702	KENDALL ;BU	CE	270810	LOCKPORT ; B	CE	1	COMED_P1-2_345-L1221__B-S	operation	1479.0	120.13	121.31	DC	17.38
8900670	274702	KENDALL ;BU	CE	270810	LOCKPORT ; B	CE	1	Base Case	operation	1201.0	119.7	120.81	DC	13.33
7291129	274804	UNIV PK N;RP	CE	243229	05OLIVE	AEP	1	AEP_P1-2_#695A	operation	971.0	137.61	137.71	DC	9.81
8900692	275179	DRESDEN ;1M	CE	271337	DRESDEN ; R	CE	1	COMED_P1-2_345-L10805_B-S	operation	442.0	118.7	119.32	DC	5.99
8900447	930740	AB1-122 TAP	CE	270717	DRESDEN ; R	CE	1	COMED_P1-2_345-L1202__B-S-A	operation	1195.0	169.91	171.47	DC	18.6
8900490	930750	AB1-122 TAP	CE	270716	DRESDEN ; B	CE	1	Base Case	operation	1201.0	155.06	159.23	DC	50.1
8900491	930750	AB1-122 TAP	CE	270716	DRESDEN ; B	CE	1	COMED_P1-2_345-L0304__R-S	operation	1479.0	148.22	152.43	DC	62.26

16 System Reinforcements

ID	Index	Facility	Upgrade Description	Cost
8900114	3	DRESDEN ; B 345.0 kV - WOLFS ; B 345.0 kV Ckt 1	ce-013 (294) : ComEd 345kV L1221 SSTE rating is 1568 MVA. The post contingency flow for this event exceeds the rating therefore an upgrade is required. The upgrade will be to reconductor a portion of the line along with sag mitigation on another portion of the line. A preliminary estimate for the upgrades is \$12.6M with a estimated construction timeline of 30 months. Upon completion of the upgrades the rating limits will be 1334/1726/1837/2084 MVA (SN/SLTE/SSTE/SLD). Project Type : FAC Cost : \$12,600,000 Time Estimate : 30.0 Months	\$12,600,000
8901133	15	AD2-038 TAP 345.0 kV - AA1-018 TAP 345.0 kV Ckt 1	8901133 No upgrade is required. ComEd 345kV L0303 SLD & ALDR ratings are 1494 MVA & 1718 MVA.	\$0
8900983,8900984,8900496,8900495	14	AB1-122 TAP 345.0 kV - DRESDEN ; B 345.0 kV Ckt 1	ce-022 (305) : ComEd 345kV L1202 SSTE Rating is 1568 MVA. The post contingency flow for this event exceeds the rating therefore an upgrade is required. The upgrade will be to reconductor the line along with an upgrade of the station conductor at STA 12 Dresden. A preliminary estimate for the upgrades is \$5.2M with a estimated construction timeline of 24 months. Upon completion the rating limits will be 1649/1649/1676/1772 MVA (SN/SLTE/SSTE/SLD). Project Type : FAC Cost : \$5,200,000 Time Estimate : 24.0 Months ce-022a (306) : ComEd 345kV L1202 SLD & ALDR ratings are 1768 MVA & 2033 MVA. The post contingency flow for this event exceeds the rating therefore an upgrade is required. The upgrade will be to re-conductor a portion of the line while mitigating sag issues on another portion of the line. An upgrade of station conductor at one terminal will also be required. A preliminary estimate for this work is \$20.4M with a estimated construction timeline of 30-36 months. Upon completion of the upgrades the rating limits will be 1334/1726/1837/2084/2397 MVA (SN/SLTE/SSTE/SLD/ALDR). Project Type : FAC Cost : \$20,400,000 Time Estimate : 30-36 Months ce-022b (307) : ComEd 345kV L1202 SSTE Rating is 1568 MVA. The post contingency flow for this event exceeds the rating therefore an upgrade is required. The upgrade will be to reconductor the line, mitigate sag on the line along with an upgrade of the station conductor at STA 12 Dresden. A preliminary estimate for the upgrades is \$21.2M with a estimated construction timeline of 24 onths. Upon completion the rating limits will be 1649/1726/1837/2084 MVA (SN/SLTE/SSTE/SLD). Project Type : FAC Cost : \$21,200,000 Time Estimate : 24.0 Months	\$21,200,000

ID	Index	Facility	Upgrade Description	Cost
8899932	10	WILTON ;3M 345.0 kV - WILTON ; 765.0 kV Ckt 1	n5145 (286) : 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
8899930	5	WILTON ; B 345.0 kV - WILTON ;3M 345.0 kV Ckt 1	n5145 (286) : 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
8899939	6	WILTON ; R 345.0 kV - WILTON ;4M 345.0 kV Ckt 1	n5145 (286) : 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
8899938	11	WILTON ;4M 345.0 kV - WILTON ; 765.0 kV Ckt 1	n5145 (286) : 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
7290252,7290253,7290250,7290251,7290249	8	UNIV PK N;RP 345.0 kV - 05OLIVE 345.0 kV Ckt 1	AEP_AE1_REF_r0001 (120) : A Sag Study will be required on the 40.64 miles of ACSR/PE 1414 62/19 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 AEP_AE1_REF_r0002 (121) : Replace 5 Jumpers (Sub cond 2156 ACSR 84/19 STD at Olive station, estimated cost : \$175,000 Project Type : FAC Cost : \$175,000 Time Estimate : 6-12 Months ce-001 (272) : AEP owns limit on L97008. CE has a sag limit on 2 types of conductors as well. CE would need to address sag limit of 2 types of conductors to reach required rating. A preliminary estimate for sag mitigation is \$21.4M 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 : \$21,400,000 Time Estimate : 30.0 Months	\$21,737,560
8901135,8901134,8899933	2	DRESDEN ; B 345.0 kV - DRESDEN ;1M 138.0 kV Ckt 1	ce-010 (289) : STA 12 TR 81. Install the 3rd auto-transformer at Station 12 including associated 345kV & 138kV bus work. The addition of this transformer will eliminate the overloading. Project Type : CON Cost : \$15,000,000 Time Estimate : 36-40 Months	\$45,000,000
8900503	4	POWERTON ; R 345.0 kV - 7TAZEWELL 345.0 kV Ckt 1	NonPJMArea (150) : The external (i.e. Non-PJM) Transmission Owner, AMIL, will not evaluate this violation until the impact study phase. Project Type : FAC Cost : \$0 Time Estimate : N/A Months ce-005 (276) : ComEd 345kV L0304 SSTE rating is 1512 MVA. The post contingency flow for this event exceeds the rating therefore an upgrade is required. The upgrade will be to mitigate the sag on the line. A preliminary estimate for this work is \$9.1M with a estimated construction timeline of 30 months. Upon completion of this upgrade the new ratings will be 1461/1656/1909/1912 MVA (SN/SLTE/SSTE/SLD). Project Type : FAC Cost : \$9,100,000 Time Estimate : 30.0 Months	\$9,100,000

ID	Index	Facility	Upgrade Description	Cost
8900110,8900111,8900109,8899780	7	KENDALL ;BU 345.0 kV - LOCKPORT ; B 345.0 kV Ckt 1	n5144 (277) : Re-conductor a portion of the Kendall Lockport B 345 kV line along with sag mitigation on a separate portion. Project Type : FAC Cost : \$38,600,000 Time Estimate : 24-30 Months n5918 (278) : Upgrade station conductor on the Kendall - Lockport 'B' 345 kV line. Project Type : FAC Cost : \$900,000 Time Estimate : 24-30 Months	\$39,500,000
8900943,8900942	13	AB1-122 TAP 345.0 kV - DRESDEN ; R 345.0 kV Ckt 1	ce-024 (309) : ComEd 345kV L1227 SLD and ALDR ratings are 1284 MVA & 1477 MVA. The post contingency flow for this event exceeds the ratings therefore an upgrade is required. The upgrade will be to mitigate the sag on a portion of the line, re-conductor another segment of the line and upgrade the station conductor at a terminal. A preliminary estimate for the upgrades is \$34.2 with an estimated construction timeline of 30-36 months. Upon completion of the upgrades the rating limits will be 1334/1726/1837/2084/2397 MVA (SN/SLTE/SSTE/SLD/ALDR). Project Type : FAC Cost : \$34,200,000 Time Estimate : 30-36 Months	\$34,200,000
8900991,8900990,8899837,8900265,8900266	1	DRESDEN ; B 345.0 kV - KENDALL ;BU 345.0 kV Ckt 1	8900265,8900990,8900991,8900266 No upgrade is required. L93505 SSTE rating is 1251 MVA. L93505 SLD & ALDR ratings are 1367 MVA & 1572 MVA. ce-006 (280) : ComEd 345kV L93505 SSTE rating is 1251 MVA. The post contingency rating for this event exceeds the rating therefore an upgrade is required. The upgrade will be to mitigate sag on the line. A preliminary estimate for this upgrade is \$10.2 M with a estimated construction timeline of 30 months. Upon completion of this upgrade the ratings will be 1201/1479/1568/1768 MVA (SN/SLTE/SSTE/SLD). Project Type : FAC Cost : \$10,200,000 Time Estimate : 30.0 Months	\$10,200,000
8901137,8899941,8901138	9	DRESDEN ;1M 138.0 kV - DRESDEN ; R 138.0 kV Ckt 1	ce-010 (289) : STA 12 TR 81. Install the 3rd auto-transformer at Station 12 including associated 345kV & 138kV bus work. The addition of this transformer will eliminate the overloading. Project Type : CON Cost : \$15,000,000 Time Estimate : 36-40 Months	\$45,000,000
8901070	12	AA1-018 TAP 345.0 kV - GOODINGS ;2R 345.0 kV Ckt 1	<u>8901070</u> No upgrade is required. ComEd 345kV L0303 SLD & ALDR ratings are 1494 MVA & 1718 MVA.	\$0
			TOTAL COST	\$249,537,560

If “No Reinforcement Needed. Not a valid violation” was provided as the Upgrade Description for a facility in the System Reinforcements table then that facility met one of the following conditions:

- a. The loading on the facility at your queue position was less than 100%; therefore, the facility is not yet overloaded, but may be overloaded by end of the AE2 queue.
- b. The TO reviewed their ratings on the facility and determined that the current rating was greater than the rating in PJM’s model. This new rating was greater than the loading at your queue position making the violation invalid.
- c. The TO reviewed the contingency and determined that contingency was not valid; therefore the violation is invalid. Any contingency corrections will be assessed and corrected in the AE2 impact study phase.

17 Flow Gate Details

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, 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 gage 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.

17.1 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
8900990	270716	DRESDEN ; B	CE	274702	KENDALL ;BU	CE	1	COMED_P7_345-L11620_B-S+_345-L11622_R-S	tower	1195.0	129.75	130.39	DC	16.68

Bus #	Bus	MW Impact
274658	DRESDEN ;2U	32.94
274728	ELWOOD EC;5P	3.46
274730	ELWOOD EC;6P	3.46
274732	ELWOOD EC;7P	3.46
274734	ELWOOD EC;8P	3.46
274736	ELWOOD EC;9P	3.46
290021	O50 E	26.69
927091	AC1-204 1	105.64
927101	AC1-204 2	104.93
930741	AB1-122 1O1	46.94
930751	AB1-122 2O1	169.57
934101	AD1-039 1	4.6
934111	AD1-039 2	16.62
936511	AD2-066 C O1	9.19
936512	AD2-066 E O1	6.13
937401	AD2-194 1	11.36
937411	AD2-194 2	11.28
938511	AE1-070 1	13.35
938521	AE1-070 2	12.13
938851	AE1-113 C O1	12.08
938852	AE1-113 E O1	37.97
939861	AE1-222 1	51.84
939871	AE1-222 2	187.26
942421	AE2-255 C O1	4.17
942422	AE2-255 E O1	12.51
BLUEG	BLUEG	0.23
CARR	CARR	0.09
CBM-S1	CBM-S1	1.11
CBM-S2	CBM-S2	0.09
CBM-W1	CBM-W1	0.51
CBM-W2	CBM-W2	20.07
CIN	CIN	0.46
G-007	G-007	0.24
IPL	IPL	0.17
MEC	MEC	7.95
O-066	O-066	1.55
RENSSELAER	RENSSELAER	0.07
TRIMBLE	TRIMBLE	0.04
Z1-043	Z1-043	13.38

17.2 Index 2

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
8899933	270716	DRESDEN ; B	CE	275179	DRESDEN ;1M	CE	1	COMED_P4_012-45-BT5-6	breaker	442.0	160.44	163.19	DC	12.2

Bus #	Bus	MW Impact
274658	DRESDEN ;2U	24.98
274879	MINONK ;1U	0.59
290021	O50 E	19.52
916512	Z1-107 E	1.49
930751	AB1-122 2O1	128.51
934111	AD1-039 2	12.59
938851	AE1-113 C O1	8.83
938852	AE1-113 E O1	27.76
939871	AE1-222 2	141.92
942421	AE2-255 C O1	3.05
942422	AE2-255 E O1	9.15
942913	AE2-310 BAT	2.11
BLUEG	BLUEG	0.91
CALDERWOOD	CALDERWOOD	0.02
CANNELTON	CANNELTON	0.04
CARR	CARR	0.07
CATAWBA	CATAWBA	0.03
CBM-S1	CBM-S1	0.03
CBM-W1	CBM-W1	4.02
CBM-W2	CBM-W2	3.3
CHEOAH	CHEOAH	0.02
CHILHOWEE	CHILHOWEE	0.01
ELMERSMITH	ELMERSMITH	0.05
G-007	G-007	0.21
GIBSON	GIBSON	0.03
HAMLET	HAMLET	0.06
MEC	MEC	5.39
NEWTON	NEWTON	0.03
O-066	O-066	1.32
RENSSELAER	RENSSELAER	0.06
SANTEETLA	SANTEETLA	0.01
TILTON	TILTON	0.16
TRIMBLE	TRIMBLE	0.1
WEC	WEC	1.05

17.3 Index 3

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
8900114	270716	DRESDEN ; B	CE	270928	WOLFS ; B	CE	1	COMED_P4_012-45-BT5-6	breaker	1479.0	119.01	121.11	DC	30.8

Bus #	Bus	MW Impact
274658	DRESDEN ;2U	61.98
274677	POWERTON ;5U	10.18
274678	POWERTON ;6U	10.09
274836	EQUISTAR ; R	3.53
274879	MINONK ;1U	1.5
290021	O50 E	49.28
904211	W3-135	0.29
916502	Z1-106 E1	0.62
916504	Z1-106 E2	0.61
930751	AB1-122 2O1	318.89
934111	AD1-039 2	31.25
936291	AD2-038 C O1	1.49
936292	AD2-038 E O1	9.96
936511	AD2-066 C O1	15.81
936512	AD2-066 E O1	10.54
938851	AE1-113 C O1	22.3
938852	AE1-113 E O1	70.1
939321	AE1-163 C O1	3.74
939322	AE1-163 E O1	22.96
939871	AE1-222 2	352.17
940621	AE2-049 C O1	4.3
940622	AE2-049 E O1	2.87
942421	AE2-255 C O1	7.7
942422	AE2-255 E O1	23.1
942651	AE2-281 C	0.53
942652	AE2-281 E	3.28
942911	AE2-310 C	4.17
942912	AE2-310 E	1.13
953201	J715 C	1.34
953202	J715 E	7.25
BLUEG	BLUEG	0.44
CALDERWOOD	CALDERWOOD	0.02
CARR	CARR	0.07
CATAWBA	CATAWBA	0.03
CBM-S1	CBM-S1	0.07
CBM-W2	CBM-W2	7.83
CHEOAH	CHEOAH	0.02
CHILHOWEE	CHILHOWEE	0.01
CIN	CIN	0.15
FARMERCITY	FARMERCITY	0.1
G-007	G-007	0.2
HAMLET	HAMLET	0.06

Bus #	Bus	MW Impact
IPL	IPL	0.03
O-066	O-066	1.31
RENSSELAER	RENSSELAER	0.06
SANTEETLA	SANTEETLA	0.01
TATANKA	TATANKA	0.73
TRIMBLE	TRIMBLE	0.05
Z1-043	Z1-043	16.13

17.4 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
8900503	270855	POWERTON ; R	CE	349662	7TAZEWELL	AMIL	1	COMED_P1-2_345-L1202__B-S-A	single	1479.0	107.15	108.2	DC	15.54

Bus #	Bus	MW Impact
274677	POWERTON ;5U	58.23
274678	POWERTON ;6U	58.36
274861	TOP CROP ;1U	0.72
274862	TOP CROP ;2U	1.39
274879	MINONK ;1U	3.03
918051	AA1-018 C	0.71
930751	AB1-122 2O1	357.31
934111	AD1-039 2	35.02
934871	AD1-116 C	2.26
936291	AD2-038 C O1	8.97
938851	AE1-113 C O1	44.99
939321	AE1-163 C O1	22.54
939871	AE1-222 2	394.6
942421	AE2-255 C O1	15.54
942651	AE2-281 C	3.22
AC1-056	AC1-056	6.52
BLUEG	BLUEG	5.09
CALDERWOOD	CALDERWOOD	0.98
CANNELTON	CANNELTON	0.48
CARR	CARR	0.23
CATAWBA	CATAWBA	0.48
CHEOAH	CHEOAH	0.89
CHILHOWEE	CHILHOWEE	0.32
COFFEEN	COFFEEN	2.37
COTTONWOOD	COTTONWOOD	6.65
DUCKCREEK	DUCKCREEK	24.18
EDWARDS	EDWARDS	12.15
ELMERSMITH	ELMERSMITH	0.87
FARMERCITY	FARMERCITY	1.94
GIBSON	GIBSON	0.32
HAMLET	HAMLET	0.74
MECS	MECS	0.96
NEWTON	NEWTON	4.21
PRAIRIE	PRAIRIE	11.18
RENSSELAER	RENSSELAER	0.18
SANTEETLA	SANTEETLA	0.26
SMITHLAND	SMITHLAND	0.6
TATANKA	TATANKA	3.01
TILTON	TILTON	1.46
TRIMBLE	TRIMBLE	0.54

Bus #	Bus	MW Impact
TVA	TVA	4.18
UNIONPOWER	UNIONPOWER	2.26

17.5 Index 5

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
8899930	270926	WILTON ;B	CE	275232	WILTON ;3M	CE	1	COMED_P4_112-65-BT5-6__	breaker	1379.0	163.22	163.3	DC	14.81

Bus #	Bus	MW Impact
270859	PWR VTR EC;R	14.78
274722	S-055 E	13.73
274772	LINCOLN ;3U	2.67
274773	LINCOLN ;4U	2.67
274774	LINCOLN ;5U	2.67
274775	LINCOLN ;6U	2.67
274776	LINCOLN ;7U	2.67
274777	LINCOLN ;8U	2.67
274788	SE CHICAG;5U	5.44
274789	SE CHICAG;6U	5.44
274790	SE CHICAG;7U	5.44
274791	SE CHICAG;8U	5.44
274792	SE CHICAG;9U	5.4
274793	SE CHICAG;0U	5.4
274794	SE CHICAG;1U	5.4
274795	SE CHICAG;2U	5.4
274859	EASYR;U1 E	13.43
274860	EASYR;U2 E	13.43
274888	PILOT HIL;1E	23.57
274890	CAYUG;1U E	20.22
274891	CAYUG;2U E	20.22
275149	KEMPTON ;1E	23.57
290021	O50 E	23.7
290051	GSG-6; E	12.77
290108	LEEDK;1U E	29.68
293061	N-015 E	19.41
293644	O22 E1	12.53
293645	O22 E2	24.32
294392	P-010 E	24.65
294763	P-046 E	11.45
295109	WESTBROOK E	6.84
295111	SUBLETTE E	3.17
296125	R-030 C3	4.97
296128	R-030 E3	19.89
296271	R-030 C2	4.91
296272	R-030 E2	19.65
296308	R-030 C1	4.91
296309	R-030 E1	19.65
910542	X3-005 E	0.89
914641	Y2-103	54.9
915011	Y3-013 1	4.58
915021	Y3-013 2	4.58

Bus #	Bus	MW Impact
915031	Y3-013 3	4.58
916221	Z1-073 E	6.59
916502	Z1-106 E1	1.54
916504	Z1-106 E2	1.54
916512	Z1-107 E	3.16
916522	Z1-108 E	3.04
917502	Z2-087 E	25.7
918052	AA1-018 E	20.09
919581	AA2-030	18.9
920272	AA2-123 E	2.98
924041	AB2-047 C O1	4.74
924042	AB2-047 E O1	31.72
924471	AB2-096	51.72
925161	AB2-173	3.83
925302	AB2-191 E	1.69
926311	AC1-109 1	2.34
926321	AC1-109 2	2.34
926331	AC1-110 1	2.32
926341	AC1-110 2	2.32
926351	AC1-111 1	0.93
926361	AC1-111 2	0.93
926371	AC1-111 3	0.93
926381	AC1-111 4	0.93
926391	AC1-111 5	0.93
926401	AC1-111 6	0.93
926431	AC1-114	2.91
926821	AC1-168 C O1	1.43
926822	AC1-168 E O1	9.57
927091	AC1-204 1	88.75
927101	AC1-204 2	88.75
927451	AC1-142A 1	5.11
927461	AC1-142A 2	5.11
927511	AC1-113 1	1.45
927521	AC1-113 2	1.45
927531	AC1-185 1	0.84
927541	AC1-185 2	0.84
927551	AC1-185 3	0.84
927561	AC1-185 4	0.84
927571	AC1-185 5	0.84
927581	AC1-185 6	0.84
927591	AC1-185 7	0.84
927601	AC1-185 8	0.84
930481	AB1-089	80.32
930501	AB1-091 O1	93.8
930741	AB1-122 1O1	89.17
930751	AB1-122 2O1	90.13
932881	AC2-115 1	2.91
932891	AC2-115 2	2.91
932921	AC2-116	1.02
932931	AC2-117	6.51
933341	AC2-147 C	1.07
933342	AC2-147 E	1.74

Bus #	Bus	MW Impact
933411	AC2-154 C	3.2
933412	AC2-154 E	5.22
933431	AC2-156 C O1	1.17
933432	AC2-156 E O1	1.91
933911	AD1-013 C	2.25
933912	AD1-013 E	3.59
933931	AD1-016 C	1.13
933932	AD1-016 E	1.85
934101	AD1-039 1	8.74
934111	AD1-039 2	8.83
934401	AD1-064 C O1	3.91
934402	AD1-064 E O1	18.33
934431	AD1-067 C	0.16
934432	AD1-067 E	0.67
934651	AD1-096 C	1.09
934652	AD1-096 E	1.78
934701	AD1-098 C O1	8.41
934702	AD1-098 E O1	6.14
934721	AD1-100 C	29.39
934722	AD1-100 E	137.14
934871	AD1-116 C	1.17
934872	AD1-116 E	1.91
934971	AD1-129 C	1.1
934972	AD1-129 E	0.74
935001	AD1-133 C O1	27.36
935002	AD1-133 E O1	18.24
936291	AD2-038 C O1	2.88
936292	AD2-038 E O1	19.25
936371	AD2-047 C O1	2.86
936372	AD2-047 E O1	30.81
936461	AD2-060	3.37
936511	AD2-066 C O1	10.34
936512	AD2-066 E O1	6.89
936781	AD2-101 C	5.82
936782	AD2-101 E	27.26
936791	AD2-102 C	14.68
936792	AD2-102 E	14.11
937001	AD2-134 C	3.34
937002	AD2-134 E	13.79
937031	AD2-137 C O1	7.17
937032	AD2-137 E O1	33.55
937051	AD2-140 C O1	7.53
937052	AD2-140 E O1	35.24
937061	AD2-141 C O1	7.48
937062	AD2-141 E O1	35.28
937071	AD2-142 C O1	15.05
937072	AD2-142 E O1	70.47
937121	AD2-148 C O1	4.5
937122	AD2-148 E O1	21.09
937131	AD2-149 C O1	4.5
937132	AD2-149 E O1	21.09
937141	AD2-150 C O1	4.5

Bus #	Bus	MW Impact
937142	AD2-150 E O1	21.09
937181	AD2-155 C O1	4.5
937182	AD2-155 E O1	21.09
937311	AD2-172 C	3.01
937312	AD2-172 E	4.15
937321	AD2-175 C	20.99
937322	AD2-175 E	13.99
937331	AD2-176 C O1	8.96
937332	AD2-176 E O1	5.97
937401	AD2-194 1	9.54
937411	AD2-194 2	9.54
938012	AE1-002 E O1	14.38
938511	AE1-070 1	11.21
938521	AE1-070 2	10.26
938851	AE1-113 C O1	10.72
938852	AE1-113 E O1	33.71
938861	AE1-114 C O1	4.39
938862	AE1-114 E O1	16.8
939051	AE1-134 1	1.67
939061	AE1-134 2	1.67
939321	AE1-163 C O1	7.23
939322	AE1-163 E O1	44.39
939351	AE1-166 C O1	14.5
939352	AE1-166 E O1	13.38
939401	AE1-172 C O1	9.5
939402	AE1-172 E O1	44.49
939691	AE1-199	2.92
939701	AE1-201 C	2.45
939702	AE1-201 E	0.54
939732	AE1-204 E	0.36
939741	AE1-205 C O1	12.45
939742	AE1-205 E O1	17.19
939861	AE1-222 1	98.48
939871	AE1-222 2	99.53
939921	AE1-228 C O1	12.28
939922	AE1-228 E O1	8.19
940101	AE1-252 C O1	16.2
940102	AE1-252 E O1	10.8
940501	AE2-035 C	3.01
940502	AE2-035 E	4.15
940621	AE2-049 C O1	11.53
940622	AE2-049 E O1	7.69
940631	AE2-050 C O1	15.38
940632	AE2-050 E O1	10.26
940752	AE2-062 E	0.16
940762	AE2-063 E	0.16
940881	AE2-077 C	3.85
940882	AE2-077 E	6.28
941131	AE2-107 C	8.93
941132	AE2-107 E	5.96
941551	AE2-152 C	18.59
941552	AE2-152 E	9.29

Bus #	Bus	MW Impact
941561	AE2-153 C O1	6.06
941562	AE2-153 E O1	28.37
941731	AE2-173	7.31
942111	AE2-223 C	2.88
942112	AE2-223 E	19.28
942421	AE2-255 C O1	3.7
942422	AE2-255 E O1	11.11
942651	AE2-281 C	1.03
942652	AE2-281 E	6.34
942881	AE2-307 C	28.2
942882	AE2-307 E	10.26
942911	AE2-310 C	11.2
942912	AE2-310 E	3.02
942991	AE2-321 C O1	9.98
942992	AE2-321 E O1	4.92
943121	AE2-341 C	15.61
943122	AE2-341 E	7.67
BLUEG	BLUEG	8.02
CALDERWOOD	CALDERWOOD	0.11
CANNELTON	CANNELTON	0.1
CARR	CARR	0.97
CATAWBA	CATAWBA	0.4
CBM-S1	CBM-S1	1.72
CBM-W1	CBM-W1	37.33
CBM-W2	CBM-W2	70.69
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.03
ELMERSMITH	ELMERSMITH	0.09
G-007	G-007	2.73
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.74
MEC	MEC	46.43
O-066	O-066	17.5
RENSSELAER	RENSSELAER	0.77
SANTEETLA	SANTEETLA	0.04
TRIMBLE	TRIMBLE	0.95
WEC	WEC	9.73
Z1-043	Z1-043	35.42

17.6 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
8899939	270927	WILTON ; R	CE	275233	WILTON ;4M	CE	1	COMED_P4_112-65-BT2-3__	breaker	1379.0	162.98	163.07	DC	15.13

Bus #	Bus	MW Impact
270859	PWR VTR EC;R	15.09
274722	S-055 E	14.02
274772	LINCOLN ;3U	2.74
274773	LINCOLN ;4U	2.74
274774	LINCOLN ;5U	2.74
274775	LINCOLN ;6U	2.74
274776	LINCOLN ;7U	2.74
274777	LINCOLN ;8U	2.74
274788	SE CHICAG;5U	5.56
274789	SE CHICAG;6U	5.56
274790	SE CHICAG;7U	5.56
274791	SE CHICAG;8U	5.56
274792	SE CHICAG;9U	5.52
274793	SE CHICAG;0U	5.52
274794	SE CHICAG;1U	5.52
274795	SE CHICAG;2U	5.52
274859	EASYR;U1 E	13.72
274860	EASYR;U2 E	13.72
274888	PILOT HIL;1E	24.06
274890	CAYUG;1U E	20.62
274891	CAYUG;2U E	20.62
275149	KEMPTON ;1E	24.06
290021	O50 E	24.2
290051	GSG-6; E	13.05
290108	LEEDK;1U E	30.31
293061	N-015 E	19.81
293516	O-009 E1	2.14
293517	O-009 E2	1.09
293518	O-009 E3	1.2
293644	O22 E1	12.79
293645	O22 E2	24.83
293715	O-029 E	12.21
293716	O-029 E	6.69
293717	O-029 E	6.15
294392	P-010 E	25.16
294763	P-046 E	11.69
295109	WESTBROOK E	6.98
295111	SUBLETTE E	3.24
296125	R-030 C3	5.07
296128	R-030 E3	20.29
296271	R-030 C2	5.01
296272	R-030 E2	20.05

Bus #	Bus	MW Impact
296308	R-030 C1	5.01
296309	R-030 E1	20.05
910542	X3-005 E	0.91
914641	Y2-103	56.07
915011	Y3-013 1	4.67
915021	Y3-013 2	4.67
915031	Y3-013 3	4.67
916221	Z1-073 E	6.73
916502	Z1-106 E1	1.58
916504	Z1-106 E2	1.58
916512	Z1-107 E	3.23
916522	Z1-108 E	3.1
917502	Z2-087 E	26.22
918052	AA1-018 E	20.53
919221	AA1-146	21.95
919581	AA2-030	21.95
920272	AA2-123 E	3.05
924041	AB2-047 C O1	4.84
924042	AB2-047 E O1	32.36
924471	AB2-096	52.83
925161	AB2-173	3.91
925302	AB2-191 E	1.73
926311	AC1-109 1	2.39
926321	AC1-109 2	2.39
926331	AC1-110 1	2.37
926341	AC1-110 2	2.37
926351	AC1-111 1	0.95
926361	AC1-111 2	0.95
926371	AC1-111 3	0.95
926381	AC1-111 4	0.95
926391	AC1-111 5	0.95
926401	AC1-111 6	0.95
926431	AC1-114	2.97
926821	AC1-168 C O1	1.46
926822	AC1-168 E O1	9.77
927091	AC1-204 1	90.65
927101	AC1-204 2	90.65
927451	AC1-142A 1	5.22
927461	AC1-142A 2	5.22
927511	AC1-113 1	1.48
927521	AC1-113 2	1.48
927531	AC1-185 1	0.86
927541	AC1-185 2	0.86
927551	AC1-185 3	0.86
927561	AC1-185 4	0.86
927571	AC1-185 5	0.86
927581	AC1-185 6	0.86
927591	AC1-185 7	0.86
927601	AC1-185 8	0.86
930481	AB1-089	82.03
930501	AB1-091 O1	95.74
930741	AB1-122 1O1	91.06

Bus #	Bus	MW Impact
930751	AB1-122 2O1	92.05
932881	AC2-115 1	2.97
932891	AC2-115 2	2.97
932921	AC2-116	1.04
932931	AC2-117	6.65
933341	AC2-147 C	1.09
933342	AC2-147 E	1.78
933411	AC2-154 C	3.27
933412	AC2-154 E	5.33
933431	AC2-156 C O1	1.19
933432	AC2-156 E O1	1.95
933911	AD1-013 C	2.3
933912	AD1-013 E	3.67
933931	AD1-016 C	1.16
933932	AD1-016 E	1.89
934101	AD1-039 1	8.92
934111	AD1-039 2	9.02
934401	AD1-064 C O1	4.0
934402	AD1-064 E O1	18.72
934431	AD1-067 C	0.16
934432	AD1-067 E	0.69
934651	AD1-096 C	1.11
934652	AD1-096 E	1.81
934701	AD1-098 C O1	8.59
934702	AD1-098 E O1	6.27
934721	AD1-100 C	29.97
934722	AD1-100 E	139.86
934871	AD1-116 C	1.2
934872	AD1-116 E	1.95
934971	AD1-129 C	1.13
934972	AD1-129 E	0.75
935001	AD1-133 C O1	27.93
935002	AD1-133 E O1	18.62
936291	AD2-038 C O1	2.94
936292	AD2-038 E O1	19.66
936371	AD2-047 C O1	2.92
936372	AD2-047 E O1	31.45
936461	AD2-060	3.44
936511	AD2-066 C O1	10.56
936512	AD2-066 E O1	7.04
936781	AD2-101 C	5.94
936782	AD2-101 E	27.82
936791	AD2-102 C	14.99
936792	AD2-102 E	14.41
937001	AD2-134 C	3.41
937002	AD2-134 E	14.09
937031	AD2-137 C O1	7.3
937032	AD2-137 E O1	34.17
937051	AD2-140 C O1	7.67
937052	AD2-140 E O1	35.89
937061	AD2-141 C O1	7.62
937062	AD2-141 E O1	35.93

Bus #	Bus	MW Impact
937071	AD2-142 C O1	15.33
937072	AD2-142 E O1	71.78
937121	AD2-148 C O1	4.6
937122	AD2-148 E O1	21.53
937131	AD2-149 C O1	4.6
937132	AD2-149 E O1	21.53
937141	AD2-150 C O1	4.6
937142	AD2-150 E O1	21.53
937181	AD2-155 C O1	4.6
937182	AD2-155 E O1	21.53
937311	AD2-172 C	3.07
937312	AD2-172 E	4.24
937321	AD2-175 C	21.42
937322	AD2-175 E	14.28
937331	AD2-176 C O1	9.15
937332	AD2-176 E O1	6.1
937401	AD2-194 1	9.75
937411	AD2-194 2	9.75
938012	AE1-002 E O1	14.65
938511	AE1-070 1	11.45
938521	AE1-070 2	10.48
938851	AE1-113 C O1	10.95
938852	AE1-113 E O1	34.43
938861	AE1-114 C O1	4.49
938862	AE1-114 E O1	17.15
939051	AE1-134 1	1.71
939061	AE1-134 2	1.71
939321	AE1-163 C O1	7.38
939322	AE1-163 E O1	45.35
939351	AE1-166 C O1	14.79
939352	AE1-166 E O1	13.65
939401	AE1-172 C O1	9.69
939402	AE1-172 E O1	45.37
939691	AE1-199	2.98
939701	AE1-201 C	2.5
939702	AE1-201 E	0.55
939732	AE1-204 E	0.36
939741	AE1-205 C O1	12.7
939742	AE1-205 E O1	17.54
939861	AE1-222 1	100.56
939871	AE1-222 2	101.65
939921	AE1-228 C O1	12.54
939922	AE1-228 E O1	8.36
940101	AE1-252 C O1	16.52
940102	AE1-252 E O1	11.01
940501	AE2-035 C	3.07
940502	AE2-035 E	4.24
940621	AE2-049 C O1	11.77
940622	AE2-049 E O1	7.85
940631	AE2-050 C O1	15.7
940632	AE2-050 E O1	10.47
940752	AE2-062 E	0.16

Bus #	Bus	MW Impact
940762	AE2-063 E	0.16
940881	AE2-077 C	3.93
940882	AE2-077 E	6.42
941131	AE2-107 C	9.12
941132	AE2-107 E	6.08
941551	AE2-152 C	18.96
941552	AE2-152 E	9.48
941561	AE2-153 C O1	6.18
941562	AE2-153 E O1	28.96
941731	AE2-173	7.45
942111	AE2-223 C	2.94
942112	AE2-223 E	19.67
942421	AE2-255 C O1	3.78
942422	AE2-255 E O1	11.34
942651	AE2-281 C	1.05
942652	AE2-281 E	6.48
942881	AE2-307 C	28.78
942882	AE2-307 E	10.47
942911	AE2-310 C	11.43
942912	AE2-310 E	3.09
942991	AE2-321 C O1	10.2
942992	AE2-321 E O1	5.02
943121	AE2-341 C	15.94
943122	AE2-341 E	7.83
BLUEG	BLUEG	8.2
CALDERWOOD	CALDERWOOD	0.12
CANNELTON	CANNELTON	0.1
CARR	CARR	0.99
CATAWBA	CATAWBA	0.4
CBM-S1	CBM-S1	1.75
CBM-W1	CBM-W1	38.13
CBM-W2	CBM-W2	72.15
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.04
ELMERSMITH	ELMERSMITH	0.09
G-007	G-007	2.79
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.76
MEC	MEC	47.41
O-066	O-066	17.87
RENSSELAER	RENSSELAER	0.78
SANTEETLA	SANTEETLA	0.04
TRIMBLE	TRIMBLE	0.98
WEC	WEC	9.93
Z1-043	Z1-043	36.17

17.7 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
8900111	274702	KENDALL ;BU	CE	270810	LOCKPORT ; B	CE	1	COMED_P4_111-45-L14321T	breaker	1479.0	120.87	122.04	DC	17.25

Bus #	Bus	MW Impact
274658	DRESDEN ;2U	34.62
274704	KENDALL ;1C	10.95
274705	KENDALL ;1S	7.3
274706	KENDALL ;2C	10.95
274707	KENDALL ;2S	7.3
274836	EQUISTAR ; R	1.99
274879	MINONK ;1U	0.84
290021	O50 E	27.6
904211	W3-135	0.18
927091	AC1-204 1	54.0
927101	AC1-204 2	53.17
930751	AB1-122 2O1	178.12
934111	AD1-039 2	17.46
936511	AD2-066 C O1	9.0
936512	AD2-066 E O1	6.0
937401	AD2-194 1	5.81
937411	AD2-194 2	5.72
938511	AE1-070 1	6.82
938521	AE1-070 2	6.15
938851	AE1-113 C O1	12.49
938852	AE1-113 E O1	39.25
939871	AE1-222 2	196.7
942421	AE2-255 C O1	4.31
942422	AE2-255 E O1	12.94
953201	J715 C	0.86
953202	J715 E	4.65
BLUEG	BLUEG	1.03
CALDERWOOD	CALDERWOOD	0.09
CANNELTON	CANNELTON	0.04
CARR	CARR	0.11
CATAWBA	CATAWBA	0.08
CBM-W2	CBM-W2	2.55
CHEOAH	CHEOAH	0.09
CHILHOWEE	CHILHOWEE	0.03
COTTONWOOD	COTTONWOOD	0.22
ELMERSMITH	ELMERSMITH	0.06
FARMERCITY	FARMERCITY	0.16
G-007	G-007	0.32
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.13
O-066	O-066	2.07
RENSSELAER	RENSSELAER	0.09

Bus #	Bus	MW Impact
SANTEETLA	SANTEETLA	0.03
TATANKA	TATANKA	0.76
TRIMBLE	TRIMBLE	0.12
TVA	TVA	0.19
UNIONPOWER	UNIONPOWER	0.09
Z1-043	Z1-043	9.62

17.8 Index 8

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
7290249	274804	UNIV PK N;RP	CE	243229	050LIVE	AEP	1	AEP_P4_#2978_05DUMONT 765_B	breaker	971.0	138.75	138.84	DC	9.74

Bus #	Bus	MW Impact
270859	PWR VTR EC;R	9.77
274722	S-055 E	9.13
274808	UNIV PK N;4U	1.28
274809	UNIV PK N;5U	1.28
274811	UNIV PK N;7U	1.28
274812	UNIV PK N;8U	1.28
274814	UNIV PK N;0U	1.28
274815	UNIV PK N;XU	1.28
274832	U4-027	8.59
274859	EASYR;U1 E	8.82
274860	EASYR;U2 E	8.82
274888	PILOT HIL;1E	14.83
274890	CAYUG;1U E	10.67
274891	CAYUG;2U E	10.67
275149	KEMPTON ;1E	14.83
290021	O50 E	15.58
290051	GSG-6; E	8.41
290108	LEEDK;1U E	19.56
293061	N-015 E	12.57
293516	O-009 E1	7.24
293517	O-009 E2	3.68
293518	O-009 E3	4.05
293644	O22 E1	7.86
293645	O22 E2	15.26
293715	O-029 E	7.82
293716	O-029 E	4.29
293717	O-029 E	3.94
293771	O-035 E	5.08
294392	P-010 E	15.97
294401	BSHIL;1U E	6.79
294410	BSHIL;2U E	6.79
294763	P-046 E	7.54
295109	WESTBROOK E	4.5
295111	SUBLETTE E	2.08
910542	X3-005 E	0.51
914641	Y2-103	36.51
915011	Y3-013 1	3.04
915021	Y3-013 2	3.04
915031	Y3-013 3	3.04
916211	Z1-072 E	3.84
916221	Z1-073 E	4.34

Bus #	Bus	MW Impact
916502	Z1-106 E1	1.02
916504	Z1-106 E2	1.02
916512	Z1-107 E	2.17
916522	Z1-108 E	2.01
918052	AA1-018 E	14.26
919221	AA1-146	14.08
919581	AA2-030	14.08
919621	AA2-039 C	1.65
919622	AA2-039 E	11.07
920272	AA2-123 E	1.98
924471	AB2-096	34.19
925161	AB2-173	2.51
925302	AB2-191 E	1.11
925581	AC1-033 C	1.11
925582	AC1-033 E	7.44
926311	AC1-109 1	1.55
926321	AC1-109 2	1.55
926331	AC1-110 1	1.53
926341	AC1-110 2	1.53
926351	AC1-111 1	0.62
926361	AC1-111 2	0.62
926371	AC1-111 3	0.62
926381	AC1-111 4	0.62
926391	AC1-111 5	0.62
926401	AC1-111 6	0.62
926431	AC1-114	1.92
926821	AC1-168 C O1	0.92
926822	AC1-168 E O1	6.16
927091	AC1-204 1	59.04
927101	AC1-204 2	59.09
927201	AC1-214 C O1	1.63
927202	AC1-214 E O1	5.18
927451	AC1-142A 1	3.45
927461	AC1-142A 2	3.44
927511	AC1-113 1	0.96
927521	AC1-113 2	0.96
927531	AC1-185 1	0.55
927541	AC1-185 2	0.55
927551	AC1-185 3	0.55
927561	AC1-185 4	0.55
927571	AC1-185 5	0.55
927581	AC1-185 6	0.55
927591	AC1-185 7	0.55
927601	AC1-185 8	0.55
930481	AB1-089	52.99
930501	AB1-091 O1	57.0
930741	AB1-122 1O1	58.08
930751	AB1-122 2O1	59.55
932881	AC2-115 1	1.92
932891	AC2-115 2	1.92
932921	AC2-116	0.67
932931	AC2-117	10.38

Bus #	Bus	MW Impact
933341	AC2-147 C	0.7
933342	AC2-147 E	1.14
933411	AC2-154 C	2.01
933412	AC2-154 E	3.28
933431	AC2-156 C O1	0.77
933432	AC2-156 E O1	1.26
933911	AD1-013 C	1.48
933912	AD1-013 E	2.37
933931	AD1-016 C	0.75
933932	AD1-016 E	1.22
934051	AD1-031 C O1	2.26
934052	AD1-031 E O1	3.68
934101	AD1-039 1	5.69
934111	AD1-039 2	5.84
934401	AD1-064 C O1	2.59
934402	AD1-064 E O1	12.1
934431	AD1-067 C	0.11
934432	AD1-067 E	0.44
934651	AD1-096 C	0.72
934652	AD1-096 E	1.17
934701	AD1-098 C O1	5.53
934702	AD1-098 E O1	4.04
934721	AD1-100 C	15.54
934722	AD1-100 E	72.54
934871	AD1-116 C	0.83
934872	AD1-116 E	1.36
934971	AD1-129 C	0.73
934972	AD1-129 E	0.49
935001	AD1-133 C O1	16.63
935002	AD1-133 E O1	11.09
936291	AD2-038 C O1	1.97
936292	AD2-038 E O1	13.16
936371	AD2-047 C O1	1.8
936372	AD2-047 E O1	19.38
936461	AD2-060	2.12
936511	AD2-066 C O1	6.81
936512	AD2-066 E O1	4.54
936781	AD2-101 C	3.5
936782	AD2-101 E	16.38
936791	AD2-102 C	9.68
936792	AD2-102 E	9.3
937001	AD2-134 C	2.2
937002	AD2-134 E	9.08
937031	AD2-137 C O1	2.69
937032	AD2-137 E O1	12.58
937051	AD2-140 C O1	2.69
937052	AD2-140 E O1	12.58
937061	AD2-141 C O1	2.67
937062	AD2-141 E O1	12.6
937071	AD2-142 C O1	5.38
937072	AD2-142 E O1	25.17
937121	AD2-148 C O1	2.74

Bus #	Bus	MW Impact
937122	AD2-148 E O1	12.81
937131	AD2-149 C O1	2.74
937132	AD2-149 E O1	12.81
937141	AD2-150 C O1	2.74
937142	AD2-150 E O1	12.81
937181	AD2-155 C O1	2.74
937182	AD2-155 E O1	12.81
937311	AD2-172 C	1.98
937312	AD2-172 E	2.73
937321	AD2-175 C	12.74
937322	AD2-175 E	8.5
937331	AD2-176 C O1	5.92
937332	AD2-176 E O1	3.95
937401	AD2-194 1	6.35
937411	AD2-194 2	6.35
937531	AD2-214 C	3.52
937532	AD2-214 E	1.66
938012	AE1-002 E O1	5.39
938511	AE1-070 1	7.46
938521	AE1-070 2	6.83
938851	AE1-113 C O1	7.05
938852	AE1-113 E O1	22.17
938861	AE1-114 C O1	2.89
938862	AE1-114 E O1	11.04
939051	AE1-134 1	1.09
939061	AE1-134 2	1.09
939321	AE1-163 C O1	4.94
939322	AE1-163 E O1	30.35
939351	AE1-166 C O1	8.26
939352	AE1-166 E O1	7.63
939401	AE1-172 C O1	4.9
939402	AE1-172 E O1	22.92
939631	AE1-193 C O1	5.51
939632	AE1-193 E O1	36.9
939681	AE1-198 C O1	16.37
939682	AE1-198 E O1	13.91
939691	AE1-199	1.92
939701	AE1-201 C	1.62
939702	AE1-201 E	0.36
939732	AE1-204 E	0.24
939861	AE1-222 1	64.14
939871	AE1-222 2	65.77
939921	AE1-228 C O1	8.09
939922	AE1-228 E O1	5.39
940101	AE1-252 C O1	8.34
940102	AE1-252 E O1	5.56
940501	AE2-035 C	1.98
940502	AE2-035 E	2.73
940621	AE2-049 C O1	7.3
940622	AE2-049 E O1	4.87
940631	AE2-050 C O1	9.78
940632	AE2-050 E O1	6.52

Bus #	Bus	MW Impact
940752	AE2-062 E	0.1
940762	AE2-063 E	0.1
940881	AE2-077 C	2.54
940882	AE2-077 E	4.14
941131	AE2-107 C	5.89
941132	AE2-107 E	3.93
941551	AE2-152 C	10.59
941552	AE2-152 E	5.3
941561	AE2-153 C O1	3.82
941562	AE2-153 E O1	17.9
942421	AE2-255 C O1	2.44
942422	AE2-255 E O1	7.3
942651	AE2-281 C	0.71
942652	AE2-281 E	4.34
942881	AE2-307 C	17.93
942882	AE2-307 E	6.52
942911	AE2-310 C	7.09
942912	AE2-310 E	1.92
942991	AE2-321 C O1	6.6
942992	AE2-321 E O1	3.25
943121	AE2-341 C	10.31
943122	AE2-341 E	5.06
990901	L-005 E	8.02
BLUEG	BLUEG	4.52
CALDERWOOD	CALDERWOOD	0.06
CANNELTON	CANNELTON	0.07
CARR	CARR	0.62
CATAWBA	CATAWBA	0.24
CBM-S1	CBM-S1	1.13
CBM-W1	CBM-W1	21.91
CBM-W2	CBM-W2	42.89
CHEOAH	CHEOAH	0.06
CHILHOWEE	CHILHOWEE	0.02
ELMERSMITH	ELMERSMITH	0.07
G-007	G-007	1.74
GIBSON	GIBSON	0.03
HAMLET	HAMLET	0.45
MEC	MEC	29.98
O-066	O-066	11.15
RENSSELAER	RENSSELAER	0.49
SANTEETLA	SANTEETLA	0.02
TRIMBLE	TRIMBLE	0.53
WEC	WEC	6.45
Z1-043	Z1-043	22.8

17.9 Index 9

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
8899941	275179	DRESDEN ;1M	CE	271337	DRESDEN ; R	CE	1	COMED_P4_012-45-BT5-6	breaker	442.0	160.39	163.15	DC	12.2

Bus #	Bus	MW Impact
274658	DRESDEN ;2U	24.98
274879	MINONK ;1U	0.59
290021	O50 E	19.52
916512	Z1-107 E	1.49
930751	AB1-122 2O1	128.51
934111	AD1-039 2	12.59
938851	AE1-113 C O1	8.83
938852	AE1-113 E O1	27.76
939871	AE1-222 2	141.92
942421	AE2-255 C O1	3.05
942422	AE2-255 E O1	9.15
942913	AE2-310 BAT	2.11
BLUEG	BLUEG	0.91
CALDERWOOD	CALDERWOOD	0.02
CANNELTON	CANNELTON	0.04
CARR	CARR	0.07
CATAWBA	CATAWBA	0.03
CBM-S1	CBM-S1	0.03
CBM-W1	CBM-W1	4.02
CBM-W2	CBM-W2	3.3
CHEOAH	CHEOAH	0.02
CHILHOWEE	CHILHOWEE	0.01
ELMERSMITH	ELMERSMITH	0.05
G-007	G-007	0.21
GIBSON	GIBSON	0.03
HAMLET	HAMLET	0.06
MEC	MEC	5.39
NEWTON	NEWTON	0.03
O-066	O-066	1.32
RENSSELAER	RENSSELAER	0.06
SANTEETLA	SANTEETLA	0.01
TILTON	TILTON	0.16
TRIMBLE	TRIMBLE	0.1
WEC	WEC	1.05

17.10 Index 10

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
8899932	275232	WILTON ;3M	CE	270644	WILTON ;	CE	1	COMED_P4_112-65-BT5-6__	breaker	1379.0	163.22	163.3	DC	14.81

Bus #	Bus	MW Impact
270859	PWR VTR EC;R	14.78
274722	S-055 E	13.73
274772	LINCOLN ;3U	2.67
274773	LINCOLN ;4U	2.67
274774	LINCOLN ;5U	2.67
274775	LINCOLN ;6U	2.67
274776	LINCOLN ;7U	2.67
274777	LINCOLN ;8U	2.67
274788	SE CHICAG;5U	5.44
274789	SE CHICAG;6U	5.44
274790	SE CHICAG;7U	5.44
274791	SE CHICAG;8U	5.44
274792	SE CHICAG;9U	5.4
274793	SE CHICAG;0U	5.4
274794	SE CHICAG;1U	5.4
274795	SE CHICAG;2U	5.4
274859	EASYR;U1 E	13.43
274860	EASYR;U2 E	13.43
274888	PILOT HIL;1E	23.57
274890	CAYUG;1U E	20.22
274891	CAYUG;2U E	20.22
275149	KEMPTON ;1E	23.57
290021	O50 E	23.7
290051	GSG-6; E	12.77
290108	LEEDK;1U E	29.68
293061	N-015 E	19.41
293644	O22 E1	12.53
293645	O22 E2	24.32
294392	P-010 E	24.65
294763	P-046 E	11.45
295109	WESTBROOK E	6.84
295111	SUBLETTE E	3.17
296125	R-030 C3	4.97
296128	R-030 E3	19.89
296271	R-030 C2	4.91
296272	R-030 E2	19.65
296308	R-030 C1	4.91
296309	R-030 E1	19.65
910542	X3-005 E	0.89
914641	Y2-103	54.9
915011	Y3-013 1	4.58
915021	Y3-013 2	4.58

Bus #	Bus	MW Impact
915031	Y3-013 3	4.58
916221	Z1-073 E	6.59
916502	Z1-106 E1	1.54
916504	Z1-106 E2	1.54
916512	Z1-107 E	3.16
916522	Z1-108 E	3.04
917502	Z2-087 E	25.7
918052	AA1-018 E	20.09
919581	AA2-030	18.9
920272	AA2-123 E	2.98
924041	AB2-047 C O1	4.74
924042	AB2-047 E O1	31.72
924471	AB2-096	51.72
925161	AB2-173	3.83
925302	AB2-191 E	1.69
926311	AC1-109 1	2.34
926321	AC1-109 2	2.34
926331	AC1-110 1	2.32
926341	AC1-110 2	2.32
926351	AC1-111 1	0.93
926361	AC1-111 2	0.93
926371	AC1-111 3	0.93
926381	AC1-111 4	0.93
926391	AC1-111 5	0.93
926401	AC1-111 6	0.93
926431	AC1-114	2.91
926821	AC1-168 C O1	1.43
926822	AC1-168 E O1	9.57
927091	AC1-204 1	88.75
927101	AC1-204 2	88.75
927451	AC1-142A 1	5.11
927461	AC1-142A 2	5.11
927511	AC1-113 1	1.45
927521	AC1-113 2	1.45
927531	AC1-185 1	0.84
927541	AC1-185 2	0.84
927551	AC1-185 3	0.84
927561	AC1-185 4	0.84
927571	AC1-185 5	0.84
927581	AC1-185 6	0.84
927591	AC1-185 7	0.84
927601	AC1-185 8	0.84
930481	AB1-089	80.32
930501	AB1-091 O1	93.8
930741	AB1-122 1O1	89.17
930751	AB1-122 2O1	90.13
932881	AC2-115 1	2.91
932891	AC2-115 2	2.91
932921	AC2-116	1.02
932931	AC2-117	6.51
933341	AC2-147 C	1.07
933342	AC2-147 E	1.74

Bus #	Bus	MW Impact
933411	AC2-154 C	3.2
933412	AC2-154 E	5.22
933431	AC2-156 C O1	1.17
933432	AC2-156 E O1	1.91
933911	AD1-013 C	2.25
933912	AD1-013 E	3.59
933931	AD1-016 C	1.13
933932	AD1-016 E	1.85
934101	AD1-039 1	8.74
934111	AD1-039 2	8.83
934401	AD1-064 C O1	3.91
934402	AD1-064 E O1	18.33
934431	AD1-067 C	0.16
934432	AD1-067 E	0.67
934651	AD1-096 C	1.09
934652	AD1-096 E	1.78
934701	AD1-098 C O1	8.41
934702	AD1-098 E O1	6.14
934721	AD1-100 C	29.39
934722	AD1-100 E	137.14
934871	AD1-116 C	1.17
934872	AD1-116 E	1.91
934971	AD1-129 C	1.1
934972	AD1-129 E	0.74
935001	AD1-133 C O1	27.36
935002	AD1-133 E O1	18.24
936291	AD2-038 C O1	2.88
936292	AD2-038 E O1	19.25
936371	AD2-047 C O1	2.86
936372	AD2-047 E O1	30.81
936461	AD2-060	3.37
936511	AD2-066 C O1	10.34
936512	AD2-066 E O1	6.89
936781	AD2-101 C	5.82
936782	AD2-101 E	27.26
936791	AD2-102 C	14.68
936792	AD2-102 E	14.11
937001	AD2-134 C	3.34
937002	AD2-134 E	13.79
937031	AD2-137 C O1	7.17
937032	AD2-137 E O1	33.55
937051	AD2-140 C O1	7.53
937052	AD2-140 E O1	35.24
937061	AD2-141 C O1	7.48
937062	AD2-141 E O1	35.28
937071	AD2-142 C O1	15.05
937072	AD2-142 E O1	70.47
937121	AD2-148 C O1	4.5
937122	AD2-148 E O1	21.09
937131	AD2-149 C O1	4.5
937132	AD2-149 E O1	21.09
937141	AD2-150 C O1	4.5

Bus #	Bus	MW Impact
937142	AD2-150 E O1	21.09
937181	AD2-155 C O1	4.5
937182	AD2-155 E O1	21.09
937311	AD2-172 C	3.01
937312	AD2-172 E	4.15
937321	AD2-175 C	20.99
937322	AD2-175 E	13.99
937331	AD2-176 C O1	8.96
937332	AD2-176 E O1	5.97
937401	AD2-194 1	9.54
937411	AD2-194 2	9.54
938012	AE1-002 E O1	14.38
938511	AE1-070 1	11.21
938521	AE1-070 2	10.26
938851	AE1-113 C O1	10.72
938852	AE1-113 E O1	33.71
938861	AE1-114 C O1	4.39
938862	AE1-114 E O1	16.8
939051	AE1-134 1	1.67
939061	AE1-134 2	1.67
939321	AE1-163 C O1	7.23
939322	AE1-163 E O1	44.39
939351	AE1-166 C O1	14.5
939352	AE1-166 E O1	13.38
939401	AE1-172 C O1	9.5
939402	AE1-172 E O1	44.49
939691	AE1-199	2.92
939701	AE1-201 C	2.45
939702	AE1-201 E	0.54
939732	AE1-204 E	0.36
939741	AE1-205 C O1	12.45
939742	AE1-205 E O1	17.19
939861	AE1-222 1	98.48
939871	AE1-222 2	99.53
939921	AE1-228 C O1	12.28
939922	AE1-228 E O1	8.19
940101	AE1-252 C O1	16.2
940102	AE1-252 E O1	10.8
940501	AE2-035 C	3.01
940502	AE2-035 E	4.15
940621	AE2-049 C O1	11.53
940622	AE2-049 E O1	7.69
940631	AE2-050 C O1	15.38
940632	AE2-050 E O1	10.26
940752	AE2-062 E	0.16
940762	AE2-063 E	0.16
940881	AE2-077 C	3.85
940882	AE2-077 E	6.28
941131	AE2-107 C	8.93
941132	AE2-107 E	5.96
941551	AE2-152 C	18.59
941552	AE2-152 E	9.29

Bus #	Bus	MW Impact
941561	AE2-153 C O1	6.06
941562	AE2-153 E O1	28.37
941731	AE2-173	7.31
942111	AE2-223 C	2.88
942112	AE2-223 E	19.28
942421	AE2-255 C O1	3.7
942422	AE2-255 E O1	11.11
942651	AE2-281 C	1.03
942652	AE2-281 E	6.34
942881	AE2-307 C	28.2
942882	AE2-307 E	10.26
942911	AE2-310 C	11.2
942912	AE2-310 E	3.02
942991	AE2-321 C O1	9.98
942992	AE2-321 E O1	4.92
943121	AE2-341 C	15.61
943122	AE2-341 E	7.67
BLUEG	BLUEG	8.02
CALDERWOOD	CALDERWOOD	0.11
CANNELTON	CANNELTON	0.1
CARR	CARR	0.97
CATAWBA	CATAWBA	0.4
CBM-S1	CBM-S1	1.72
CBM-W1	CBM-W1	37.33
CBM-W2	CBM-W2	70.69
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.03
ELMERSMITH	ELMERSMITH	0.09
G-007	G-007	2.73
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.74
MEC	MEC	46.43
O-066	O-066	17.5
RENSSELAER	RENSSELAER	0.77
SANTEETLA	SANTEETLA	0.04
TRIMBLE	TRIMBLE	0.95
WEC	WEC	9.73
Z1-043	Z1-043	35.42

17.11 Index 11

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
8899938	275233	WILTON ;4M	CE	270644	WILTON ;	CE	1	COMED_P4_112-65-BT2-3__	breaker	1379.0	162.98	163.07	DC	15.13

Bus #	Bus	MW Impact
270859	PWR VTR EC;R	15.09
274722	S-055 E	14.02
274772	LINCOLN ;3U	2.74
274773	LINCOLN ;4U	2.74
274774	LINCOLN ;5U	2.74
274775	LINCOLN ;6U	2.74
274776	LINCOLN ;7U	2.74
274777	LINCOLN ;8U	2.74
274788	SE CHICAG;5U	5.56
274789	SE CHICAG;6U	5.56
274790	SE CHICAG;7U	5.56
274791	SE CHICAG;8U	5.56
274792	SE CHICAG;9U	5.52
274793	SE CHICAG;0U	5.52
274794	SE CHICAG;1U	5.52
274795	SE CHICAG;2U	5.52
274859	EASYR;U1 E	13.72
274860	EASYR;U2 E	13.72
274888	PILOT HIL;1E	24.06
274890	CAYUG;1U E	20.62
274891	CAYUG;2U E	20.62
275149	KEMPTON ;1E	24.06
290021	O50 E	24.2
290051	GSG-6; E	13.05
290108	LEEDK;1U E	30.31
293061	N-015 E	19.81
293516	O-009 E1	2.14
293517	O-009 E2	1.09
293518	O-009 E3	1.2
293644	O22 E1	12.79
293645	O22 E2	24.83
293715	O-029 E	12.21
293716	O-029 E	6.69
293717	O-029 E	6.15
294392	P-010 E	25.16
294763	P-046 E	11.69
295109	WESTBROOK E	6.98
295111	SUBLETTE E	3.24
296125	R-030 C3	5.07
296128	R-030 E3	20.29
296271	R-030 C2	5.01
296272	R-030 E2	20.05

Bus #	Bus	MW Impact
296308	R-030 C1	5.01
296309	R-030 E1	20.05
910542	X3-005 E	0.91
914641	Y2-103	56.07
915011	Y3-013 1	4.67
915021	Y3-013 2	4.67
915031	Y3-013 3	4.67
916221	Z1-073 E	6.73
916502	Z1-106 E1	1.58
916504	Z1-106 E2	1.58
916512	Z1-107 E	3.23
916522	Z1-108 E	3.1
917502	Z2-087 E	26.22
918052	AA1-018 E	20.53
919221	AA1-146	21.95
919581	AA2-030	21.95
920272	AA2-123 E	3.05
924041	AB2-047 C O1	4.84
924042	AB2-047 E O1	32.36
924471	AB2-096	52.83
925161	AB2-173	3.91
925302	AB2-191 E	1.73
926311	AC1-109 1	2.39
926321	AC1-109 2	2.39
926331	AC1-110 1	2.37
926341	AC1-110 2	2.37
926351	AC1-111 1	0.95
926361	AC1-111 2	0.95
926371	AC1-111 3	0.95
926381	AC1-111 4	0.95
926391	AC1-111 5	0.95
926401	AC1-111 6	0.95
926431	AC1-114	2.97
926821	AC1-168 C O1	1.46
926822	AC1-168 E O1	9.77
927091	AC1-204 1	90.65
927101	AC1-204 2	90.65
927451	AC1-142A 1	5.22
927461	AC1-142A 2	5.22
927511	AC1-113 1	1.48
927521	AC1-113 2	1.48
927531	AC1-185 1	0.86
927541	AC1-185 2	0.86
927551	AC1-185 3	0.86
927561	AC1-185 4	0.86
927571	AC1-185 5	0.86
927581	AC1-185 6	0.86
927591	AC1-185 7	0.86
927601	AC1-185 8	0.86
930481	AB1-089	82.03
930501	AB1-091 O1	95.74
930741	AB1-122 1O1	91.06

Bus #	Bus	MW Impact
930751	AB1-122 2O1	92.05
932881	AC2-115 1	2.97
932891	AC2-115 2	2.97
932921	AC2-116	1.04
932931	AC2-117	6.65
933341	AC2-147 C	1.09
933342	AC2-147 E	1.78
933411	AC2-154 C	3.27
933412	AC2-154 E	5.33
933431	AC2-156 C O1	1.19
933432	AC2-156 E O1	1.95
933911	AD1-013 C	2.3
933912	AD1-013 E	3.67
933931	AD1-016 C	1.16
933932	AD1-016 E	1.89
934101	AD1-039 1	8.92
934111	AD1-039 2	9.02
934401	AD1-064 C O1	4.0
934402	AD1-064 E O1	18.72
934431	AD1-067 C	0.16
934432	AD1-067 E	0.69
934651	AD1-096 C	1.11
934652	AD1-096 E	1.81
934701	AD1-098 C O1	8.59
934702	AD1-098 E O1	6.27
934721	AD1-100 C	29.97
934722	AD1-100 E	139.86
934871	AD1-116 C	1.2
934872	AD1-116 E	1.95
934971	AD1-129 C	1.13
934972	AD1-129 E	0.75
935001	AD1-133 C O1	27.93
935002	AD1-133 E O1	18.62
936291	AD2-038 C O1	2.94
936292	AD2-038 E O1	19.66
936371	AD2-047 C O1	2.92
936372	AD2-047 E O1	31.45
936461	AD2-060	3.44
936511	AD2-066 C O1	10.56
936512	AD2-066 E O1	7.04
936781	AD2-101 C	5.94
936782	AD2-101 E	27.82
936791	AD2-102 C	14.99
936792	AD2-102 E	14.41
937001	AD2-134 C	3.41
937002	AD2-134 E	14.09
937031	AD2-137 C O1	7.3
937032	AD2-137 E O1	34.17
937051	AD2-140 C O1	7.67
937052	AD2-140 E O1	35.89
937061	AD2-141 C O1	7.62
937062	AD2-141 E O1	35.93

Bus #	Bus	MW Impact
937071	AD2-142 C O1	15.33
937072	AD2-142 E O1	71.78
937121	AD2-148 C O1	4.6
937122	AD2-148 E O1	21.53
937131	AD2-149 C O1	4.6
937132	AD2-149 E O1	21.53
937141	AD2-150 C O1	4.6
937142	AD2-150 E O1	21.53
937181	AD2-155 C O1	4.6
937182	AD2-155 E O1	21.53
937311	AD2-172 C	3.07
937312	AD2-172 E	4.24
937321	AD2-175 C	21.42
937322	AD2-175 E	14.28
937331	AD2-176 C O1	9.15
937332	AD2-176 E O1	6.1
937401	AD2-194 1	9.75
937411	AD2-194 2	9.75
938012	AE1-002 E O1	14.65
938511	AE1-070 1	11.45
938521	AE1-070 2	10.48
938851	AE1-113 C O1	10.95
938852	AE1-113 E O1	34.43
938861	AE1-114 C O1	4.49
938862	AE1-114 E O1	17.15
939051	AE1-134 1	1.71
939061	AE1-134 2	1.71
939321	AE1-163 C O1	7.38
939322	AE1-163 E O1	45.35
939351	AE1-166 C O1	14.79
939352	AE1-166 E O1	13.65
939401	AE1-172 C O1	9.69
939402	AE1-172 E O1	45.37
939691	AE1-199	2.98
939701	AE1-201 C	2.5
939702	AE1-201 E	0.55
939732	AE1-204 E	0.36
939741	AE1-205 C O1	12.7
939742	AE1-205 E O1	17.54
939861	AE1-222 1	100.56
939871	AE1-222 2	101.65
939921	AE1-228 C O1	12.54
939922	AE1-228 E O1	8.36
940101	AE1-252 C O1	16.52
940102	AE1-252 E O1	11.01
940501	AE2-035 C	3.07
940502	AE2-035 E	4.24
940621	AE2-049 C O1	11.77
940622	AE2-049 E O1	7.85
940631	AE2-050 C O1	15.7
940632	AE2-050 E O1	10.47
940752	AE2-062 E	0.16

Bus #	Bus	MW Impact
940762	AE2-063 E	0.16
940881	AE2-077 C	3.93
940882	AE2-077 E	6.42
941131	AE2-107 C	9.12
941132	AE2-107 E	6.08
941551	AE2-152 C	18.96
941552	AE2-152 E	9.48
941561	AE2-153 C O1	6.18
941562	AE2-153 E O1	28.96
941731	AE2-173	7.45
942111	AE2-223 C	2.94
942112	AE2-223 E	19.67
942421	AE2-255 C O1	3.78
942422	AE2-255 E O1	11.34
942651	AE2-281 C	1.05
942652	AE2-281 E	6.48
942881	AE2-307 C	28.78
942882	AE2-307 E	10.47
942911	AE2-310 C	11.43
942912	AE2-310 E	3.09
942991	AE2-321 C O1	10.2
942992	AE2-321 E O1	5.02
943121	AE2-341 C	15.94
943122	AE2-341 E	7.83
BLUEG	BLUEG	8.2
CALDERWOOD	CALDERWOOD	0.12
CANNELTON	CANNELTON	0.1
CARR	CARR	0.99
CATAWBA	CATAWBA	0.4
CBM-S1	CBM-S1	1.75
CBM-W1	CBM-W1	38.13
CBM-W2	CBM-W2	72.15
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.04
ELMERSMITH	ELMERSMITH	0.09
G-007	G-007	2.79
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.76
MEC	MEC	47.41
O-066	O-066	17.87
RENSSELAER	RENSSELAER	0.78
SANTEETLA	SANTEETLA	0.04
TRIMBLE	TRIMBLE	0.98
WEC	WEC	9.93
Z1-043	Z1-043	36.17

17.12 Index 12

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
8901070	918050	AA1-018 TAP	CE	270769	GOODINGS ;2R	CE	1	COMED_P7_345-L1202__B-S+_345-L1227__R-S-A	tower	1494.0	107.62	109.03	DC	21.04

Bus #	Bus	MW Impact
274677	POWERTON ;5U	19.72
274678	POWERTON ;6U	19.77
274879	MINONK ;1U	1.03
290021	O50 E	33.67
293644	O22 E1	6.49
293645	O22 E2	12.6
294401	BSHIL;1U E	4.59
294410	BSHIL;2U E	4.59
918051	AA1-018 C	1.5
918052	AA1-018 E	82.42
919621	AA2-039 C	1.12
919622	AA2-039 E	7.48
925581	AC1-033 C	0.75
925582	AC1-033 E	5.03
926841	AC1-171 C O1	0.64
926842	AC1-171 E O1	4.28
930741	AB1-122 1O1	102.44
930751	AB1-122 2O1	121.01
934051	AD1-031 C O1	1.52
934052	AD1-031 E O1	2.49
934101	AD1-039 1	10.04
934111	AD1-039 2	11.86
934871	AD1-116 C	4.8
934872	AD1-116 E	7.83
936291	AD2-038 C O1	8.21
936292	AD2-038 E O1	54.98
938851	AE1-113 C O1	15.24
938852	AE1-113 E O1	47.9
939321	AE1-163 C O1	20.64
939322	AE1-163 E O1	126.8
939631	AE1-193 C O1	3.72
939632	AE1-193 E O1	24.92
939681	AE1-198 C O1	11.06
939682	AE1-198 E O1	9.39
939861	AE1-222 1	113.13
939871	AE1-222 2	133.64
942421	AE2-255 C O1	5.26
942422	AE2-255 E O1	15.78
942651	AE2-281 C	2.95
942652	AE2-281 E	18.11

Bus #	Bus	MW Impact
954702	J844 E	20.15
990901	L-005 E	7.0
CARR	CARR	0.05
CBM-S1	CBM-S1	2.43
CBM-S2	CBM-S2	0.5
CBM-W1	CBM-W1	4.36
CBM-W2	CBM-W2	37.47
CIN	CIN	0.82
CPL	CPL	0.14
G-007	G-007	0.13
IPL	IPL	0.39
LGEE	LGEE	0.08
MEC	MEC	14.92
O-066	O-066	0.84
RENSSELAER	RENSSELAER	0.04
Z1-043	Z1-043	13.44

17.13 Index 13

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
8900942	930740	AB1-122 TAP	CE	270717	DRESDEN ; R	CE	1	COMED_P7_345-L19601_B-S+_345-L9801__R-S_FSA	tower	1195.0	178.23	179.25	DC	12.14

Bus #	Bus	MW Impact
274677	POWERTON ;5U	20.85
274678	POWERTON ;6U	20.9
274861	TOP CROP ;1U	0.55
274862	TOP CROP ;2U	1.07
274879	MINONK ;1U	0.59
290021	O50 E	19.42
293644	O22 E1	18.14
293645	O22 E2	35.21
294401	BSHIL;1U E	6.21
294410	BSHIL;2U E	6.21
918051	AA1-018 C	0.53
918052	AA1-018 E	29.09
919621	AA2-039 C	1.51
919622	AA2-039 E	10.12
925581	AC1-033 C	1.02
925582	AC1-033 E	6.81
926841	AC1-171 C O1	0.85
926842	AC1-171 E O1	5.65
930741	AB1-122 1O1	524.77
934051	AD1-031 C O1	2.06
934052	AD1-031 E O1	3.36
934101	AD1-039 1	51.43
934871	AD1-116 C	1.69
934872	AD1-116 E	2.76
936291	AD2-038 C O1	4.35
936292	AD2-038 E O1	29.1
938851	AE1-113 C O1	8.79
938852	AE1-113 E O1	27.63
939321	AE1-163 C O1	10.93
939322	AE1-163 E O1	67.13
939631	AE1-193 C O1	5.04
939632	AE1-193 E O1	33.72
939681	AE1-198 C O1	14.96
939682	AE1-198 E O1	12.71
939861	AE1-222 1	579.53
942421	AE2-255 C O1	3.04
942422	AE2-255 E O1	9.11
942651	AE2-281 C	1.56
942652	AE2-281 E	9.59
951631	J456 C	1.74

Bus #	Bus	MW Impact
951632	J456 E	9.42
954702	J844 E	27.3
990901	L-005 E	9.42
CARR	CARR	0.05
CBM-S1	CBM-S1	3.22
CBM-S2	CBM-S2	0.72
CBM-W1	CBM-W1	6.57
CBM-W2	CBM-W2	48.65
CIN	CIN	0.98
CPLE	CPLE	0.21
G-007	G-007	0.11
IPL	IPL	0.48
LGEE	LGEE	0.12
MEC	MEC	20.16
O-066	O-066	0.71
RENSSELAER	RENSSELAER	0.04
Z1-043	Z1-043	18.19

17.14 Index 14

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
8900983	930750	AB1-122 TAP	CE	270716	DRESDEN ; B	CE	1	COMED_P7_345-L19601_B-S+_345-L9801__R-S_FSA	tower	1768.0	132.19	135.3	DC	54.99

Bus #	Bus	MW Impact
274677	POWERTON ;5U	24.55
274678	POWERTON ;6U	24.38
274861	TOP CROP ;1U	0.65
274862	TOP CROP ;2U	1.26
274879	MINONK ;1U	2.68
290021	O50 E	87.98
293644	O22 E1	21.37
293645	O22 E2	41.49
918051	AA1-018 C	0.62
918052	AA1-018 E	33.94
930751	AB1-122 2O1	520.96
934111	AD1-039 2	51.05
934871	AD1-116 C	1.98
934872	AD1-116 E	3.23
936291	AD2-038 C O1	5.07
936292	AD2-038 E O1	33.95
938851	AE1-113 C O1	39.81
938852	AE1-113 E O1	125.15
939321	AE1-163 C O1	12.75
939322	AE1-163 E O1	78.31
939871	AE1-222 2	575.32
942421	AE2-255 C O1	13.75
942422	AE2-255 E O1	41.24
942651	AE2-281 C	1.82
942652	AE2-281 E	11.19
CARR	CARR	0.03
CBM-S1	CBM-S1	2.82
CBM-S2	CBM-S2	0.65
CBM-W1	CBM-W1	3.43
CBM-W2	CBM-W2	42.14
CIN	CIN	1.11
CPL	CPL	0.19
G-007	G-007	0.07
IPL	IPL	0.56
LGEE	LGEE	0.14
MEC	MEC	15.29
O-066	O-066	0.44
RENSSELAER	RENSSELAER	0.02
Z1-043	Z1-043	13.54

17.15 Index 15

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
8901133	936290	AD2-038 TAP	CE	918050	AA1-018 TAP	CE	1	COMED_P7_345-L1202__B-S_+_345-L1227__R-S-A	tower	1494.0	101.82	103.23	DC	21.05

Bus #	Bus	MW Impact
274677	POWERTON ;5U	19.73
274678	POWERTON ;6U	19.78
274879	MINONK ;1U	1.03
290021	O50 E	33.69
293644	O22 E1	6.5
293645	O22 E2	12.62
293771	O-035 E	3.09
294401	BSHIL;1U E	4.59
294410	BSHIL;2U E	4.59
916211	Z1-072 E	2.34
919621	AA2-039 C	1.12
919622	AA2-039 E	7.49
925581	AC1-033 C	0.75
925582	AC1-033 E	5.04
926841	AC1-171 C O1	0.64
926842	AC1-171 E O1	4.29
927201	AC1-214 C O1	0.99
927202	AC1-214 E O1	3.15
930741	AB1-122 1O1	102.49
930751	AB1-122 2O1	121.07
934051	AD1-031 C O1	1.53
934052	AD1-031 E O1	2.49
934101	AD1-039 1	10.04
934111	AD1-039 2	11.86
936291	AD2-038 C O1	8.22
936292	AD2-038 E O1	54.99
938851	AE1-113 C O1	15.24
938852	AE1-113 E O1	47.92
939321	AE1-163 C O1	20.65
939322	AE1-163 E O1	126.83
939631	AE1-193 C O1	3.73
939632	AE1-193 E O1	24.96
939681	AE1-198 C O1	11.07
939682	AE1-198 E O1	9.41
939861	AE1-222 1	113.19
939871	AE1-222 2	133.7
942421	AE2-255 C O1	5.26
942422	AE2-255 E O1	15.79
942651	AE2-281 C	2.95
942652	AE2-281 E	18.12

Bus #	Bus	MW Impact
951631	J456 C	1.31
951632	J456 E	7.1
953951	J859	8.12
954702	J844 E	20.15
990901	L-005 E	7.01
CARR	CARR	0.05
CBM-S1	CBM-S1	2.46
CBM-S2	CBM-S2	0.52
CBM-W1	CBM-W1	4.42
CBM-W2	CBM-W2	37.73
CIN	CIN	0.85
CPL	CPL	0.14
G-007	G-007	0.12
IPL	IPL	0.41
LGEE	LGEE	0.09
MEC	MEC	14.97
O-066	O-066	0.77
RENSSELAER	RENSSELAER	0.04
Z1-043	Z1-043	13.47

Affected Systems

18 Affected Systems

18.1 LG&E

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

18.2 MISO

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

18.3 TVA

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

18.4 Duke Energy Progress

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

18.5 NYISO

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

Contingency Name	Contingency Definition
COMED_P4_111-45-L16704T	CONTINGENCY 'COMED_P4_111-45-L16704T' 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 TRIP BRANCH FROM BUS 270730 TO BUS 270916 CKT 1 / ELEC JUNC; B 345 WAYNE ; B 345 TRIP BRANCH FROM BUS 270730 TO BUS 270928 CKT 1 / ELEC JUNC; B 345 WOLFS ; B 345 TRIP BRANCH FROM BUS 270928 TO BUS 272794 TO BUS 275334 CKT 1 / WOLFS ; B 345 WOLFS ; B 138 WOLFS;1C 34.5 DISCONNECT BUS 275239 / ELEC JUNC;2M 138 END
COMED_P7_345-L1223_TR-S+_345-L14321TB-N	CONTINGENCY 'COMED_P7_345-L1223_TR-S+_345-L14321TB-N' TRIP BRANCH FROM BUS 270717 TO BUS 270731 CKT 1 / DRES; R 345 ELECT;4R 345 TRIP BRANCH FROM BUS 275180 TO BUS 270717 CKT 1 / DRES;3M 138 DRES; R 345 TRIP BRANCH FROM BUS 275180 TO BUS 271336 CKT 1 / DRES;3M 138 DRES; B 138 TRIP BRANCH FROM BUS 275180 TO BUS 275280 CKT 1 / DRES;3M 138 DRES;3C 34.5 TRIP BRANCH FROM BUS 270928 TO BUS 270730 CKT 1 / WOLFS; B 345 ELECT; B 345 TRIP BRANCH FROM BUS 270928 TO BUS 272794 TO BUS 275334 CKT 1 / WOLFS; B 345 WOLFS; B 138 WOLFS;1C 34.5 END
COMED_P7_345-L19601_B-S+_345-L9801__R-S_FSA	CONTINGENCY 'COMED_P7_345-L19601_B-S+_345-L9801__R-S_FSA' TRIP BRANCH FROM BUS 270790 TO BUS 270770 CKT 1 / KATYD; B 345 GOODI;4B 345 TRIP BRANCH FROM BUS 918050 TO BUS 270769 CKT 1 / AA1-018 GOODINGS ;2R 345 END
COMED_P7_345-L1202__B-S+_345-L1227__R-S-A	CONTINGENCY 'COMED_P7_345-L1202__B-S+_345-L1227__R-S-A' TRIP BRANCH FROM BUS 270716 TO BUS 930750 CKT 1 / DRES; B 345 AB1-122 TAP 345 TRIP BRANCH FROM BUS 930740 TO BUS 270717 CKT 1 / AB1-122 TAP 345 DRES; R 345 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_012-45-BT5-6__	CONTINGENCY 'COMED_P4_012-45-BT5-6__' TRIP BRANCH FROM BUS 270716 TO BUS 270736 CKT 1 / DRES; B 345 ELWOO; B 345 TRIP BRANCH FROM BUS 270736 TO BUS 270737 CKT 1 / ELWOO; B 345 ELWOO; R 345 TRIP BRANCH FROM BUS 274702 TO BUS 270716 CKT 1 / KEND
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_111-45-L14321T	CONTINGENCY 'COMED_P4_111-45-L14321T' TRIP BRANCH FROM BUS 270928 TO BUS 270730 CKT 1 / WOLFS ; B 345 ELEC JUNC; B 345 TRIP BRANCH FROM BUS 270928 TO BUS 272794 TO BUS 275334 CKT 1 / WOLFS ; B 345 WOLFS ; B 138 WOLFS ;1C 34.5 TRIP BRANCH FROM BUS 270730 TO BUS 270846 CKT 1 / ELEC JUNC; B 345 PLANO ; B 345 TRIP BRANCH FROM BUS 270730 TO BUS 270916 CKT 1 / ELEC JUNC; B 345 WAYNE ; B 345 DISCONNECT BUS 275239 / ELEC JUNC;2M 138 END
COMED_P7_345-L0301__B-S+_345-L9801__R-S_FSA	CONTINGENCY 'COMED_P7_345-L0301__B-S+_345-L9801__R-S_FSA' TRIP BRANCH FROM BUS 270854 TO BUS 270790 CKT 1 / POWER; B 345 KATYDID TRIP BRANCH FROM BUS 918050 TO BUS 270769 CKT 1 / AA1-018 GOODINGS ;2R 345 END
COMED_P7_345-L11620_B-S+_345-L11622_R-S	CONTINGENCY 'COMED_P7_345-L11620_B-S+_345-L11622_R-S' TRIP BRANCH FROM BUS 270736 TO BUS 270770 CKT 1 / ELWOO; B 345 GOODI;3B 345 TRIP BRANCH FROM BUS 270737 TO BUS 270769 CKT 1 / ELWOO; R 345 GOODI;1R 345 END
COMED_P4_023-65-BT4-5__	CONTINGENCY 'COMED_P4_023-65-BT4-5__' TRIP BRANCH FROM BUS 275168 TO BUS 270607 CKT 1 / COLLI;2M 345 COLLI; 765 TRIP BRANCH FROM BUS 275168 TO BUS 270697 CKT 1 / COLLI;2M 345 COLLI; R 345 TRIP BRANCH FROM BUS 275168 TO BUS 275268 CKT 1 / COLLI;2M 345 COLLI;2C 33 TRIP BRANCH FROM BUS 270644 TO BUS 243206 CKT 1 / WILTO; 765 05DUMONT 765 END
COMED_P1-2_345-L1202__B-S-A	CONTINGENCY 'COMED_P1-2_345-L1202__B-S-A' TRIP BRANCH FROM BUS 270716 TO BUS 930750 CKT 1 / DRESDEN ; B 345 AB1-122 TAP 345 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_345-L1221__B-S	CONTINGENCY 'COMED_P1-2_345-L1221__B-S' TRIP BRANCH FROM BUS 270716 TO BUS 270928 CKT 1 / DRES; B 345 WOLFS; B 345 END
COMED_P7_345-L1221__B-S+_345-L1223_TR-S	CONTINGENCY 'COMED_P7_345-L1221__B-S+_345-L1223_TR-S' TRIP BRANCH FROM BUS 270716 TO BUS 270928 CKT 1 / DRES; B 345 WOLFS; B 345 TRIP BRANCH FROM BUS 270717 TO BUS 270731 CKT 1 / DRES; R 345 ELECT;4R 345 TRIP BRANCH FROM BUS 275180 TO BUS 270717 CKT 1 / DRES;3M 138 DRES; R 345 TRIP BRANCH FROM BUS 275180 TO BUS 271336 CKT 1 / DRES;3M 138 DRES; B 138 TRIP BRANCH FROM BUS 275180 TO BUS 275280 CKT 1 / DRES;3M 138 DRES;3C 34.5 END
Base Case	

Contingency Name	Contingency Definition
COMED_P4_111-45-L11126_	CONTINGENCY 'COMED_P4_111-45-L11126_' TRIP BRANCH FROM BUS 270730 TO BUS 270916 CKT 1 / ELEC JUNC; B 345 WAYNE ; B 345 TRIP BRANCH FROM BUS 270916 TO BUS 270917 CKT 1 / WAYNE ; B 345 WAYNE ; R 345 TRIP BRANCH FROM BUS 270730 TO BUS 270846 CKT 1 / ELEC JUNC; B 345 PLANO ; B 345 TRIP BRANCH FROM BUS 270730 TO BUS 270928 CKT 1 / ELEC JUNC; B 345 WOLFS ; B 345 TRIP BRANCH FROM BUS 270928 TO BUS 272794 TO BUS 275334 CKT 1 / WOLFS ; B 345 WOLFS ; B 138 WOLFS ;1C 34.5 DISCONNECT BUS 275239 / ELEC JUNC;2M 138 END
COMED_P1-2_345-L10805_B-S	CONTINGENCY 'COMED_P1-2_345-L10805_B-S' TRIP BRANCH FROM BUS 270810 TO BUS 274702 CKT 1 / LOCKP; B 345 KEND
AEP_P1-2_#695A	CONTINGENCY 'AEP_P1-2_#695A' OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTON ; 765 1 END
COMED_P1-2_345-L0304__R-S	CONTINGENCY 'COMED_P1-2_345-L0304__R-S' TRIP BRANCH FROM BUS 270855 TO BUS 349662 CKT 1 / POWER; R 345 7TAZEWELL 345 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_P2-2_111_EJ-345B__2	CONTINGENCY 'COMED_P2-2_111_EJ-345B__2' TRIP BRANCH FROM BUS 270730 TO BUS 270846 CKT 1 / ELECT; B 345 PLANO; B 345 TRIP BRANCH FROM BUS 270730 TO BUS 270916 CKT 1 / ELECT; B 345 WAYNE; B 345 TRIP BRANCH FROM BUS 270730 TO BUS 270928 CKT 1 / ELECT; B 345 WOLFS; B 345 TRIP BRANCH FROM BUS 270928 TO BUS 272794 TO BUS 275334 CKT 1 / WOLFS; B 345 WOLFS; B 138 WOLFS;1C 34.5 DISCONNECT BUS 275239 / ELECT;2M 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
AEP_P4_#2978_05DUMONT 765_B	CONTINGENCY 'AEP_P4_#2978_05DUMONT 765_B' OPEN BRANCH FROM BUS 243206 TO BUS 243207 CKT 1 / 243206 05DUMONT 765 243207 05GRNTWN 765 1 OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTON ; 765 1 END

Short Circuit

19 Short Circuit

No issues identified.

20 Secondary Point of Interconnection General

20.1 Secondary Point of Interconnection

Queue Position AE2-255, a 100 MW wind farm proposes to interconnect with the ComEd transmission system by tying to the 300 MW proposed wind farm to be interconnected to the Secondary POI for PJM queue position AE1-113.

20.2 Cost Summary

Will be supplied in Impact Study should the Interconnection Customer elect this option.

21 Network Impacts for Secondary Point of Interconnection

The Queue Project AE2-255 was evaluated as a 100.0 MW (Capacity 25.0 MW) injection tapping the Powerton to Goodings Grove 345kV line in the ComEd area. Project AE2-255 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE2-255 was studied with a commercial probability of 0.53. Potential network impacts were as follows:

Summer Peak Load Flow

22 Generation Deliverability

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

None

23 Multiple Facility Contingency

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

None

24 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	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
8899930	270926	WILTON ; B	CE	275232	WILTON ;3M	CE	1	COMED_P4_112-65-BT5-6	breaker	1379.0	163.14	163.22	DC	14.69
8899939	270927	WILTON ; R	CE	275233	WILTON ;4M	CE	1	COMED_P4_112-65-BT2-3	breaker	1379.0	162.9	162.98	DC	15.0
7290249	274804	UNIV PK N;RP	CE	243229	05OLIVE	AEP	1	AEP_P4_#2978_05DUMONT 765_B	breaker	971.0	138.75	138.85	DC	10.0
7290250	274804	UNIV PK N;RP	CE	243229	05OLIVE	AEP	1	COMED_P4_023-65-BT2-3	breaker	971.0	137.64	137.75	DC	10.07
7290251	274804	UNIV PK N;RP	CE	243229	05OLIVE	AEP	1	COMED_P4_112-65-BT4-5	breaker	971.0	137.63	137.73	DC	10.07
7290252	274804	UNIV PK N;RP	CE	243229	05OLIVE	AEP	1	COMED_P4_112-65-BT3-4	breaker	971.0	137.63	137.73	DC	10.07
7290253	274804	UNIV PK N;RP	CE	243229	05OLIVE	AEP	1	COMED_P4_023-65-BT4-5	breaker	971.0	137.63	137.73	DC	10.07
8899932	275232	WILTON ;3M	CE	270644	WILTON ;	CE	1	COMED_P4_112-65-BT5-6	breaker	1379.0	163.14	163.22	DC	14.69
8899938	275233	WILTON ;4M	CE	270644	WILTON ;	CE	1	COMED_P4_112-65-BT2-3	breaker	1379.0	162.9	162.98	DC	15.0
8901070	918050	AA1-018 TAP	CE	270769	GOODINGS ;2R	CE	1	COMED_P7_345-L1202__B-S_+ 345-L1227__R-S-A	tower	1494.0	104.47	107.16	DC	40.14
8900942	930740	AB1-122 TAP	CE	270717	DRESDEN ; R	CE	1	COMED_P7_345-L19601__B-S_+ 345-L9801__R-S_FSA	tower	1195.0	178.23	180.1	DC	22.3
8900943	930740	AB1-122 TAP	CE	270717	DRESDEN ; R	CE	1	COMED_P7_345-L0301__B-S_+ 345-L9801__R-S_FSA	tower	1195.0	172.63	174.5	DC	22.31
8900983	930750	AB1-122 TAP	CE	270716	DRESDEN ; B	CE	1	COMED_P7_345-L19601__B-S_+ 345-L9801__R-S_FSA	tower	1768.0	132.19	133.66	DC	26.02
8900984	930750	AB1-122 TAP	CE	270716	DRESDEN ; B	CE	1	COMED_P7_345-L0301__B-S_+ 345-L9801__R-S_FSA	tower	1768.0	127.73	129.2	DC	26.03
8901133	936290	AD2-038 TAP	CE	918050	AA1-018 TAP	CE	1	COMED_P7_345-L1202__B-S_+ 345-L1227__R-S-A	tower	1494.0	101.83	104.51	DC	40.15

25 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	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
8900502	270855	POWERTON ; R	CE	349662	7TAZEWELL	AMIL	1	COMED_P1-2_345-L1202__B-S-A	operation	1479.0	145.09	148.31	DC	47.54
7291129	274804	UNIV PK N;RP	CE	243229	05OLIVE	AEP	1	AEP_P1-2_#695A	operation	971.0	137.61	137.71	DC	10.07
8900449	930740	AB1-122 TAP	CE	270717	DRESDEN ; R	CE	1	COMED_P1-2_345-L1202__B-S-B	operation	1195.0	151.43	152.56	DC	13.5
8900490	930750	AB1-122 TAP	CE	270716	DRESDEN ; B	CE	1	Base Case	operation	1201.0	155.05	156.1	DC	12.62
8900491	930750	AB1-122 TAP	CE	270716	DRESDEN ; B	CE	1	COMED_P1-2_345-L0304__R-S	operation	1479.0	148.22	150.1	DC	27.77

26 Flow Gate Details

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, 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 gage 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.

26.1 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
8899930	270926	WILTON ;B	CE	275232	WILTON ;3M	CE	1	COMED_P4_112-65-BT5-6__	breaker	1379.0	163.14	163.22	DC	14.69

Bus #	Bus	MW Impact
270859	PWR VTR EC;R	14.78
274722	S-055 E	13.73
274772	LINCOLN ;3U	2.67
274773	LINCOLN ;4U	2.67
274774	LINCOLN ;5U	2.67
274775	LINCOLN ;6U	2.67
274776	LINCOLN ;7U	2.67
274777	LINCOLN ;8U	2.67
274788	SE CHICAG;5U	5.44
274789	SE CHICAG;6U	5.44
274790	SE CHICAG;7U	5.44
274791	SE CHICAG;8U	5.44
274792	SE CHICAG;9U	5.4
274793	SE CHICAG;0U	5.4
274794	SE CHICAG;1U	5.4
274795	SE CHICAG;2U	5.4
274859	EASYR;U1 E	13.43
274860	EASYR;U2 E	13.43
274888	PILOT HIL;1E	23.57
274890	CAYUG;1U E	20.22
274891	CAYUG;2U E	20.22
275149	KEMPTON ;1E	23.57
290021	O50 E	23.7
290051	GSG-6; E	12.77
290108	LEEDK;1U E	29.68
293061	N-015 E	19.41
293644	O22 E1	12.53
293645	O22 E2	24.32
294392	P-010 E	24.65
294763	P-046 E	11.45
295109	WESTBROOK E	6.84
295111	SUBLETTE E	3.17
296125	R-030 C3	4.97
296128	R-030 E3	19.89
296271	R-030 C2	4.91
296272	R-030 E2	19.65
296308	R-030 C1	4.91
296309	R-030 E1	19.65
910542	X3-005 E	0.89
914641	Y2-103	54.9
915011	Y3-013 1	4.58
915021	Y3-013 2	4.58

Bus #	Bus	MW Impact
915031	Y3-013 3	4.58
916221	Z1-073 E	6.59
916502	Z1-106 E1	1.54
916504	Z1-106 E2	1.54
916512	Z1-107 E	3.16
916522	Z1-108 E	3.04
917502	Z2-087 E	25.71
918052	AA1-018 E	20.09
919581	AA2-030	18.9
920272	AA2-123 E	2.99
924041	AB2-047 C O1	4.74
924042	AB2-047 E O1	31.72
924471	AB2-096	51.73
925161	AB2-173	3.83
925302	AB2-191 E	1.69
926311	AC1-109 1	2.34
926321	AC1-109 2	2.34
926331	AC1-110 1	2.32
926341	AC1-110 2	2.32
926351	AC1-111 1	0.93
926361	AC1-111 2	0.93
926371	AC1-111 3	0.93
926381	AC1-111 4	0.93
926391	AC1-111 5	0.93
926401	AC1-111 6	0.93
926431	AC1-114	2.91
926821	AC1-168 C O1	1.43
926822	AC1-168 E O1	9.57
927091	AC1-204 1	88.75
927101	AC1-204 2	88.75
927451	AC1-142A 1	5.11
927461	AC1-142A 2	5.11
927511	AC1-113 1	1.45
927521	AC1-113 2	1.45
927531	AC1-185 1	0.84
927541	AC1-185 2	0.84
927551	AC1-185 3	0.84
927561	AC1-185 4	0.84
927571	AC1-185 5	0.84
927581	AC1-185 6	0.84
927591	AC1-185 7	0.84
927601	AC1-185 8	0.84
930481	AB1-089	80.33
930501	AB1-091 O1	93.8
930741	AB1-122 1O1	89.17
930751	AB1-122 2O1	90.13
932881	AC2-115 1	2.91
932891	AC2-115 2	2.91
932921	AC2-116	1.02
932931	AC2-117	6.51
933341	AC2-147 C	1.07
933342	AC2-147 E	1.74

Bus #	Bus	MW Impact
933411	AC2-154 C	3.2
933412	AC2-154 E	5.22
933431	AC2-156 C O1	1.17
933432	AC2-156 E O1	1.91
933911	AD1-013 C	2.25
933912	AD1-013 E	3.59
933931	AD1-016 C	1.13
933932	AD1-016 E	1.85
934101	AD1-039 1	8.74
934111	AD1-039 2	8.83
934401	AD1-064 C O1	3.91
934402	AD1-064 E O1	18.33
934431	AD1-067 C	0.16
934432	AD1-067 E	0.67
934651	AD1-096 C	1.09
934652	AD1-096 E	1.78
934701	AD1-098 C O1	8.41
934702	AD1-098 E O1	6.14
934721	AD1-100 C	29.39
934722	AD1-100 E	137.14
934871	AD1-116 C	1.17
934872	AD1-116 E	1.91
934971	AD1-129 C	1.1
934972	AD1-129 E	0.74
935001	AD1-133 C O1	27.36
935002	AD1-133 E O1	18.24
936291	AD2-038 C O1	2.88
936292	AD2-038 E O1	19.25
936371	AD2-047 C O1	2.86
936372	AD2-047 E O1	30.81
936461	AD2-060	3.37
936511	AD2-066 C O1	10.34
936512	AD2-066 E O1	6.89
936781	AD2-101 C	5.82
936782	AD2-101 E	27.26
936791	AD2-102 C	14.68
936792	AD2-102 E	14.11
937001	AD2-134 C	3.34
937002	AD2-134 E	13.8
937031	AD2-137 C O1	7.17
937032	AD2-137 E O1	33.55
937051	AD2-140 C O1	7.53
937052	AD2-140 E O1	35.24
937061	AD2-141 C O1	7.48
937062	AD2-141 E O1	35.28
937071	AD2-142 C O1	15.05
937072	AD2-142 E O1	70.48
937121	AD2-148 C O1	4.51
937122	AD2-148 E O1	21.09
937131	AD2-149 C O1	4.51
937132	AD2-149 E O1	21.09
937141	AD2-150 C O1	4.51

Bus #	Bus	MW Impact
937142	AD2-150 E O1	21.09
937181	AD2-155 C O1	4.51
937182	AD2-155 E O1	21.09
937311	AD2-172 C	3.01
937312	AD2-172 E	4.15
937321	AD2-175 C	20.99
937322	AD2-175 E	13.99
937331	AD2-176 C O1	8.96
937332	AD2-176 E O1	5.97
937401	AD2-194 1	9.54
937411	AD2-194 2	9.54
938012	AE1-002 E O1	14.38
938511	AE1-070 1	11.21
938521	AE1-070 2	10.26
938851	AE1-113 C O1	10.72
938852	AE1-113 E O1	33.71
938861	AE1-114 C O1	4.39
938862	AE1-114 E O1	16.8
939051	AE1-134 1	1.67
939061	AE1-134 2	1.67
939321	AE1-163 C O1	7.23
939322	AE1-163 E O1	44.39
939351	AE1-166 C O1	14.5
939352	AE1-166 E O1	13.38
939401	AE1-172 C O1	9.5
939402	AE1-172 E O1	44.49
939691	AE1-199	2.92
939701	AE1-201 C	2.45
939702	AE1-201 E	0.54
939732	AE1-204 E	0.36
939741	AE1-205 C O1	12.45
939742	AE1-205 E O1	17.19
939861	AE1-222 1	98.48
939871	AE1-222 2	99.54
939921	AE1-228 C O1	12.28
939922	AE1-228 E O1	8.19
940101	AE1-252 C O1	16.2
940102	AE1-252 E O1	10.8
940501	AE2-035 C	3.01
940502	AE2-035 E	4.15
940621	AE2-049 C O2	11.62
940622	AE2-049 E O2	7.75
940631	AE2-050 C O2	15.56
940632	AE2-050 E O2	10.38
940752	AE2-062 E	0.16
940762	AE2-063 E	0.16
940881	AE2-077 C	3.85
940882	AE2-077 E	6.28
941131	AE2-107 C	8.92
941132	AE2-107 E	5.95
941551	AE2-152 C O2	14.72
941552	AE2-152 E O2	9.81

Bus #	Bus	MW Impact
941561	AE2-153 C O2	5.83
941562	AE2-153 E O2	27.3
941731	AE2-173	7.43
942111	AE2-223 C	2.88
942112	AE2-223 E	19.28
942421	AE2-255 C O2	3.67
942422	AE2-255 E O2	11.02
942651	AE2-281 C	1.03
942652	AE2-281 E	6.34
942881	AE2-307 C	28.54
942882	AE2-307 E	10.38
942911	AE2-310 C	11.28
942912	AE2-310 E	3.05
942991	AE2-321 C O2	10.0
942992	AE2-321 E O2	4.93
943121	AE2-341 C	15.61
943122	AE2-341 E	7.67
BLUEG	BLUEG	8.01
CALDERWOOD	CALDERWOOD	0.11
CANNELTON	CANNELTON	0.1
CARR	CARR	0.97
CATAWBA	CATAWBA	0.4
CBM-S1	CBM-S1	1.72
CBM-W1	CBM-W1	37.34
CBM-W2	CBM-W2	70.72
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.03
ELMERSMITH	ELMERSMITH	0.09
G-007	G-007	2.73
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.74
MEC	MEC	46.44
O-066	O-066	17.5
RENSSELAER	RENSSELAER	0.77
SANTEETLA	SANTEETLA	0.04
TRIMBLE	TRIMBLE	0.95
WEC	WEC	9.73
Z1-043	Z1-043	35.42

26.2 Index 2

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
8899939	270927	WILTON ; R	CE	275233	WILTON ;4M	CE	1	COMED_P4_112-65-BT2-3__	breaker	1379.0	162.9	162.98	DC	15.0

Bus #	Bus	MW Impact
270859	PWR VTR EC;R	15.09
274722	S-055 E	14.02
274772	LINCOLN ;3U	2.74
274773	LINCOLN ;4U	2.74
274774	LINCOLN ;5U	2.74
274775	LINCOLN ;6U	2.74
274776	LINCOLN ;7U	2.74
274777	LINCOLN ;8U	2.74
274788	SE CHICAG;5U	5.56
274789	SE CHICAG;6U	5.56
274790	SE CHICAG;7U	5.56
274791	SE CHICAG;8U	5.56
274792	SE CHICAG;9U	5.52
274793	SE CHICAG;0U	5.52
274794	SE CHICAG;1U	5.52
274795	SE CHICAG;2U	5.52
274859	EASYR;U1 E	13.72
274860	EASYR;U2 E	13.72
274888	PILOT HIL;1E	24.06
274890	CAYUG;1U E	20.62
274891	CAYUG;2U E	20.62
275149	KEMPTON ;1E	24.06
290021	O50 E	24.2
290051	GSG-6; E	13.05
290108	LEEDK;1U E	30.31
293061	N-015 E	19.81
293516	O-009 E1	2.14
293517	O-009 E2	1.09
293518	O-009 E3	1.2
293644	O22 E1	12.79
293645	O22 E2	24.84
293715	O-029 E	12.21
293716	O-029 E	6.69
293717	O-029 E	6.15
294392	P-010 E	25.16
294763	P-046 E	11.7
295109	WESTBROOK E	6.98
295111	SUBLETTE E	3.24
296125	R-030 C3	5.07
296128	R-030 E3	20.29
296271	R-030 C2	5.01
296272	R-030 E2	20.05

Bus #	Bus	MW Impact
296308	R-030 C1	5.01
296309	R-030 E1	20.05
910542	X3-005 E	0.91
914641	Y2-103	56.07
915011	Y3-013 1	4.67
915021	Y3-013 2	4.67
915031	Y3-013 3	4.67
916221	Z1-073 E	6.73
916502	Z1-106 E1	1.58
916504	Z1-106 E2	1.58
916512	Z1-107 E	3.23
916522	Z1-108 E	3.1
917502	Z2-087 E	26.23
918052	AA1-018 E	20.53
919221	AA1-146	21.95
919581	AA2-030	21.95
920272	AA2-123 E	3.05
924041	AB2-047 C O1	4.84
924042	AB2-047 E O1	32.36
924471	AB2-096	52.83
925161	AB2-173	3.91
925302	AB2-191 E	1.73
926311	AC1-109 1	2.39
926321	AC1-109 2	2.39
926331	AC1-110 1	2.37
926341	AC1-110 2	2.37
926351	AC1-111 1	0.95
926361	AC1-111 2	0.95
926371	AC1-111 3	0.95
926381	AC1-111 4	0.95
926391	AC1-111 5	0.95
926401	AC1-111 6	0.95
926431	AC1-114	2.97
926821	AC1-168 C O1	1.46
926822	AC1-168 E O1	9.77
927091	AC1-204 1	90.65
927101	AC1-204 2	90.65
927451	AC1-142A 1	5.22
927461	AC1-142A 2	5.22
927511	AC1-113 1	1.48
927521	AC1-113 2	1.48
927531	AC1-185 1	0.86
927541	AC1-185 2	0.86
927551	AC1-185 3	0.86
927561	AC1-185 4	0.86
927571	AC1-185 5	0.86
927581	AC1-185 6	0.86
927591	AC1-185 7	0.86
927601	AC1-185 8	0.86
930481	AB1-089	82.03
930501	AB1-091 O1	95.74
930741	AB1-122 1O1	91.06

Bus #	Bus	MW Impact
930751	AB1-122 2O1	92.05
932881	AC2-115 1	2.97
932891	AC2-115 2	2.97
932921	AC2-116	1.04
932931	AC2-117	6.65
933341	AC2-147 C	1.09
933342	AC2-147 E	1.78
933411	AC2-154 C	3.27
933412	AC2-154 E	5.33
933431	AC2-156 C O1	1.19
933432	AC2-156 E O1	1.95
933911	AD1-013 C	2.3
933912	AD1-013 E	3.67
933931	AD1-016 C	1.16
933932	AD1-016 E	1.89
934101	AD1-039 1	8.92
934111	AD1-039 2	9.02
934401	AD1-064 C O1	4.0
934402	AD1-064 E O1	18.72
934431	AD1-067 C	0.16
934432	AD1-067 E	0.69
934651	AD1-096 C	1.11
934652	AD1-096 E	1.81
934701	AD1-098 C O1	8.59
934702	AD1-098 E O1	6.27
934721	AD1-100 C	29.97
934722	AD1-100 E	139.86
934871	AD1-116 C	1.2
934872	AD1-116 E	1.95
934971	AD1-129 C	1.13
934972	AD1-129 E	0.75
935001	AD1-133 C O1	27.93
935002	AD1-133 E O1	18.62
936291	AD2-038 C O1	2.94
936292	AD2-038 E O1	19.66
936371	AD2-047 C O1	2.92
936372	AD2-047 E O1	31.46
936461	AD2-060	3.44
936511	AD2-066 C O1	10.56
936512	AD2-066 E O1	7.04
936781	AD2-101 C	5.94
936782	AD2-101 E	27.83
936791	AD2-102 C	14.99
936792	AD2-102 E	14.41
937001	AD2-134 C	3.41
937002	AD2-134 E	14.09
937031	AD2-137 C O1	7.3
937032	AD2-137 E O1	34.17
937051	AD2-140 C O1	7.67
937052	AD2-140 E O1	35.89
937061	AD2-141 C O1	7.62
937062	AD2-141 E O1	35.93

Bus #	Bus	MW Impact
937071	AD2-142 C O1	15.33
937072	AD2-142 E O1	71.78
937121	AD2-148 C O1	4.6
937122	AD2-148 E O1	21.53
937131	AD2-149 C O1	4.6
937132	AD2-149 E O1	21.53
937141	AD2-150 C O1	4.6
937142	AD2-150 E O1	21.53
937181	AD2-155 C O1	4.6
937182	AD2-155 E O1	21.53
937311	AD2-172 C	3.07
937312	AD2-172 E	4.24
937321	AD2-175 C	21.43
937322	AD2-175 E	14.28
937331	AD2-176 C O1	9.15
937332	AD2-176 E O1	6.1
937401	AD2-194 1	9.75
937411	AD2-194 2	9.75
938012	AE1-002 E O1	14.65
938511	AE1-070 1	11.45
938521	AE1-070 2	10.48
938851	AE1-113 C O1	10.95
938852	AE1-113 E O1	34.43
938861	AE1-114 C O1	4.49
938862	AE1-114 E O1	17.15
939051	AE1-134 1	1.71
939061	AE1-134 2	1.71
939321	AE1-163 C O1	7.38
939322	AE1-163 E O1	45.35
939351	AE1-166 C O1	14.79
939352	AE1-166 E O1	13.65
939401	AE1-172 C O1	9.69
939402	AE1-172 E O1	45.37
939691	AE1-199	2.98
939701	AE1-201 C	2.5
939702	AE1-201 E	0.55
939732	AE1-204 E	0.36
939741	AE1-205 C O1	12.7
939742	AE1-205 E O1	17.54
939861	AE1-222 1	100.56
939871	AE1-222 2	101.66
939921	AE1-228 C O1	12.54
939922	AE1-228 E O1	8.36
940101	AE1-252 C O1	16.52
940102	AE1-252 E O1	11.01
940501	AE2-035 C	3.07
940502	AE2-035 E	4.24
940621	AE2-049 C O2	11.86
940622	AE2-049 E O2	7.91
940631	AE2-050 C O2	15.89
940632	AE2-050 E O2	10.59
940752	AE2-062 E	0.16

Bus #	Bus	MW Impact
940762	AE2-063 E	0.16
940881	AE2-077 C	3.93
940882	AE2-077 E	6.42
941131	AE2-107 C	9.11
941132	AE2-107 E	6.07
941551	AE2-152 C O2	15.03
941552	AE2-152 E O2	10.02
941561	AE2-153 C O2	5.95
941562	AE2-153 E O2	27.87
941731	AE2-173	7.58
942111	AE2-223 C	2.94
942112	AE2-223 E	19.67
942421	AE2-255 C O2	3.75
942422	AE2-255 E O2	11.25
942651	AE2-281 C	1.05
942652	AE2-281 E	6.48
942881	AE2-307 C	29.12
942882	AE2-307 E	10.59
942911	AE2-310 C	11.52
942912	AE2-310 E	3.11
942991	AE2-321 C O2	10.21
942992	AE2-321 E O2	5.03
943121	AE2-341 C	15.94
943122	AE2-341 E	7.83
BLUEG	BLUEG	8.19
CALDERWOOD	CALDERWOOD	0.12
CANNELTON	CANNELTON	0.1
CARR	CARR	0.99
CATAWBA	CATAWBA	0.4
CBM-S1	CBM-S1	1.75
CBM-W1	CBM-W1	38.13
CBM-W2	CBM-W2	72.18
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.04
ELMERSMITH	ELMERSMITH	0.09
G-007	G-007	2.79
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.76
MEC	MEC	47.42
O-066	O-066	17.87
RENSSELAER	RENSSELAER	0.78
SANTEETLA	SANTEETLA	0.04
TRIMBLE	TRIMBLE	0.97
WEC	WEC	9.94
Z1-043	Z1-043	36.17

26.3 Index 3

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
7290249	274804	UNIV PK N;RP	CE	243229	05OLIVE	AEP	1	AEP_P4_#2978_05DUMONT 765_B	breaker	971.0	138.75	138.85	DC	10.0

Bus #	Bus	MW Impact
270859	PWR VTR EC;R	9.77
274722	S-055 E	9.13
274808	UNIV PK N;4U	1.28
274809	UNIV PK N;5U	1.28
274811	UNIV PK N;7U	1.28
274812	UNIV PK N;8U	1.28
274814	UNIV PK N;0U	1.28
274815	UNIV PK N;XU	1.28
274832	U4-027	8.59
274859	EASYR;U1 E	8.82
274860	EASYR;U2 E	8.82
274888	PILOT HIL;1E	14.83
274890	CAYUG;1U E	10.67
274891	CAYUG;2U E	10.67
275149	KEMPTON ;1E	14.83
290021	O50 E	15.58
290051	GSG-6; E	8.41
290108	LEEDK;1U E	19.56
293061	N-015 E	12.57
293516	O-009 E1	7.24
293517	O-009 E2	3.68
293518	O-009 E3	4.05
293644	O22 E1	7.86
293645	O22 E2	15.26
293715	O-029 E	7.82
293716	O-029 E	4.29
293717	O-029 E	3.94
293771	O-035 E	5.08
294392	P-010 E	15.97
294401	BSHIL;1U E	6.79
294410	BSHIL;2U E	6.79
294763	P-046 E	7.54
295109	WESTBROOK E	4.5
295111	SUBLETTE E	2.08
910542	X3-005 E	0.51
914641	Y2-103	36.51
915011	Y3-013 1	3.04
915021	Y3-013 2	3.04
915031	Y3-013 3	3.04
916211	Z1-072 E	3.84
916221	Z1-073 E	4.34

Bus #	Bus	MW Impact
916502	Z1-106 E1	1.02
916504	Z1-106 E2	1.02
916512	Z1-107 E	2.17
916522	Z1-108 E	2.01
918052	AA1-018 E	14.26
919221	AA1-146	14.08
919581	AA2-030	14.08
919621	AA2-039 C	1.65
919622	AA2-039 E	11.07
920272	AA2-123 E	1.98
924471	AB2-096	34.19
925161	AB2-173	2.51
925302	AB2-191 E	1.11
925581	AC1-033 C	1.11
925582	AC1-033 E	7.44
926311	AC1-109 1	1.55
926321	AC1-109 2	1.55
926331	AC1-110 1	1.53
926341	AC1-110 2	1.53
926351	AC1-111 1	0.62
926361	AC1-111 2	0.62
926371	AC1-111 3	0.62
926381	AC1-111 4	0.62
926391	AC1-111 5	0.62
926401	AC1-111 6	0.62
926431	AC1-114	1.92
926821	AC1-168 C O1	0.92
926822	AC1-168 E O1	6.16
927091	AC1-204 1	59.05
927101	AC1-204 2	59.09
927201	AC1-214 C O1	1.63
927202	AC1-214 E O1	5.18
927451	AC1-142A 1	3.45
927461	AC1-142A 2	3.44
927511	AC1-113 1	0.96
927521	AC1-113 2	0.96
927531	AC1-185 1	0.55
927541	AC1-185 2	0.55
927551	AC1-185 3	0.55
927561	AC1-185 4	0.55
927571	AC1-185 5	0.55
927581	AC1-185 6	0.55
927591	AC1-185 7	0.55
927601	AC1-185 8	0.55
930481	AB1-089	52.99
930501	AB1-091 O1	57.0
930741	AB1-122 1O1	58.08
930751	AB1-122 2O1	59.56
932881	AC2-115 1	1.92
932891	AC2-115 2	1.92
932921	AC2-116	0.67
932931	AC2-117	10.38

Bus #	Bus	MW Impact
933341	AC2-147 C	0.7
933342	AC2-147 E	1.14
933411	AC2-154 C	2.01
933412	AC2-154 E	3.28
933431	AC2-156 C O1	0.77
933432	AC2-156 E O1	1.26
933911	AD1-013 C	1.48
933912	AD1-013 E	2.37
933931	AD1-016 C	0.75
933932	AD1-016 E	1.22
934051	AD1-031 C O1	2.26
934052	AD1-031 E O1	3.68
934101	AD1-039 1	5.69
934111	AD1-039 2	5.84
934401	AD1-064 C O1	2.59
934402	AD1-064 E O1	12.1
934431	AD1-067 C	0.11
934432	AD1-067 E	0.44
934651	AD1-096 C	0.72
934652	AD1-096 E	1.17
934701	AD1-098 C O1	5.53
934702	AD1-098 E O1	4.04
934721	AD1-100 C	15.54
934722	AD1-100 E	72.54
934871	AD1-116 C	0.83
934872	AD1-116 E	1.36
934971	AD1-129 C	0.73
934972	AD1-129 E	0.49
935001	AD1-133 C O1	16.63
935002	AD1-133 E O1	11.09
936291	AD2-038 C O1	1.97
936292	AD2-038 E O1	13.16
936371	AD2-047 C O1	1.8
936372	AD2-047 E O1	19.38
936461	AD2-060	2.12
936511	AD2-066 C O1	6.81
936512	AD2-066 E O1	4.54
936781	AD2-101 C	3.5
936782	AD2-101 E	16.38
936791	AD2-102 C	9.68
936792	AD2-102 E	9.3
937001	AD2-134 C	2.2
937002	AD2-134 E	9.08
937031	AD2-137 C O1	2.69
937032	AD2-137 E O1	12.58
937051	AD2-140 C O1	2.69
937052	AD2-140 E O1	12.58
937061	AD2-141 C O1	2.67
937062	AD2-141 E O1	12.6
937071	AD2-142 C O1	5.38
937072	AD2-142 E O1	25.17
937121	AD2-148 C O1	2.74

Bus #	Bus	MW Impact
937122	AD2-148 E O1	12.81
937131	AD2-149 C O1	2.74
937132	AD2-149 E O1	12.81
937141	AD2-150 C O1	2.74
937142	AD2-150 E O1	12.81
937181	AD2-155 C O1	2.74
937182	AD2-155 E O1	12.81
937311	AD2-172 C	1.98
937312	AD2-172 E	2.73
937321	AD2-175 C	12.74
937322	AD2-175 E	8.5
937331	AD2-176 C O1	5.92
937332	AD2-176 E O1	3.95
937401	AD2-194 1	6.35
937411	AD2-194 2	6.35
937531	AD2-214 C	3.52
937532	AD2-214 E	1.66
938012	AE1-002 E O1	5.39
938511	AE1-070 1	7.46
938521	AE1-070 2	6.83
938851	AE1-113 C O1	7.05
938852	AE1-113 E O1	22.17
938861	AE1-114 C O1	2.89
938862	AE1-114 E O1	11.04
939051	AE1-134 1	1.09
939061	AE1-134 2	1.09
939321	AE1-163 C O1	4.94
939322	AE1-163 E O1	30.35
939351	AE1-166 C O1	8.26
939352	AE1-166 E O1	7.63
939401	AE1-172 C O1	4.9
939402	AE1-172 E O1	22.92
939631	AE1-193 C O1	5.51
939632	AE1-193 E O1	36.9
939681	AE1-198 C O1	16.37
939682	AE1-198 E O1	13.91
939691	AE1-199	1.92
939701	AE1-201 C	1.62
939702	AE1-201 E	0.36
939732	AE1-204 E	0.24
939861	AE1-222 1	64.14
939871	AE1-222 2	65.77
939921	AE1-228 C O1	8.09
939922	AE1-228 E O1	5.39
940101	AE1-252 C O1	8.34
940102	AE1-252 E O1	5.56
940501	AE2-035 C	1.98
940502	AE2-035 E	2.73
940621	AE2-049 C O2	7.31
940622	AE2-049 E O2	4.87
940631	AE2-050 C O2	9.99
940632	AE2-050 E O2	6.66

Bus #	Bus	MW Impact
940752	AE2-062 E	0.1
940762	AE2-063 E	0.1
940881	AE2-077 C	2.54
940882	AE2-077 E	4.14
941131	AE2-107 C	5.88
941132	AE2-107 E	3.92
941551	AE2-152 C O2	9.51
941552	AE2-152 E O2	6.34
941561	AE2-153 C O2	3.72
941562	AE2-153 E O2	17.43
942421	AE2-255 C O2	2.5
942422	AE2-255 E O2	7.5
942651	AE2-281 C	0.71
942652	AE2-281 E	4.34
942881	AE2-307 C	18.31
942882	AE2-307 E	6.66
942911	AE2-310 C	7.09
942912	AE2-310 E	1.92
942991	AE2-321 C O2	6.62
942992	AE2-321 E O2	3.26
943121	AE2-341 C	10.31
943122	AE2-341 E	5.06
990901	L-005 E	8.02
BLUEG	BLUEG	4.51
CALDERWOOD	CALDERWOOD	0.06
CANNELTON	CANNELTON	0.07
CARR	CARR	0.62
CATAWBA	CATAWBA	0.24
CBM-S1	CBM-S1	1.13
CBM-W1	CBM-W1	21.91
CBM-W2	CBM-W2	42.89
CHEOAH	CHEOAH	0.06
CHILHOWEE	CHILHOWEE	0.02
ELMERSMITH	ELMERSMITH	0.07
G-007	G-007	1.74
GIBSON	GIBSON	0.03
HAMLET	HAMLET	0.45
MEC	MEC	29.98
O-066	O-066	11.15
RENSSELAER	RENSSELAER	0.49
SANTEETLA	SANTEETLA	0.02
TRIMBLE	TRIMBLE	0.53
WEC	WEC	6.45
Z1-043	Z1-043	22.8

26.4 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
8899932	275232	WILTON ;3M	CE	270644	WILTON ;	CE	1	COMED_P4_112-65-BT5-6__	breaker	1379.0	163.14	163.22	DC	14.69

Bus #	Bus	MW Impact
270859	PWR VTR EC;R	14.78
274722	S-055 E	13.73
274772	LINCOLN ;3U	2.67
274773	LINCOLN ;4U	2.67
274774	LINCOLN ;5U	2.67
274775	LINCOLN ;6U	2.67
274776	LINCOLN ;7U	2.67
274777	LINCOLN ;8U	2.67
274788	SE CHICAG;5U	5.44
274789	SE CHICAG;6U	5.44
274790	SE CHICAG;7U	5.44
274791	SE CHICAG;8U	5.44
274792	SE CHICAG;9U	5.4
274793	SE CHICAG;0U	5.4
274794	SE CHICAG;1U	5.4
274795	SE CHICAG;2U	5.4
274859	EASYR;U1 E	13.43
274860	EASYR;U2 E	13.43
274888	PILOT HIL;1E	23.57
274890	CAYUG;1U E	20.22
274891	CAYUG;2U E	20.22
275149	KEMPTON ;1E	23.57
290021	O50 E	23.7
290051	GSG-6; E	12.77
290108	LEEDK;1U E	29.68
293061	N-015 E	19.41
293644	O22 E1	12.53
293645	O22 E2	24.32
294392	P-010 E	24.65
294763	P-046 E	11.45
295109	WESTBROOK E	6.84
295111	SUBLETTE E	3.17
296125	R-030 C3	4.97
296128	R-030 E3	19.89
296271	R-030 C2	4.91
296272	R-030 E2	19.65
296308	R-030 C1	4.91
296309	R-030 E1	19.65
910542	X3-005 E	0.89
914641	Y2-103	54.9
915011	Y3-013 1	4.58
915021	Y3-013 2	4.58

Bus #	Bus	MW Impact
915031	Y3-013 3	4.58
916221	Z1-073 E	6.59
916502	Z1-106 E1	1.54
916504	Z1-106 E2	1.54
916512	Z1-107 E	3.16
916522	Z1-108 E	3.04
917502	Z2-087 E	25.71
918052	AA1-018 E	20.09
919581	AA2-030	18.9
920272	AA2-123 E	2.99
924041	AB2-047 C O1	4.74
924042	AB2-047 E O1	31.72
924471	AB2-096	51.73
925161	AB2-173	3.83
925302	AB2-191 E	1.69
926311	AC1-109 1	2.34
926321	AC1-109 2	2.34
926331	AC1-110 1	2.32
926341	AC1-110 2	2.32
926351	AC1-111 1	0.93
926361	AC1-111 2	0.93
926371	AC1-111 3	0.93
926381	AC1-111 4	0.93
926391	AC1-111 5	0.93
926401	AC1-111 6	0.93
926431	AC1-114	2.91
926821	AC1-168 C O1	1.43
926822	AC1-168 E O1	9.57
927091	AC1-204 1	88.75
927101	AC1-204 2	88.75
927451	AC1-142A 1	5.11
927461	AC1-142A 2	5.11
927511	AC1-113 1	1.45
927521	AC1-113 2	1.45
927531	AC1-185 1	0.84
927541	AC1-185 2	0.84
927551	AC1-185 3	0.84
927561	AC1-185 4	0.84
927571	AC1-185 5	0.84
927581	AC1-185 6	0.84
927591	AC1-185 7	0.84
927601	AC1-185 8	0.84
930481	AB1-089	80.33
930501	AB1-091 O1	93.8
930741	AB1-122 1O1	89.17
930751	AB1-122 2O1	90.13
932881	AC2-115 1	2.91
932891	AC2-115 2	2.91
932921	AC2-116	1.02
932931	AC2-117	6.51
933341	AC2-147 C	1.07
933342	AC2-147 E	1.74

Bus #	Bus	MW Impact
933411	AC2-154 C	3.2
933412	AC2-154 E	5.22
933431	AC2-156 C O1	1.17
933432	AC2-156 E O1	1.91
933911	AD1-013 C	2.25
933912	AD1-013 E	3.59
933931	AD1-016 C	1.13
933932	AD1-016 E	1.85
934101	AD1-039 1	8.74
934111	AD1-039 2	8.83
934401	AD1-064 C O1	3.91
934402	AD1-064 E O1	18.33
934431	AD1-067 C	0.16
934432	AD1-067 E	0.67
934651	AD1-096 C	1.09
934652	AD1-096 E	1.78
934701	AD1-098 C O1	8.41
934702	AD1-098 E O1	6.14
934721	AD1-100 C	29.39
934722	AD1-100 E	137.14
934871	AD1-116 C	1.17
934872	AD1-116 E	1.91
934971	AD1-129 C	1.1
934972	AD1-129 E	0.74
935001	AD1-133 C O1	27.36
935002	AD1-133 E O1	18.24
936291	AD2-038 C O1	2.88
936292	AD2-038 E O1	19.25
936371	AD2-047 C O1	2.86
936372	AD2-047 E O1	30.81
936461	AD2-060	3.37
936511	AD2-066 C O1	10.34
936512	AD2-066 E O1	6.89
936781	AD2-101 C	5.82
936782	AD2-101 E	27.26
936791	AD2-102 C	14.68
936792	AD2-102 E	14.11
937001	AD2-134 C	3.34
937002	AD2-134 E	13.8
937031	AD2-137 C O1	7.17
937032	AD2-137 E O1	33.55
937051	AD2-140 C O1	7.53
937052	AD2-140 E O1	35.24
937061	AD2-141 C O1	7.48
937062	AD2-141 E O1	35.28
937071	AD2-142 C O1	15.05
937072	AD2-142 E O1	70.48
937121	AD2-148 C O1	4.51
937122	AD2-148 E O1	21.09
937131	AD2-149 C O1	4.51
937132	AD2-149 E O1	21.09
937141	AD2-150 C O1	4.51

Bus #	Bus	MW Impact
937142	AD2-150 E O1	21.09
937181	AD2-155 C O1	4.51
937182	AD2-155 E O1	21.09
937311	AD2-172 C	3.01
937312	AD2-172 E	4.15
937321	AD2-175 C	20.99
937322	AD2-175 E	13.99
937331	AD2-176 C O1	8.96
937332	AD2-176 E O1	5.97
937401	AD2-194 1	9.54
937411	AD2-194 2	9.54
938012	AE1-002 E O1	14.38
938511	AE1-070 1	11.21
938521	AE1-070 2	10.26
938851	AE1-113 C O1	10.72
938852	AE1-113 E O1	33.71
938861	AE1-114 C O1	4.39
938862	AE1-114 E O1	16.8
939051	AE1-134 1	1.67
939061	AE1-134 2	1.67
939321	AE1-163 C O1	7.23
939322	AE1-163 E O1	44.39
939351	AE1-166 C O1	14.5
939352	AE1-166 E O1	13.38
939401	AE1-172 C O1	9.5
939402	AE1-172 E O1	44.49
939691	AE1-199	2.92
939701	AE1-201 C	2.45
939702	AE1-201 E	0.54
939732	AE1-204 E	0.36
939741	AE1-205 C O1	12.45
939742	AE1-205 E O1	17.19
939861	AE1-222 1	98.48
939871	AE1-222 2	99.54
939921	AE1-228 C O1	12.28
939922	AE1-228 E O1	8.19
940101	AE1-252 C O1	16.2
940102	AE1-252 E O1	10.8
940501	AE2-035 C	3.01
940502	AE2-035 E	4.15
940621	AE2-049 C O2	11.62
940622	AE2-049 E O2	7.75
940631	AE2-050 C O2	15.56
940632	AE2-050 E O2	10.38
940752	AE2-062 E	0.16
940762	AE2-063 E	0.16
940881	AE2-077 C	3.85
940882	AE2-077 E	6.28
941131	AE2-107 C	8.92
941132	AE2-107 E	5.95
941551	AE2-152 C O2	14.72
941552	AE2-152 E O2	9.81

Bus #	Bus	MW Impact
941561	AE2-153 C O2	5.83
941562	AE2-153 E O2	27.3
941731	AE2-173	7.43
942111	AE2-223 C	2.88
942112	AE2-223 E	19.28
942421	AE2-255 C O2	3.67
942422	AE2-255 E O2	11.02
942651	AE2-281 C	1.03
942652	AE2-281 E	6.34
942881	AE2-307 C	28.54
942882	AE2-307 E	10.38
942911	AE2-310 C	11.28
942912	AE2-310 E	3.05
942991	AE2-321 C O2	10.0
942992	AE2-321 E O2	4.93
943121	AE2-341 C	15.61
943122	AE2-341 E	7.67
BLUEG	BLUEG	8.01
CALDERWOOD	CALDERWOOD	0.11
CANNELTON	CANNELTON	0.1
CARR	CARR	0.97
CATAWBA	CATAWBA	0.4
CBM-S1	CBM-S1	1.72
CBM-W1	CBM-W1	37.34
CBM-W2	CBM-W2	70.72
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.03
ELMERSMITH	ELMERSMITH	0.09
G-007	G-007	2.73
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.74
MEC	MEC	46.44
O-066	O-066	17.5
RENSSELAER	RENSSELAER	0.77
SANTEETLA	SANTEETLA	0.04
TRIMBLE	TRIMBLE	0.95
WEC	WEC	9.73
Z1-043	Z1-043	35.42

26.5 Index 5

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
8899938	275233	WILTON ;4M	CE	270644	WILTON ;	CE	1	COMED_P4_112-65-BT2-3__	breaker	1379.0	162.9	162.98	DC	15.0

Bus #	Bus	MW Impact
270859	PWR VTR EC;R	15.09
274722	S-055 E	14.02
274772	LINCOLN ;3U	2.74
274773	LINCOLN ;4U	2.74
274774	LINCOLN ;5U	2.74
274775	LINCOLN ;6U	2.74
274776	LINCOLN ;7U	2.74
274777	LINCOLN ;8U	2.74
274788	SE CHICAG;5U	5.56
274789	SE CHICAG;6U	5.56
274790	SE CHICAG;7U	5.56
274791	SE CHICAG;8U	5.56
274792	SE CHICAG;9U	5.52
274793	SE CHICAG;0U	5.52
274794	SE CHICAG;1U	5.52
274795	SE CHICAG;2U	5.52
274859	EASYR;U1 E	13.72
274860	EASYR;U2 E	13.72
274888	PILOT HIL;1E	24.06
274890	CAYUG;1U E	20.62
274891	CAYUG;2U E	20.62
275149	KEMPTON ;1E	24.06
290021	O50 E	24.2
290051	GSG-6; E	13.05
290108	LEEDK;1U E	30.31
293061	N-015 E	19.81
293516	O-009 E1	2.14
293517	O-009 E2	1.09
293518	O-009 E3	1.2
293644	O22 E1	12.79
293645	O22 E2	24.84
293715	O-029 E	12.21
293716	O-029 E	6.69
293717	O-029 E	6.15
294392	P-010 E	25.16
294763	P-046 E	11.7
295109	WESTBROOK E	6.98
295111	SUBLETTE E	3.24
296125	R-030 C3	5.07
296128	R-030 E3	20.29
296271	R-030 C2	5.01
296272	R-030 E2	20.05

Bus #	Bus	MW Impact
296308	R-030 C1	5.01
296309	R-030 E1	20.05
910542	X3-005 E	0.91
914641	Y2-103	56.07
915011	Y3-013 1	4.67
915021	Y3-013 2	4.67
915031	Y3-013 3	4.67
916221	Z1-073 E	6.73
916502	Z1-106 E1	1.58
916504	Z1-106 E2	1.58
916512	Z1-107 E	3.23
916522	Z1-108 E	3.1
917502	Z2-087 E	26.23
918052	AA1-018 E	20.53
919221	AA1-146	21.95
919581	AA2-030	21.95
920272	AA2-123 E	3.05
924041	AB2-047 C O1	4.84
924042	AB2-047 E O1	32.36
924471	AB2-096	52.83
925161	AB2-173	3.91
925302	AB2-191 E	1.73
926311	AC1-109 1	2.39
926321	AC1-109 2	2.39
926331	AC1-110 1	2.37
926341	AC1-110 2	2.37
926351	AC1-111 1	0.95
926361	AC1-111 2	0.95
926371	AC1-111 3	0.95
926381	AC1-111 4	0.95
926391	AC1-111 5	0.95
926401	AC1-111 6	0.95
926431	AC1-114	2.97
926821	AC1-168 C O1	1.46
926822	AC1-168 E O1	9.77
927091	AC1-204 1	90.65
927101	AC1-204 2	90.65
927451	AC1-142A 1	5.22
927461	AC1-142A 2	5.22
927511	AC1-113 1	1.48
927521	AC1-113 2	1.48
927531	AC1-185 1	0.86
927541	AC1-185 2	0.86
927551	AC1-185 3	0.86
927561	AC1-185 4	0.86
927571	AC1-185 5	0.86
927581	AC1-185 6	0.86
927591	AC1-185 7	0.86
927601	AC1-185 8	0.86
930481	AB1-089	82.03
930501	AB1-091 O1	95.74
930741	AB1-122 1O1	91.06

Bus #	Bus	MW Impact
930751	AB1-122 2O1	92.05
932881	AC2-115 1	2.97
932891	AC2-115 2	2.97
932921	AC2-116	1.04
932931	AC2-117	6.65
933341	AC2-147 C	1.09
933342	AC2-147 E	1.78
933411	AC2-154 C	3.27
933412	AC2-154 E	5.33
933431	AC2-156 C O1	1.19
933432	AC2-156 E O1	1.95
933911	AD1-013 C	2.3
933912	AD1-013 E	3.67
933931	AD1-016 C	1.16
933932	AD1-016 E	1.89
934101	AD1-039 1	8.92
934111	AD1-039 2	9.02
934401	AD1-064 C O1	4.0
934402	AD1-064 E O1	18.72
934431	AD1-067 C	0.16
934432	AD1-067 E	0.69
934651	AD1-096 C	1.11
934652	AD1-096 E	1.81
934701	AD1-098 C O1	8.59
934702	AD1-098 E O1	6.27
934721	AD1-100 C	29.97
934722	AD1-100 E	139.86
934871	AD1-116 C	1.2
934872	AD1-116 E	1.95
934971	AD1-129 C	1.13
934972	AD1-129 E	0.75
935001	AD1-133 C O1	27.93
935002	AD1-133 E O1	18.62
936291	AD2-038 C O1	2.94
936292	AD2-038 E O1	19.66
936371	AD2-047 C O1	2.92
936372	AD2-047 E O1	31.46
936461	AD2-060	3.44
936511	AD2-066 C O1	10.56
936512	AD2-066 E O1	7.04
936781	AD2-101 C	5.94
936782	AD2-101 E	27.83
936791	AD2-102 C	14.99
936792	AD2-102 E	14.41
937001	AD2-134 C	3.41
937002	AD2-134 E	14.09
937031	AD2-137 C O1	7.3
937032	AD2-137 E O1	34.17
937051	AD2-140 C O1	7.67
937052	AD2-140 E O1	35.89
937061	AD2-141 C O1	7.62
937062	AD2-141 E O1	35.93

Bus #	Bus	MW Impact
937071	AD2-142 C O1	15.33
937072	AD2-142 E O1	71.78
937121	AD2-148 C O1	4.6
937122	AD2-148 E O1	21.53
937131	AD2-149 C O1	4.6
937132	AD2-149 E O1	21.53
937141	AD2-150 C O1	4.6
937142	AD2-150 E O1	21.53
937181	AD2-155 C O1	4.6
937182	AD2-155 E O1	21.53
937311	AD2-172 C	3.07
937312	AD2-172 E	4.24
937321	AD2-175 C	21.43
937322	AD2-175 E	14.28
937331	AD2-176 C O1	9.15
937332	AD2-176 E O1	6.1
937401	AD2-194 1	9.75
937411	AD2-194 2	9.75
938012	AE1-002 E O1	14.65
938511	AE1-070 1	11.45
938521	AE1-070 2	10.48
938851	AE1-113 C O1	10.95
938852	AE1-113 E O1	34.43
938861	AE1-114 C O1	4.49
938862	AE1-114 E O1	17.15
939051	AE1-134 1	1.71
939061	AE1-134 2	1.71
939321	AE1-163 C O1	7.38
939322	AE1-163 E O1	45.35
939351	AE1-166 C O1	14.79
939352	AE1-166 E O1	13.65
939401	AE1-172 C O1	9.69
939402	AE1-172 E O1	45.37
939691	AE1-199	2.98
939701	AE1-201 C	2.5
939702	AE1-201 E	0.55
939732	AE1-204 E	0.36
939741	AE1-205 C O1	12.7
939742	AE1-205 E O1	17.54
939861	AE1-222 1	100.56
939871	AE1-222 2	101.66
939921	AE1-228 C O1	12.54
939922	AE1-228 E O1	8.36
940101	AE1-252 C O1	16.52
940102	AE1-252 E O1	11.01
940501	AE2-035 C	3.07
940502	AE2-035 E	4.24
940621	AE2-049 C O2	11.86
940622	AE2-049 E O2	7.91
940631	AE2-050 C O2	15.89
940632	AE2-050 E O2	10.59
940752	AE2-062 E	0.16

Bus #	Bus	MW Impact
940762	AE2-063 E	0.16
940881	AE2-077 C	3.93
940882	AE2-077 E	6.42
941131	AE2-107 C	9.11
941132	AE2-107 E	6.07
941551	AE2-152 C O2	15.03
941552	AE2-152 E O2	10.02
941561	AE2-153 C O2	5.95
941562	AE2-153 E O2	27.87
941731	AE2-173	7.58
942111	AE2-223 C	2.94
942112	AE2-223 E	19.67
942421	AE2-255 C O2	3.75
942422	AE2-255 E O2	11.25
942651	AE2-281 C	1.05
942652	AE2-281 E	6.48
942881	AE2-307 C	29.12
942882	AE2-307 E	10.59
942911	AE2-310 C	11.52
942912	AE2-310 E	3.11
942991	AE2-321 C O2	10.21
942992	AE2-321 E O2	5.03
943121	AE2-341 C	15.94
943122	AE2-341 E	7.83
BLUEG	BLUEG	8.19
CALDERWOOD	CALDERWOOD	0.12
CANNELTON	CANNELTON	0.1
CARR	CARR	0.99
CATAWBA	CATAWBA	0.4
CBM-S1	CBM-S1	1.75
CBM-W1	CBM-W1	38.13
CBM-W2	CBM-W2	72.18
CHEOAH	CHEOAH	0.12
CHILHOWEE	CHILHOWEE	0.04
ELMERSMITH	ELMERSMITH	0.09
G-007	G-007	2.79
GIBSON	GIBSON	0.01
HAMLET	HAMLET	0.76
MEC	MEC	47.42
O-066	O-066	17.87
RENSSELAER	RENSSELAER	0.78
SANTEETLA	SANTEETLA	0.04
TRIMBLE	TRIMBLE	0.97
WEC	WEC	9.94
Z1-043	Z1-043	36.17

26.6 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
8901070	918050	AA1-018 TAP	CE	270769	GOODINGS ;2R	CE	1	COMED_P7_345-L1202__B-S+_345-L1227__R-S-A	tower	1494.0	104.47	107.16	DC	40.14

Bus #	Bus	MW Impact
274677	POWERTON ;5U	19.72
274678	POWERTON ;6U	19.77
274879	MINONK ;1U	1.03
290021	O50 E	33.67
293644	O22 E1	6.49
293645	O22 E2	12.6
918051	AA1-018 C	1.5
918052	AA1-018 E	82.42
926841	AC1-171 C O1	0.64
926842	AC1-171 E O1	4.28
930741	AB1-122 1O1	102.44
930751	AB1-122 2O1	121.01
934101	AD1-039 1	10.04
934111	AD1-039 2	11.86
934871	AD1-116 C	4.8
934872	AD1-116 E	7.83
936291	AD2-038 C O1	8.21
936292	AD2-038 E O1	54.98
938851	AE1-113 C O1	15.24
938852	AE1-113 E O1	47.9
939321	AE1-163 C O1	20.64
939322	AE1-163 E O1	126.8
939861	AE1-222 1	113.13
939871	AE1-222 2	133.64
942421	AE2-255 C O2	10.04
942422	AE2-255 E O2	30.11
942651	AE2-281 C	2.95
942652	AE2-281 E	18.11
954702	J844 E	20.15
990901	L-005 E	7.0
CARR	CARR	0.05
CBM-S1	CBM-S1	2.43
CBM-S2	CBM-S2	0.5
CBM-W1	CBM-W1	4.36
CBM-W2	CBM-W2	37.47
CIN	CIN	0.82
CPL	CPL	0.14
G-007	G-007	0.13
IPL	IPL	0.39
LGEE	LGEE	0.08

Bus #	Bus	MW Impact
MEC	MEC	14.92
O-066	O-066	0.84
RENSSELAER	RENSSELAER	0.04
Z1-043	Z1-043	13.44

26.7 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
8900942	930740	AB1-122 TAP	CE	270717	DRESDEN ; R	CE	1	COMED_P7_345-L19601_B-S+_345-L9801__R-S_FSA	tower	1195.0	178.23	180.1	DC	22.3

Bus #	Bus	MW Impact
274677	POWERTON ;5U	20.85
274678	POWERTON ;6U	20.91
274861	TOP CROP ;1U	0.55
274862	TOP CROP ;2U	1.07
274879	MINONK ;1U	0.59
290021	O50 E	19.42
293644	O22 E1	18.14
293645	O22 E2	35.21
294401	BSHIL;1U E	6.21
294410	BSHIL;2U E	6.21
918051	AA1-018 C	0.53
918052	AA1-018 E	29.09
919621	AA2-039 C	1.51
919622	AA2-039 E	10.12
925581	AC1-033 C	1.02
925582	AC1-033 E	6.81
926841	AC1-171 C O1	0.85
926842	AC1-171 E O1	5.65
930741	AB1-122 1O1	524.77
934051	AD1-031 C O1	2.06
934052	AD1-031 E O1	3.36
934101	AD1-039 1	51.43
934871	AD1-116 C	1.69
934872	AD1-116 E	2.76
936291	AD2-038 C O1	4.35
936292	AD2-038 E O1	29.1
938851	AE1-113 C O1	8.79
938852	AE1-113 E O1	27.63
939321	AE1-163 C O1	10.93
939322	AE1-163 E O1	67.13
939631	AE1-193 C O1	5.04
939632	AE1-193 E O1	33.72
939681	AE1-198 C O1	14.96
939682	AE1-198 E O1	12.71
939861	AE1-222 1	579.53
942421	AE2-255 C O2	5.58
942422	AE2-255 E O2	16.73
942651	AE2-281 C	1.56
942652	AE2-281 E	9.59
951631	J456 C	1.74

Bus #	Bus	MW Impact
951632	J456 E	9.42
954702	J844 E	27.3
990901	L-005 E	9.42
CARR	CARR	0.05
CBM-S1	CBM-S1	3.22
CBM-S2	CBM-S2	0.72
CBM-W1	CBM-W1	6.57
CBM-W2	CBM-W2	48.65
CIN	CIN	0.98
CPLE	CPLE	0.21
G-007	G-007	0.11
IPL	IPL	0.48
LGEE	LGEE	0.12
MEC	MEC	20.16
O-066	O-066	0.71
RENSSELAER	RENSSELAER	0.04
Z1-043	Z1-043	18.19

26.8 Index 8

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
8900983	930750	AB1-122 TAP	CE	270716	DRESDEN ; B	CE	1	COMED_P7_345-L19601_B-S+_345-L9801__R-S_FSA	tower	1768.0	132.19	133.66	DC	26.02

Bus #	Bus	MW Impact
274677	POWERTON ;5U	24.55
274678	POWERTON ;6U	24.38
274861	TOP CROP ;1U	0.65
274862	TOP CROP ;2U	1.26
274879	MINONK ;1U	2.68
290021	O50 E	87.98
293644	O22 E1	21.37
293645	O22 E2	41.49
918051	AA1-018 C	0.62
918052	AA1-018 E	33.94
930751	AB1-122 2O1	520.97
934111	AD1-039 2	51.05
934871	AD1-116 C	1.98
934872	AD1-116 E	3.23
936291	AD2-038 C O1	5.07
936292	AD2-038 E O1	33.95
938851	AE1-113 C O1	39.81
938852	AE1-113 E O1	125.15
939321	AE1-163 C O1	12.75
939322	AE1-163 E O1	78.31
939871	AE1-222 2	575.33
942421	AE2-255 C O2	6.5
942422	AE2-255 E O2	19.51
942651	AE2-281 C	1.82
942652	AE2-281 E	11.19
CARR	CARR	0.03
CBM-S1	CBM-S1	2.82
CBM-S2	CBM-S2	0.65
CBM-W1	CBM-W1	3.43
CBM-W2	CBM-W2	42.14
CIN	CIN	1.11
CPL	CPL	0.19
G-007	G-007	0.07
IPL	IPL	0.56
LGEE	LGEE	0.14
MEC	MEC	15.29
O-066	O-066	0.44
RENSSELAER	RENSSELAER	0.02
Z1-043	Z1-043	13.54

26.9 Index 9

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
8901133	936290	AD2-038 TAP	CE	918050	AA1-018 TAP	CE	1	COMED_P7_345-L1202__B-S_+_345-L1227__R-S-A	tower	1494.0	101.83	104.51	DC	40.15

Bus #	Bus	MW Impact
274677	POWERTON ;5U	19.73
274678	POWERTON ;6U	19.78
274879	MINONK ;1U	1.03
290021	O50 E	33.69
293644	O22 E1	6.5
293645	O22 E2	12.62
293771	O-035 E	3.09
294401	BSHIL;1U E	4.59
294410	BSHIL;2U E	4.59
916211	Z1-072 E	2.34
919621	AA2-039 C	1.12
919622	AA2-039 E	7.49
925581	AC1-033 C	0.75
925582	AC1-033 E	5.04
926841	AC1-171 C O1	0.64
926842	AC1-171 E O1	4.29
927201	AC1-214 C O1	0.99
927202	AC1-214 E O1	3.15
930741	AB1-122 1O1	102.5
930751	AB1-122 2O1	121.07
934051	AD1-031 C O1	1.53
934052	AD1-031 E O1	2.49
934101	AD1-039 1	10.04
934111	AD1-039 2	11.86
936291	AD2-038 C O1	8.22
936292	AD2-038 E O1	54.99
938851	AE1-113 C O1	15.24
938852	AE1-113 E O1	47.92
939321	AE1-163 C O1	20.65
939322	AE1-163 E O1	126.83
939631	AE1-193 C O1	3.73
939632	AE1-193 E O1	24.96
939681	AE1-198 C O1	11.07
939682	AE1-198 E O1	9.41
939861	AE1-222 1	113.2
939871	AE1-222 2	133.7
942421	AE2-255 C O2	10.04
942422	AE2-255 E O2	30.12
942651	AE2-281 C	2.95
942652	AE2-281 E	18.12

Bus #	Bus	MW Impact
951631	J456 C	1.31
951632	J456 E	7.1
953951	J859	8.12
954702	J844 E	20.15
990901	L-005 E	7.01
CARR	CARR	0.05
CBM-S1	CBM-S1	2.46
CBM-S2	CBM-S2	0.52
CBM-W1	CBM-W1	4.42
CBM-W2	CBM-W2	37.73
CIN	CIN	0.85
CPL	CPL	0.14
G-007	G-007	0.12
IPL	IPL	0.41
LGEE	LGEE	0.09
MEC	MEC	14.97
O-066	O-066	0.77
RENSSELAER	RENSSELAER	0.04
Z1-043	Z1-043	13.47

Contingency Name	Contingency Definition
AEP_P1-2_#695A	CONTINGENCY 'AEP_P1-2_#695A' OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTON ; 765 1 END
COMED_P7_345-L0301__B-S+_345-L9801__R-S_FSA	CONTINGENCY 'COMED_P7_345-L0301__B-S+_345-L9801__R-S_FSA' TRIP BRANCH FROM BUS 270854 TO BUS 270790 CKT 1 / POWER; B 345 KATYDID TRIP BRANCH FROM BUS 918050 TO BUS 270769 CKT 1 / AA1-018 GOODINGS ;2R 345 END
COMED_P1-2_345-L1202__B-S-B	CONTINGENCY 'COMED_P1-2_345-L1202__B-S-B' TRIP BRANCH FROM BUS 930750 TO BUS 270822 CKT 1 / AB1-122 TAP 345 MOLECREEK; B 345 END
COMED_P1-2_345-L0304__R-S	CONTINGENCY 'COMED_P1-2_345-L0304__R-S' TRIP BRANCH FROM BUS 270855 TO BUS 349662 CKT 1 / POWER; R 345 7TAZEWELL 345 END
COMED_P7_345-L1202__B-S+_345-L1227__R-S-A	CONTINGENCY 'COMED_P7_345-L1202__B-S+_345-L1227__R-S-A' TRIP BRANCH FROM BUS 270716 TO BUS 930750 CKT 1 / DRESDEN ; B 345 AB1-122 TAP 345 TRIP BRANCH FROM BUS 930740 TO BUS 270717 CKT 1 / AB1-122 TAP 345 DRESDEN ; R 345 END
COMED_P7_345-L19601_B-S+_345-L9801__R-S_FSA	CONTINGENCY 'COMED_P7_345-L19601_B-S+_345-L9801__R-S_FSA' TRIP BRANCH FROM BUS 270790 TO BUS 270770 CKT 1 / KATYD; B 345 GOODI;4B 345 TRIP BRANCH FROM BUS 918050 TO BUS 270769 CKT 1 / AA1-018 GOODINGS ;2R 345 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-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
AEP_P4_#2978_05DUMONT 765_B	CONTINGENCY 'AEP_P4_#2978_05DUMONT 765_B' OPEN BRANCH FROM BUS 243206 TO BUS 243207 CKT 1 / 243206 05DUMONT 765 243207 05GRNTWN 765 1 OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTON ; 765 1 END
Base Case	

Contingency Name	Contingency Definition
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
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
COMED_P1-2_345-L1202__B-S-A	CONTINGENCY 'COMED_P1-2_345-L1202__B-S-A' TRIP BRANCH FROM BUS 270716 TO BUS 930750 CKT 1 / DRESDEN ; B 345 AB1-122 TAP 345 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_P4_023-65-BT4-5__	CONTINGENCY 'COMED_P4_023-65-BT4-5__' TRIP BRANCH FROM BUS 275168 TO BUS 270607 CKT 1 / COLLI;2M 345 COLLI; 765 TRIP BRANCH FROM BUS 275168 TO BUS 270697 CKT 1 / COLLI;2M 345 COLLI; R 345 TRIP BRANCH FROM BUS 275168 TO BUS 275268 CKT 1 / COLLI;2M 345 COLLI;2C 33 TRIP BRANCH FROM BUS 270644 TO BUS 243206 CKT 1 / WILTO; 765 05DUMONT 765 END

Short Circuit

27 Short Circuit

No issues identified