



**Generation Interconnection
System Impact Study Report
for
Queue Project AF2-199
NELSON-ELECTRIC JUNCTION 345 KV
60 MW Capacity / 100 MW Energy**

February 2021

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1 Introduction

This System Impact Study has been prepared in accordance with the PJM Open Access Transmission Tariff, 205, as well as the System Impact Study Agreement between the Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is ComEd.

2 Preface

The intent of the System Impact Study is to determine a plan, with approximate cost and construction time estimates, to connect the subject generation interconnection project to the PJM network at a location specified by the Interconnection Customer. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system. All facilities required for interconnection of a generation interconnection project must be designed to meet the technical specifications (on PJM web site) for the appropriate transmission owner.

In some instances an Interconnection Customer may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection or merchant transmission upgrade, may also contribute to the need for the same network reinforcement. 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 System Impact Study is performed.

The System Impact 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.

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.

3 General

The Interconnection Customer (IC), has proposed a Solar generating facility located in Lee County, Illinois. The installed facilities will have a total capability of 100 MW with 60 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is November 01, 2023. This study does not imply a TO commitment to this in-service date.

Queue Number	AF2-199
Project Name	NELSON-ELECTRIC JUNCTION 345 KV
State	Illinois
County	Lee
Transmission Owner	ComEd
MFO	100
MWE	100
MWC	60
Fuel	Solar
Basecase Study Year	2023

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

4 Point of Interconnection

AF2-199 will interconnect with the ComEd on transmission system tapping the Nelson to Electric Junction 345 kV line utilizing the same attachment facilities as AF2-041.

5 Cost Summary

The AF2-199 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$ 250,000
Allocation towards System Network Upgrade Costs*	\$ 29,590,000
Total Costs	\$ 29,840,000

*As your project progresses through the study process and other projects modify their request or withdraw, then your cost allocation could change.

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

Note 1: PJM Open Access Transmission Tariff (OATT) section 217.3A outline cost allocation rules. The rules are further clarified in PJM Manual 14A Attachment B. The allocation of costs for a network upgrade will start with the first Queue project to cause the need for the upgrade. Later queue projects will receive cost allocation contingent on their contribution to the violation and are allocated to the queues that have not closed less than 5 years following the execution of the first Interconnection Service Agreement which identifies the need for this upgrade.

Note 2: For customers with System Reinforcements listed: If your present cost allocation to a System Reinforcement indicates \$0, then please be aware that as changes to the interconnection process occur, such as prior queued projects withdrawing from the queue, reducing in size, etc, the cost responsibilities can change and a cost allocation may be assigned to your project. In addition, although your present cost allocation to a System Reinforcement is presently \$0, your project may need this system reinforcement completed to be deliverable to the PJM system. If your project comes into service prior to completion of the system reinforcement, an interim deliverability study for your project will be required.

6 Transmission Owner Scope of Work

6.1 Attachment Facilities

The addition of a 100 MW solar facility behind the meter will require review and possible upgrade of SCADA, Communication, relays and metering. The estimated cost is \$250,000. ComEd would take approximately 18-months to review and possibly upgrade SCADA, Communication, relays and metering after the ISA / ICSA are signed.

Notes on Cost Estimate:

- 1) These estimates are Order-of-Magnitude estimates of the costs that ComEd would bill to the customer for this interconnection. These estimates are based on a one-line electrical diagram of the project and the information provided by the IC.
- 2) There were no site visits performed for these estimates. There may be costs related to specific site related issues that are not identified in these estimates. The site reviews will be performed during the Facilities Study or during detailed engineering.
- 3) These estimates are not a guarantee of the maximum amount payable by the IC and the actual costs of ComEd's work may differ significantly from these estimates. The IC will be responsible for paying actual costs of ComEd's work in accordance with Sections 212.1 and 217 of the PJM Open Access Transmission Tariff.

- 4) The IC is responsible for all engineering, procurement, testing and construction of all equipment on the IC's side of the POI.
- 5) These cost estimates do not include cost of acquiring right-of-way for the transmission line and purchasing any additional land, if needed, for the line terminations. The need and cost of acquiring property and associated legal costs will be investigated during Facilities Study for this project.

7 Schedule

See Sections 6 and 11.

8 Transmission Owner Analysis

See Sections 6 and 11.

9 Interconnection Customer Requirements

The Interconnection Customer is responsible for all design and construction related activities on the Interconnection Customer's side of the Point of Interconnection.

10 Revenue Metering and SCADA Requirements

10.1 PJM Requirements

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

10.2 Meteorological Data Reporting Requirements

The solar generation facility shall provide the Transmission Provider with site-specific meteorological data including:

- Temperature (degrees Fahrenheit)
- Atmospheric pressure (hectopascals)
- Irradiance
- Forced outage data

10.3 Interconnected Transmission Owner Requirements

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

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.

11 Summer Peak Analysis

The Queue Project AF2-199 was evaluated as a 100MW (Capacity 60.0 MW) injection into the AF2-041 Tap 345 kV substation) which is a tap of the Nelson to Electric Junction 345 kV line (specifically the AF1-012 Tap - Electric Junction line segment) in the ComEd area. Project AF2-199 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-199 was studied with a commercial probability of 100%. Potential network impacts were as follows:

11.1 Generation Deliverability

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

None

11.2 Multiple Facility Contingency

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

None

11.3 Contribution to Previously Identified Overloads

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC/D C	MW IMPACT
157327123	274768	LEE CO EC;BP	345.0	CE	270678	BYRON ; B	345.0	CE	1	COMED_P1-2_345-L15502 B-R-C	single	1726.0	105.31	106.65	AC	23.32
96366096	957470	AF2-041 TAP	345.0	CE	270730	ELECT JCT; B	345.0	CE	1	COMED_P4_006-45-BT3-4__	breaker	1656.0	127.97	131.53	AC	59.42
96366596	957470	AF2-041 TAP	345.0	CE	270730	ELECT JCT; B	345.0	CE	1	COMED_P1-2_345-L0627__ B-R	single	1656.0	103.96	106.09	AC	35.65
96366597	957470	AF2-041 TAP	345.0	CE	270730	ELECT JCT; B	345.0	CE	1	Base Case	single	1334.0	101.84	104.03	AC	32.54

11.4 Steady-State Voltage Requirements

None

11.5 Potential Congestion due to Local Energy Deliverability

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed

with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC/D C	MW IMPACT
96366705	270730	ELECT JCT; B	345.0	CE	270812	LOMBARD ; B	345.0	CE	1	Base Case	operation	1201.0	113.36	114.53	AC	14.36
96366706	270730	ELECT JCT; B	345.0	CE	270812	LOMBARD ; B	345.0	CE	1	COMED_P 2-1_111-L11120__	operation	1479.0	108.58	109.57	AC	14.81
157327392	270828	NELSON ; B	345.0	CE	946160	AF1-281 TAP	345.0	CE	1	COMED_P 1-2_345-L15502_B-R-C	operation	1479.0	99.02	101.65	AC	39.24
96366777	274768	LEE CO EC;BP	345.0	CE	270678	BYRON ; B	345.0	CE	1	Base Case	operation	1334.0	101.97	102.94	AC	14.68
157327114	274768	LEE CO EC;BP	345.0	CE	270678	BYRON ; B	345.0	CE	1	COMED_P 1-2_345-L15502_B-R-C	operation	1726.0	117.24	119.19	AC	38.86
157327239	946160	AF1-281 TAP	345.0	CE	274768	LEE CO EC;BP	345.0	CE	1	COMED_P 1-2_345-L15502_B-R-C	operation	1479.0	111.39	113.55	AC	39.24
96366591	957470	AF2-041 TAP	345.0	CE	270730	ELECT JCT; B	345.0	CE	1	Base Case	operation	1334.0	124.42	128.38	AC	54.23
96366592	957470	AF2-041 TAP	345.0	CE	270730	ELECT JCT; B	345.0	CE	1	COMED_P 1-2_345-L0627__B-R	operation	1656.0	126.97	130.51	AC	59.42

11.6 System Reinforcements

ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF2-199	Upgrade Number																																																								
96366596,96366096,96366597	2	AF2-041 TAP 345.0 kV - ELECT JCT; B 345.0 kV Ckt 1	Replace station conductor at TSS111 EJ, replace MOD. Relay upgrades, re-conductor part of the line. Cost : \$ 22,300,000. Time Estimate : 36 Months New ratings will be 1683/2068/2172/2308 (SN/SLTE/SSTE/SLD). The cost allocation is:	\$22.3 M + \$10.5 M	\$1.89 M + \$10.5 M	N6639.1 N6639.2																																																								
			<table><tr><th>Queue</th><th>MW Contribution</th><th>Percentage of Cost</th><th>Cost (\$22.3M)</th></tr><tr><td>AE1-114</td><td>20.9</td><td>2.98%</td><td>\$0.66</td></tr><tr><td>J981</td><td>24.8</td><td>3.53%</td><td>\$0.79</td></tr><tr><td>J982</td><td>20.8</td><td>2.96%</td><td>\$0.66</td></tr><tr><td>J1084</td><td>31.7</td><td>4.52%</td><td>\$1.01</td></tr><tr><td>J1181</td><td>19.2</td><td>2.74%</td><td>\$0.61</td></tr><tr><td>AF1-012</td><td>75.21</td><td>10.72%</td><td>\$2.39</td></tr><tr><td>AF1-280</td><td>68.73</td><td>9.79%</td><td>\$2.18</td></tr><tr><td>AF1-296</td><td>51.7</td><td>7.37%</td><td>\$1.64</td></tr><tr><td>AF1-318</td><td>21.09</td><td>3.01%</td><td>\$0.67</td></tr><tr><td>AF2-041</td><td>178.2</td><td>25.39%</td><td>\$5.66</td></tr><tr><td>AF2-182</td><td>102.6</td><td>14.62%</td><td>\$3.26</td></tr><tr><td>AF2-183</td><td>27.4</td><td>3.90%</td><td>\$0.87</td></tr><tr><td>AF2-199</td><td>59.4</td><td>8.46%</td><td>\$1.89</td></tr></table>				Queue	MW Contribution	Percentage of Cost	Cost (\$22.3M)	AE1-114	20.9	2.98%	\$0.66	J981	24.8	3.53%	\$0.79	J982	20.8	2.96%	\$0.66	J1084	31.7	4.52%	\$1.01	J1181	19.2	2.74%	\$0.61	AF1-012	75.21	10.72%	\$2.39	AF1-280	68.73	9.79%	\$2.18	AF1-296	51.7	7.37%	\$1.64	AF1-318	21.09	3.01%	\$0.67	AF2-041	178.2	25.39%	\$5.66	AF2-182	102.6	14.62%	\$3.26	AF2-183	27.4	3.90%	\$0.87	AF2-199	59.4	8.46%	\$1.89
			Queue				MW Contribution	Percentage of Cost	Cost (\$22.3M)																																																					
			AE1-114				20.9	2.98%	\$0.66																																																					
			J981				24.8	3.53%	\$0.79																																																					
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			J1084				31.7	4.52%	\$1.01																																																					
			J1181				19.2	2.74%	\$0.61																																																					
			AF1-012				75.21	10.72%	\$2.39																																																					
			AF1-280				68.73	9.79%	\$2.18																																																					
			AF1-296				51.7	7.37%	\$1.64																																																					
			AF1-318				21.09	3.01%	\$0.67																																																					
			AF2-041				178.2	25.39%	\$5.66																																																					
			AF2-182				102.6	14.62%	\$3.26																																																					
			AF2-183				27.4	3.90%	\$0.87																																																					
AF2-199	59.4	8.46%	\$1.89																																																											
Additional upgrade required for AF2-199:																																																														
The upgrade is to perform sag mitigation on a portion of the line section along with re-conductoring on a different section, upgrade station conductor at both line terminals, replace both line motor operated disconnect witches and line current transformers, upgrade line relay schemes at both terminals as well. A preliminary estimate for the upgrade is \$10.5 M with an estimated construction timeline of 36 months. Upon completion of the upgrades the ratings will be 1683/2068/2367/2564 MVA (SN/SLTE/SSTE/SLD).																																																														
It should be evaluated during the Facilities Study whether a circuit breaker can be added to the Byron Blue ring bus to eliminate the stuck breaker contingency causing one of the overload. Presently, however there is an N-0/Basecase overload violating the normal rating as well.																																																														

ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF2-199	Upgrade Number
157327123	1	LEE CO EC;BP 345.0 kV - BYRON ; B 345.0 kV Ckt 1	The upgrade will be to re-conductor the line and upgrade station conductor at Byron Station. A preliminary estimate for the upgrades is \$17.2M. The preliminary construction timeline is 24-30 months contingent upon outage coordination with Byron Nuclear Station. Note that the preliminary cost estimate does not include the potential for new transmission towers. This unknown will add to this estimate if required. Upon completion of the upgrades the new ratings will be 1679/1904/1944/2088 MVA (SN/SLTE/SSTE/SLD).	\$17.2 M	\$17.2 M	N5254
Total Costs				\$50,000,000	\$29,590,000	

Note : For customers with System Reinforcements listed: If your present cost allocation to a System Reinforcement indicates \$0, then please be aware that as changes to the interconnection process occur, such as prior queued projects withdrawing from the queue, reducing in size, etc, the cost responsibilities can change and a cost allocation may be assigned to your project. In addition, although your present cost allocation to a System Reinforcement is presently \$0, your project may need this system reinforcement completed to be deliverable to the PJM system. If your project comes into service prior to completion of the system reinforcement, an interim deliverability study for your project will be required.

11.7 Flow Gate Details

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

11.7.1 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
157327123	274768	LEE CO EC;BP	CE	270678	BYRON ; B	CE	1	COMED_P1-2_345-L15502_B-R-C	single	1726.0	105.31	106.65	AC	23.32

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
274662	QUAD CITI;1U	42.0614	80/20	42.0614
274663	QUAD CITI;2U	42.1441	80/20	42.1441
274699	CORDOVA ;1C	7.4012	80/20	7.4012
274700	CORDOVA ;2C	7.4012	80/20	7.4012
274701	CORDOVA ;1S	8.3264	80/20	8.3264
274715	NELSON EC;1C	10.9942	80/20	10.9942
274716	NELSON EC;1S	8.0219	80/20	8.0219
274717	NELSON EC;2C	11.0791	80/20	11.0791
274718	NELSON EC;2S	8.0938	80/20	8.0938
274760	LEE CO EC;1U	7.0142	80/20	7.0142
274761	LEE CO EC;2U	7.0142	80/20	7.0142
274762	LEE CO EC;3U	6.9164	80/20	6.9164
274763	LEE CO EC;4U	6.9430	80/20	6.9430
274764	LEE CO EC;5U	7.0319	80/20	7.0319
274765	LEE CO EC;6U	7.0319	80/20	7.0319
274766	LEE CO EC;7U	6.9253	80/20	6.9253
274767	LEE CO EC;8U	6.9253	80/20	6.9253
274848	CAMP GROVE;RU	0.6005	80/20	0.6005
274849	CRESCENT ;1U	0.1799	80/20	0.1799
274850	MENDOTA H;RU	0.0446	80/20	0.0446
274851	PROVIDENC;RU	0.2745	80/20	0.2745
274855	GSG-6 ;RU	0.1879	80/20	0.1879
274857	BIG SKY ;U1	2.1336	80/20	2.1336
274858	BIG SKY ;U2	2.1336	80/20	2.1336
274877	BISHOP HL;1U	0.4454	80/20	0.4454
274878	BISHOP HL;2U	0.4454	80/20	0.4454
276156	O-029 C	0.5061	80/20	0.5061
276157	O-029 C	0.5471	80/20	0.5471
276158	O-029 C	0.9985	80/20	0.9985
276160	W4-084	0.1462	80/20	0.1462
293513	O-009 C1	0.9346	80/20	0.9346
293514	O-009 C2	0.4742	80/20	0.4742
293515	O-009 C3	0.5243	80/20	0.5243
295108	WESTBROOK C	0.0639	80/20	0.0639
295110	SUBLETTE C	0.0288	80/20	0.0288
919221	AA1-146	10.2561	80/20	10.2561
919581	AA2-030	61.0337	80/20	61.0337
925301	AB2-191	0.0721	80/20	0.0721
925581	AC1-033 C	1.7365	80/20	1.7365
926821	AC1-168 C O1	0.6693	80/20	0.6693
926841	AC1-171 C O1	0.7087	80/20	0.7087

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
927201	AC1-214 C O1	2.0968	80/20	2.0968
927531	AC1-185 1	0.5334	80/20	0.5334
927541	AC1-185 2	0.5334	80/20	0.5334
927551	AC1-185 3	0.5334	80/20	0.5334
927561	AC1-185 4	0.5334	80/20	0.5334
927571	AC1-185 5	0.5334	80/20	0.5334
927581	AC1-185 6	0.5334	80/20	0.5334
927591	AC1-185 7	0.5334	80/20	0.5334
927601	AC1-185 8	0.5334	80/20	0.5334
934051	AD1-031 C O1	3.5272	80/20	3.5272
934431	AD1-067 C	0.0562	80/20	0.0562
934701	AD1-098 C O1	3.5362	80/20	3.5362
937001	AD2-134 C	1.1693	80/20	1.1693
937531	AD2-214 C	11.7337	80/20	11.7337
938861	AE1-114 C O1	2.6241	80/20	2.6241
939051	AE1-134 1	4.7427	80/20	4.7427
939061	AE1-134 2	4.7427	80/20	4.7427
943411	AF1-012 C	40.8145	80/20	40.8145
946151	AF1-280 C O1	66.6683	80/20	66.6683
946161	AF1-281 C	1.4599	80/20	1.4599
946321	AF1-296 C O1	9.8816	80/20	9.8816
946541	AF1-318 C O1	4.1820	80/20	4.1820
951381	J504	6.4395	PJM External (MISO)	6.4395
951421	J514	3.9054	PJM External (MISO)	3.9054
951511	J530 C	6.4260	PJM External (MISO)	6.4260
954901	J963	1.6343	PJM External (MISO)	1.6343
955051	J981 C	4.5702	PJM External (MISO)	4.5702
955971	J1084	37.1040	PJM External (MISO)	37.1040
956411	J1131	19.9460	PJM External (MISO)	19.9460
957471	AF2-041 C	69.9534	80/20	69.9534
957751	AF2-069 C	0.2428	80/20	0.2428
957761	AF2-070 C	0.3421	80/20	0.3421
958341	AF2-128 C O1	1.0186	80/20	1.0186
958911	AF2-182 C	87.5934	80/20	87.5934
958921	AF2-183 C	15.5722	80/20	15.5722
959081	AF2-199 C	23.3178	80/20	23.3178
959091	AF2-200 C O1	46.6356	80/20	46.6356
960551	AF2-346 C	17.4919	80/20	17.4919
961011	AF2-392 C O1	10.2386	80/20	10.2386
961021	AF2-393 O1	17.4522	80/20	17.4522
961031	AF2-394 O1	11.6348	80/20	11.6348
LGEE	LGEE	0.1791	Confirmed LTF	0.1791
CPL	CPL	0.4042	Confirmed LTF	0.4042
CBM-W2	CBM-W2	22.8092	Confirmed LTF	22.8092
NY	NY	0.0337	Confirmed LTF	0.0337
TVA	TVA	2.7720	Confirmed LTF	2.7720
CBM-S2	CBM-S2	4.6760	Confirmed LTF	4.6760
CBM-S1	CBM-S1	14.2369	Confirmed LTF	14.2369
MADISON	MADISON	9.9228	Confirmed LTF	9.9228
MEC	MEC	17.5696	Confirmed LTF	17.5696
CBM-W1	CBM-W1	21.2545	Confirmed LTF	21.2545

11.7.2 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
96366096	957470	AF2-041 TAP	CE	270730	ELECT JCT; B	CE	1	COMED_P4_006-45-BT3-4__	breaker	1656.0	127.97	131.53	AC	59.42

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
274715	NELSON EC;1C	9.6789	50/50	9.6789
274716	NELSON EC;1S	7.0622	50/50	7.0622
274717	NELSON EC;2C	9.7536	50/50	9.7536
274718	NELSON EC;2S	7.1254	50/50	7.1254
274761	LEE CO EC;2U	4.5359	50/50	4.5359
274764	LEE CO EC;5U	4.5474	50/50	4.5474
274765	LEE CO EC;6U	4.5474	50/50	4.5474
274859	EASYR;U1 E	27.9170	Adder	32.84
274860	EASYR;U2 E	27.9170	Adder	32.84
293516	O-009 E1	17.2864	Adder	20.34
293517	O-009 E2	8.7801	Adder	10.33
293518	O-009 E3	9.6693	Adder	11.38
293715	O-029 E	18.4811	Adder	21.74
293716	O-029 E	10.1329	Adder	11.92
293717	O-029 E	9.3132	Adder	10.96
293771	O-035 E	4.9354	Adder	5.81
294401	BSHIL;1U E	8.0866	Adder	9.51
294410	BSHIL;2U E	8.0866	Adder	9.51
916211	Z1-072 E	3.7349	Adder	4.39
919221	AA1-146	9.0290	50/50	9.0290
919581	AA2-030	53.7317	50/50	53.7317
925581	AC1-033 C	1.3245	Adder	1.56
925582	AC1-033 E	8.8671	Adder	10.43
927201	AC1-214 C O1	1.5840	Adder	1.86
927202	AC1-214 E O1	5.0354	Adder	5.92
934051	AD1-031 C O1	2.6901	Adder	3.16
934052	AD1-031 E O1	4.3892	Adder	5.16
937531	AD2-214 C	9.0882	Adder	10.69
937532	AD2-214 E	6.0588	Adder	7.13
938861	AE1-114 C O1	4.1862	Adder	4.92
938862	AE1-114 E O1	14.2822	Adder	16.8
939051	AE1-134 1	4.1753	50/50	4.1753
939061	AE1-134 2	4.1753	50/50	4.1753
943411	AF1-012 C	44.9662	50/50	44.9662
943412	AF1-012 E	29.9775	50/50	29.9775
946151	AF1-280 C O1	46.8759	50/50	46.8759
946152	AF1-280 E O1	21.5561	50/50	21.5561
946161	AF1-281 C	1.0265	50/50	1.0265
946162	AF1-281 E	5.8167	50/50	5.8167
946321	AF1-296 C O1	7.6870	Adder	9.04
946322	AF1-296 E O1	35.9888	Adder	42.34

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
950471	J438 C	3.3717	PJM External (MISO)	3.3717
950472	J438 E	13.4869	PJM External (MISO)	13.4869
951381	J504	5.7865	PJM External (MISO)	5.7865
951421	J514	3.4599	PJM External (MISO)	3.4599
951511	J530 C	5.5045	PJM External (MISO)	5.5045
951512	J530 E	22.0180	PJM External (MISO)	22.0180
954091	J873 C	3.3038	PJM External (MISO)	3.3038
954092	J873 E	17.8742	PJM External (MISO)	17.8742
954702	J844 E	14.1620	PJM External (MISO)	14.1620
954792	J952 E	6.7954	PJM External (MISO)	6.7954
954861	J959 C	2.2974	PJM External (MISO)	2.2974
954862	J959 E	12.4296	PJM External (MISO)	12.4296
954901	J963	1.4067	PJM External (MISO)	1.4067
955051	J981 C	3.8638	PJM External (MISO)	3.8638
955052	J981 E	20.9042	PJM External (MISO)	20.9042
955971	J1084	31.5210	PJM External (MISO)	31.5210
956411	J1131	16.9080	PJM External (MISO)	16.9080
956831	J1181 C	3.0077	PJM External (MISO)	3.0077
956832	J1181 E	16.2723	PJM External (MISO)	16.2723
957471	AF2-041 C	106.9488	50/50	106.9488
957472	AF2-041 E	71.2992	50/50	71.2992
957751	AF2-069 C	0.1834	Adder	0.22
957752	AF2-069 E	0.5919	Adder	0.7
957761	AF2-070 C	0.2584	Adder	0.3
957762	AF2-070 E	1.2547	Adder	1.48
958911	AF2-182 C	61.5888	50/50	61.5888
958912	AF2-182 E	41.0592	50/50	41.0592
958921	AF2-183 C	10.9491	50/50	10.9491
958922	AF2-183 E	16.4237	50/50	16.4237
959081	AF2-199 C	35.6496	50/50	35.6496
959082	AF2-199 E	23.7664	50/50	23.7664
959091	AF2-200 C O1	71.2992	50/50	71.2992
959092	AF2-200 E O1	47.5328	50/50	47.5328
960551	AF2-346 C	19.2713	50/50	19.2713
960552	AF2-346 E	12.8475	50/50	12.8475
961011	AF2-392 C O1	8.1451	Adder	9.58
961012	AF2-392 E O1	38.1340	Adder	44.86
961021	AF2-393 O1	13.8837	Adder	16.33
961031	AF2-394 O1	9.2558	Adder	10.89
990901	L-005 E	10.8712	Adder	12.79
LGEE	LGEE	0.0268	Confirmed LTF	0.0268
CPL	CPL	0.2441	Confirmed LTF	0.2441
BLUEG	BLUEG	0.0226	Confirmed LTF	0.0226
CBM-W2	CBM-W2	21.1630	Confirmed LTF	21.1630
NY	NY	0.1814	Confirmed LTF	0.1814
TVA	TVA	2.4920	Confirmed LTF	2.4920
O-066	O-066	2.0227	Confirmed LTF	2.0227
CBM-S2	CBM-S2	3.3177	Confirmed LTF	3.3177
CBM-S1	CBM-S1	12.4222	Confirmed LTF	12.4222
G-007	G-007	0.3120	Confirmed LTF	0.3120
MADISON	MADISON	14.5414	Confirmed LTF	14.5414
MEC	MEC	18.0574	Confirmed LTF	18.0574

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
TRIMBLE	TRIMBLE	0.0295	Confirmed LTF	0.0295
CBM-W1	CBM-W1	45.2362	Confirmed LTF	45.2362

11.8 Queue Dependencies

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

Queue Number	Project Name	Status
AA1-146	Nelson	Active
AA2-030	Nelson	Active
AB2-191	Mendota Hills	In Service
AC1-033	Kewanee	Active
AC1-168	Kewanee-Streator	Active
AC1-171	Powerton	Active
AC1-185	Lee County	In Service
AC1-214	Crescent Ridge	Partially in Service - Under Construction
AD1-031	Kewanee 138 kV	Active
AD1-067	Mendota Hills	In Service
AD1-098	Dixon-McGirr	Active
AD2-134	Shady Oaks	Active
AD2-214	Rock Falls-Garden Plains	Active
AE1-114	Maryland-Lancaster 138 kV	Active
AE1-134	Nelson 345 kV	Active
AF1-012	Electric Junc-Nelson	Active
AF1-280	Nelson-Lee County	Active
AF1-281	Nelson-Lee County	Active
AF1-296	Garden Plain 138 kV	Active
AF1-318	Crescent Ridge-Corbin	Active
AF2-041	Nelson-Electric Junction 345 kV	Active
AF2-069	Crescent Ridge 138 kV	Active
AF2-070	Crescent Ridge 138 kV	Active
AF2-128	Crescent Ridge-Corbin 138 kV	Active
AF2-182	Nelson-Lee County 345 kV II	Active
AF2-183	Nelson-Lee County 345 kV	Active
AF2-199	Nelson-Electric Junction 345 kV	Active
AF2-200	Nelson-Electric Junction 345 kV	Active
AF2-346	Electric Junction-Nelson 345 kV	Active
AF2-392	Nelson-Dixon 138 kV	Active
AF2-393	Nelson-Dixon 138 kV	Active
AF2-394	Nelson-Dixon 138 kV	Active
W4-084	Dixon 12kV	Deactivated
Z1-072	Crescent Ridge	In Service
J1084	MISO	MISO

Queue Number	Project Name	Status
J1131	MISO	MISO
J1181	MISO	MISO
J438	MISO	MISO
J504	MISO	MISO
J514	MISO	MISO
J530	MISO	MISO
J844	MISO	MISO
J873	MISO	MISO
J952	MISO	MISO
J959	MISO	MISO
J963	MISO	MISO
J981	MISO	MISO

11.9 Contingency Descriptions

Contingency Name	Contingency Definition
COMED_P1-2_345-L0627__B-R	CONTINGENCY 'COMED_P1-2_345-L0627__B-R' TRIP BRANCH FROM BUS 274768 TO BUS 270678 CKT 1 / LEECO;BP 345 BYRON; B 345 END
COMED_P1-2_345-L15502__B-R-C	CONTINGENCY 'COMED_P1-2_345-L15502__B-R-C' TRIP BRANCH FROM BUS 957470 TO BUS 270730 CKT 1 / AF2-041 TAP 345 ELEC JUNC; B 345 END
COMED_P2-1_111-L11120__	CONTINGENCY 'COMED_P2-1_111-L11120__' TRIP BRANCH FROM BUS 270733 TO BUS 270747 CKT 1 / ELECT;3R 345 W407K;0T 345 END
Base Case	
COMED_P4_006-45-BT3-4__	CONTINGENCY 'COMED_P4_006-45-BT3-4__' TRIP BRANCH FROM BUS 274768 TO BUS 270678 CKT 1 / LEECO;BP 345 BYRON; B 345 REMOVE UNIT 1 FROM BUS 274656 / BYRON;1U 25 END

12 Short Circuit Analysis

No breakers were identified as overdutied as part of this study.

13 Stability and Reactive Power

Analysis to be run in the Facilities Study Phase.

14 Affected Systems

14.1 MISO

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

Attachment 1: One Line Diagram

AF2-199
SECONDARY POI

