Generation Interconnection

Feasibility Study Report

for

Queue Project AF2-329

“SANDWICH-PLANO 138 KV”

July 2020

1 Introduction

This Feasibility Study has been prepared in accordance with the PJM Open Access Transmission Tariff, 36.2, as well as the Feasibility Study Agreement between the Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is ComEd.

2 Preface

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

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

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.

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

3 General

The Interconnection Customer (IC) has proposed a storage uprate to a planned/existing solar generating facility located in Kendall County, Illinois. This project is an increase to the Interconnection Customer's AF1-030 project, and will share the same Point of Interconnection. The AF2-329 queue position is a 52.2 MW uprate (52.2 MW Capacity uprate) to the previous AF1-030 project. The total installed facilities will have a capability of 152.2 MWs Energy with 119.1 MWs of this output being recognized by PJM as Capacity. The proposed in-service date for this uprate project is December 01, 2023. This study does not imply a TO commitment to this in-service date.

Queue Number	AF2-329
Project Name	SANDWICH-PLANO 138 KV
State	Illinois
County	Kendall
Transmission Owner	ComEd
MFO	152.2
MWE	52.2
MWC	52.2
Fuel	Storage
Basecase Study Year	2023

A new service customer with a generating facility that could be commercially operable prior to June 1st of the basecase study year is required to request an interim deliverability analysis from PJM.

4 Point of Interconnection

AF2-329 will interconnect with the ComEd transmission system as an uprate to AF1-030 which taps the Sandwich to Plano 138 kV line.

5 Cost Summary

The AF2-329 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$200,000
Total System Network Upgrade Costs	$16,600,000
Total Costs	$

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.

6 Transmission Owner Scope of Work

Attachment Facilities

To accommodate interconnection of AF2-329; the relaying, SCADA, Communication and metering will be reviewed and upgraded if needed. It should be noted that if the AF1-030 project drops out, then scope of AF2-329 would change.

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

Description	Total Cost
The relaying, SCADA, communication, and metering will be reviewed and upgraded if needed.	$200,000
Total Physical Interconnection Costs	$200,000

7 Schedule

ComEd would take approximately 18-months to review and possibly upgrade the relaying, SCADA, Communication and metering after the ISA / ICSA are signed.

8 Transmission Owner Analysis

See Section 6.

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 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 - Load Flow Analysis

The Queue Project AF2-329 was evaluated as a 52.2 MW (Capacity 52.2 MW) injection as an uprate to AF1-030 which taps the Sandwich to Plano 138 kV line in the ComEd area. Project AF2-329 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-329 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

11.1 Generation Deliverability

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

None

11.2 Multiple Facility Contingency

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
96598255	272803	W PLANO ; R	138.0	CE	272251	PLANO ; R	138.0	CE	1	COMED_P4_111-38-TR82___	breaker	449.0	93.69	103.26	DC	42.96
96599631	943120	AE2-341 TAP	138.0	CE	272803	W PLANO ; R	138.0	CE	1	COMED_P7_138-L11106_B-R_+_345-L15502_B-R	tower	498.0	99.47	108.12	DC	43.07

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|DC	MW IMPACT
96598240	272728	WATERMAN ; B	138.0	CE	272445	SANDWICH ; R	138.0	CE	1	COMED_P4_083-38-BT3-4__	breaker	331.0	117.14	119.03	DC	6.25
96599610	272728	WATERMAN ; B	138.0	CE	272445	SANDWICH ; R	138.0	CE	1	COMED_P7_138-L11106_B-R_+_345-L15502_B-R	tower	331.0	107.3	110.06	DC	9.13
96598254	272803	W PLANO ; R	138.0	CE	272251	PLANO; R	138.0	CE	1	COMED_P4_083-38-BT3-4__	breaker	498.0	109.0	118.23	DC	45.95
96598228	943120	AE2-341 TAP	138.0	CE	272803	W PLANO ; R	138.0	CE	1	COMED_P4_083-38-BT3-4__	breaker	498.0	116.55	125.78	DC	45.95

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
9659822 9	943120	AE2-341 TAP	138. 0	CE	272803	W PLANO ; R	138. 0	CE	1	COMED_P4_11 1-38-TR82___	breake r	449.0	102.06	111.63	DC	42.96

11.4 Potential Congestion due to Local Energy Deliverability

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

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
9659897 8	270700	CORDOVA ; B	345. 0	CE	270828	NELSON ; B	345. 0	CE	1	COMED_P1 -2_345- L0404___- R	operatio n	2058. 0	99.98	100.11	DC	3.56
9659898 2	270864	QUAD 1 3- 11	345. 0	CE	270890	ESS H471 ;	345. 0	CE	1	COMED_P1 -2_345- L15503_B- R	operatio n	2058. 0	99.89	100.02	DC	3.54
9659868 7	272728	WATERMA N ; B	138. 0	CE	271560	GLIDDE N ;BT	138. 0	CE	1	272803 W PLANO ; R 138 943120 AE2-341 TAP 138 1	operatio n	321.0	132.58	141.49	DC	28.61
9659887 4	272803	W PLANO ; R	138. 0	CE	272251	PLANO; R	138. 0	CE	1	COMED_P1 -2_138- L11106_B- R	operatio n	449.0	92.83	102.43	DC	43.12
9659887 5	272803	W PLANO ; R	138. 0	CE	272251	PLANO; R	138. 0	CE	1	Base Case	operatio n	351.0	90.55	102.31	DC	41.26
9659879 0	943120	AE2-341 TAP	138. 0	CE	272803	W PLANO ; R	138. 0	CE	1	Base Case	operatio n	351.0	101.29	113.05	DC	41.26
9659879 1	943120	AE2-341 TAP	138. 0	CE	272803	W PLANO ; R	138. 0	CE	1	COMED_P1 -2_138- L11106_B- R	operatio n	449.0	101.21	110.81	DC	43.12

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
96598254,96598255	1	W PLANO ; R 138.0 kV - PLANO; R 138.0 kV Ckt 1	**CE_NUN_L14609 (835) : ComEd 138kV l14609 LSD & ALDR ratings are 498 MVA & 573 MVA. The upgrade will be to re-conductor a portion of the line. A preliminary estimate for the upgrade is $3.5M with an estimated construction timeline of 24 months. Upon completion of the upgrade the ratings will be 487/534/612/574/722 MVA (SN/SLTE/SSTE/SLD/ALDR).** **Project Type : FAC** **Cost : $3,500,000** **Time Estimate : 24.0 Months**	$3,500,000
96598229,96599631,96598228	2	AE2-341 TAP 138.0 kV - W PLANO ; R 138.0 kV Ckt 1	**CE_NUN_L14609 (835) : ComEd 138kV l14609 LSD & ALDR ratings are 498 MVA & 573 MVA. The upgrade will be to re-conductor a portion of the line. A preliminary estimate for the upgrade is $3.5M with an estimated construction timeline of 24 months. Upon completion of the upgrade the ratings will be 487/534/612/574/722 MVA (SN/SLTE/SSTE/SLD/ALDR).** **Project Type : FAC** **Cost : $3,500,000** **Time Estimate : 24.0 Months**	$3,500,000
96598240,96599610	3	WATERMAN ; B 138.0 kV - SANDWICH ; R 138.0 kV Ckt 1	**ce-007 (866) : L11301 SLD = 331 MVA& ALDR = 381 MVA. The post contingency flow for this event exceeds the rating therefore upgrades are required. The upgrades will be to re-conductor the line, station conductor upgrades. A preliminary estimate is $ 13.1 M with a estimated construction time of 30 months. Upon completion the ratings will be 292/321/367/433/498 MVA N1:N6SN/SLTE/SSTE/SLD/ALDR).** **Project Type : FAC** **Cost : $13,100,000** **Time Estimate : 30.0 Months**	$13,100,000
			Total System Network Upgrade Costs	**$16,600,000**

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

11.6 Flow Gate Details

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

11.6.1 Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
96598254	272803	W PLANO ; R	CE	272251	PLANO; R	CE	1	COMED_P4_083-38-BT3-4__	breaker	498.0	109.0	118.23	DC	45.95

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
272364	ESS H440N ;R	1.6118	50/50	1.6118
274850	MENDOTA H;RU	0.3743	50/50	0.3743
274855	GSG-6 ;RU	1.5765	50/50	1.5765
274872	LEE DEKAL;1U	4.4258	50/50	4.4258
290051	GSG-6; E	36.5590	50/50	36.5590
290108	LEEDK;1U E	106.9080	50/50	106.9080
916221	AB2-191	0.6047	50/50	0.6047
933431	AC2-156 C O1	6.1569	50/50	6.1569
933432	AC2-156 E O1	10.0455	50/50	10.0455
933911	AD1-013 C	6.5744	50/50	6.5744
933912	AD1-013 E	10.5020	50/50	10.5020
934431	AD1-067 C	0.4591	50/50	0.4591
934432	AD1-067 E	1.9302	50/50	1.9302
934701	AD1-098 C O1	23.0680	50/50	23.0680
934702	AD1-098 E O1	16.8420	50/50	16.8420
937001	AD2-134 C	9.5571	50/50	9.5571
937002	AD2-134 E	39.4804	50/50	39.4804
941131	AE2-107 C	33.4296	50/50	33.4296
941132	AE2-107 E	22.2864	50/50	22.2864
943121	AE2-341 C	88.5612	50/50	88.5612
943122	AE2-341 E	43.4883	50/50	43.4883
943381	AF1-009 C	1.9955	50/50	1.9955
943382	AF1-009 E	7.9820	50/50	7.9820
943591	AF1-030 C O1	58.8941	50/50	58.8941
943592	AF1-030 E O1	29.1389	50/50	29.1389
946671	AF1-331	8.5382	50/50	8.5382
960381	AF2-329	45.9532	50/50	45.9532
960751	AF2-366 C O1	34.7118	50/50	34.7118
960752	AF2-366 E O1	23.1412	50/50	23.1412
WEC	WEC	0.1490	Confirmed LTF	0.1490
CBM-W2	CBM-W2	1.9001	Confirmed LTF	1.9001
NY	NY	0.0437	Confirmed LTF	0.0437
CBM-W1	CBM-W1	6.3801	Confirmed LTF	6.3801
TVA	TVA	0.2016	Confirmed LTF	0.2016
O-066	O-066	0.5040	Confirmed LTF	0.5040
CBM-S2	CBM-S2	0.0983	Confirmed LTF	0.0983
CBM-S1	CBM-S1	0.9457	Confirmed LTF	0.9457
G-007	G-007	0.0780	Confirmed LTF	0.0780
MADISON	MADISON	1.8668	Confirmed LTF	1.8668
MEC	MEC	1.8003	Confirmed LTF	1.8003
GIBSON	GIBSON	0.0044	Confirmed LTF	0.0044

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
BLUEG	BLUEG	0.0764	Confirmed LTF	0.0764
TRIMBLE	TRIMBLE	0.0267	Confirmed LTF	0.0267

11.6.2 Index 2

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
96598228	943120	AE2-341 TAP	CE	272803	W PLANO ; R	CE	1	COMED_P4_083-38-BT3-4__	breaker	498.0	116.55	125.78	DC	45.95

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
272364	ESS H440N ;R	1.6118	50/50	1.6118
274850	MENDOTA H;RU	0.3743	50/50	0.3743
274855	GSG-6 ;RU	1.5765	50/50	1.5765
274872	LEE DEKAL;1U	4.4258	50/50	4.4258
290051	GSG-6; E	36.5590	50/50	36.5590
290108	LEEDK;1U E	106.9080	50/50	106.9080
916221	AB2-191	0.6047	50/50	0.6047
933431	AC2-156 C O1	6.1569	50/50	6.1569
933432	AC2-156 E O1	10.0455	50/50	10.0455
933911	AD1-013 C	6.5744	50/50	6.5744
933912	AD1-013 E	10.5020	50/50	10.5020
934431	AD1-067 C	0.4591	50/50	0.4591
934432	AD1-067 E	1.9302	50/50	1.9302
934701	AD1-098 C O1	23.0680	50/50	23.0680
934702	AD1-098 E O1	16.8420	50/50	16.8420
937001	AD2-134 C	9.5571	50/50	9.5571
937002	AD2-134 E	39.4804	50/50	39.4804
941131	AE2-107 C	33.4296	50/50	33.4296
941132	AE2-107 E	22.2864	50/50	22.2864
943121	AE2-341 C	88.5612	50/50	88.5612
943122	AE2-341 E	43.4883	50/50	43.4883
943381	AF1-009 C	1.9955	50/50	1.9955
943382	AF1-009 E	7.9820	50/50	7.9820
943591	AF1-030 C O1	58.8941	50/50	58.8941
943592	AF1-030 E O1	29.1389	50/50	29.1389
946671	AF1-331	8.5382	50/50	8.5382
960381	AF2-329	45.9532	50/50	45.9532
960751	AF2-366 C O1	34.7118	50/50	34.7118
960752	AF2-366 E O1	23.1412	50/50	23.1412
WEC	WEC	0.1490	Confirmed LTF	0.1490
CBM-W2	CBM-W2	1.9001	Confirmed LTF	1.9001
NY	NY	0.0437	Confirmed LTF	0.0437
CBM-W1	CBM-W1	6.3801	Confirmed LTF	6.3801
TVA	TVA	0.2016	Confirmed LTF	0.2016
O-066	O-066	0.5040	Confirmed LTF	0.5040
CBM-S2	CBM-S2	0.0983	Confirmed LTF	0.0983

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CBM-S1	CBM-S1	0.9457	Confirmed LTF	0.9457
G-007	G-007	0.0780	Confirmed LTF	0.0780
MADISON	MADISON	1.8668	Confirmed LTF	1.8668
MEC	MEC	1.8003	Confirmed LTF	1.8003
GIBSON	GIBSON	0.0044	Confirmed LTF	0.0044
BLUEG	BLUEG	0.0764	Confirmed LTF	0.0764
TRIMBLE	TRIMBLE	0.0267	Confirmed LTF	0.0267

11.6.3 Index 3

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
96598240	272728	WATERMAN ; B	CE	272445	SANDWICH ; R	CE	1	COMED_P4_083-38-BT3-4__	breaker	331.0	117.14	119.03	DC	6.25

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
272364	ESS H440N ;R	1.6118	50/50	1.6118
274850	MENDOTA H;RU	0.3743	50/50	0.3743
274855	GSG-6 ;RU	1.5765	50/50	1.5765
274872	LEE DEKAL;1U	4.4258	50/50	4.4258
290051	GSG-6; E	36.5590	50/50	36.5590
290108	LEEDK;1U E	106.9080	50/50	106.9080
916221	AB2-191	0.6047	50/50	0.6047
933911	AD1-013 C	6.5744	50/50	6.5744
933912	AD1-013 E	10.5020	50/50	10.5020
934431	AD1-067 C	0.4591	50/50	0.4591
934432	AD1-067 E	1.9302	50/50	1.9302
934701	AD1-098 C O1	23.0680	50/50	23.0680
934702	AD1-098 E O1	16.8420	50/50	16.8420
937001	AD2-134 C	9.5571	50/50	9.5571
937002	AD2-134 E	39.4804	50/50	39.4804
941131	AE2-107 C	33.4296	50/50	33.4296
941132	AE2-107 E	22.2864	50/50	22.2864
943381	AF1-009 C	1.9955	50/50	1.9955
943382	AF1-009 E	7.9820	50/50	7.9820
946671	AF1-331	8.5382	50/50	8.5382
960382	AF2-329 BAT	6.2468	50/50	6.2468
960751	AF2-366 C O1	34.7118	50/50	34.7118
960752	AF2-366 E O1	23.1412	50/50	23.1412
WEC	WEC	0.1490	Confirmed LTF	0.1490
CBM-W2	CBM-W2	1.9001	Confirmed LTF	1.9001
NY	NY	0.0437	Confirmed LTF	0.0437
CBM-W1	CBM-W1	6.3801	Confirmed LTF	6.3801
TVA	TVA	0.2016	Confirmed LTF	0.2016
O-066	O-066	0.5040	Confirmed LTF	0.5040
CBM-S2	CBM-S2	0.0983	Confirmed LTF	0.0983
CBM-S1	CBM-S1	0.9457	Confirmed LTF	0.9457
G-007	G-007	0.0780	Confirmed LTF	0.0780

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
MADISON	MADISON	1.8668	Confirmed LTF	1.8668
MEC	MEC	1.8003	Confirmed LTF	1.8003
GIBSON	GIBSON	0.0044	Confirmed LTF	0.0044
BLUEG	BLUEG	0.0764	Confirmed LTF	0.0764
TRIMBLE	TRIMBLE	0.0267	Confirmed LTF	0.0267

11.7 Queue Dependencies

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

Queue Number	Project Name	Status
AB2-191	Mendota Hills	In Service
AC2-156	Sandwich 34.5kV	Active
AD1-013	Twombly Road 138kV	Active
AD1-067	Mendota Hills	Active
AD1-098	Dixon-McGirr	Active
AD2-134	Shady Oaks	Active
AE2-107	Haumesser Road 138 kV	Active
AE2-341	Sandwich-Plano	Active
AF1-009	Dixon-McGirr	Active
AF1-030	Plano-R 138 kV	Active
AF1-331	Twombley Road	Active
AF2-329	Sandwich-Plano 138 kV	Active
AF2-366	Glidden-Waterman 345 kV	Active

11.8 Contingency Descriptions

Contingency Name	Contingency Definition
COMED_P1-2_345-L0404___-R	CONTINGENCY 'COMED_P1-2_345-L0404___-R' TRIP BRANCH FROM BUS 270864 TO BUS 270890 CKT 1 / QUAD3-11 345 H471 ; 345 END
COMED_P7_138-L11106_B-R_+_345-L15502_B-R	CONTINGENCY 'COMED_P7_138-L11106_B-R_+_345-L15502_B-R' TRIP BRANCH FROM BUS 271390 TO BUS 271586 CKT 1 / ELECT; B 138 W541 ; B 138 TRIP BRANCH FROM BUS 271560 TO BUS 271558 CKT 1 / GLIDD;BT 138 GLIDD; B 138 TRIP BRANCH FROM BUS 271560 TO BUS 272728 CKT 1 / GLIDD;BT 138 WATER; B 138 TRIP BRANCH FROM BUS 271586 TO BUS 272114 CKT 1 / W541 ; B 138 N AUR; B 138 TRIP BRANCH FROM BUS 272114 TO BUS 272522 CKT 1 / N AUR; B 138 SUGAR; B 138 TRIP BRANCH FROM BUS 272522 TO BUS 271560 CKT 1 / SUGAR; B 138 GLIDD;BT 138 MOVE 100 PERCENT LOAD FROM BUS 271586 TO BUS 271587 / W541 ; B 138 W541 ; R 138 MOVE 100 PERCENT LOAD FROM BUS 272522 TO BUS 272523 / SUGAR; B 138 SUGAR; R 138 CLOSE LINE FROM BUS 272114 TO BUS 272115 CKT 1 / N AUR; B 138 N AUR; R 138 TRIP BRANCH FROM BUS 270828 TO BUS 943410 CKT 1 / NELSON ; B 345 AF1-012 END
COMED_P4_111-38-TR82___	CONTINGENCY 'COMED_P4_111-38-TR82___' TRIP BRANCH FROM BUS 271390 TO BUS 271586 CKT 1 / ELECT; B 138 W541 ; B 138 TRIP BRANCH FROM BUS 271390 TO BUS 272724 CKT 1 / ELECT; B 138 WARRE;BT 138 TRIP BRANCH FROM BUS 271390 TO BUS 275239 CKT 1 / ELECT; B 138 ELECT;2M 138 MOVE 100 PERCENT LOAD FROM BUS 271586 TO BUS 271587 / W541 ; B 138 W541 ; R 138 MOVE 100 PERCENT LOAD FROM BUS 272522 TO BUS 272523 / SUGAR; B 138 SUGAR; R 138 CLOSE LINE FROM BUS 272114 TO BUS 272115 CKT 1 / N AUR; B 138 N AUR; R 138 DISCONNECT BUS 271560 / GLIDD;BT 138 DISCONNECT BUS 272522 / SUGAR; B 138 DISCONNECT BUS 275239 / ELECT;2M 138 REMOVE SWSHUNT FROM BUS 271390 END
272803 W PLANO ; R 138 943120 AE2-341 TAP 138 1	CONTINGENCY '272803 W PLANO ; R 138 943120 AE2-341 TAP 138 1' OPEN BRANCH FROM BUS 272803 TO BUS 943120 CKT 1 END
Base Case	

Contingency Name	Contingency Definition
COMED_P1-2_138-L11106_B-R	CONTINGENCY 'COMED_P1-2_138-L11106_B-R' TRIP BRANCH FROM BUS 271390 TO BUS 271586 CKT 1 / ELECT; B 138 W541 ; B 138 TRIP BRANCH FROM BUS 271560 TO BUS 271558 CKT 1 / GLIDD;BT 138 GLIDD; B 138 TRIP BRANCH FROM BUS 271560 TO BUS 272728 CKT 1 / GLIDD;BT 138 WATER; B 138 TRIP BRANCH FROM BUS 271586 TO BUS 272114 CKT 1 / W541 ; B 138 N AUR; B 138 TRIP BRANCH FROM BUS 272114 TO BUS 272522 CKT 1 / N AUR; B 138 SUGAR; B 138 TRIP BRANCH FROM BUS 272522 TO BUS 271560 CKT 1 / SUGAR; B 138 GLIDD;BT 138 MOVE 100 PERCENT LOAD FROM BUS 271586 TO BUS 271587 / W541 ; B 138 W541 ; R 138 MOVE 100 PERCENT LOAD FROM BUS 272522 TO BUS 272523 / SUGAR; B 138 SUGAR; R 138 CLOSE LINE FROM BUS 272114 TO BUS 272115 CKT 1 / N AUR; B 138 N AUR; R 138 END
COMED_P4_083-38-BT3-4__	CONTINGENCY 'COMED_P4_083-38-BT3-4__' TRIP BRANCH FROM BUS 271390 TO BUS 271586 CKT 1 / ELECT; B 138 W541 ; B 138 TRIP BRANCH FROM BUS 271560 TO BUS 271558 CKT 1 / GLIDD;BT 138 GLIDD; B 138 TRIP BRANCH FROM BUS 271560 TO BUS 272728 CKT 1 / GLIDD;BT 138 WATER; B 138 TRIP BRANCH FROM BUS 271586 TO BUS 272114 CKT 1 / W541 ; B 138 N AUR; B 138 TRIP BRANCH FROM BUS 272114 TO BUS 272522 CKT 1 / N AUR; B 138 SUGAR; B 138 TRIP BRANCH FROM BUS 272522 TO BUS 271560 CKT 1 / SUGAR; B 138 GLIDD;BT 138 MOVE 100 PERCENT LOAD FROM BUS 271586 TO BUS 271587 / W541 ; B 138 W541 ; R 138 MOVE 100 PERCENT LOAD FROM BUS 272522 TO BUS 272523 / SUGAR; B 138 SUGAR; R 138 CLOSE LINE FROM BUS 272114 TO BUS 272115 CKT 1 / N AUR; B 138 N AUR; R 138 TRIP BRANCH FROM BUS 271558 TO BUS 960750 CKT 1 / GLIDD; B 138 WATER;3B 138 MOVE 100 PERCENT LOAD FROM BUS 272761 TO BUS 272759 / W DEK;7R 138 W DEK;4R 138 DISCONNECT BUS 271581 / B200 ; R 138 DISCONNECT BUS 272757 / W DEK;7T 138 END
COMED_P1-2_345-L15503_B-R	CONTINGENCY 'COMED_P1-2_345-L15503_B-R' TRIP BRANCH FROM BUS 270828 TO BUS 270700 CKT 1 / NELSO; B 345 CORDO; B 345 END

12 Short Circuit Analysis

The following breakers are overdutied:

None

12.1 System Reinforcements - Short Circuit

None

13 Affected Systems

None