# Generation Interconnection

# Feasibility Study Report

# for

# Queue Project AF2-267

# “LANCASTER 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.

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.

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.

The conduct of light load analysis as required under the PJM planning process is not performed during the Generation Interconnection Feasibility Study phase of the PJM study process. Additional reinforcement

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requirements for this Interconnection Request may be defined during the conduct of the light load analysis which shall be performed following execution of the System Impact Study agreement.

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## 3 General

The Interconnection Customer (IC) has proposed a wind generating facility located in Stephenson County, Illinois. The installed facilities will have a total capability of 210.9 MW with 37.11 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is March 31, 2022. This study does not imply a TO commitment to this in-service date.

| Queue Number | AF2-267 |
|---|---|
| Project Name | LANCASTER 138 KV |
| State | Illinois |
| County | Stephenson |
| Transmission Owner | ComEd |
| MFO | 210.9 |
| MWE | 210.9 |
| MWC | 37.11 |
| Fuel | Wind |
| 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

Queue Position AF2-267, a 210.9 MW wind farm, proposes to interconnect with the ComEd transmission system by tying into the 138kV bus at the Lancaster TSS 119 substation. AF2-267 will interconnect to the Lancaster Substation at the south portion of the 138kV bus.

## 5 Cost Summary

The AF2-267 project will be responsible for the following costs:

| Description | Total Cost |
|---|---|
| Total Physical Interconnection Costs | $17,500,000 |
| Total System Network Upgrade Costs | $118,412,440 |
| Total Costs | $135,912,440 |

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

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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

The AF2-267 generator lead would interconnect to the 138kV bus at the Lancaster TSS 119. The required Attachment Facilities are one 138kV line MOD, a dead-end structure and revenue metering as shown in the one-line diagram.

| Scope of Work | Cost Estimate |
|---|---|
| Installation of one 138kV line MOD, one dead-end structure and one set of revenue metering (see notes below on cost estimate) | $1,000,000 |
| **Total Cost Estimate (see notes below on cost estimate)** | **$1,000,000** |

Direct Connection Network Upgrades

In order to accommodate interconnection of AF2-267, the Lancaster 138kV substation would need to be expanded into a breaker-and-a-half bus configuration. The south 138kV bus will need to be expanded into a ring bus configuration expandable to breaker and a half configuration in the future to create a line termination for the generator lead.

The scope of work includes the installation of three new 138kV circuit breakers, removing one existing 138kV circuit breaker, and transferring terminations of three existing lines L11902, L19414, and a yet to be named 138kV line that connects to Maryland TSS 124 as shown in the one-line diagram below.

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

The estimated cost for the Direct Connection Network upgrade is given below.

| Scope of Work | Cost Estimate |
|---|---|
| Expansion of 138kV Lancaster TSS 119 as described above | $12,000,000 |
| Terminations of three existing lines L11902, L19414, and an unnamed line | $3,000,000 |
| **Total Cost Estimate (see notes below on cost estimate)** | **$15,000,000** |

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ComEd would take approximately 24-months to construct the substation and transmission line work after the ISA / ICSA are signed.

Non-Direct Connection Network Upgrades

The integration of the expanded 138kV Lancaster TSS 119 substation would require relay/communications/SCADA upgrades at Maryland TSS 124, Lena TSS 180, and Sabrooke TSS 194. The ComEd cost is given below:

| **Scope of Work** | **Cost Estimate** |
|---|---|
| Relay/communications/SCADA upgrades at Maryland TSS 124 substation | $500,000 |
| Relay/communications/SCADA upgrades at Lena TSS 180 substation | $500,000 |
| Relay/communications/SCADA upgrades at Sabrooke TSS 194 substation | $500,000 |
| **Total Cost Estimate (see notes below on cost estimate)** | **$1,500,000** |

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.

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## 7 Schedule

See Sections 6 and 11.5.

## 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 - Primary POI

The Queue Project AF2-267 was evaluated as a 210.9 MW (Capacity 37.1 MW) injection at the Lancaster 138 kV substation in the ComEd area. Project AF2-267 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-267 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

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## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 96486899 | 271898 | LANCASTER; BT | 138.0 | CE | 271897 | LANCASTER; R | 138.0 | CE | 1 | COMED_P4_006-45-BT3-4__ | breaker | 321.0 | 72.31 | 117.92 | DC | 146.42 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 96486839 | 270759 | GARDEN PR; R | 345.0 | CE | 960580 | AF2-349 TAP | 345.0 | CE | 1 | COMED_P4_144-45-BT6-8__ | breaker | 1479.0 | 126.29 | 127.65 | DC | 44.82 |
| 96486987 | 270807 | LIBERTYVI; R | 345.0 | CE | 270857 | P HTS 117; R | 345.0 | CE | 1 | COMED_P4_016-45-BT6-11_ | breaker | 1479.0 | 108.07 | 108.68 | DC | 19.9 |
| 96486729 | 271897 | LANCASTER; R | 138.0 | CE | 272240 | PECATONIC; B | 138.0 | CE | 1 | COMED_P4_194-38-L19414_ | breaker | 275.0 | 139.28 | 183.55 | DC | 121.73 |
| 96486766 | 271897 | LANCASTER; R | 138.0 | CE | 271499 | FREEPORT;RT | 138.0 | CE | 1 | COMED_P4_171-38-L17121_ | breaker | 336.0 | 111.91 | 144.74 | DC | 110.3 |
| 96486734 | 272240 | PECATONIC; B | 138.0 | CE | 272747 | WEMPLETOW; R | 138.0 | CE | 1 | COMED_P4_194-38-L19414_ | breaker | 275.0 | 134.44 | 178.71 | DC | 121.73 |
| 96488190 | 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 | 105.79 | 107.3 | DC | 11.09 |
| 95413591 | 960680 | AF2-359 TAP | 345.0 | CE | 243229 | 05OLIVE | 345.0 | AEP | 1 | AEP_P4_#2978_05DUMONT_NON_FSA | breaker | 971.0 | 110.33 | 110.34 | DC | 20.03 |
| 95413592 | 960680 | AF2-359 TAP | 345.0 | CE | 243229 | 05OLIVE | 345.0 | AEP | 1 | AEP_P4_#2978_05DUMONT_FSA | breaker | 971.0 | 110.33 | 110.34 | DC | 20.03 |
| 95413593 | 960680 | AF2-359 TAP | 345.0 | CE | 243229 | 05OLIVE | 345.0 | AEP | 1 | COMED_P4_023-65-BT2-3__ | breaker | 971.0 | 110.01 | 110.02 | DC | 20.19 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

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| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96487332** | 270694 | CHERRY VA; B | 345.0 | CE | 270759 | GARDEN PR; R | 345.0 | CE | 1 | COMED_P1-2_345-L0626__B-R-B | operation | 1479.0 | 125.96 | 129.08 | DC | 45.6 |
| **96487334** | 270694 | CHERRY VA; B | 345.0 | CE | 270759 | GARDEN PR; R | 345.0 | CE | 1 | Base Case | operation | 1201.0 | 111.75 | 114.72 | DC | 35.37 |
| **96487340** | 270759 | GARDEN PR; R | 345.0 | CE | 960580 | AF2-349 TAP | 345.0 | CE | 1 | COMED_P1-2_345-L0626__B-R-B | operation | 1479.0 | 126.27 | 127.66 | DC | 45.6 |
| **96487342** | 270759 | GARDEN PR; R | 345.0 | CE | 960580 | AF2-349 TAP | 345.0 | CE | 1 | Base Case | operation | 1201.0 | 116.14 | 117.47 | DC | 35.37 |
| **96487441** | 270770 | GOODINGS ;4B | 345.0 | CE | 270766 | GOODINGS ;3B | 345.0 | CE | 1 | COMED_P1-2_345-L11613AB-S | operation | 1802.0 | 114.61 | 114.93 | DC | 21.62 |
| **96487446** | 270770 | GOODINGS ;4B | 345.0 | CE | 270766 | GOODINGS ;3B | 345.0 | CE | 1 | Base Case | operation | 1560.0 | 101.46 | 101.91 | DC | 15.61 |
| **96487439** | 270828 | NELSON ; B | 345.0 | CE | 943410 | AF1-012 TAP | 345.0 | CE | 1 | Base Case | operation | 1334.0 | 104.86 | 105.59 | DC | 22.61 |
| **96487565** | 271096 | BLACKHAWK; BT | 138.0 | CE | 271192 | CHERRY VA; B | 138.0 | CE | 1 | COMED_P2-1_194-L15622__ | operation | 386.0 | 88.12 | 100.36 | DC | 47.25 |
| **96487568** | 271097 | BLACKHAWK; RT | 138.0 | CE | 271193 | CHERRY VA; R | 138.0 | CE | 1 | COMED_P2-1_194-L15626__ | operation | 386.0 | 86.72 | 100.36 | DC | 52.64 |
| **96487552** | 271499 | FREEPORT ;RT | 138.0 | CE | 272599 | ESS B427 ;4T | 138.0 | CE | 1 | COMED_P2-1_119-L17121__ | operation | 449.0 | 76.69 | 101.78 | DC | 112.64 |
| **96487553** | 271499 | FREEPORT ;RT | 138.0 | CE | 272599 | ESS B427 ;4T | 138.0 | CE | 1 | COMED_P1-2_138-L17121_R-R | operation | 449.0 | 76.69 | 101.78 | DC | 112.64 |
| **96487196** | 271897 | LANCASTER; R | 138.0 | CE | 272240 | PECATONIC; B | 138.0 | CE | 1 | COMED_P1-2_138-L19414GR-R | operation | 264.0 | 144.13 | 190.49 | DC | 122.4 |
| **96487201** | 271897 | LANCASTER; R | 138.0 | CE | 272240 | PECATONIC; B | 138.0 | CE | 1 | Base Case | operation | 208.0 | 124.31 | 163.51 | DC | 81.52 |
| **96487261** | 271897 | LANCASTER; R | 138.0 | CE | 271499 | FREEPORT ;RT | 138.0 | CE | 1 | COMED_P2-1_119-L17121__ | operation | 317.0 | 117.51 | 152.87 | DC | 112.1 |
| **96487262** | 271897 | LANCASTER; R | 138.0 | CE | 271499 | FREEPORT ;RT | 138.0 | CE | 1 | COMED_P1-2_138-L17121_R-R | operation | 317.0 | 117.51 | 152.87 | DC | 112.1 |
| **96487266** | 271897 | LANCASTER; R | 138.0 | CE | 271499 | FREEPORT ;RT | 138.0 | CE | 1 | Base Case | operation | 249.0 | 91.35 | 117.88 | DC | 66.05 |
| **96487497** | 271898 | LANCASTER;BT | 138.0 | CE | 271897 | LANCASTER; R | 138.0 | CE | 1 | COMED_P1-2_345-L0627__B-R | operation | 321.0 | 61.47 | 107.08 | DC | 146.42 |
| **96487491** | 271978 | MARYLAND ; B | 138.0 | CE | 271328 | DIXON ;BT | 138.0 | CE | 1 | COMED_P1-2_138-L17121_R-R | operation | 321.0 | 82.68 | 113.28 | DC | 98.24 |
| **96487492** | 271978 | MARYLAND ; B | 138.0 | CE | 271328 | DIXON ;BT | 138.0 | CE | 1 | COMED_P2-1_119-L17121__ | operation | 321.0 | 82.68 | 113.28 | DC | 98.24 |
| **96487206** | 272240 | PECATONIC; B | 138.0 | CE | 272747 | WEMPLETOW; R | 138.0 | CE | 1 | COMED_P1-2_138-L19414GR-R | operation | 264.0 | 139.13 | 185.49 | DC | 122.4 |
| **96487211** | 272240 | PECATONIC; B | 138.0 | CE | 272747 | WEMPLETOW; R | 138.0 | CE | 1 | Base Case | operation | 208.0 | 120.04 | 159.23 | DC | 81.52 |

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| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96487555** | 272599 | ESS B427 ;4T | 138.0 | CE | 272491 | S PECATON; R | 138.0 | CE | 1 | COMED_P2-1_119-L17121__ | operation | 449.0 | 76.47 | 101.56 | DC | 112.64 |
| **96487556** | 272599 | ESS B427 ;4T | 138.0 | CE | 272491 | S PECATON; R | 138.0 | CE | 1 | COMED_P1-2_138-L17121_R-R | operation | 449.0 | 76.47 | 101.56 | DC | 112.64 |
| **96487256** | 274750 | CRETE EC ;BP | 345.0 | CE | 255112 | 17STJOHN | 345.0 | NIPS | 1 | Base Case | operation | 1091.0 | 153.75 | 153.83 | DC | 16.24 |
| **96487512** | 274804 | UNIV PK N;RP | 345.0 | CE | 960680 | AF2-359 TAP | 345.0 | CE | 1 | COMED_P1-2_695_B2 | operation | 971.0 | 106.45 | 106.52 | DC | 20.16 |
| **96487544** | 930480 | AB1-089 TAP | 345.0 | CE | 270916 | WAYNE ; B | 345.0 | CE | 1 | COMED_P1-2_345-L97116__-R_FSA | operation | 2058.0 | 100.13 | 101.09 | DC | 43.14 |
| **96487376** | 938860 | AE1-114 TAP | 138.0 | CE | 271978 | MARYLAND ; B | 138.0 | CE | 1 | COMED_P1-2_138-L17121_R-R | operation | 321.0 | 93.74 | 124.34 | DC | 98.24 |
| **96487377** | 938860 | AE1-114 TAP | 138.0 | CE | 271978 | MARYLAND ; B | 138.0 | CE | 1 | COMED_P2-1_119-L17121__ | operation | 321.0 | 93.74 | 124.34 | DC | 98.24 |
| **96487353** | 943410 | AF1-012 TAP | 345.0 | CE | 957470 | AF2-041 TAP | 345.0 | CE | 1 | Base Case | operation | 1334.0 | 110.4 | 111.16 | DC | 22.61 |
| **95413792** | 956820 | J1180 TAP | 345.0 | AMIL | 247712 | 05SULLIVAN | 345.0 | AEP | 1 | AEP_P1-2_#286 | operation | 1466.0 | 138.2 | 138.21 | DC | 14.66 |
| **96487296** | 957470 | AF2-041 TAP | 345.0 | CE | 270730 | ELECT JCT; B | 345.0 | CE | 1 | Base Case | operation | 1334.0 | 133.84 | 134.6 | DC | 22.61 |
| **96487312** | 960580 | AF2-349 TAP | 345.0 | CE | 270883 | SILVER LK; R | 345.0 | CE | 1 | COMED_P1-2_345-L0626__B-R-B | operation | 1479.0 | 126.25 | 127.64 | DC | 45.6 |
| **96487314** | 960580 | AF2-349 TAP | 345.0 | CE | 270883 | SILVER LK; R | 345.0 | CE | 1 | Base Case | operation | 1201.0 | 116.12 | 117.44 | DC | 35.37 |
| **95413878** | 960680 | AF2-359 TAP | 345.0 | CE | 243229 | 05OLIVE | 345.0 | AEP | 1 | COMED_P1-2_695_B2 | operation | 971.0 | 109.89 | 109.9 | DC | 20.16 |

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## 11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

| ID | Idx | Facility | Upgrade Description | Cost |
|---|---|---|---|---|
| 96486987 | 3 | LIBERTYVI; R 345.0 kV - P HTS 117; R 345.0 kV Ckt 1 | ComEd<br>CE_NUN_L11723 (843) : ComEd 345kV L11723 SSTE rating is 1568 MVA. The upgrade will be to replace station conductor at both terminals and sag mitigation on the line. A preliminary estimate for this upgrade is $8.2M with an estimated construction timeline of 24 months. Upon completion of the upgrade the ratings will be 1334/1726/1837/2084 MVA (SN/SLTE/SSTE/SLD).<br>Project Type : FAC<br>Cost : $8,200,000<br>Time Estimate : Months | $8,200,000 |
| 96486734 | 6 | PECATONIC; B 138.0 kV - WEMPLETOW; R 138.0 kV Ckt 1 | ComEd<br>CE_NUN_17121 (861) : ComEd 138kV L17121 SLD & ALDR ratings are 275 MVA & 316 MVA. The upgrade will be to re-conductor the line. A preliminary estimate for the upgrade is $6.4M. A preliminary construction timeline is 24 months. Upon completion the ratings will be 351/449/459/498/573 MVA (SN/SSTE/SLTE/SLD/ALDR).<br>Project Type : FAC<br>Cost : $6,400,000<br>Time Estimate : 24.0 Months | $6,400,000 |
| 96486766 | 5 | LANCASTER; R 138.0 kV - FREEPORT ;RT 138.0 kV Ckt 1 | ComEd<br>CE_NUN_L11904_1 (935) : ComEd 138kV L11904 SLD & ALDR ratings are 421 MVA & 484 MVA. The upgrade will be to mitigate sag on the line conductor and upgrade station conductor. A preliminary estimate for the upgrade is $750K with a preliminary construction timeline of 24 months. Upon completion the ratings will be 351/449/459/498/573 MVA (SN/SLTE/SSTE/SLD/ALDR).<br>Project Type : FAC<br>Cost : $750,000<br>Time Estimate : 24.0 Months | $750,000 |
| 96486899 | 1 | LANCASTER;BT 138.0 kV - LANCASTER; R 138.0 kV Ckt 1 | ComEd<br>CE_NUN_L11902 (930) : Upgrade is to replace the wave trap on the line at a terminal. A preliminary estimate for this upgrade is $500K with an estimated construction timeline of 24-30 months. Upon completion of the upgrade the ratings will 314/393/421 MVA (SN/SLTE/SLD).<br>Project Type : FAC<br>Cost : $500,000<br>Time Estimate : 24-30 Months | $500,000 |

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| ID | Idx | Facility | Upgrade Description | Cost |
|---|---|---|---|---|
| **96488190** | 7 | **WATERMAN ; B 138.0 kV - SANDWICH ; R 138.0 kV Ckt 1** | **ComEd**<br>**ce-007 (886) : 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 an estimated construction time of 30 months. Upon completion the ratings will be 292/321/367/433/498 MVA N1:N6SN/SLTE/SSTE/SLD/ALDR).**<br>**Project Type : FAC**<br>**Cost : $13,100,000**<br>**Time Estimate : 30.0 Months** | $13,100,000 |
| **96486839** | 2 | **GARDEN PR; R 345.0 kV - AF2-349 TAP 345.0 kV Ckt 1** | **ComEd**<br>**ce-012a : ComEd 345kV L15616 SN rating is 1201 MVA. The post contingency flow for this event exceeds the rating therefore an upgrade is required. The upgrade will be to re-conductor the line and station bus work. A preliminary estimate for this upgrade is $45.7M with an estimated construction timeline of 30 months. Upon completion of the upgrade the ratings will be 1248/1441/1667/1982 MVA SN/SLTE/SSTE/SLD.**<br>**Project Type : FAC**<br>**Cost : $45,700,000**<br>**Time Estimate : 30.0 Months**<br><br>**ce-012 : L15616 SSTE rating is 1568 MVA. The post contingency flow for this event exceeds the rating therefore upgrades are required. Re-conductor 26.7 miles of 2338 kcmil. Mitigate sag limits. Upgrade relay package. Replace station conductor at both line terminals. Replace 2-345 kV breakers at TSS 138 Silver Lake. A preliminary estimate for the upgrades is $32.4M with an estimated construction timeline of 36 months. Upon completion of all upgrades the new ratings will be 1461/1656/1909/1912 MVA (SN/SLTE/SSTE/SLD).**<br>**Project Type : FAC**<br>**Cost : $32,400,000**<br>**Time Estimate : 36.0 Months** | $78,100,000 |
| **96486729** | 4 | **LANCASTER; R 138.0 kV - PECATONIC; B 138.0 kV Ckt 1** | **ComEd**<br>**CE_NUN_17121 (861) : ComEd 138kV L17121 SLD & ALDR ratings are 275 MVA & 316 MVA. The upgrade will be to re-conductor the line. A preliminary estimate for the upgrade is $6.4M. A preliminary construction timeline is 24 months. Upon completion the ratings will be 351/449/459/498/573 MVA (SN/SSTE/SLTE/SLD/ALDR).**<br>**Project Type : FAC**<br>**Cost : $6,400,000**<br>**Time Estimate : 24.0 Months** | $6,400,000 |

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| ID | Idx | Facility | Upgrade Description | Cost |
|---|---|---|---|---|
| 95413591,95413592,95413593 | 8 | AF2-359 TAP 345.0 kV - 05OLIVE 345.0 kV Ckt 1 | **AEP**<br>**n4057 (502) : 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 Re-conductor/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.**<br>**Project Type : FAC**<br>**Cost : $162,440**<br>**Time Estimate : 6-12 Months**<br><br>**ComEd**<br>**CE_NUN_L97008 (917) : Sag mitigation on a portion of the line. A preliminary estimate for this work is $M with an estimated construction timeline of 30 months. Upon completion of the upgrade the rating swill be 1334/1334/1391/1523 MVA (SN/SLTE/SSTE/SLD).**<br>**Project Type : FAC**<br>**Cost : $4,800,000**<br>**Time Estimate : 30.0 Months** | $4,962,440 |
| | | | **TOTAL COST** | **$118,412,440** |

## 11.6 Flow Gate Details - Primary POI

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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96486899** | 271898 | LANCASTER;BT | CE | 271897 | LANCASTER; R | CE | 1 | COMED_P4_006-45-BT3-4__ | breaker | 321.0 | 72.31 | 117.92 | DC | 146.42 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **293516** | O-009 E1 | 3.5425 | Adder | 4.17 |
| **293517** | O-009 E2 | 1.7993 | Adder | 2.12 |
| **293518** | O-009 E3 | 1.9815 | Adder | 2.33 |
| **293715** | O-029 E | 3.7873 | Adder | 4.46 |
| **293716** | O-029 E | 2.0765 | Adder | 2.44 |
| **293717** | O-029 E | 1.9086 | Adder | 2.25 |
| **938861** | AE1-114 C O1 | 15.0787 | 50/50 | 15.0787 |
| **938862** | AE1-114 E O1 | 51.4448 | 50/50 | 51.4448 |
| **943401** | AF1-011 C | 0.4836 | Adder | 0.57 |
| **943402** | AF1-011 E | 0.8118 | Adder | 0.96 |
| **943922** | AF1-060 BAT | 3.1547 | 50/50 | 3.1547 |
| **959761** | AF2-267 C O1 | 25.7709 | 50/50 | 25.7709 |
| **959762** | AF2-267 E O1 | 120.6485 | 50/50 | 120.6485 |
| **961011** | AF2-392 C O1 | 1.1224 | Adder | 2.49 |
| **961012** | AF2-392 E O1 | 5.2549 | Adder | 11.66 |
| **961021** | AF2-393 O1 | 1.9132 | Adder | 4.25 |
| **961031** | AF2-394 O1 | 1.2755 | Adder | 2.83 |
| **LGEE** | LGEE | 0.0405 | Confirmed LTF | 0.0405 |
| **CPLE** | CPLE | 0.0615 | Confirmed LTF | 0.0615 |
| **G-007A** | G-007A | 0.0839 | Confirmed LTF | 0.0839 |
| **VFT** | VFT | 0.2257 | Confirmed LTF | 0.2257 |
| **CBM-W2** | CBM-W2 | 2.4242 | Confirmed LTF | 2.4242 |
| **TVA** | TVA | 0.3010 | Confirmed LTF | 0.3010 |
| **CBM-S2** | CBM-S2 | 0.6358 | Confirmed LTF | 0.6358 |
| **CBM-S1** | CBM-S1 | 1.6018 | Confirmed LTF | 1.6018 |
| **MADISON** | MADISON | 0.2460 | Confirmed LTF | 0.2460 |
| **MEC** | MEC | 1.5270 | Confirmed LTF | 1.5270 |

### 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96486839** | 270759 | GARDEN PR; R | CE | 960580 | AF2-349 TAP | CE | 1 | COMED_P4_144-45-BT6-8__ | breaker | 1479.0 | 126.29 | 127.65 | DC | 44.82 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **274830** | U3-021 1 | 20.9976 | Adder | 24.7 |
| **274831** | U3-021 2 | 24.7031 | 50/50 | 24.7031 |
| **274859** | EASYR;U1 E | 14.5664 | Adder | 17.14 |
| **274860** | EASYR;U2 E | 14.5664 | Adder | 17.14 |
| **276172** | Z1-108 BAT | 2.0808 | Merchant Transmission | 2.0808 |
| **290051** | GSG-6; E | 7.4601 | Adder | 8.78 |
| **290108** | LEEDK;1U E | 14.8614 | Adder | 17.48 |
| **293516** | O-009 E1 | 7.6387 | Adder | 8.99 |
| **293517** | O-009 E2 | 3.8799 | Adder | 4.56 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **293518** | O-009 E3 | 4.2728 | Adder | 5.03 |
| **293715** | O-029 E | 8.1666 | Adder | 9.61 |
| **293716** | O-029 E | 4.4776 | Adder | 5.27 |
| **293717** | O-029 E | 4.1154 | Adder | 4.84 |
| **294763** | P-046 E | 14.4554 | Adder | 17.01 |
| **919581** | AA2-030 | 17.1750 | Adder | 20.21 |
| **924471** | AB2-096 | 171.5490 | 50/50 | 171.5490 |
| **926431** | AC1-114 | 4.1929 | Adder | 4.93 |
| **927511** | AC1-113 1 | 2.0964 | Adder | 2.47 |
| **927521** | AC1-113 2 | 2.0964 | Adder | 2.47 |
| **930481** | AB1-089 | 118.8946 | Adder | 139.88 |
| **932881** | AC2-115 1 | 4.1927 | Adder | 4.93 |
| **932891** | AC2-115 2 | 4.1927 | Adder | 4.93 |
| **932921** | AC2-116 | 1.4675 | Adder | 1.73 |
| **933911** | AD1-013 C | 1.2998 | Adder | 1.53 |
| **933912** | AD1-013 E | 2.0764 | Adder | 2.44 |
| **934431** | AD1-067 C | 0.0937 | Adder | 0.11 |
| **934432** | AD1-067 E | 0.3939 | Adder | 0.46 |
| **934651** | **AD1-096 C (Withdrawn : 07/22/2020)** | **1.3809** | **Adder** | **1.62** |
| **934652** | **AD1-096 E (Withdrawn : 07/22/2020)** | **2.2530** | **Adder** | **2.65** |
| **934701** | AD1-098 C O1 | 5.0181 | Adder | 5.9 |
| **934702** | AD1-098 E O1 | 3.6638 | Adder | 4.31 |
| **934971** | AD1-129 C | 1.0978 | Adder | 1.29 |
| **934972** | AD1-129 E | 0.7318 | Adder | 0.86 |
| **936791** | AD2-102 C | 24.1128 | Adder | 28.37 |
| **936792** | AD2-102 E | 16.0752 | Adder | 18.91 |
| **937001** | AD2-134 C | 1.9502 | Adder | 2.29 |
| **937002** | AD2-134 E | 8.0563 | Adder | 9.48 |
| **937311** | AD2-172 C | 3.7946 | Adder | 4.46 |
| **937312** | AD2-172 E | 5.2401 | Adder | 6.16 |
| **937531** | AD2-214 C | 3.8828 | Adder | 4.57 |
| **937532** | AD2-214 E | 2.5885 | Adder | 3.05 |
| **938861** | AE1-114 C O1 | 5.2127 | Adder | 6.13 |
| **938862** | AE1-114 E O1 | 17.7845 | Adder | 20.92 |
| **939051** | AE1-134 1 | 1.3346 | Adder | 1.57 |
| **939061** | AE1-134 2 | 1.3346 | Adder | 1.57 |
| **940501** | AE2-035 C | 3.7946 | Adder | 4.46 |
| **940502** | AE2-035 E | 5.2401 | Adder | 6.16 |
| **941131** | AE2-107 C | 4.3325 | Adder | 5.1 |
| **941132** | AE2-107 E | 2.8883 | Adder | 3.4 |
| **943381** | AF1-009 C | 0.4341 | Adder | 0.51 |
| **943382** | AF1-009 E | 1.7364 | Adder | 2.04 |
| **943401** | AF1-011 C | 1.0428 | Adder | 1.23 |
| **943402** | AF1-011 E | 1.7504 | Adder | 2.06 |
| **943411** | AF1-012 C | 9.6104 | Adder | 11.31 |
| **943412** | AF1-012 E | 6.4070 | Adder | 7.54 |
| **943921** | AF1-060 | 1.8684 | Adder | 2.2 |
| **946151** | AF1-280 C O1 | 19.0338 | Adder | 22.39 |
| **946152** | AF1-280 E O1 | 8.7527 | Adder | 10.3 |
| **946161** | AF1-281 C | 0.4168 | Adder | 0.49 |
| **946162** | AF1-281 E | 2.3619 | Adder | 2.78 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **946321** | AF1-296 C O1 | 3.2866 | Adder | 3.87 |
| **946322** | AF1-296 E O1 | 15.3873 | Adder | 18.1 |
| **946501** | AF1-314 C | 6.7420 | Adder | 7.93 |
| **946502** | AF1-314 E | 31.5649 | Adder | 37.14 |
| **946531** | AF1-317 C O1 | 1.8306 | Adder | 2.15 |
| **946671** | AF1-331 | 1.6881 | Adder | 1.99 |
| **950101** | J390 | 83.5450 | PJM External (MISO) | 83.5450 |
| **952431** | J760 | 5.3670 | PJM External (MISO) | 5.3670 |
| **952511** | J584 C | 1.0629 | PJM External (MISO) | 1.0629 |
| **952512** | J584 E | 5.7507 | PJM External (MISO) | 5.7507 |
| **953111** | J807 C | 1.2215 | PJM External (MISO) | 1.2215 |
| **953112** | J807 E | 6.6085 | PJM External (MISO) | 6.6085 |
| **953681** | J818 | 14.1654 | PJM External (MISO) | 14.1654 |
| **953691** | J819 C | 1.4959 | PJM External (MISO) | 1.4959 |
| **953692** | J819 E | 8.0935 | PJM External (MISO) | 8.0935 |
| **953901** | J850 | 21.0400 | PJM External (MISO) | 21.0400 |
| **954001** | J864 | 4.4262 | PJM External (MISO) | 4.4262 |
| **955221** | J1000 | 3.7405 | PJM External (MISO) | 3.7405 |
| **955971** | J1084 | 11.1330 | PJM External (MISO) | 11.1330 |
| **956581** | J1154 | 7.1355 | PJM External (MISO) | 7.1355 |
| **956901** | J1188 | 5.8100 | PJM External (MISO) | 5.8100 |
| **958911** | AF2-182 | 13.2542 | Adder | 29.42 |
| **958921** | AF2-183 C | 2.3563 | Adder | 5.23 |
| **958922** | AF2-183 E | 3.5344 | Adder | 7.85 |
| **959101** | AF2-201 C O1 | 4.9224 | Adder | 10.93 |
| **959102** | AF2-201 E O1 | 14.1353 | Adder | 31.38 |
| **959761** | AF2-267 C O1 | 3.5535 | Adder | 7.89 |
| **959762** | AF2-267 E O1 | 16.6362 | Adder | 36.93 |
| **960551** | AF2-346 C | 2.1829 | Adder | 4.85 |
| **960552** | AF2-346 E | 1.4553 | Adder | 3.23 |
| **960721** | AF2-363 C O1 | 2.1972 | Adder | 4.88 |
| **960722** | AF2-363 E O1 | 1.4648 | Adder | 3.25 |
| **960751** | AF2-366 C O1 | 2.3027 | Adder | 5.11 |
| **960752** | AF2-366 E O1 | 1.5352 | Adder | 3.41 |
| **961011** | AF2-392 C O1 | 2.0808 | Adder | 4.62 |
| **961012** | AF2-392 E O1 | 9.7421 | Adder | 21.63 |
| **961021** | AF2-393 O1 | 3.5469 | Adder | 7.87 |
| **961031** | AF2-394 O1 | 2.3646 | Adder | 5.25 |
| **WEC** | WEC | 0.5292 | Confirmed LTF | 0.5292 |
| **CBM-W2** | CBM-W2 | 8.7551 | Confirmed LTF | 8.7551 |
| **NY** | NY | 0.2483 | Confirmed LTF | 0.2483 |
| **CBM-W1** | CBM-W1 | 40.2447 | Confirmed LTF | 40.2447 |
| **TVA** | TVA | 0.9352 | Confirmed LTF | 0.9352 |
| **O-066** | O-066 | 2.9030 | Confirmed LTF | 2.9030 |
| **CBM-S2** | CBM-S2 | 0.1792 | Confirmed LTF | 0.1792 |
| **CBM-S1** | CBM-S1 | 4.2089 | Confirmed LTF | 4.2089 |
| **TILTON** | TILTON | 0.1210 | Confirmed LTF | 0.1210 |
| **G-007** | G-007 | 0.4482 | Confirmed LTF | 0.4482 |
| **MADISON** | MADISON | 11.4993 | Confirmed LTF | 11.4993 |
| **MEC** | MEC | 9.5086 | Confirmed LTF | 9.5086 |
| **GIBSON** | GIBSON | 0.0824 | Confirmed LTF | 0.0824 |
| **BLUEG** | BLUEG | 0.5208 | Confirmed LTF | 0.5208 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **TRIMBLE** | TRIMBLE | 0.1781 | Confirmed LTF | 0.1781 |

### 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96486987** | 270807 | LIBERTYVI; R | CE | 270857 | P HTS 117; R | CE | 1 | COMED_P4_016-45-BT6-11_ | breaker | 1479.0 | 108.07 | 108.68 | DC | 19.9 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **274683** | WAUKEGAN ;8U | 8.6783 | 50/50 | 8.6783 |
| **274725** | ZION EC ;1P | 6.6512 | 50/50 | 6.6512 |
| **274726** | ZION EC ;2P | 6.6512 | 50/50 | 6.6512 |
| **274727** | ZION EC ;3P | 6.6512 | 50/50 | 6.6512 |
| **274828** | WAUKEGAN ;BP | 2.4683 | 50/50 | 2.4683 |
| **274830** | U3-021 1 | 5.6437 | Adder | 6.64 |
| **274831** | U3-021 2 | 5.6437 | Adder | 6.64 |
| **274859** | EASYR;U1 E | 5.9764 | Adder | 7.03 |
| **274860** | EASYR;U2 E | 5.9764 | Adder | 7.03 |
| **276170** | Z1-108 E | 2.7896 | 50/50 | 2.7896 |
| **290051** | GSG-6; E | 3.8377 | Adder | 4.51 |
| **293516** | O-009 E1 | 3.5313 | Adder | 4.15 |
| **293517** | O-009 E2 | 1.7936 | Adder | 2.11 |
| **293518** | O-009 E3 | 1.9753 | Adder | 2.32 |
| **293715** | O-029 E | 3.7754 | Adder | 4.44 |
| **293716** | O-029 E | 2.0700 | Adder | 2.44 |
| **293717** | O-029 E | 1.9025 | Adder | 2.24 |
| **294763** | P-046 E | 6.4178 | Adder | 7.55 |
| **915011** | Y3-013 1 | 7.0107 | 50/50 | 7.0107 |
| **915021** | Y3-013 2 | 7.0107 | 50/50 | 7.0107 |
| **915031** | Y3-013 3 | 7.0107 | 50/50 | 7.0107 |
| **919581** | AA2-030 | 7.8842 | Adder | 9.28 |
| **920272** | AA2-123 E | 2.1451 | Adder | 2.52 |
| **924471** | AB2-096 | 46.1090 | 50/50 | 46.1090 |
| **926431** | AC1-114 | 1.8090 | Adder | 2.13 |
| **927511** | AC1-113 1 | 0.9047 | Adder | 1.06 |
| **927521** | AC1-113 2 | 0.9047 | Adder | 1.06 |
| **930481** | AB1-089 | 41.6636 | Adder | 49.02 |
| **932881** | AC2-115 1 | 1.8093 | Adder | 2.13 |
| **932891** | AC2-115 2 | 1.8093 | Adder | 2.13 |
| **932921** | AC2-116 | 0.6331 | Adder | 0.74 |
| **933911** | AD1-013 C | 0.6727 | Adder | 0.79 |
| **933912** | AD1-013 E | 1.0746 | Adder | 1.26 |
| **933931** | AD1-016 C | 0.8151 | Adder | 0.96 |
| **933932** | AD1-016 E | 1.3299 | Adder | 1.56 |
| **934431** | AD1-067 C | 0.0482 | Adder | 0.06 |
| **934432** | AD1-067 E | 0.2026 | Adder | 0.24 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| 934651 | AD1-096 C (Withdrawn : 07/22/2020) | 0.5775 | Adder | 0.68 |
| 934652 | AD1-096 E (Withdrawn : 07/22/2020) | 0.9422 | Adder | 1.11 |
| 934701 | AD1-098 C O1 | 2.5607 | Adder | 3.01 |
| 934702 | AD1-098 E O1 | 1.8695 | Adder | 2.2 |
| 934971 | AD1-129 C | 0.7344 | Adder | 0.86 |
| 934972 | AD1-129 E | 0.4896 | Adder | 0.58 |
| 936791 | AD2-102 C | 11.0762 | Adder | 13.03 |
| 936792 | AD2-102 E | 7.3841 | Adder | 8.69 |
| 937001 | AD2-134 C | 1.0032 | Adder | 1.18 |
| 937002 | AD2-134 E | 4.1443 | Adder | 4.88 |
| 937311 | AD2-172 C | 1.6847 | Adder | 1.98 |
| 937312 | AD2-172 E | 2.3265 | Adder | 2.74 |
| 937531 | AD2-214 C | 1.9195 | Adder | 2.26 |
| 937532 | AD2-214 E | 1.2797 | Adder | 1.51 |
| 938861 | AE1-114 C O1 | 2.3366 | Adder | 2.75 |
| 938862 | AE1-114 E O1 | 7.9718 | Adder | 9.38 |
| 939051 | AE1-134 1 | 0.6127 | Adder | 0.72 |
| 939061 | AE1-134 2 | 0.6127 | Adder | 0.72 |
| 940501 | AE2-035 C | 1.6847 | Adder | 1.98 |
| 940502 | AE2-035 E | 2.3265 | Adder | 2.74 |
| 942991 | AE2-321 C | 7.1113 | Adder | 8.37 |
| 942992 | AE2-321 E | 3.5026 | Adder | 4.12 |
| 943381 | AF1-009 C | 0.2215 | Adder | 0.26 |
| 943382 | AF1-009 E | 0.8860 | Adder | 1.04 |
| 943401 | AF1-011 C | 0.4821 | Adder | 0.57 |
| 943402 | AF1-011 E | 0.8092 | Adder | 0.95 |
| 943411 | AF1-012 C | 4.6928 | Adder | 5.52 |
| 943412 | AF1-012 E | 3.1285 | Adder | 3.68 |
| 943801 | AF1-048 C | 3.3243 | Adder | 3.91 |
| 943802 | AF1-048 E | 2.2162 | Adder | 2.61 |
| 943921 | AF1-060 | 0.8295 | Adder | 0.98 |
| 944041 | AF1-072 | 1.3737 | Adder | 1.62 |
| 946151 | AF1-280 C O1 | 8.0304 | Adder | 9.45 |
| 946152 | AF1-280 E O1 | 3.6928 | Adder | 4.34 |
| 946161 | AF1-281 C | 0.1758 | Adder | 0.21 |
| 946162 | AF1-281 E | 0.9965 | Adder | 1.17 |
| 946321 | AF1-296 C O1 | 1.7144 | Adder | 2.02 |
| 946322 | AF1-296 E O1 | 8.0264 | Adder | 9.44 |
| 946501 | AF1-314 C | 2.9933 | Adder | 3.52 |
| 946502 | AF1-314 E | 14.0140 | Adder | 16.49 |
| 946531 | AF1-317 C O1 | 0.8939 | Adder | 1.05 |
| 946661 | AF1-330 C | 1.7589 | Adder | 2.07 |
| 946662 | AF1-330 E | 0.3861 | Adder | 0.45 |
| 946671 | AF1-331 | 0.8736 | Adder | 1.03 |
| 950101 | J390 | 64.9490 | PJM External (MISO) | 64.9490 |
| 951391 | J505 | 11.3580 | PJM External (MISO) | 11.3580 |
| 952381 | J703 | 13.4479 | PJM External (MISO) | 13.4479 |
| 952391 | J704 | 5.7371 | PJM External (MISO) | 5.7371 |
| 952431 | J760 | 2.3139 | PJM External (MISO) | 2.3139 |
| 952511 | J584 C | 0.7661 | PJM External (MISO) | 0.7661 |
| 952512 | J584 E | 4.1449 | PJM External (MISO) | 4.1449 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **953111** | J807 C | 0.8131 | PJM External (MISO) | 0.8131 |
| **953112** | J807 E | 4.3988 | PJM External (MISO) | 4.3988 |
| **953151** | J831 | 5.3220 | PJM External (MISO) | 5.3220 |
| **953331** | J801 | 3.7866 | PJM External (MISO) | 3.7866 |
| **953491** | J947 | 30.2260 | PJM External (MISO) | 30.2260 |
| **953681** | J818 | 14.4664 | PJM External (MISO) | 14.4664 |
| **953691** | J819 C | 1.0459 | PJM External (MISO) | 1.0459 |
| **953692** | J819 E | 5.6584 | PJM External (MISO) | 5.6584 |
| **953701** | J821 C | 1.2327 | PJM External (MISO) | 1.2327 |
| **953702** | J821 E | 6.6694 | PJM External (MISO) | 6.6694 |
| **953891** | J849 | 13.1488 | PJM External (MISO) | 13.1488 |
| **953901** | J850 | 23.6375 | PJM External (MISO) | 23.6375 |
| **954001** | J864 | 3.3697 | PJM External (MISO) | 3.3697 |
| **954141** | J878 | 29.1780 | PJM External (MISO) | 29.1780 |
| **954191** | J886 | 17.0220 | PJM External (MISO) | 17.0220 |
| **954511** | J926 C | 0.8233 | PJM External (MISO) | 0.8233 |
| **954512** | J926 E | 4.4544 | PJM External (MISO) | 4.4544 |
| **954691** | J732 | 35.4250 | PJM External (MISO) | 35.4250 |
| **954741** | J928 C | 1.3126 | PJM External (MISO) | 1.3126 |
| **954742** | J928 E | 7.1013 | PJM External (MISO) | 7.1013 |
| **955091** | J986 | 12.7640 | PJM External (MISO) | 12.7640 |
| **955241** | J1002 | 9.0882 | PJM External (MISO) | 9.0882 |
| **955251** | J1003 | 5.0285 | PJM External (MISO) | 5.0285 |
| **955301** | J1009 | 70.6280 | PJM External (MISO) | 70.6280 |
| **955311** | J1010 | 60.9480 | PJM External (MISO) | 60.9480 |
| **955321** | J1011 | 60.9480 | PJM External (MISO) | 60.9480 |
| **955581** | J1042 C | 3.6588 | PJM External (MISO) | 3.6588 |
| **955582** | J1042 E | 20.7332 | PJM External (MISO) | 20.7332 |
| **955671** | J1051 | 5.8870 | PJM External (MISO) | 5.8870 |
| **955691** | J1053 | 23.8160 | PJM External (MISO) | 23.8160 |
| **955981** | J1085 C | 3.1791 | PJM External (MISO) | 3.1791 |
| **955982** | J1085 E | 17.1999 | PJM External (MISO) | 17.1999 |
| **956141** | J1101 | 2.2696 | PJM External (MISO) | 2.2696 |
| **956321** | J1121 | 18.0520 | PJM External (MISO) | 18.0520 |
| **956571** | J1153 | 19.2705 | PJM External (MISO) | 19.2705 |
| **956581** | J1154 | 7.2795 | PJM External (MISO) | 7.2795 |
| **956731** | J1171 | 11.3880 | PJM External (MISO) | 11.3880 |
| **956852** | J1183 E | 0.1420 | PJM External (MISO) | 0.1420 |
| **956901** | J1188 | 4.4180 | PJM External (MISO) | 4.4180 |
| **957331** | AF2-027 C | 4.6738 | 50/50 | 4.6738 |
| **957332** | AF2-027 E | 7.0107 | 50/50 | 7.0107 |
| **958911** | AF2-182 | 5.5920 | Adder | 12.41 |
| **958921** | AF2-183 C | 0.9941 | Adder | 2.21 |
| **958922** | AF2-183 E | 1.4912 | Adder | 3.31 |
| **959101** | AF2-201 C O1 | 2.1854 | Adder | 4.85 |
| **959102** | AF2-201 E O1 | 6.2757 | Adder | 13.93 |
| **959761** | AF2-267 C O1 | 1.5776 | Adder | 3.5 |
| **959762** | AF2-267 E O1 | 7.3857 | Adder | 16.39 |
| **960551** | AF2-346 C | 1.0659 | Adder | 2.37 |
| **960552** | AF2-346 E | 0.7106 | Adder | 1.58 |
| **960581** | AF2-349 C | 24.3576 | 50/50 | 24.3576 |
| **960582** | AF2-349 E | 16.2384 | 50/50 | 16.2384 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **960721** | AF2-363 C O1 | 1.1441 | Adder | 2.54 |
| **960722** | AF2-363 E O1 | 0.7628 | Adder | 1.69 |
| **960731** | AF2-364 C O1 | 1.4035 | Adder | 3.12 |
| **960732** | AF2-364 E O1 | 0.9357 | Adder | 2.08 |
| **961011** | AF2-392 C O1 | 0.9559 | Adder | 2.12 |
| **961012** | AF2-392 E O1 | 4.4753 | Adder | 9.93 |
| **961021** | AF2-393 O1 | 1.6294 | Adder | 3.62 |
| **961031** | AF2-394 O1 | 1.0862 | Adder | 2.41 |
| **WEC** | WEC | 5.5421 | Confirmed LTF | 5.5421 |
| **CBM-W2** | CBM-W2 | 6.9205 | Confirmed LTF | 6.9205 |
| **NY** | NY | 0.1759 | Confirmed LTF | 0.1759 |
| **CBM-W1** | CBM-W1 | 67.0161 | Confirmed LTF | 67.0161 |
| **TVA** | TVA | 0.7756 | Confirmed LTF | 0.7756 |
| **O-066** | O-066 | 2.0429 | Confirmed LTF | 2.0429 |
| **CBM-S2** | CBM-S2 | 0.3410 | Confirmed LTF | 0.3410 |
| **CBM-S1** | CBM-S1 | 3.5443 | Confirmed LTF | 3.5443 |
| **TILTON** | TILTON | 0.1077 | Confirmed LTF | 0.1077 |
| **G-007** | G-007 | 0.3151 | Confirmed LTF | 0.3151 |
| **MADISON** | MADISON | 12.6988 | Confirmed LTF | 12.6988 |
| **MEC** | MEC | 7.7210 | Confirmed LTF | 7.7210 |
| **GIBSON** | GIBSON | 0.0617 | Confirmed LTF | 0.0617 |
| **BLUEG** | BLUEG | 0.3715 | Confirmed LTF | 0.3715 |
| **TRIMBLE** | TRIMBLE | 0.1274 | Confirmed LTF | 0.1274 |

### 11.6.4 Index 4

| ID | FROM BUS# | FROM BUS | FROM BUS AREA | TO BUS# | TO BUS | TO BUS AREA | CKT ID | CONT NAME | Type | Rating MVA | PRE PROJECT LOADING % | POST PROJECT LOADING % | AC\|DC | MW IMPACT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96486729** | 271897 | LANCASTER; R | CE | 272240 | PECATONIC; B | CE | 1 | COMED_P4_194-38-L19414_ | breaker | 275.0 | 139.28 | 183.55 | DC | 121.73 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **274856** | ECOGROVE ;U1 | 1.9932 | 50/50 | 1.9932 |
| **294763** | P-046 E | 46.2200 | 50/50 | 46.2200 |
| **937311** | AD2-172 C | 12.1328 | 50/50 | 12.1328 |
| **937312** | AD2-172 E | 16.7548 | 50/50 | 16.7548 |
| **938861** | AE1-114 C O1 | 12.3886 | 50/50 | 12.3886 |
| **938862** | AE1-114 E O1 | 42.2669 | 50/50 | 42.2669 |
| **940501** | AE2-035 C | 12.1328 | 50/50 | 12.1328 |
| **940502** | AE2-035 E | 16.7548 | 50/50 | 16.7548 |
| **943921** | AF1-060 | 5.9739 | 50/50 | 5.9739 |
| **946501** | AF1-314 C | 21.5570 | 50/50 | 21.5570 |
| **946502** | AF1-314 E | 100.9260 | 50/50 | 100.9260 |
| **959101** | AF2-201 C O1 | 29.6964 | 50/50 | 29.6964 |
| **959102** | AF2-201 E O1 | 85.2759 | 50/50 | 85.2759 |
| **959761** | AF2-267 C O1 | 21.4260 | 50/50 | 21.4260 |
| **959762** | AF2-267 E O1 | 100.3076 | 50/50 | 100.3076 |
| **LGEE** | LGEE | 0.0120 | Confirmed LTF | 0.0120 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **CPLE** | CPLE | 0.0179 | Confirmed LTF | 0.0179 |
| **G-007A** | G-007A | 0.0168 | Confirmed LTF | 0.0168 |
| **VFT** | VFT | 0.0452 | Confirmed LTF | 0.0452 |
| **CBM-W2** | CBM-W2 | 0.8026 | Confirmed LTF | 0.8026 |
| **TVA** | TVA | 0.0952 | Confirmed LTF | 0.0952 |
| **CBM-S2** | CBM-S2 | 0.1850 | Confirmed LTF | 0.1850 |
| **CBM-S1** | CBM-S1 | 0.5027 | Confirmed LTF | 0.5027 |
| **MEC** | MEC | 0.4545 | Confirmed LTF | 0.4545 |

### 11.6.5 Index 5

| ID | FROM BUS# | FROM BUS | FROM BUS AREA | TO BUS# | TO BUS | TO BUS AREA | CKT ID | CONT NAME | Type | Rating MVA | PRE PROJECT LOADING % | POST PROJECT LOADING % | AC\|DC | MW IMPACT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96486766** | 271897 | LANCASTER; R | CE | 271499 | FREEPORT ;RT | CE | 1 | COMED_P4_171-38-L17121_ | breaker | 336.0 | 111.91 | 144.74 | DC | 110.3 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **274856** | ECOGROVE ;U1 | 1.8005 | 50/50 | 1.8005 |
| **294763** | P-046 E | 41.7528 | 50/50 | 41.7528 |
| **937311** | AD2-172 C | 10.9601 | 50/50 | 10.9601 |
| **937312** | AD2-172 E | 15.1354 | 50/50 | 15.1354 |
| **938861** | AE1-114 C O1 | 11.2040 | 50/50 | 11.2040 |
| **938862** | AE1-114 E O1 | 38.2255 | 50/50 | 38.2255 |
| **940501** | AE2-035 C | 10.9601 | 50/50 | 10.9601 |
| **940502** | AE2-035 E | 15.1354 | 50/50 | 15.1354 |
| **943921** | AF1-060 | 5.3965 | 50/50 | 5.3965 |
| **946501** | AF1-314 C | 19.4735 | 50/50 | 19.4735 |
| **946502** | AF1-314 E | 91.1714 | 50/50 | 91.1714 |
| **959101** | AF2-201 C O1 | 26.8262 | 50/50 | 26.8262 |
| **959102** | AF2-201 E O1 | 77.0339 | 50/50 | 77.0339 |
| **959761** | AF2-267 C O1 | 19.4134 | 50/50 | 19.4134 |
| **959762** | AF2-267 E O1 | 90.8852 | 50/50 | 90.8852 |
| **LGEE** | LGEE | 0.0200 | Confirmed LTF | 0.0200 |
| **CPLE** | CPLE | 0.0291 | Confirmed LTF | 0.0291 |
| **G-007A** | G-007A | 0.0479 | Confirmed LTF | 0.0479 |
| **VFT** | VFT | 0.1290 | Confirmed LTF | 0.1290 |
| **CBM-W2** | CBM-W2 | 1.0565 | Confirmed LTF | 1.0565 |
| **CBM-W1** | CBM-W1 | 0.0876 | Confirmed LTF | 0.0876 |
| **TVA** | TVA | 0.1330 | Confirmed LTF | 0.1330 |
| **CBM-S2** | CBM-S2 | 0.2948 | Confirmed LTF | 0.2948 |
| **CBM-S1** | CBM-S1 | 0.7157 | Confirmed LTF | 0.7157 |
| **MADISON** | MADISON | 0.2238 | Confirmed LTF | 0.2238 |
| **MEC** | MEC | 0.6435 | Confirmed LTF | 0.6435 |

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### 11.6.6 Index 6

| ID | FROM BUS# | FROM BUS | FROM BUS AREA | TO BUS# | TO BUS | TO BUS AREA | CKT ID | CONT NAME | Type | Rating MVA | PRE PROJECT LOADING % | POST PROJECT LOADING % | AC\|DC | MW IMPACT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96486734** | 272240 | PECATONIC; B | CE | 272747 | WEMPLETOW; R | CE | 1 | COMED_P4_194-38-L19414_ | breaker | 275.0 | 134.44 | 178.71 | DC | 121.73 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **274856** | ECOGROVE ;U1 | 1.9932 | 50/50 | 1.9932 |
| **294763** | P-046 E | 46.2200 | 50/50 | 46.2200 |
| **937311** | AD2-172 C | 12.1328 | 50/50 | 12.1328 |
| **937312** | AD2-172 E | 16.7548 | 50/50 | 16.7548 |
| **938861** | AE1-114 C O1 | 12.3886 | 50/50 | 12.3886 |
| **938862** | AE1-114 E O1 | 42.2669 | 50/50 | 42.2669 |
| **940501** | AE2-035 C | 12.1328 | 50/50 | 12.1328 |
| **940502** | AE2-035 E | 16.7548 | 50/50 | 16.7548 |
| **943921** | AF1-060 | 5.9739 | 50/50 | 5.9739 |
| **946501** | AF1-314 C | 21.5570 | 50/50 | 21.5570 |
| **946502** | AF1-314 E | 100.9260 | 50/50 | 100.9260 |
| **959101** | AF2-201 C O1 | 29.6964 | 50/50 | 29.6964 |
| **959102** | AF2-201 E O1 | 85.2759 | 50/50 | 85.2759 |
| **959761** | AF2-267 C O1 | 21.4260 | 50/50 | 21.4260 |
| **959762** | AF2-267 E O1 | 100.3076 | 50/50 | 100.3076 |
| **LGEE** | LGEE | 0.0120 | Confirmed LTF | 0.0120 |
| **CPLE** | CPLE | 0.0179 | Confirmed LTF | 0.0179 |
| **G-007A** | G-007A | 0.0168 | Confirmed LTF | 0.0168 |
| **VFT** | VFT | 0.0452 | Confirmed LTF | 0.0452 |
| **CBM-W2** | CBM-W2 | 0.8026 | Confirmed LTF | 0.8026 |
| **TVA** | TVA | 0.0952 | Confirmed LTF | 0.0952 |
| **CBM-S2** | CBM-S2 | 0.1850 | Confirmed LTF | 0.1850 |
| **CBM-S1** | CBM-S1 | 0.5027 | Confirmed LTF | 0.5027 |
| **MEC** | MEC | 0.4545 | Confirmed LTF | 0.4545 |

### 11.6.7 Index 7

| ID | FROM BUS# | FROM BUS | FROM BUS AREA | TO BUS# | TO BUS | TO BUS AREA | CKT ID | CONT NAME | Type | Rating MVA | PRE PROJECT LOADING % | POST PROJECT LOADING % | AC\|DC | MW IMPACT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96488190** | 272728 | WATERMAN ; B | CE | 272445 | SANDWICH ; R | CE | 1 | COMED_P7_138-L11106_B-R_+_345-L15502_B-R | tower | 331.0 | 105.79 | 107.3 | DC | 11.09 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **272364** | ESS H440N ;R | 1.2190 | 50/50 | 1.2190 |
| **274850** | MENDOTA H;RU | 0.2807 | 50/50 | 0.2807 |
| **274855** | GSG-6 ;RU | 1.1820 | 50/50 | 1.1820 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **274872** | LEE DEKAL;1U | 3.1941 | 50/50 | 3.1941 |
| **290051** | GSG-6; E | 27.4100 | 50/50 | 27.4100 |
| **290108** | LEEDK;1U E | 77.1560 | 50/50 | 77.1560 |
| **294763** | P-046 E | 3.5741 | Adder | 4.2 |
| **916221** | AB2-191 | 0.4534 | 50/50 | 0.4534 |
| **933911** | AD1-013 C | 4.9916 | 50/50 | 4.9916 |
| **933912** | AD1-013 E | 7.9736 | 50/50 | 7.9736 |
| **934431** | AD1-067 C | 0.3442 | 50/50 | 0.3442 |
| **934432** | AD1-067 E | 1.4472 | 50/50 | 1.4472 |
| **934651** | **AD1-096 C (Withdrawn : 07/22/2020)** | **0.4340** | **Adder** | **0.51** |
| **934652** | **AD1-096 E (Withdrawn : 07/22/2020)** | **0.7081** | **Adder** | **0.83** |
| **934701** | AD1-098 C O1 | 17.3573 | 50/50 | 17.3573 |
| **934702** | AD1-098 E O1 | 12.6727 | 50/50 | 12.6727 |
| **937001** | AD2-134 C | 7.1654 | 50/50 | 7.1654 |
| **937002** | AD2-134 E | 29.6003 | 50/50 | 29.6003 |
| **937311** | AD2-172 C | 0.9382 | Adder | 1.1 |
| **937312** | AD2-172 E | 1.2956 | Adder | 1.52 |
| **938861** | AE1-114 C O1 | 1.8158 | Adder | 2.14 |
| **938862** | AE1-114 E O1 | 6.1950 | Adder | 7.29 |
| **940501** | AE2-035 C | 0.9382 | Adder | 1.1 |
| **940502** | AE2-035 E | 1.2956 | Adder | 1.52 |
| **941131** | AE2-107 C | 23.9826 | 50/50 | 23.9826 |
| **941132** | AE2-107 E | 15.9884 | 50/50 | 15.9884 |
| **943381** | AF1-009 C | 1.5015 | 50/50 | 1.5015 |
| **943382** | AF1-009 E | 6.0060 | 50/50 | 6.0060 |
| **943921** | AF1-060 | 0.4619 | Adder | 0.54 |
| **946501** | AF1-314 C | 1.6670 | Adder | 1.96 |
| **946502** | AF1-314 E | 7.8044 | Adder | 9.18 |
| **946671** | AF1-331 | 6.4826 | 50/50 | 6.4826 |
| **959101** | AF2-201 C O1 | 1.2171 | Adder | 2.7 |
| **959102** | AF2-201 E O1 | 3.4949 | Adder | 7.76 |
| **959761** | AF2-267 C O1 | 0.8793 | Adder | 1.95 |
| **959762** | AF2-267 E O1 | 4.1164 | Adder | 9.14 |
| **960382** | AF2-329 BAT | 9.1266 | 50/50 | 9.1266 |
| **960721** | AF2-363 C O1 | 16.7331 | 50/50 | 16.7331 |
| **960722** | AF2-363 E O1 | 11.1554 | 50/50 | 11.1554 |
| **960751** | AF2-366 C O1 | 21.9976 | 50/50 | 21.9976 |
| **960752** | AF2-366 E O1 | 14.6651 | 50/50 | 14.6651 |
| **961011** | AF2-392 C O1 | 1.0422 | Adder | 2.31 |
| **961012** | AF2-392 E O1 | 4.8792 | Adder | 10.83 |
| **961021** | AF2-393 O1 | 1.7764 | Adder | 3.94 |
| **961031** | AF2-394 O1 | 1.1843 | Adder | 2.63 |
| **WEC** | WEC | 0.3663 | Confirmed LTF | 0.3663 |
| **CBM-W2** | CBM-W2 | 2.9894 | Confirmed LTF | 2.9894 |
| **NY** | NY | 0.0669 | Confirmed LTF | 0.0669 |
| **CBM-W1** | CBM-W1 | 11.9220 | Confirmed LTF | 11.9220 |
| **TVA** | TVA | 0.3248 | Confirmed LTF | 0.3248 |
| **O-066** | O-066 | 0.7728 | Confirmed LTF | 0.7728 |
| **CBM-S2** | CBM-S2 | 0.1792 | Confirmed LTF | 0.1792 |
| **CBM-S1** | CBM-S1 | 1.5166 | Confirmed LTF | 1.5166 |
| **TILTON** | TILTON | 0.0031 | Confirmed LTF | 0.0031 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **G-007** | G-007 | 0.1196 | Confirmed LTF | 0.1196 |
| **MADISON** | MADISON | 3.2357 | Confirmed LTF | 3.2357 |
| **MEC** | MEC | 2.9110 | Confirmed LTF | 2.9110 |
| **GIBSON** | GIBSON | 0.0082 | Confirmed LTF | 0.0082 |
| **BLUEG** | BLUEG | 0.1180 | Confirmed LTF | 0.1180 |
| **TRIMBLE** | TRIMBLE | 0.0417 | Confirmed LTF | 0.0417 |

### 11.6.8 Index 8

| ID | FROM BUS# | FROM BUS | FROM BUS AREA | TO BUS# | TO BUS | TO BUS AREA | CKT ID | CONT NAME | Type | Rating MVA | PRE PROJECT LOADING % | POST PROJECT LOADING % | AC\|DC | MW IMPACT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **95413593** | 960680 | AF2-359 TAP | CE | 243229 | 05OLIVE | AEP | 1 | COMED_P4_023-65-BT2-3__ | breaker | 971.0 | 110.01 | 110.02 | DC | 20.19 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **274806** | UNIV PK N;2U | 1.8438 | 50/50 | 1.8438 |
| **274808** | UNIV PK N;4U | 1.8438 | 50/50 | 1.8438 |
| **274809** | UNIV PK N;5U | 1.8438 | 50/50 | 1.8438 |
| **274811** | UNIV PK N;7U | 1.8438 | 50/50 | 1.8438 |
| **274812** | UNIV PK N;8U | 1.8438 | 50/50 | 1.8438 |
| **274814** | UNIV PK N;0U | 1.8438 | 50/50 | 1.8438 |
| **274815** | UNIV PK N;XU | 1.8438 | 50/50 | 1.8438 |
| **274830** | U3-021 1 | 4.2476 | Adder | 5.0 |
| **274831** | U3-021 2 | 4.2476 | Adder | 5.0 |
| **274881** | PILOT HIL;1E | 12.8032 | Adder | 15.06 |
| **275149** | KELLYCK ;1E | 12.8032 | Adder | 15.06 |
| **276167** | Z1-106 E2 | 0.8826 | Adder | 1.04 |
| **276168** | Z1-106 E1 | 0.8825 | Adder | 1.04 |
| **276169** | Z1-107 E | 1.8729 | Adder | 2.2 |
| **276170** | Z1-108 E | 1.7374 | Adder | 2.04 |
| **290021** | O50 E | 13.4028 | Adder | 15.77 |
| **290051** | GSG-6; E | 7.3164 | Adder | 8.61 |
| **290108** | LEEDK;1U E | 16.9456 | Adder | 19.94 |
| **293061** | N-015 E | 10.8722 | Adder | 12.79 |
| **293644** | O22 E1 | 6.7404 | Adder | 7.93 |
| **293645** | O22 E2 | 13.0843 | Adder | 15.39 |
| **294392** | P-010 E | 13.8077 | Adder | 16.24 |
| **915011** | Y3-013 1 | 2.6194 | Adder | 3.08 |
| **915021** | Y3-013 2 | 2.6194 | Adder | 3.08 |
| **915031** | Y3-013 3 | 2.6194 | Adder | 3.08 |
| **918052** | AA1-018 E OP | 12.3171 | Adder | 14.49 |
| **920272** | AA2-123 E | 1.7039 | Adder | 2.0 |
| **924471** | AB2-096 | 29.4971 | Adder | 34.7 |
| **926311** | AC1-109 1 | 1.3339 | Adder | 1.57 |
| **926321** | AC1-109 2 | 1.3339 | Adder | 1.57 |
| **926331** | AC1-110 1 | 1.3265 | Adder | 1.56 |
| **926341** | AC1-110 2 | 1.3265 | Adder | 1.56 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **926351** | AC1-111 1 | 0.5336 | Adder | 0.63 |
| **926361** | AC1-111 2 | 0.5336 | Adder | 0.63 |
| **926371** | AC1-111 3 | 0.5336 | Adder | 0.63 |
| **926381** | AC1-111 4 | 0.5336 | Adder | 0.63 |
| **926391** | AC1-111 5 | 0.5336 | Adder | 0.63 |
| **926401** | AC1-111 6 | 0.5336 | Adder | 0.63 |
| **926431** | AC1-114 | 1.6543 | Adder | 1.95 |
| **927451** | AC1-142A 1 | 2.9724 | Adder | 3.5 |
| **927461** | AC1-142A 2 | 2.9711 | Adder | 3.5 |
| **927511** | AC1-113 1 | 0.8271 | Adder | 0.97 |
| **927521** | AC1-113 2 | 0.8271 | Adder | 0.97 |
| **930481** | AB1-089 | 45.7308 | Adder | 53.8 |
| **930501** | AB1-091 O1 | 49.2090 | Adder | 57.89 |
| **930741** | AB1-122 1O1 | 49.9014 | Adder | 58.71 |
| **930751** | AB1-122 2O1 | 51.4116 | Adder | 60.48 |
| **932881** | AC2-115 1 | 1.6543 | Adder | 1.95 |
| **932891** | AC2-115 2 | 1.6543 | Adder | 1.95 |
| **932921** | AC2-116 | 0.5790 | Adder | 0.68 |
| **932931** | AC2-117 | 8.9559 | Adder | 10.54 |
| **933411** | AC2-154 C | 1.7377 | Adder | 2.04 |
| **933412** | AC2-154 E | 2.8353 | Adder | 3.34 |
| **933431** | AC2-156 C O1 | 0.6670 | Adder | 0.78 |
| **933432** | AC2-156 E O1 | 1.0883 | Adder | 1.28 |
| **933911** | AD1-013 C | 1.2925 | Adder | 1.52 |
| **933912** | AD1-013 E | 2.0647 | Adder | 2.43 |
| **933931** | AD1-016 C | 0.6475 | Adder | 0.76 |
| **933932** | AD1-016 E | 1.0564 | Adder | 1.24 |
| **934101** | AD1-039 1 | 4.8903 | Adder | 5.75 |
| **934111** | AD1-039 2 | 5.0383 | Adder | 5.93 |
| **934431** | AD1-067 C | 0.0919 | Adder | 0.11 |
| **934432** | AD1-067 E | 0.3863 | Adder | 0.45 |
| **934651** | **AD1-096 C (Withdrawn : 07/22/2020)** | **0.6191** | **Adder** | **0.73** |
| **934652** | **AD1-096 E (Withdrawn : 07/22/2020)** | **1.0100** | **Adder** | **1.19** |
| **934701** | AD1-098 C O1 | 4.8123 | Adder | 5.66 |
| **934702** | AD1-098 E O1 | 3.5135 | Adder | 4.13 |
| **934721** | AD1-100 C | 13.3798 | Adder | 15.74 |
| **934722** | AD1-100 E | 62.4393 | Adder | 73.46 |
| **934871** | AD1-116 C | 0.7173 | Adder | 0.84 |
| **934872** | AD1-116 E | 1.1704 | Adder | 1.38 |
| **934971** | AD1-129 C | 0.6293 | Adder | 0.74 |
| **934972** | AD1-129 E | 0.4195 | Adder | 0.49 |
| **936291** | AD2-038 C O1 | 1.6921 | Adder | 1.99 |
| **936292** | AD2-038 E O1 | 11.3243 | Adder | 13.32 |
| **936371** | AD2-047 C O1 | 3.1096 | Adder | 3.66 |
| **936372** | AD2-047 E O1 | 15.1824 | Adder | 17.86 |
| **936461** | AD2-060 | 1.8292 | Adder | 2.15 |
| **936511** | AD2-066 C O1 | 5.8817 | Adder | 6.92 |
| **936512** | AD2-066 E O1 | 3.9211 | Adder | 4.61 |
| **936791** | AD2-102 C | 9.8257 | Adder | 11.56 |
| **936792** | AD2-102 E | 6.5504 | Adder | 7.71 |
| **937001** | AD2-134 C | 1.9126 | Adder | 2.25 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **937002** | AD2-134 E | 7.9011 | Adder | 9.3 |
| **937401** | AD2-194 1 | 5.4728 | Adder | 6.44 |
| **937411** | AD2-194 2 | 5.4769 | Adder | 6.44 |
| **938511** | AE1-070 1 | 6.4306 | Adder | 7.57 |
| **938521** | AE1-070 2 | 5.8877 | Adder | 6.93 |
| **938851** | AE1-113 C | 5.5287 | Adder | 6.5 |
| **938852** | AE1-113 E | 19.6016 | Adder | 23.06 |
| **939321** | AE1-163 C O1 | 4.2520 | Adder | 5.0 |
| **939322** | AE1-163 E O1 | 26.1197 | Adder | 30.73 |
| **939351** | AE1-166 C O1 | 7.1193 | Adder | 8.38 |
| **939352** | AE1-166 E O1 | 6.5717 | Adder | 7.73 |
| **940752** | AE2-062 E | 0.0901 | Adder | 0.11 |
| **941131** | AE2-107 C | 5.0975 | Adder | 6.0 |
| **941132** | AE2-107 E | 3.3983 | Adder | 4.0 |
| **941551** | AE2-152 C O1 | 8.2146 | Adder | 9.66 |
| **941552** | AE2-152 E O1 | 5.4764 | Adder | 6.44 |
| **941561** | AE2-153 C O1 | 3.2948 | Adder | 3.88 |
| **941562** | AE2-153 E O1 | 15.4256 | Adder | 18.15 |
| **942421** | AE2-255 C O1 | 2.0942 | Adder | 2.46 |
| **942422** | AE2-255 E O1 | 6.2826 | Adder | 7.39 |
| **942651** | AE2-281 C O1 | 0.6074 | Adder | 0.71 |
| **942652** | AE2-281 E O1 | 3.7314 | Adder | 4.39 |
| **942991** | AE2-321 C | 5.6990 | Adder | 6.7 |
| **942992** | AE2-321 E | 2.8070 | Adder | 3.3 |
| **943121** | AE2-341 C | 8.9093 | Adder | 10.48 |
| **943122** | AE2-341 E | 4.3749 | Adder | 5.15 |
| **943381** | AF1-009 C | 0.4163 | Adder | 0.49 |
| **943382** | AF1-009 E | 1.6651 | Adder | 1.96 |
| **943591** | AF1-030 C O1 | 5.9248 | Adder | 6.97 |
| **943592** | AF1-030 E O1 | 2.9314 | Adder | 3.45 |
| **943801** | AF1-048 C | 2.6641 | Adder | 3.13 |
| **943802** | AF1-048 E | 1.7760 | Adder | 2.09 |
| **944041** | AF1-072 | 1.5041 | Adder | 1.77 |
| **944911** | AF1-156 C | 8.4242 | Adder | 9.91 |
| **944912** | AF1-156 E | 5.6161 | Adder | 6.61 |
| **945351** | AF1-200 FTIR | 216.1577 | Merchant Transmission | 216.1577 |
| **946661** | AF1-330 C | 1.3972 | Adder | 1.64 |
| **946662** | AF1-330 E | 0.3067 | Adder | 0.36 |
| **946671** | AF1-331 | 1.6786 | Adder | 1.97 |
| **957021** | AF2-003 C O1 | 2.3046 | Adder | 5.12 |
| **957022** | AF2-003 E O1 | 10.7899 | Adder | 23.95 |
| **957331** | AF2-027 C | 0.9255 | Adder | 2.05 |
| **957332** | AF2-027 E | 1.3883 | Adder | 3.08 |
| **957471** | AF2-041 C | 7.8536 | Adder | 17.43 |
| **957472** | AF2-041 E | 5.2357 | Adder | 11.62 |
| **958011** | AF2-095 C O1 | 6.5912 | Adder | 14.63 |
| **958012** | AF2-095 E O1 | 3.1017 | Adder | 6.89 |
| **958021** | AF2-096 C O1 | 12.8851 | Adder | 28.6 |
| **958022** | AF2-096 E O1 | 6.0933 | Adder | 13.53 |
| **958481** | AF2-142 C | 4.5021 | Adder | 9.99 |
| **958482** | AF2-142 E | 3.0014 | Adder | 6.66 |
| **958491** | AF2-143 C | 4.1392 | Adder | 9.19 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **958492** | AF2-143 E | 2.7595 | Adder | 6.13 |
| **959081** | AF2-199 C | 2.6179 | Adder | 5.81 |
| **959082** | AF2-199 E | 1.7452 | Adder | 3.87 |
| **959091** | AF2-200 C | 5.2357 | Adder | 11.62 |
| **959092** | AF2-200 E | 3.4905 | Adder | 7.75 |
| **959351** | AF2-226 C | 0.8756 | Adder | 1.94 |
| **959352** | AF2-226 E | 1.3134 | Adder | 2.92 |
| **959761** | AF2-267 C O1 | 0.0259 | Adder | 0.06 |
| **959762** | AF2-267 E O1 | 0.1213 | Adder | 0.27 |
| **960281** | AF2-319 C | 0.8756 | Adder | 1.94 |
| **960282** | AF2-319 E | 1.3134 | Adder | 2.92 |
| **960381** | AF2-329 | 2.4501 | Adder | 5.44 |
| **960581** | AF2-349 C | 8.0603 | Adder | 17.89 |
| **960582** | AF2-349 E | 5.3736 | Adder | 11.93 |
| **960591** | AF2-350 C O1 | 2.9082 | Adder | 6.46 |
| **960592** | AF2-350 E O1 | 1.9388 | Adder | 4.3 |
| **960601** | AF2-351 C O1 | 0.3878 | Adder | 0.86 |
| **960602** | AF2-351 E O1 | 0.5816 | Adder | 1.29 |
| **960681** | AF2-359 C | 65.7532 | 50/50 | 65.7532 |
| **960682** | AF2-359 E | 43.8355 | 50/50 | 43.8355 |
| **960721** | AF2-363 C O1 | 2.2009 | Adder | 4.89 |
| **960722** | AF2-363 E O1 | 1.4673 | Adder | 3.26 |
| **960731** | AF2-364 C O1 | 2.2737 | Adder | 5.05 |
| **960732** | AF2-364 E O1 | 1.5158 | Adder | 3.36 |
| **960751** | AF2-366 C O1 | 2.5726 | Adder | 5.71 |
| **960752** | AF2-366 E O1 | 1.7151 | Adder | 3.81 |
| **WEC** | WEC | 3.0779 | Confirmed LTF | 3.0779 |
| **CALDERWOOD** | CALDERWOOD | 0.0691 | Confirmed LTF | 0.0691 |
| **CBM-W2** | CBM-W2 | 14.5536 | Confirmed LTF | 14.5536 |
| **NY** | NY | 0.9246 | Confirmed LTF | 0.9246 |
| **CBM-W1** | CBM-W1 | 47.2252 | Confirmed LTF | 47.2252 |
| **TVA** | TVA | 0.9016 | Confirmed LTF | 0.9016 |
| **O-066** | O-066 | 10.9133 | Confirmed LTF | 10.9133 |
| **CHEOAH** | CHEOAH | 0.0776 | Confirmed LTF | 0.0776 |
| **CBM-S1** | CBM-S1 | 3.0246 | Confirmed LTF | 3.0246 |
| **G-007** | G-007 | 1.6879 | Confirmed LTF | 1.6879 |
| **MADISON** | MADISON | 15.8740 | Confirmed LTF | 15.8740 |
| **MEC** | MEC | 10.4477 | Confirmed LTF | 10.4477 |
| **GIBSON** | GIBSON | 0.1343 | Confirmed LTF | 0.1343 |
| **BLUEG** | BLUEG | 1.6666 | Confirmed LTF | 1.6666 |
| **TRIMBLE** | TRIMBLE | 0.5660 | Confirmed LTF | 0.5660 |
| **CATAWBA** | CATAWBA | 0.2394 | Confirmed LTF | 0.2394 |

## 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.

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| Queue Number | Project Name | Status |
|---|---|---|
| **AA1-018** | Powerton-Goodings Grove | In Service |
| **AA2-030** | Nelson | Active |
| **AA2-123** | Marengo 34kV | In Service |
| **AB1-089** | Byron-Wayne 345kV #1 | Active |
| **AB1-091** | Davis Creek 345kV | Active |
| **AB1-122** | Kendall-Tazewell & Dresden-Mole Creek | Active |
| **AB2-096** | Silver Lake-Cherry Valley | Active |
| **AB2-191** | Mendota Hills | In Service |
| **AC1-109** | Aurora 345kV | Active |
| **AC1-110** | Aurora 138kV | Active |
| **AC1-111** | Aurora 138kV | Active |
| **AC1-113** | Rockford | Active |
| **AC1-114** | Rockford II | Active |
| **AC1-142A** | Joliet | Active |
| **AC2-115** | Rockford | Active |
| **AC2-116** | Rockford II | Active |
| **AC2-117** | University Park North | Engineering and Procurement |
| **AC2-154** | Davis Creek 138kV | Active |
| **AC2-156** | Sandwich 34.5kV | Active |
| **AD1-013** | Twombly Road 138kV | Active |
| **AD1-016** | Marengo | Active |
| **AD1-039** | Kendall-Tazewell & Dresden-Mole Creek | Active |
| **AD1-067** | Mendota Hills | Active |
| **AD1-096** | Stillman Valley 34 kV | Withdrawn |
| **AD1-098** | Dixon-McGirr | Active |
| **AD1-100** | Loretto-Wilton & Braidwood-Davis Creek | Active |
| **AD1-116** | Nevada 345 kV | Active |
| **AD1-129** | Belvidere 34 kV | Active |
| **AD2-038** | Powerton | Active |
| **AD2-047** | Davis Creek 138 kV | Active |
| **AD2-060** | Davis Creek 138kV | Active |
| **AD2-066** | Mazon-Crescent Ridge | Active |
| **AD2-102** | Wempletown 345 kV | Active |
| **AD2-134** | Shady Oaks | Active |
| **AD2-172** | Lena 138kV | Active |
| **AD2-194** | Elwood | Active |
| **AD2-214** | Rock Falls-Garden Plains | Active |
| **AE1-070** | Elwood 345 kV | Active |
| **AE1-113** | Mole Creek 345 kV | Active |
| **AE1-114** | Maryland-Lancaster 138 kV | Active |
| **AE1-134** | Nelson 345 kV | Active |
| **AE1-163** | Powerton-Nevada 345 kV | Active |
| **AE1-166** | Loretto-Wilton & Braidwood-Davis Creek | Active |
| **AE2-035** | Lena 138 kV | Active |
| **AE2-062** | Normantown | Active |
| **AE2-107** | Haumesser Road 138 kV | Active |
| **AE2-152** | Loretto-Wilton & Braidwood-Davis Creek | Active |
| **AE2-153** | Braidwood-Davis Creek | Active |
| **AE2-255** | Molecreek 345 kV | Active |
| **AE2-281** | Powerton-Nevada 345 kV | Active |

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| Queue Number | Project Name | Status |
|---|---|---|
| **AE2-321** | Belvidere-Marengo 138 kV | Active |
| **AE2-341** | Sandwich-Plano | Active |
| **AF1-009** | Dixon-McGirr | Active |
| **AF1-011** | Schauff Road | Active |
| **AF1-012** | Electric Junc-Nelson | Active |
| **AF1-030** | Plano-R 138 kV | Active |
| **AF1-048** | Belvidere-Marengo | Active |
| **AF1-060** | Lena 138 kV | Active |
| **AF1-072** | Rocky Road | Active |
| **AF1-156** | Braidwood-Davis Creek | Active |
| **AF1-200** | Plano 345 kV | Active |
| **AF1-280** | Nelson-Lee County | Active |
| **AF1-281** | Nelson-Lee County | Active |
| **AF1-296** | Garden Plain 138 kV | Active |
| **AF1-314** | Lena 138 kV | Active |
| **AF1-317** | Electric Jct-Nelson | Active |
| **AF1-330** | Marengo | Active |
| **AF1-331** | Twombley Road | Active |
| **AF2-003** | Powerton-Mole Creek | Active |
| **AF2-027** | Zion Energy Center 345 kV | Active |
| **AF2-041** | Nelson-Electric Junction 345 kV | Active |
| **AF2-095** | Wilmington-Davis Creek | Active |
| **AF2-096** | Braidwood-East Frankfort 345 kV | Active |
| **AF2-142** | Nevada 345 kV | Active |
| **AF2-143** | Powerton-Nevada 345 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 |
| **AF2-201** | Lena-Ecogrove 138 kV | Active |
| **AF2-226** | Katydid Road 345 kV | Active |
| **AF2-267** | Lancaster 138 kV | Active |
| **AF2-319** | Katydid Road 345 kV | Active |
| **AF2-329** | Sandwich-Plano 138 kV | Active |
| **AF2-346** | Electric Junction-Nelson 345 kV | Active |
| **AF2-349** | Garden Prairie-Silver Lake 345 kV | Active |
| **AF2-350** | Kensington 138 kV | Active |
| **AF2-351** | Kensington 138 kV | Active |
| **AF2-359** | Olive-University Park 345 kV | Active |
| **AF2-363** | Glidden 138 kV | Active |
| **AF2-364** | Wayne Red 138 kV | Active |
| **AF2-366** | Glidden-Waterman 138 kV | Active |
| **AF2-392** | Nelson-Dixon 138 kV | Active |
| **AF2-393** | Nelson-Dixon 138 kV | Active |
| **AF2-394** | Nelson-Dixon 138 kV | Active |
| **U3-021** | Silver Lake-Cherry Valley | Active |
| **Y3-013** | Zion Energy Center | Active |
| **Z1-106** | West Chicago 34kV | In Service |
| **Z1-107** | Joliet 34kV | In Service |
| **Z1-108** | McHenry 34kV | In Service |
| **J1000** | MISO | MISO |
| **J1002** | MISO | MISO |

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| Queue Number | Project Name | Status |
|---|---|---|
| **J1003** | MISO | MISO |
| **J1009** | MISO | MISO |
| **J1010** | MISO | MISO |
| **J1011** | MISO | MISO |
| **J1042** | MISO | MISO |
| **J1051** | MISO | MISO |
| **J1053** | MISO | MISO |
| **J1084** | MISO | MISO |
| **J1085** | MISO | MISO |
| **J1101** | MISO | MISO |
| **J1121** | MISO | MISO |
| **J1153** | MISO | MISO |
| **J1154** | MISO | MISO |
| **J1171** | MISO | MISO |
| **J1183** | MISO | MISO |
| **J1188** | MISO | MISO |
| **J390** | MISO | MISO |
| **J505** | MISO | MISO |
| **J584** | MISO | MISO |
| **J703** | MISO | MISO |
| **J704** | MISO | MISO |
| **J732** | MISO | MISO |
| **J760** | MISO | MISO |
| **J801** | MISO | MISO |
| **J807** | MISO | MISO |
| **J818** | MISO | MISO |
| **J819** | MISO | MISO |
| **J821** | MISO | MISO |
| **J831** | MISO | MISO |
| **J849** | MISO | MISO |
| **J850** | MISO | MISO |
| **J864** | MISO | MISO |
| **J878** | MISO | MISO |
| **J886** | MISO | MISO |
| **J926** | MISO | MISO |
| **J928** | MISO | MISO |
| **J947** | MISO | MISO |
| **J986** | MISO | MISO |

## 11.8 Contingency Descriptions - Primary POI

| Contingency Name | Contingency Definition |
|---|---|
| **AEP_P1-2_#286** | CONTINGENCY 'AEP_P1-2_#286'<br>OPEN BRANCH FROM BUS 243221 TO BUS 348885 CKT 1 / 243221 05EUGENE 345 348885 7BUNSONVILLE 345 1<br>END |

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| Contingency Name | Contingency Definition |
|---|---|
| **COMED_P1-2_345-L11613AB-S** | CONTINGENCY 'COMED_P1-2_345-L11613AB-S'<br>TRIP BRANCH FROM BUS 270666 TO BUS 270664 CKT 1 / B ISL;BT 345 B ISL; B 345<br>TRIP BRANCH FROM BUS 270666 TO BUS 270926 CKT 1 / B ISL;BT 345 WILTO; B 345<br>TRIP BRANCH FROM BUS 270770 TO BUS 270666 CKT 1 / GOODI;4B 345 B ISL;BT 345<br>END |
| **COMED_P1-2_138-L17121_R-R** | CONTINGENCY 'COMED_P1-2_138-L17121_R-R'<br>TRIP BRANCH FROM BUS 272240 TO BUS 271897 CKT 1 / PECAT; B 138 LANCA; R 138<br>TRIP BRANCH FROM BUS 272747 TO BUS 272240 CKT 1 / WEMPL; R 138 PECAT; B 138<br>MOVE 100 PERCENT LOAD FROM BUS 272240 TO BUS 272746 / PECAT; B 138 WEMPL; B 138<br>END |
| **COMED_P4_006-45-BT3-4__** | CONTINGENCY 'COMED_P4_006-45-BT3-4__'<br>TRIP BRANCH FROM BUS 274768 TO BUS 270678 CKT 1 / LEECO;BP 345 BYRON; B 345<br>REMOVE UNIT 1 FROM BUS 274656 / BYRON;1U 25<br>END |
| **COMED_P1-2_345-L0626__B-R-B** | CONTINGENCY 'COMED_P1-2_345-L0626__B-R-B'<br>TRIP BRANCH FROM BUS 930480 TO BUS 270916 CKT 1 / AB1-089 TAP 345 WAYNE ; B 345<br>END |
| **COMED_P1-2_345-L0627__B-R** | CONTINGENCY 'COMED_P1-2_345-L0627__B-R'<br>TRIP BRANCH FROM BUS 274768 TO BUS 270678 CKT 1 / LEECO;BP 345 BYRON; B 345<br>END |
| **AEP_P4_#2978_05DUMONT_NON_FSA** | CONTINGENCY 'AEP_P4_#2978_05DUMONT_NON_FSA'<br>OPEN BRANCH FROM BUS 243206 TO BUS 907040 CKT 1 / 243206 05DUMONT 765 X1-020<br>OPEN BRANCH FROM BUS 243207 TO BUS 907040 CKT 1<br>OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTON ; 765 1<br>END |

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| Contingency Name | Contingency Definition |
|---|---|
| **COMED_P4_016-45-BT6-11_** | CONTINGENCY 'COMED_P4_016-45-BT6-11_'<br>TRIP BRANCH FROM BUS 270914 TO BUS 270830 CKT 1 / WAUKEGAN ; B 345 NBROOK159; B 345<br>TRIP BRANCH FROM BUS 270915 TO BUS 270914 CKT 1 / WAUKEGAN ; R 345 WAUKEGAN ; B 345<br>TRIP BRANCH FROM BUS 275206 TO BUS 270830 CKT 1 / NBROOK159;2M 138 NBROOK159; B 345<br>TRIP BRANCH FROM BUS 275206 TO BUS 272120 CKT 1 / NBROOK159;2M 138 NBROOK159; B 138<br>TRIP BRANCH FROM BUS 275206 TO BUS 275306 CKT 1 / NBROOK159;2M 138 NBROOK159;2C 34.5<br>CLOSE BRANCH FROM BUS 272120 TO BUS 272121 CKT 1 / NBROOK159; B 138 NBROOK159; R 138<br>TRIP BRANCH FROM BUS 270942 TO BUS 270915 CKT 1 / ZION STA ;0B 345 WAUKEGAN ; R 345<br>END |
| **AEP_P4_#2978_05DUMONT_FSA** | CONTINGENCY 'AEP_P4_#2978_05DUMONT_FSA'<br>OPEN BRANCH FROM BUS 243206 TO BUS 907040 CKT 1 / 243206 05DUMONT 765 X1-020<br>OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTON ; 765 1<br>END |
| **COMED_P7_138-L11106_B-R_+_345-L15502_B-R** | CONTINGENCY 'COMED_P7_138-L11106_B-R_+_345-L15502_B-R'<br>TRIP BRANCH FROM BUS 271390 TO BUS 271586 CKT 1 / ELECT; B 138 W541 ; B 138<br>TRIP BRANCH FROM BUS 271560 TO BUS 271558 CKT 1 / GLIDD;BT 138 GLIDD; B 138<br>TRIP BRANCH FROM BUS 271560 TO BUS 272728 CKT 1 / GLIDD;BT 138 WATER; B 138<br>TRIP BRANCH FROM BUS 271586 TO BUS 272114 CKT 1 / W541 ; B 138 N AUR; B 138<br>TRIP BRANCH FROM BUS 272114 TO BUS 272522 CKT 1 / N AUR; B 138 SUGAR; B 138<br>TRIP BRANCH FROM BUS 272522 TO BUS 271560 CKT 1 / SUGAR; B 138 GLIDD;BT 138<br>MOVE 100 PERCENT LOAD FROM BUS 271586 TO BUS 271587 / W541 ; B 138 W541 ; R 138<br>MOVE 100 PERCENT LOAD FROM BUS 272522 TO BUS 272523 / SUGAR; B 138 SUGAR; R 138<br>CLOSE LINE FROM BUS 272114 TO BUS 272115 CKT 1 / N AUR; B 138 N AUR; R 138<br>TRIP BRANCH FROM BUS 270828 TO BUS 943410 CKT 1 / NELSON ; B 345 AF1-012<br>END |
| **COMED_P1-2_345-L97116__-R_FSA** | CONTINGENCY 'COMED_P1-2_345-L97116__-R_FSA'<br>TRIP BRANCH FROM BUS 960580 TO BUS 270883 CKT 1 / U3-021 SILVE; R 345<br>END |

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| Contingency Name | Contingency Definition |
|---|---|
| **COMED_P4_171-38-L17121_** | CONTINGENCY 'COMED_P4_171-38-L17121_'<br>TRIP BRANCH FROM BUS 272240 TO BUS 271897 CKT 1 / PECAT; B 138 LANCA; R 138<br>TRIP BRANCH FROM BUS 272747 TO BUS 272240 CKT 1 / WEMPL; R 138 PECAT; B 138<br>MOVE 100 PERCENT LOAD FROM BUS 272240 TO BUS 272746 / PECAT; B 138 WEMPL; B 138<br>DISCONNECT BUS 272747 / WEMPL; R 138<br>END |
| **COMED_P1-2_695_B2** | CONTINGENCY 'COMED_P1-2_695_B2'<br>OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTO; 765 1<br>END |
| **COMED_P2-1_194-L15626__** | CONTINGENCY 'COMED_P2-1_194-L15626__'<br>TRIP BRANCH FROM BUS 271096 TO BUS 272432 CKT 1 / BHAWK;BT 138 SABRO; B 138<br>END |

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| Contingency Name | Contingency Definition |
|---|---|
| **OMED_P4_194-38-L19414_** | CONTINGENCY 'COMED_P4_194-38-L19414_'<br>TRIP BRANCH FROM BUS 271483 TO BUS 273154 CKT 1 / FORDAM ; R 138 FORDHAM ; R 12.5<br>TRIP BRANCH FROM BUS 271495 TO BUS 274184 CKT 6 / FREEPORT ;5R 138 FREEPORT; 34.5<br>TRIP BRANCH FROM BUS 271499 TO BUS 271495 CKT 1 / FREEPORT ;5T 138 FREEPORT ;5R 138<br>TRIP BRANCH FROM BUS 271499 TO BUS 271897 CKT 1 / FREEPORT ;5T 138 LANCASTER; R 138<br>TRIP BRANCH FROM BUS 272245 TO BUS 271483 CKT 1 / PIERPONT ; R 138 FORDAM ; R 138<br>TRIP BRANCH FROM BUS 272247 TO BUS 272245 CKT 1 / PIERPONT ;RT 138 PIERPONT ; R 138<br>TRIP BRANCH FROM BUS 272247 TO BUS 272491 CKT 1 / PIERPONT ;RT 138 S PECATON; R 138<br>TRIP BRANCH FROM BUS 272433 TO BUS 272247 CKT 1 / SABROOKE ; R 138 PIERPONT ;RT 138<br>TRIP BRANCH FROM BUS 272599 TO BUS 271499 CKT 1 / ESS B427 ;4T 138 FREEPORT ;5T 138<br>TRIP BRANCH FROM BUS 272599 TO BUS 272491 CKT 1 / ESS B427 ;4T 138 S PECATON; R 138<br>TRIP BRANCH FROM BUS 272599 TO BUS 272597 CKT 1 / ESS B427 ;4T 138 ESS B427 ; R 138<br>MOVE 100 PERCENT LOAD FROM BUS 271495 TO BUS 271494 / FREEPORT ;5R 138 FREEPORT ;2R 138<br>MOVE 100 PERCENT LOAD FROM BUS 272245 TO BUS 272244 / PIERPONT ; R 138 PIERPONT ; B 138<br>MOVE 50 PERCENT LOAD FROM BUS 272491 TO BUS 272240 / S PECATON; R 138 PECATONIC; B 138<br>MOVE 50 PERCENT LOAD FROM BUS 272491 TO BUS 272244 / S PECATON; R 138 PIERPONT ; B 138<br>CLOSE BRANCH FROM BUS 272596 TO BUS 272597 CKT 1 / ESS B427 ; B 138 ESS B427 ; R 138<br>MOVE 100 PERCENT LOAD FROM BUS 272433 TO BUS 272432 / SABROOKE ; R 138 SABROOKE ; B 138<br>DISCONNECT BUS 272433 / SABROOKE ; R 138<br>END |
| **COMED_P2-1_119-L17121__** | CONTINGENCY 'COMED_P2-1_119-L17121__'<br>TRIP BRANCH FROM BUS 272240 TO BUS 271897 CKT 1 / PECAT; B 138 LANCA; R 138<br>END |

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| Contingency Name | Contingency Definition |
|---|---|
| **COMED_P1-2_138-L19414GR-R** | CONTINGENCY 'COMED_P1-2_138-L19414GR-R'<br>TRIP BRANCH FROM BUS 271483 TO BUS 273154 CKT 1 / FORDAM ; R 138 FORDHAM ; R 12.5<br>TRIP BRANCH FROM BUS 271495 TO BUS 274184 CKT 6 / FREEPORT ;5R 138 FREEPORT; 34.5<br>TRIP BRANCH FROM BUS 271499 TO BUS 271495 CKT 1 / FREEPORT ;5T 138 FREEPORT ;5R 138<br>TRIP BRANCH FROM BUS 271499 TO BUS 271897 CKT 1 / FREEPORT ;5T 138 LANCASTER; R 138<br>TRIP BRANCH FROM BUS 272245 TO BUS 271483 CKT 1 / PIERPONT ; R 138 FORDAM ; R 138<br>TRIP BRANCH FROM BUS 272247 TO BUS 272245 CKT 1 / PIERPONT ;RT 138 PIERPONT ; R 138<br>TRIP BRANCH FROM BUS 272247 TO BUS 272491 CKT 1 / PIERPONT ;RT 138 S PECATON; R 138<br>TRIP BRANCH FROM BUS 272433 TO BUS 272247 CKT 1 / SABROOKE ; R 138 PIERPONT ;RT 138<br>TRIP BRANCH FROM BUS 272599 TO BUS 271499 CKT 1 / ESS B427 ;4T 138 FREEPORT ;5T 138<br>TRIP BRANCH FROM BUS 272599 TO BUS 272491 CKT 1 / ESS B427 ;4T 138 S PECATON; R 138<br>TRIP BRANCH FROM BUS 272599 TO BUS 272597 CKT 1 / ESS B427 ;4T 138 ESS B427 ; R 138<br>MOVE 100 PERCENT LOAD FROM BUS 271495 TO BUS 271494 / FREEPORT ;5R 138 FREEPORT ;2R 138<br>MOVE 100 PERCENT LOAD FROM BUS 272245 TO BUS 272244 / PIERPONT ; R 138 PIERPONT ; B 138<br>MOVE 50 PERCENT LOAD FROM BUS 272491 TO BUS 272240 / S PECATON; R 138 PECATONIC; B 138<br>MOVE 50 PERCENT LOAD FROM BUS 272491 TO BUS 272244 / S PECATON; R 138 PIERPONT ; B 138<br>CLOSE BRANCH FROM BUS 272596 TO BUS 272597 CKT 1 / ESS B427 ; B 138 ESS B427 ; R 138<br>END |
| **Base Case** | |
| **COMED_P4_023-65-BT2-3__** | CONTINGENCY 'COMED_P4_023-65-BT2-3__'<br>TRIP BRANCH FROM BUS 270644 TO BUS 243206 CKT 1 / WILTO; 765 05DUMONT 765<br>TRIP BRANCH FROM BUS 270607 TO BUS 270630 CKT 1 / COLLI; 765 PLANO; 765<br>END |
| **COMED_P2-1_194-L15622__** | CONTINGENCY 'COMED_P2-1_194-L15622__'<br>TRIP BRANCH FROM BUS 271097 TO BUS 272433 CKT 1 / BHAWK;RT 138 SABRO; R 138<br>END |

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| Contingency Name | Contingency Definition |
|---|---|
| **COMED_P4_144-45-BT6-8__** | CONTINGENCY 'COMED_P4_144-45-BT6-8__'<br>TRIP BRANCH FROM BUS 930480 TO BUS 270916 CKT 1 / AB1-089 TAP 345 WAYNE ; B 345<br>TRIP BRANCH FROM BUS 270730 TO BUS 270916 CKT 1 / ELEC JUNC; B 345 WAYNE ; B 345<br>TRIP BRANCH FROM BUS 270916 TO BUS 270917 CKT 1 / WAYNE ; B 345 WAYNE ; R 345<br>END |

## 12 Short Circuit Analysis - Primary POI

The following breakers are overdutied:

None

### 12.1 System Reinforcements - Short Circuit

None

## 13 Summer Peak - Load Flow Analysis - Secondary POI

The Queue Project AF2-267 was evaluated as a 210.9 MW (Capacity 37.1 MW) injection tapping the Lena to Eleroy 138 kV line in the ComEd area. Project AF2-267 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-267 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

### 13.1 Generation Deliverability

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

None

### 13.2 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96486899** | 271898 | LANCASTER; BT | 138.0 | CE | 271897 | LANCASTER; R | 138.0 | CE | 1 | COMED_P4_006-45-BT3-4__ | breaker | 321.0 | 72.31 | 117.92 | DC | 146.42 |

### 13.3 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)

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| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 96486987 | 270807 | LIBERTYVI; R | 345.0 | CE | 270857 | P HTS 117; R | 345.0 | CE | 1 | COMED_P4_016-45-BT6-11_ | breaker | 1479.0 | 108.08 | 108.69 | DC | 19.9 |
| 96486729 | 271897 | LANCASTER; R | 138.0 | CE | 272240 | PECATONIC; B | 138.0 | CE | 1 | COMED_P4_194-38-L19414_ | breaker | 275.0 | 139.28 | 183.55 | DC | 121.73 |
| 96486766 | 271897 | LANCASTER; R | 138.0 | CE | 271499 | FREEPORT;RT | 138.0 | CE | 1 | COMED_P4_171-38-L17121_ | breaker | 336.0 | 111.91 | 144.74 | DC | 110.3 |
| 96486734 | 272240 | PECATONIC; B | 138.0 | CE | 272747 | WEMPLETOW; R | 138.0 | CE | 1 | COMED_P4_194-38-L19414_ | breaker | 275.0 | 134.44 | 178.71 | DC | 121.73 |
| 96488190 | 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 | 105.79 | 107.3 | DC | 11.09 |
| 144283620 | 274804 | UNIV PKN;RP | 345.0 | CE | 243229 | 05OLIVE | 345.0 | AEP | 1 | AEP_P4_#2978_05DUMONT_FSA | breaker | 971.0 | 106.89 | 106.96 | DC | 20.03 |
| 144283621 | 274804 | UNIV PKN;RP | 345.0 | CE | 243229 | 05OLIVE | 345.0 | AEP | 1 | AEP_P4_#2978_05DUMONT_NON_FSA | breaker | 971.0 | 106.89 | 106.96 | DC | 20.03 |
| 144283622 | 274804 | UNIV PKN;RP | 345.0 | CE | 243229 | 05OLIVE | 345.0 | AEP | 1 | COMED_P4_023-65-BT2-3__ | breaker | 971.0 | 106.57 | 106.64 | DC | 20.19 |

## 13.4 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 96487332 | 270694 | CHERRY VA; B | 345.0 | CE | 270759 | GARDEN PR; R | 345.0 | CE | 1 | COMED_P1-2_345-L0626__B-R-B | operation | 1479.0 | 125.73 | 128.84 | DC | 45.6 |
| 96487334 | 270694 | CHERRY VA; B | 345.0 | CE | 270759 | GARDEN PR; R | 345.0 | CE | 1 | Base Case | operation | 1201.0 | 111.74 | 114.71 | DC | 35.37 |
| 96487340 | 270759 | GARDEN PR; R | 345.0 | CE | 960580 | AF2-349 TAP | 345.0 | CE | 1 | COMED_P1-2_345-L0626__B-R-B | operation | 1479.0 | 126.27 | 127.66 | DC | 45.6 |
| 96487342 | 270759 | GARDEN PR; R | 345.0 | CE | 960580 | AF2-349 TAP | 345.0 | CE | 1 | Base Case | operation | 1201.0 | 116.14 | 117.47 | DC | 35.37 |
| 96487441 | 270770 | GOODINGS ;4B | 345.0 | CE | 270766 | GOODINGS ;3B | 345.0 | CE | 1 | COMED_P1-2_345-L11613AB-S | operation | 1802.0 | 111.83 | 112.1 | DC | 21.62 |
| 96487439 | 270828 | NELSON ; B | 345.0 | CE | 943410 | AF1-012 TAP | 345.0 | CE | 1 | Base Case | operation | 1334.0 | 104.86 | 105.59 | DC | 22.61 |
| 96487565 | 271096 | BLACKHAWK; BT | 138.0 | CE | 271192 | CHERRY VA; B | 138.0 | CE | 1 | COMED_P2-1_194-L15622__ | operation | 386.0 | 88.12 | 100.36 | DC | 47.25 |
| 96487568 | 271097 | BLACKHAWK; RT | 138.0 | CE | 271193 | CHERRY VA; R | 138.0 | CE | 1 | COMED_P2-1_194-L15626__ | operation | 386.0 | 86.72 | 100.36 | DC | 52.64 |

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| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 96487552 | 271499 | FREEPORT ;RT | 138.0 | CE | 272599 | ESS B427 ;4T | 138.0 | CE | 1 | COMED_P2-1_119-L17121__ | operation | 449.0 | 76.69 | 101.78 | DC | 112.64 |
| 96487553 | 271499 | FREEPORT ;RT | 138.0 | CE | 272599 | ESS B427 ;4T | 138.0 | CE | 1 | COMED_P1-2_138-L17121_R-R | operation | 449.0 | 76.69 | 101.78 | DC | 112.64 |
| 96487196 | 271897 | LANCASTER; R | 138.0 | CE | 272240 | PECATONIC; B | 138.0 | CE | 1 | COMED_P1-2_138-L19414GR-R | operation | 264.0 | 144.13 | 190.49 | DC | 122.4 |
| 96487201 | 271897 | LANCASTER; R | 138.0 | CE | 272240 | PECATONIC; B | 138.0 | CE | 1 | Base Case | operation | 208.0 | 124.31 | 163.51 | DC | 81.52 |
| 96487261 | 271897 | LANCASTER; R | 138.0 | CE | 271499 | FREEPORT ;RT | 138.0 | CE | 1 | COMED_P2-1_119-L17121__ | operation | 317.0 | 117.51 | 152.87 | DC | 112.1 |
| 96487262 | 271897 | LANCASTER; R | 138.0 | CE | 271499 | FREEPORT ;RT | 138.0 | CE | 1 | COMED_P1-2_138-L17121_R-R | operation | 317.0 | 117.51 | 152.87 | DC | 112.1 |
| 96487266 | 271897 | LANCASTER; R | 138.0 | CE | 271499 | FREEPORT ;RT | 138.0 | CE | 1 | Base Case | operation | 249.0 | 91.35 | 117.88 | DC | 66.05 |
| 96487497 | 271898 | LANCASTER;BT | 138.0 | CE | 271897 | LANCASTER; R | 138.0 | CE | 1 | COMED_P1-2_345-L0627__B-R | operation | 321.0 | 61.47 | 107.08 | DC | 146.42 |
| 96487491 | 271978 | MARYLAND ; B | 138.0 | CE | 271328 | DIXON ;BT | 138.0 | CE | 1 | COMED_P1-2_138-L17121_R-R | operation | 321.0 | 82.68 | 113.28 | DC | 98.24 |
| 96487492 | 271978 | MARYLAND ; B | 138.0 | CE | 271328 | DIXON ;BT | 138.0 | CE | 1 | COMED_P2-1_119-L17121__ | operation | 321.0 | 82.68 | 113.28 | DC | 98.24 |
| 96487206 | 272240 | PECATONIC; B | 138.0 | CE | 272747 | WEMPLETOW; R | 138.0 | CE | 1 | COMED_P1-2_138-L19414GR-R | operation | 264.0 | 139.13 | 185.49 | DC | 122.4 |
| 96487211 | 272240 | PECATONIC; B | 138.0 | CE | 272747 | WEMPLETOW; R | 138.0 | CE | 1 | Base Case | operation | 208.0 | 120.04 | 159.23 | DC | 81.52 |
| 96487555 | 272599 | ESS B427 ;4T | 138.0 | CE | 272491 | S PECATON; R | 138.0 | CE | 1 | COMED_P2-1_119-L17121__ | operation | 449.0 | 76.47 | 101.56 | DC | 112.64 |
| 96487556 | 272599 | ESS B427 ;4T | 138.0 | CE | 272491 | S PECATON; R | 138.0 | CE | 1 | COMED_P1-2_138-L17121_R-R | operation | 449.0 | 76.47 | 101.56 | DC | 112.64 |
| 96487256 | 274750 | CRETE EC ;BP | 345.0 | CE | 255112 | 17STJOHN | 345.0 | NIPS | 1 | Base Case | operation | 1091.0 | 154.28 | 154.37 | DC | 16.24 |
| 144284052 | 274804 | UNIV PK N;RP | 345.0 | CE | 243229 | 05OLIVE | 345.0 | AEP | 1 | COMED_P1-2_695_B2 | operation | 971.0 | 106.43 | 106.5 | DC | 20.16 |
| 96487544 | 930480 | AB1-089 TAP | 345.0 | CE | 270916 | WAYNE ; B | 345.0 | CE | 1 | COMED_P1-2_345-L97116__-R_FSA | operation | 2058.0 | 100.13 | 101.1 | DC | 43.14 |
| 96487376 | 938860 | AE1-114 TAP | 138.0 | CE | 271978 | MARYLAND ; B | 138.0 | CE | 1 | COMED_P1-2_138-L17121_R-R | operation | 321.0 | 93.74 | 124.34 | DC | 98.24 |
| 96487377 | 938860 | AE1-114 TAP | 138.0 | CE | 271978 | MARYLAND ; B | 138.0 | CE | 1 | COMED_P2-1_119-L17121__ | operation | 321.0 | 93.74 | 124.34 | DC | 98.24 |
| 96487353 | 943410 | AF1-012 TAP | 345.0 | CE | 957470 | AF2-041 TAP | 345.0 | CE | 1 | Base Case | operation | 1334.0 | 110.4 | 111.15 | DC | 22.61 |
| 95413792 | 956820 | J1180 TAP | 345.0 | AMIL | 247712 | 05SULLIVAN | 345.0 | AEP | 1 | AEP_P1-2_#286 | operation | 1466.0 | 138.2 | 138.21 | DC | 14.66 |

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| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96487296** | 957470 | AF2-041 TAP | 345.0 | CE | 270730 | ELECT JCT; B | 345.0 | CE | 1 | Base Case | operation | 1334.0 | 133.84 | 134.6 | DC | 22.61 |
| **96487312** | 960580 | AF2-349 TAP | 345.0 | CE | 270883 | SILVER LK; R | 345.0 | CE | 1 | COMED_P1-2_345-L0626__B-R-B | operation | 1479.0 | 126.25 | 127.64 | DC | 45.6 |
| **96487314** | 960580 | AF2-349 TAP | 345.0 | CE | 270883 | SILVER LK; R | 345.0 | CE | 1 | Base Case | operation | 1201.0 | 116.12 | 117.44 | DC | 35.37 |

## 13.5 Flow Gate Details - Secondary POI

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".

### 13.5.1 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96486899** | 271898 | LANCASTER;BT | CE | 271897 | LANCASTER; R | CE | 1 | COMED_P4_006-45-BT3-4__ | breaker | 321.0 | 72.31 | 117.92 | DC | 146.42 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **293516** | O-009 E1 | 3.5425 | Adder | 4.17 |
| **293517** | O-009 E2 | 1.7993 | Adder | 2.12 |
| **293518** | O-009 E3 | 1.9815 | Adder | 2.33 |
| **293715** | O-029 E | 3.7873 | Adder | 4.46 |
| **293716** | O-029 E | 2.0765 | Adder | 2.44 |
| **293717** | O-029 E | 1.9086 | Adder | 2.25 |
| **938861** | AE1-114 C O1 | 15.0787 | 50/50 | 15.0787 |
| **938862** | AE1-114 E O1 | 51.4448 | 50/50 | 51.4448 |
| **943401** | AF1-011 C | 0.4836 | Adder | 0.57 |
| **943402** | AF1-011 E | 0.8118 | Adder | 0.96 |
| **943922** | AF1-060 BAT | 3.1547 | 50/50 | 3.1547 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **959761** | AF2-267 C O2 | 25.7709 | 50/50 | 25.7709 |
| **959762** | AF2-267 E O2 | 120.6485 | 50/50 | 120.6485 |
| **961011** | AF2-392 C O2 | 1.0441 | Adder | 2.32 |
| **961012** | AF2-392 E O2 | 4.8881 | Adder | 10.85 |
| **961021** | AF2-393 O2 | 1.7797 | Adder | 3.95 |
| **961031** | AF2-394 O2 | 1.1864 | Adder | 2.63 |
| **LGEE** | LGEE | 0.0405 | Confirmed LTF | 0.0405 |
| **CPLE** | CPLE | 0.0615 | Confirmed LTF | 0.0615 |
| **G-007A** | G-007A | 0.0839 | Confirmed LTF | 0.0839 |
| **VFT** | VFT | 0.2257 | Confirmed LTF | 0.2257 |
| **CBM-W2** | CBM-W2 | 2.4242 | Confirmed LTF | 2.4242 |
| **TVA** | TVA | 0.3010 | Confirmed LTF | 0.3010 |
| **CBM-S2** | CBM-S2 | 0.6358 | Confirmed LTF | 0.6358 |
| **CBM-S1** | CBM-S1 | 1.6018 | Confirmed LTF | 1.6018 |
| **MADISON** | MADISON | 0.2460 | Confirmed LTF | 0.2460 |
| **MEC** | MEC | 1.5270 | Confirmed LTF | 1.5270 |

### 13.5.2 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96486987** | 270807 | LIBERTYVI; R | CE | 270857 | P HTS 117; R | CE | 1 | COMED_P4_016-45-BT6-11_ | breaker | 1479.0 | 108.08 | 108.69 | DC | 19.9 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **274683** | WAUKEGAN ;8U | 8.6783 | 50/50 | 8.6783 |
| **274725** | ZION EC ;1P | 6.6512 | 50/50 | 6.6512 |
| **274726** | ZION EC ;2P | 6.6512 | 50/50 | 6.6512 |
| **274727** | ZION EC ;3P | 6.6512 | 50/50 | 6.6512 |
| **274828** | WAUKEGAN ;BP | 2.4683 | 50/50 | 2.4683 |
| **274830** | U3-021 1 | 5.6437 | Adder | 6.64 |
| **274831** | U3-021 2 | 5.6437 | Adder | 6.64 |
| **274859** | EASYR;U1 E | 5.9764 | Adder | 7.03 |
| **274860** | EASYR;U2 E | 5.9764 | Adder | 7.03 |
| **276170** | Z1-108 E | 2.7896 | 50/50 | 2.7896 |
| **290051** | GSG-6; E | 3.8377 | Adder | 4.51 |
| **293516** | O-009 E1 | 3.5313 | Adder | 4.15 |
| **293517** | O-009 E2 | 1.7936 | Adder | 2.11 |
| **293518** | O-009 E3 | 1.9753 | Adder | 2.32 |
| **293715** | O-029 E | 3.7754 | Adder | 4.44 |
| **293716** | O-029 E | 2.0700 | Adder | 2.44 |
| **293717** | O-029 E | 1.9025 | Adder | 2.24 |
| **294763** | P-046 E | 6.4178 | Adder | 7.55 |
| **915011** | Y3-013 1 | 7.0107 | 50/50 | 7.0107 |
| **915021** | Y3-013 2 | 7.0107 | 50/50 | 7.0107 |
| **915031** | Y3-013 3 | 7.0107 | 50/50 | 7.0107 |
| **919581** | AA2-030 | 7.8842 | Adder | 9.28 |
| **920272** | AA2-123 E | 2.1451 | Adder | 2.52 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **924471** | AB2-096 | 46.1090 | 50/50 | 46.1090 |
| **926431** | AC1-114 | 1.8090 | Adder | 2.13 |
| **927511** | AC1-113 1 | 0.9047 | Adder | 1.06 |
| **927521** | AC1-113 2 | 0.9047 | Adder | 1.06 |
| **930481** | AB1-089 | 41.6636 | Adder | 49.02 |
| **932881** | AC2-115 1 | 1.8093 | Adder | 2.13 |
| **932891** | AC2-115 2 | 1.8093 | Adder | 2.13 |
| **932921** | AC2-116 | 0.6331 | Adder | 0.74 |
| **933911** | AD1-013 C | 0.6727 | Adder | 0.79 |
| **933912** | AD1-013 E | 1.0746 | Adder | 1.26 |
| **933931** | AD1-016 C | 0.8151 | Adder | 0.96 |
| **933932** | AD1-016 E | 1.3299 | Adder | 1.56 |
| **934431** | AD1-067 C | 0.0482 | Adder | 0.06 |
| **934432** | AD1-067 E | 0.2026 | Adder | 0.24 |
| **934651** | **AD1-096 C (Withdrawn : 07/22/2020)** | **0.5775** | **Adder** | **0.68** |
| **934652** | **AD1-096 E (Withdrawn : 07/22/2020)** | **0.9422** | **Adder** | **1.11** |
| **934701** | AD1-098 C O1 | 2.5607 | Adder | 3.01 |
| **934702** | AD1-098 E O1 | 1.8695 | Adder | 2.2 |
| **934971** | AD1-129 C | 0.7344 | Adder | 0.86 |
| **934972** | AD1-129 E | 0.4896 | Adder | 0.58 |
| **936791** | AD2-102 C | 11.0762 | Adder | 13.03 |
| **936792** | AD2-102 E | 7.3841 | Adder | 8.69 |
| **937001** | AD2-134 C | 1.0032 | Adder | 1.18 |
| **937002** | AD2-134 E | 4.1443 | Adder | 4.88 |
| **937311** | AD2-172 C | 1.6847 | Adder | 1.98 |
| **937312** | AD2-172 E | 2.3265 | Adder | 2.74 |
| **937531** | AD2-214 C | 1.9195 | Adder | 2.26 |
| **937532** | AD2-214 E | 1.2797 | Adder | 1.51 |
| **938861** | AE1-114 C O1 | 2.3366 | Adder | 2.75 |
| **938862** | AE1-114 E O1 | 7.9718 | Adder | 9.38 |
| **939051** | AE1-134 1 | 0.6127 | Adder | 0.72 |
| **939061** | AE1-134 2 | 0.6127 | Adder | 0.72 |
| **940501** | AE2-035 C | 1.6847 | Adder | 1.98 |
| **940502** | AE2-035 E | 2.3265 | Adder | 2.74 |
| **942991** | AE2-321 C | 7.1113 | Adder | 8.37 |
| **942992** | AE2-321 E | 3.5026 | Adder | 4.12 |
| **943381** | AF1-009 C | 0.2215 | Adder | 0.26 |
| **943382** | AF1-009 E | 0.8860 | Adder | 1.04 |
| **943401** | AF1-011 C | 0.4821 | Adder | 0.57 |
| **943402** | AF1-011 E | 0.8092 | Adder | 0.95 |
| **943411** | AF1-012 C | 4.6928 | Adder | 5.52 |
| **943412** | AF1-012 E | 3.1285 | Adder | 3.68 |
| **943801** | AF1-048 C | 3.3243 | Adder | 3.91 |
| **943802** | AF1-048 E | 2.2162 | Adder | 2.61 |
| **943921** | AF1-060 | 0.8295 | Adder | 0.98 |
| **944041** | AF1-072 | 1.3737 | Adder | 1.62 |
| **946151** | AF1-280 C O1 | 8.0304 | Adder | 9.45 |
| **946152** | AF1-280 E O1 | 3.6928 | Adder | 4.34 |
| **946161** | AF1-281 C | 0.1758 | Adder | 0.21 |
| **946162** | AF1-281 E | 0.9965 | Adder | 1.17 |
| **946321** | AF1-296 C O1 | 1.7144 | Adder | 2.02 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **946322** | AF1-296 E O1 | 8.0264 | Adder | 9.44 |
| **946501** | AF1-314 C | 2.9933 | Adder | 3.52 |
| **946502** | AF1-314 E | 14.0140 | Adder | 16.49 |
| **946531** | AF1-317 C O1 | 0.8939 | Adder | 1.05 |
| **946661** | AF1-330 C | 1.7589 | Adder | 2.07 |
| **946662** | AF1-330 E | 0.3861 | Adder | 0.45 |
| **946671** | AF1-331 | 0.8736 | Adder | 1.03 |
| **950101** | J390 | 64.9490 | PJM External (MISO) | 64.9490 |
| **951391** | J505 | 11.3580 | PJM External (MISO) | 11.3580 |
| **952381** | J703 | 13.4479 | PJM External (MISO) | 13.4479 |
| **952391** | J704 | 5.7371 | PJM External (MISO) | 5.7371 |
| **952431** | J760 | 2.3139 | PJM External (MISO) | 2.3139 |
| **952511** | J584 C | 0.7661 | PJM External (MISO) | 0.7661 |
| **952512** | J584 E | 4.1449 | PJM External (MISO) | 4.1449 |
| **953111** | J807 C | 0.8131 | PJM External (MISO) | 0.8131 |
| **953112** | J807 E | 4.3988 | PJM External (MISO) | 4.3988 |
| **953151** | J831 | 5.3220 | PJM External (MISO) | 5.3220 |
| **953331** | J801 | 3.7866 | PJM External (MISO) | 3.7866 |
| **953491** | J947 | 30.2260 | PJM External (MISO) | 30.2260 |
| **953681** | J818 | 14.4664 | PJM External (MISO) | 14.4664 |
| **953691** | J819 C | 1.0459 | PJM External (MISO) | 1.0459 |
| **953692** | J819 E | 5.6584 | PJM External (MISO) | 5.6584 |
| **953701** | J821 C | 1.2327 | PJM External (MISO) | 1.2327 |
| **953702** | J821 E | 6.6694 | PJM External (MISO) | 6.6694 |
| **953891** | J849 | 13.1488 | PJM External (MISO) | 13.1488 |
| **953901** | J850 | 23.6375 | PJM External (MISO) | 23.6375 |
| **954001** | J864 | 3.3697 | PJM External (MISO) | 3.3697 |
| **954141** | J878 | 29.1780 | PJM External (MISO) | 29.1780 |
| **954191** | J886 | 17.0220 | PJM External (MISO) | 17.0220 |
| **954511** | J926 C | 0.8233 | PJM External (MISO) | 0.8233 |
| **954512** | J926 E | 4.4544 | PJM External (MISO) | 4.4544 |
| **954691** | J732 | 35.4250 | PJM External (MISO) | 35.4250 |
| **954741** | J928 C | 1.3126 | PJM External (MISO) | 1.3126 |
| **954742** | J928 E | 7.1013 | PJM External (MISO) | 7.1013 |
| **955091** | J986 | 12.7640 | PJM External (MISO) | 12.7640 |
| **955241** | J1002 | 9.0882 | PJM External (MISO) | 9.0882 |
| **955251** | J1003 | 5.0285 | PJM External (MISO) | 5.0285 |
| **955301** | J1009 | 70.6280 | PJM External (MISO) | 70.6280 |
| **955311** | J1010 | 60.9480 | PJM External (MISO) | 60.9480 |
| **955321** | J1011 | 60.9480 | PJM External (MISO) | 60.9480 |
| **955581** | J1042 C | 3.6588 | PJM External (MISO) | 3.6588 |
| **955582** | J1042 E | 20.7332 | PJM External (MISO) | 20.7332 |
| **955671** | J1051 | 5.8870 | PJM External (MISO) | 5.8870 |
| **955691** | J1053 | 23.8160 | PJM External (MISO) | 23.8160 |
| **955981** | J1085 C | 3.1791 | PJM External (MISO) | 3.1791 |
| **955982** | J1085 E | 17.1999 | PJM External (MISO) | 17.1999 |
| **956141** | J1101 | 2.2696 | PJM External (MISO) | 2.2696 |
| **956321** | J1121 | 18.0520 | PJM External (MISO) | 18.0520 |
| **956571** | J1153 | 19.2705 | PJM External (MISO) | 19.2705 |
| **956581** | J1154 | 7.2795 | PJM External (MISO) | 7.2795 |
| **956731** | J1171 | 11.3880 | PJM External (MISO) | 11.3880 |
| **956852** | J1183 E | 0.1420 | PJM External (MISO) | 0.1420 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **956901** | J1188 | 4.4180 | PJM External (MISO) | 4.4180 |
| **957331** | AF2-027 C | 4.6738 | 50/50 | 4.6738 |
| **957332** | AF2-027 E | 7.0107 | 50/50 | 7.0107 |
| **958911** | AF2-182 | 5.5920 | Adder | 12.41 |
| **958921** | AF2-183 C | 0.9941 | Adder | 2.21 |
| **958922** | AF2-183 E | 1.4912 | Adder | 3.31 |
| **959101** | AF2-201 C O2 | 2.1854 | Adder | 4.85 |
| **959102** | AF2-201 E O2 | 6.2757 | Adder | 13.93 |
| **959761** | AF2-267 C O2 | 1.5776 | Adder | 3.5 |
| **959762** | AF2-267 E O2 | 7.3857 | Adder | 16.39 |
| **960551** | AF2-346 C | 1.0659 | Adder | 2.37 |
| **960552** | AF2-346 E | 0.7106 | Adder | 1.58 |
| **960581** | AF2-349 C | 24.3576 | 50/50 | 24.3576 |
| **960582** | AF2-349 E | 16.2384 | 50/50 | 16.2384 |
| **960721** | AF2-363 C O2 | 1.5650 | Adder | 3.47 |
| **960722** | AF2-363 E O2 | 1.0434 | Adder | 2.32 |
| **960731** | AF2-364 C O2 | 1.4161 | Adder | 3.14 |
| **960732** | AF2-364 E O2 | 0.9441 | Adder | 2.1 |
| **961011** | AF2-392 C O2 | 0.9182 | Adder | 2.04 |
| **961012** | AF2-392 E O2 | 4.2986 | Adder | 9.54 |
| **961021** | AF2-393 O2 | 1.5650 | Adder | 3.47 |
| **961031** | AF2-394 O2 | 1.0434 | Adder | 2.32 |
| **WEC** | WEC | 5.5421 | Confirmed LTF | 5.5421 |
| **CBM-W2** | CBM-W2 | 6.9205 | Confirmed LTF | 6.9205 |
| **NY** | NY | 0.1759 | Confirmed LTF | 0.1759 |
| **CBM-W1** | CBM-W1 | 67.0161 | Confirmed LTF | 67.0161 |
| **TVA** | TVA | 0.7756 | Confirmed LTF | 0.7756 |
| **O-066** | O-066 | 2.0429 | Confirmed LTF | 2.0429 |
| **CBM-S2** | CBM-S2 | 0.3410 | Confirmed LTF | 0.3410 |
| **CBM-S1** | CBM-S1 | 3.5443 | Confirmed LTF | 3.5443 |
| **TILTON** | TILTON | 0.1077 | Confirmed LTF | 0.1077 |
| **G-007** | G-007 | 0.3151 | Confirmed LTF | 0.3151 |
| **MADISON** | MADISON | 12.6988 | Confirmed LTF | 12.6988 |
| **MEC** | MEC | 7.7210 | Confirmed LTF | 7.7210 |
| **GIBSON** | GIBSON | 0.0617 | Confirmed LTF | 0.0617 |
| **BLUEG** | BLUEG | 0.3715 | Confirmed LTF | 0.3715 |
| **TRIMBLE** | TRIMBLE | 0.1274 | Confirmed LTF | 0.1274 |

### 13.5.3 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96486729** | 271897 | LANCASTER; R | CE | 272240 | PECATONIC; B | CE | 1 | COMED_P4_194-38-L19414_ | breaker | 275.0 | 139.28 | 183.55 | DC | 121.73 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **274856** | ECOGROVE ;U1 | 1.9932 | 50/50 | 1.9932 |
| **294763** | P-046 E | 46.2200 | 50/50 | 46.2200 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **937311** | AD2-172 C | 12.1328 | 50/50 | 12.1328 |
| **937312** | AD2-172 E | 16.7548 | 50/50 | 16.7548 |
| **938861** | AE1-114 C O1 | 12.3886 | 50/50 | 12.3886 |
| **938862** | AE1-114 E O1 | 42.2669 | 50/50 | 42.2669 |
| **940501** | AE2-035 C | 12.1328 | 50/50 | 12.1328 |
| **940502** | AE2-035 E | 16.7548 | 50/50 | 16.7548 |
| **943921** | AF1-060 | 5.9739 | 50/50 | 5.9739 |
| **946501** | AF1-314 C | 21.5570 | 50/50 | 21.5570 |
| **946502** | AF1-314 E | 100.9260 | 50/50 | 100.9260 |
| **959101** | AF2-201 C O2 | 29.6964 | 50/50 | 29.6964 |
| **959102** | AF2-201 E O2 | 85.2759 | 50/50 | 85.2759 |
| **959761** | AF2-267 C O2 | 21.4260 | 50/50 | 21.4260 |
| **959762** | AF2-267 E O2 | 100.3076 | 50/50 | 100.3076 |
| **LGEE** | LGEE | 0.0120 | Confirmed LTF | 0.0120 |
| **CPLE** | CPLE | 0.0179 | Confirmed LTF | 0.0179 |
| **G-007A** | G-007A | 0.0168 | Confirmed LTF | 0.0168 |
| **VFT** | VFT | 0.0452 | Confirmed LTF | 0.0452 |
| **CBM-W2** | CBM-W2 | 0.8026 | Confirmed LTF | 0.8026 |
| **TVA** | TVA | 0.0952 | Confirmed LTF | 0.0952 |
| **CBM-S2** | CBM-S2 | 0.1850 | Confirmed LTF | 0.1850 |
| **CBM-S1** | CBM-S1 | 0.5027 | Confirmed LTF | 0.5027 |
| **MEC** | MEC | 0.4545 | Confirmed LTF | 0.4545 |

### 13.5.4 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96486766** | 271897 | LANCASTER; R | CE | 271499 | FREEPORT ;RT | CE | 1 | COMED_P4_171-38-L17121_ | breaker | 336.0 | 111.91 | 144.74 | DC | 110.3 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **274856** | ECOGROVE ;U1 | 1.8005 | 50/50 | 1.8005 |
| **294763** | P-046 E | 41.7528 | 50/50 | 41.7528 |
| **937311** | AD2-172 C | 10.9601 | 50/50 | 10.9601 |
| **937312** | AD2-172 E | 15.1354 | 50/50 | 15.1354 |
| **938861** | AE1-114 C O1 | 11.2040 | 50/50 | 11.2040 |
| **938862** | AE1-114 E O1 | 38.2255 | 50/50 | 38.2255 |
| **940501** | AE2-035 C | 10.9601 | 50/50 | 10.9601 |
| **940502** | AE2-035 E | 15.1354 | 50/50 | 15.1354 |
| **943921** | AF1-060 | 5.3965 | 50/50 | 5.3965 |
| **946501** | AF1-314 C | 19.4735 | 50/50 | 19.4735 |
| **946502** | AF1-314 E | 91.1714 | 50/50 | 91.1714 |
| **959101** | AF2-201 C O2 | 26.8262 | 50/50 | 26.8262 |
| **959102** | AF2-201 E O2 | 77.0339 | 50/50 | 77.0339 |
| **959761** | AF2-267 C O2 | 19.4134 | 50/50 | 19.4134 |
| **959762** | AF2-267 E O2 | 90.8852 | 50/50 | 90.8852 |
| **LGEE** | LGEE | 0.0200 | Confirmed LTF | 0.0200 |
| **CPLE** | CPLE | 0.0291 | Confirmed LTF | 0.0291 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **G-007A** | G-007A | 0.0479 | Confirmed LTF | 0.0479 |
| **VFT** | VFT | 0.1290 | Confirmed LTF | 0.1290 |
| **CBM-W2** | CBM-W2 | 1.0565 | Confirmed LTF | 1.0565 |
| **CBM-W1** | CBM-W1 | 0.0876 | Confirmed LTF | 0.0876 |
| **TVA** | TVA | 0.1330 | Confirmed LTF | 0.1330 |
| **CBM-S2** | CBM-S2 | 0.2948 | Confirmed LTF | 0.2948 |
| **CBM-S1** | CBM-S1 | 0.7157 | Confirmed LTF | 0.7157 |
| **MADISON** | MADISON | 0.2238 | Confirmed LTF | 0.2238 |
| **MEC** | MEC | 0.6435 | Confirmed LTF | 0.6435 |

### 13.5.5 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96486734** | 272240 | PECATONIC; B | CE | 272747 | WEMPLETOW; R | CE | 1 | COMED_P4_194-38-L19414_ | breaker | 275.0 | 134.44 | 178.71 | DC | 121.73 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **274856** | ECOGROVE ;U1 | 1.9932 | 50/50 | 1.9932 |
| **294763** | P-046 E | 46.2200 | 50/50 | 46.2200 |
| **937311** | AD2-172 C | 12.1328 | 50/50 | 12.1328 |
| **937312** | AD2-172 E | 16.7548 | 50/50 | 16.7548 |
| **938861** | AE1-114 C O1 | 12.3886 | 50/50 | 12.3886 |
| **938862** | AE1-114 E O1 | 42.2669 | 50/50 | 42.2669 |
| **940501** | AE2-035 C | 12.1328 | 50/50 | 12.1328 |
| **940502** | AE2-035 E | 16.7548 | 50/50 | 16.7548 |
| **943921** | AF1-060 | 5.9739 | 50/50 | 5.9739 |
| **946501** | AF1-314 C | 21.5570 | 50/50 | 21.5570 |
| **946502** | AF1-314 E | 100.9260 | 50/50 | 100.9260 |
| **959101** | AF2-201 C O2 | 29.6964 | 50/50 | 29.6964 |
| **959102** | AF2-201 E O2 | 85.2759 | 50/50 | 85.2759 |
| **959761** | AF2-267 C O2 | 21.4260 | 50/50 | 21.4260 |
| **959762** | AF2-267 E O2 | 100.3076 | 50/50 | 100.3076 |
| **LGEE** | LGEE | 0.0120 | Confirmed LTF | 0.0120 |
| **CPLE** | CPLE | 0.0179 | Confirmed LTF | 0.0179 |
| **G-007A** | G-007A | 0.0168 | Confirmed LTF | 0.0168 |
| **VFT** | VFT | 0.0452 | Confirmed LTF | 0.0452 |
| **CBM-W2** | CBM-W2 | 0.8026 | Confirmed LTF | 0.8026 |
| **TVA** | TVA | 0.0952 | Confirmed LTF | 0.0952 |
| **CBM-S2** | CBM-S2 | 0.1850 | Confirmed LTF | 0.1850 |
| **CBM-S1** | CBM-S1 | 0.5027 | Confirmed LTF | 0.5027 |
| **MEC** | MEC | 0.4545 | Confirmed LTF | 0.4545 |

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### 13.5.6 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **96488190** | 272728 | WATERMAN ; B | CE | 272445 | SANDWICH ; R | CE | 1 | COMED_P7_138-L11106_B-R_+_345-L15502_B-R | tower | 331.0 | 105.79 | 107.3 | DC | 11.09 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **272364** | ESS H440N ;R | 1.2190 | 50/50 | 1.2190 |
| **274850** | MENDOTA H;RU | 0.2807 | 50/50 | 0.2807 |
| **274855** | GSG-6 ;RU | 1.1820 | 50/50 | 1.1820 |
| **274872** | LEE DEKAL;1U | 3.1941 | 50/50 | 3.1941 |
| **290051** | GSG-6; E | 27.4100 | 50/50 | 27.4100 |
| **290108** | LEEDK;1U E | 77.1560 | 50/50 | 77.1560 |
| **294763** | P-046 E | 3.5741 | Adder | 4.2 |
| **916221** | AB2-191 | 0.4534 | 50/50 | 0.4534 |
| **933911** | AD1-013 C | 4.9916 | 50/50 | 4.9916 |
| **933912** | AD1-013 E | 7.9736 | 50/50 | 7.9736 |
| **934431** | AD1-067 C | 0.3442 | 50/50 | 0.3442 |
| **934432** | AD1-067 E | 1.4472 | 50/50 | 1.4472 |
| **934651** | AD1-096 C (Withdrawn : 07/22/2020) | 0.4340 | Adder | 0.51 |
| **934652** | AD1-096 E (Withdrawn : 07/22/2020) | 0.7081 | Adder | 0.83 |
| **934701** | AD1-098 C O1 | 17.3573 | 50/50 | 17.3573 |
| **934702** | AD1-098 E O1 | 12.6727 | 50/50 | 12.6727 |
| **937001** | AD2-134 C | 7.1654 | 50/50 | 7.1654 |
| **937002** | AD2-134 E | 29.6003 | 50/50 | 29.6003 |
| **937311** | AD2-172 C | 0.9382 | Adder | 1.1 |
| **937312** | AD2-172 E | 1.2956 | Adder | 1.52 |
| **938861** | AE1-114 C O1 | 1.8158 | Adder | 2.14 |
| **938862** | AE1-114 E O1 | 6.1950 | Adder | 7.29 |
| **940501** | AE2-035 C | 0.9382 | Adder | 1.1 |
| **940502** | AE2-035 E | 1.2956 | Adder | 1.52 |
| **941131** | AE2-107 C | 23.9826 | 50/50 | 23.9826 |
| **941132** | AE2-107 E | 15.9884 | 50/50 | 15.9884 |
| **943381** | AF1-009 C | 1.5015 | 50/50 | 1.5015 |
| **943382** | AF1-009 E | 6.0060 | 50/50 | 6.0060 |
| **943921** | AF1-060 | 0.4619 | Adder | 0.54 |
| **946501** | AF1-314 C | 1.6670 | Adder | 1.96 |
| **946502** | AF1-314 E | 7.8044 | Adder | 9.18 |
| **946671** | AF1-331 | 6.4826 | 50/50 | 6.4826 |
| **959101** | AF2-201 C O2 | 1.2171 | Adder | 2.7 |
| **959102** | AF2-201 E O2 | 3.4949 | Adder | 7.76 |
| **959761** | AF2-267 C O2 | 0.8793 | Adder | 1.95 |
| **959762** | AF2-267 E O2 | 4.1164 | Adder | 9.14 |
| **960382** | AF2-329 BAT | 9.1266 | 50/50 | 9.1266 |
| **960721** | AF2-363 C O2 | 11.7216 | 50/50 | 11.7216 |
| **960722** | AF2-363 E O2 | 7.8144 | 50/50 | 7.8144 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **960751** | AF2-366 C O2 | 22.3182 | 50/50 | 22.3182 |
| **960752** | AF2-366 E O2 | 14.8788 | 50/50 | 14.8788 |
| **961011** | AF2-392 C O2 | 1.0101 | Adder | 2.24 |
| **961012** | AF2-392 E O2 | 4.7292 | Adder | 10.5 |
| **961021** | AF2-393 O2 | 1.7218 | Adder | 3.82 |
| **961031** | AF2-394 O2 | 1.1479 | Adder | 2.55 |
| **WEC** | WEC | 0.3663 | Confirmed LTF | 0.3663 |
| **CBM-W2** | CBM-W2 | 2.9894 | Confirmed LTF | 2.9894 |
| **NY** | NY | 0.0669 | Confirmed LTF | 0.0669 |
| **CBM-W1** | CBM-W1 | 11.9220 | Confirmed LTF | 11.9220 |
| **TVA** | TVA | 0.3248 | Confirmed LTF | 0.3248 |
| **O-066** | O-066 | 0.7728 | Confirmed LTF | 0.7728 |
| **CBM-S2** | CBM-S2 | 0.1792 | Confirmed LTF | 0.1792 |
| **CBM-S1** | CBM-S1 | 1.5166 | Confirmed LTF | 1.5166 |
| **TILTON** | TILTON | 0.0031 | Confirmed LTF | 0.0031 |
| **G-007** | G-007 | 0.1196 | Confirmed LTF | 0.1196 |
| **MADISON** | MADISON | 3.2357 | Confirmed LTF | 3.2357 |
| **MEC** | MEC | 2.9110 | Confirmed LTF | 2.9110 |
| **GIBSON** | GIBSON | 0.0082 | Confirmed LTF | 0.0082 |
| **BLUEG** | BLUEG | 0.1180 | Confirmed LTF | 0.1180 |
| **TRIMBLE** | TRIMBLE | 0.0417 | Confirmed LTF | 0.0417 |

### 13.5.7 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **144283622** | 274804 | UNIV PK N;RP | CE | 243229 | 05OLIVE | AEP | 1 | COMED_P4_023-65-BT2-3__ | breaker | 971.0 | 106.57 | 106.64 | DC | 20.19 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **274806** | UNIV PK N;2U | 1.8438 | 50/50 | 1.8438 |
| **274808** | UNIV PK N;4U | 1.8438 | 50/50 | 1.8438 |
| **274809** | UNIV PK N;5U | 1.8438 | 50/50 | 1.8438 |
| **274811** | UNIV PK N;7U | 1.8438 | 50/50 | 1.8438 |
| **274812** | UNIV PK N;8U | 1.8438 | 50/50 | 1.8438 |
| **274814** | UNIV PK N;0U | 1.8438 | 50/50 | 1.8438 |
| **274815** | UNIV PK N;XU | 1.8438 | 50/50 | 1.8438 |
| **274830** | U3-021 1 | 4.2476 | Adder | 5.0 |
| **274831** | U3-021 2 | 4.2476 | Adder | 5.0 |
| **274881** | PILOT HIL;1E | 12.8032 | Adder | 15.06 |
| **275149** | KELLYCK ;1E | 12.8032 | Adder | 15.06 |
| **276167** | Z1-106 E2 | 0.8826 | Adder | 1.04 |
| **276168** | Z1-106 E1 | 0.8825 | Adder | 1.04 |
| **276169** | Z1-107 E | 1.8729 | Adder | 2.2 |
| **276170** | Z1-108 E | 1.7374 | Adder | 2.04 |
| **290021** | O50 E | 13.4028 | Adder | 15.77 |
| **290051** | GSG-6; E | 7.3164 | Adder | 8.61 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **290108** | LEEDK;1U E | 16.9456 | Adder | 19.94 |
| **293061** | N-015 E | 10.8722 | Adder | 12.79 |
| **293644** | O22 E1 | 6.7404 | Adder | 7.93 |
| **293645** | O22 E2 | 13.0843 | Adder | 15.39 |
| **294392** | P-010 E | 13.8077 | Adder | 16.24 |
| **915011** | Y3-013 1 | 2.6194 | Adder | 3.08 |
| **915021** | Y3-013 2 | 2.6194 | Adder | 3.08 |
| **915031** | Y3-013 3 | 2.6194 | Adder | 3.08 |
| **918052** | AA1-018 E OP | 12.3171 | Adder | 14.49 |
| **920272** | AA2-123 E | 1.7039 | Adder | 2.0 |
| **924471** | AB2-096 | 29.4971 | Adder | 34.7 |
| **926311** | AC1-109 1 | 1.3339 | Adder | 1.57 |
| **926321** | AC1-109 2 | 1.3339 | Adder | 1.57 |
| **926331** | AC1-110 1 | 1.3265 | Adder | 1.56 |
| **926341** | AC1-110 2 | 1.3265 | Adder | 1.56 |
| **926351** | AC1-111 1 | 0.5336 | Adder | 0.63 |
| **926361** | AC1-111 2 | 0.5336 | Adder | 0.63 |
| **926371** | AC1-111 3 | 0.5336 | Adder | 0.63 |
| **926381** | AC1-111 4 | 0.5336 | Adder | 0.63 |
| **926391** | AC1-111 5 | 0.5336 | Adder | 0.63 |
| **926401** | AC1-111 6 | 0.5336 | Adder | 0.63 |
| **926431** | AC1-114 | 1.6543 | Adder | 1.95 |
| **927451** | AC1-142A 1 | 2.9724 | Adder | 3.5 |
| **927461** | AC1-142A 2 | 2.9711 | Adder | 3.5 |
| **927511** | AC1-113 1 | 0.8271 | Adder | 0.97 |
| **927521** | AC1-113 2 | 0.8271 | Adder | 0.97 |
| **930481** | AB1-089 | 45.7308 | Adder | 53.8 |
| **930501** | AB1-091 O1 | 49.2090 | Adder | 57.89 |
| **930741** | AB1-122 1O1 | 49.9014 | Adder | 58.71 |
| **930751** | AB1-122 2O1 | 51.4116 | Adder | 60.48 |
| **932881** | AC2-115 1 | 1.6543 | Adder | 1.95 |
| **932891** | AC2-115 2 | 1.6543 | Adder | 1.95 |
| **932921** | AC2-116 | 0.5790 | Adder | 0.68 |
| **932931** | AC2-117 | 8.9559 | Adder | 10.54 |
| **933411** | AC2-154 C | 1.7377 | Adder | 2.04 |
| **933412** | AC2-154 E | 2.8353 | Adder | 3.34 |
| **933431** | AC2-156 C O1 | 0.6670 | Adder | 0.78 |
| **933432** | AC2-156 E O1 | 1.0883 | Adder | 1.28 |
| **933911** | AD1-013 C | 1.2925 | Adder | 1.52 |
| **933912** | AD1-013 E | 2.0647 | Adder | 2.43 |
| **933931** | AD1-016 C | 0.6475 | Adder | 0.76 |
| **933932** | AD1-016 E | 1.0564 | Adder | 1.24 |
| **934101** | AD1-039 1 | 4.8903 | Adder | 5.75 |
| **934111** | AD1-039 2 | 5.0383 | Adder | 5.93 |
| **934431** | AD1-067 C | 0.0919 | Adder | 0.11 |
| **934432** | AD1-067 E | 0.3863 | Adder | 0.45 |
| **934651** | AD1-096 C (Withdrawn : 07/22/2020) | 0.6191 | Adder | 0.73 |
| **934652** | AD1-096 E (Withdrawn : 07/22/2020) | 1.0100 | Adder | 1.19 |
| **934701** | AD1-098 C O1 | 4.8123 | Adder | 5.66 |
| **934702** | AD1-098 E O1 | 3.5135 | Adder | 4.13 |
| **934721** | AD1-100 C | 13.3798 | Adder | 15.74 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **934722** | AD1-100 E | 62.4393 | Adder | 73.46 |
| **934871** | AD1-116 C | 0.7173 | Adder | 0.84 |
| **934872** | AD1-116 E | 1.1704 | Adder | 1.38 |
| **934971** | AD1-129 C | 0.6293 | Adder | 0.74 |
| **934972** | AD1-129 E | 0.4195 | Adder | 0.49 |
| **936291** | AD2-038 C O1 | 1.6921 | Adder | 1.99 |
| **936292** | AD2-038 E O1 | 11.3243 | Adder | 13.32 |
| **936371** | AD2-047 C O1 | 3.1096 | Adder | 3.66 |
| **936372** | AD2-047 E O1 | 15.1824 | Adder | 17.86 |
| **936461** | AD2-060 | 1.8292 | Adder | 2.15 |
| **936511** | AD2-066 C O1 | 5.8817 | Adder | 6.92 |
| **936512** | AD2-066 E O1 | 3.9211 | Adder | 4.61 |
| **936791** | AD2-102 C | 9.8257 | Adder | 11.56 |
| **936792** | AD2-102 E | 6.5504 | Adder | 7.71 |
| **937001** | AD2-134 C | 1.9126 | Adder | 2.25 |
| **937002** | AD2-134 E | 7.9011 | Adder | 9.3 |
| **937401** | AD2-194 1 | 5.4728 | Adder | 6.44 |
| **937411** | AD2-194 2 | 5.4769 | Adder | 6.44 |
| **938511** | AE1-070 1 | 6.4306 | Adder | 7.57 |
| **938521** | AE1-070 2 | 5.8877 | Adder | 6.93 |
| **938851** | AE1-113 C | 5.5287 | Adder | 6.5 |
| **938852** | AE1-113 E | 19.6016 | Adder | 23.06 |
| **939321** | AE1-163 C O1 | 4.2520 | Adder | 5.0 |
| **939322** | AE1-163 E O1 | 26.1197 | Adder | 30.73 |
| **939351** | AE1-166 C O1 | 7.1193 | Adder | 8.38 |
| **939352** | AE1-166 E O1 | 6.5717 | Adder | 7.73 |
| **940752** | AE2-062 E | 0.0901 | Adder | 0.11 |
| **941131** | AE2-107 C | 5.0975 | Adder | 6.0 |
| **941132** | AE2-107 E | 3.3983 | Adder | 4.0 |
| **941551** | AE2-152 C O1 | 8.2146 | Adder | 9.66 |
| **941552** | AE2-152 E O1 | 5.4764 | Adder | 6.44 |
| **941561** | AE2-153 C O1 | 3.2948 | Adder | 3.88 |
| **941562** | AE2-153 E O1 | 15.4256 | Adder | 18.15 |
| **942421** | AE2-255 C O1 | 2.0942 | Adder | 2.46 |
| **942422** | AE2-255 E O1 | 6.2826 | Adder | 7.39 |
| **942651** | AE2-281 C O1 | 0.6074 | Adder | 0.71 |
| **942652** | AE2-281 E O1 | 3.7314 | Adder | 4.39 |
| **942991** | AE2-321 C | 5.6990 | Adder | 6.7 |
| **942992** | AE2-321 E | 2.8070 | Adder | 3.3 |
| **943121** | AE2-341 C | 8.9093 | Adder | 10.48 |
| **943122** | AE2-341 E | 4.3749 | Adder | 5.15 |
| **943381** | AF1-009 C | 0.4163 | Adder | 0.49 |
| **943382** | AF1-009 E | 1.6651 | Adder | 1.96 |
| **943591** | AF1-030 C O1 | 5.9248 | Adder | 6.97 |
| **943592** | AF1-030 E O1 | 2.9314 | Adder | 3.45 |
| **943801** | AF1-048 C | 2.6641 | Adder | 3.13 |
| **943802** | AF1-048 E | 1.7760 | Adder | 2.09 |
| **944041** | AF1-072 | 1.5041 | Adder | 1.77 |
| **944911** | AF1-156 C | 8.4242 | Adder | 9.91 |
| **944912** | AF1-156 E | 5.6161 | Adder | 6.61 |
| **945351** | AF1-200 FTIR | 216.1577 | Merchant Transmission | 216.1577 |
| **946661** | AF1-330 C | 1.3972 | Adder | 1.64 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **946662** | AF1-330 E | 0.3067 | Adder | 0.36 |
| **946671** | AF1-331 | 1.6786 | Adder | 1.97 |
| **957021** | AF2-003 C O2 | 2.3534 | Adder | 5.22 |
| **957022** | AF2-003 E O2 | 11.0183 | Adder | 24.46 |
| **957331** | AF2-027 C | 0.9255 | Adder | 2.05 |
| **957332** | AF2-027 E | 1.3883 | Adder | 3.08 |
| **957471** | AF2-041 C | 7.8536 | Adder | 17.43 |
| **957472** | AF2-041 E | 5.2357 | Adder | 11.62 |
| **958011** | AF2-095 C O2 | 6.5839 | Adder | 14.61 |
| **958012** | AF2-095 E O2 | 3.0983 | Adder | 6.88 |
| **958021** | AF2-096 C O2 | 12.6477 | Adder | 28.07 |
| **958022** | AF2-096 E O2 | 5.9811 | Adder | 13.28 |
| **958481** | AF2-142 C | 4.5021 | Adder | 9.99 |
| **958482** | AF2-142 E | 3.0014 | Adder | 6.66 |
| **958491** | AF2-143 C | 4.1392 | Adder | 9.19 |
| **958492** | AF2-143 E | 2.7595 | Adder | 6.13 |
| **959081** | AF2-199 C O2 | 2.6179 | Adder | 5.81 |
| **959082** | AF2-199 E O2 | 1.7452 | Adder | 3.87 |
| **959091** | AF2-200 C O2 | 5.2357 | Adder | 11.62 |
| **959092** | AF2-200 E O2 | 3.4905 | Adder | 7.75 |
| **959101** | AF2-201 C O2 | 0.7794 | Adder | 1.73 |
| **959102** | AF2-201 E O2 | 2.2381 | Adder | 4.97 |
| **959351** | AF2-226 C | 0.8756 | Adder | 1.94 |
| **959352** | AF2-226 E | 1.3134 | Adder | 2.92 |
| **959761** | AF2-267 C O2 | 1.6005 | Adder | 3.55 |
| **959762** | AF2-267 E O2 | 7.4929 | Adder | 16.63 |
| **960281** | AF2-319 C | 0.8756 | Adder | 1.94 |
| **960282** | AF2-319 E | 1.3134 | Adder | 2.92 |
| **960381** | AF2-329 | 2.4501 | Adder | 5.44 |
| **960581** | AF2-349 C | 8.0603 | Adder | 17.89 |
| **960582** | AF2-349 E | 5.3736 | Adder | 11.93 |
| **960591** | AF2-350 C O2 | 2.9082 | Adder | 6.46 |
| **960592** | AF2-350 E O2 | 1.9388 | Adder | 4.3 |
| **960601** | AF2-351 C O2 | 0.3878 | Adder | 0.86 |
| **960602** | AF2-351 E O2 | 0.5816 | Adder | 1.29 |
| **960721** | AF2-363 C O2 | 2.1822 | Adder | 4.84 |
| **960722** | AF2-363 E O2 | 1.4548 | Adder | 3.23 |
| **960731** | AF2-364 C O2 | 2.2722 | Adder | 5.04 |
| **960732** | AF2-364 E O2 | 1.5148 | Adder | 3.36 |
| **960751** | AF2-366 C O2 | 2.5736 | Adder | 5.71 |
| **960752** | AF2-366 E O2 | 1.7157 | Adder | 3.81 |
| **WEC** | WEC | 3.0779 | Confirmed LTF | 3.0779 |
| **CALDERWOOD** | CALDERWOOD | 0.0691 | Confirmed LTF | 0.0691 |
| **CBM-W2** | CBM-W2 | 14.5536 | Confirmed LTF | 14.5536 |
| **NY** | NY | 0.9246 | Confirmed LTF | 0.9246 |
| **CBM-W1** | CBM-W1 | 47.2252 | Confirmed LTF | 47.2252 |
| **TVA** | TVA | 0.9016 | Confirmed LTF | 0.9016 |
| **O-066** | O-066 | 10.9133 | Confirmed LTF | 10.9133 |
| **CHEOAH** | CHEOAH | 0.0776 | Confirmed LTF | 0.0776 |
| **CBM-S1** | CBM-S1 | 3.0246 | Confirmed LTF | 3.0246 |
| **G-007** | G-007 | 1.6879 | Confirmed LTF | 1.6879 |
| **MADISON** | MADISON | 15.8740 | Confirmed LTF | 15.8740 |

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| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|---|---|---|---|---|
| **MEC** | MEC | 10.4477 | Confirmed LTF | 10.4477 |
| **GIBSON** | GIBSON | 0.1343 | Confirmed LTF | 0.1343 |
| **BLUEG** | BLUEG | 1.6666 | Confirmed LTF | 1.6666 |
| **TRIMBLE** | TRIMBLE | 0.5660 | Confirmed LTF | 0.5660 |
| **CATAWBA** | CATAWBA | 0.2394 | Confirmed LTF | 0.2394 |

## 13.6 Contingency Descriptions - Secondary POI

| Contingency Name | Contingency Definition |
|---|---|
| **AEP_P1-2_#286** | CONTINGENCY 'AEP_P1-2_#286'<br>OPEN BRANCH FROM BUS 243221 TO BUS 348885 CKT 1 / 243221 05EUGENE 345 348885 7BUNSONVILLE 345 1<br>END |
| **COMED_P1-2_345-L11613AB-S** | CONTINGENCY 'COMED_P1-2_345-L11613AB-S'<br>TRIP BRANCH FROM BUS 270666 TO BUS 270664 CKT 1 / B ISL;BT 345 B ISL; B 345<br>TRIP BRANCH FROM BUS 270666 TO BUS 270926 CKT 1 / B ISL;BT 345 WILTO; B 345<br>TRIP BRANCH FROM BUS 270770 TO BUS 270666 CKT 1 / GOODI;4B 345 B ISL;BT 345<br>END |
| **COMED_P1-2_138-L17121_R-R** | CONTINGENCY 'COMED_P1-2_138-L17121_R-R'<br>TRIP BRANCH FROM BUS 272240 TO BUS 271897 CKT 1 / PECAT; B 138 LANCA; R 138<br>TRIP BRANCH FROM BUS 272747 TO BUS 272240 CKT 1 / WEMPL; R 138 PECAT; B 138<br>MOVE 100 PERCENT LOAD FROM BUS 272240 TO BUS 272746 / PECAT; B 138 WEMPL; B 138<br>END |
| **COMED_P4_006-45-BT3-4__** | CONTINGENCY 'COMED_P4_006-45-BT3-4__'<br>TRIP BRANCH FROM BUS 274768 TO BUS 270678 CKT 1 / LEECO;BP 345 BYRON; B 345<br>REMOVE UNIT 1 FROM BUS 274656 / BYRON;1U 25<br>END |
| **COMED_P1-2_345-L0627__B-R** | CONTINGENCY 'COMED_P1-2_345-L0627__B-R'<br>TRIP BRANCH FROM BUS 274768 TO BUS 270678 CKT 1 / LEECO;BP 345 BYRON; B 345<br>END |
| **COMED_P1-2_345-L0626__B-R-B** | CONTINGENCY 'COMED_P1-2_345-L0626__B-R-B'<br>TRIP BRANCH FROM BUS 930480 TO BUS 270916 CKT 1 / AB1-089 TAP 345 WAYNE ; B 345<br>END |

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| Contingency Name | Contingency Definition |
|---|---|
| **COMED_P4_016-45-BT6-11_** | CONTINGENCY 'COMED_P4_016-45-BT6-11_'<br>TRIP BRANCH FROM BUS 270914 TO BUS 270830 CKT 1 / WAUKEGAN ; B 345 NBROOK159; B 345<br>TRIP BRANCH FROM BUS 270915 TO BUS 270914 CKT 1 / WAUKEGAN ; R 345 WAUKEGAN ; B 345<br>TRIP BRANCH FROM BUS 275206 TO BUS 270830 CKT 1 / NBROOK159;2M 138 NBROOK159; B 345<br>TRIP BRANCH FROM BUS 275206 TO BUS 272120 CKT 1 / NBROOK159;2M 138 NBROOK159; B 138<br>TRIP BRANCH FROM BUS 275206 TO BUS 275306 CKT 1 / NBROOK159;2M 138 NBROOK159;2C 34.5<br>CLOSE BRANCH FROM BUS 272120 TO BUS 272121 CKT 1 / NBROOK159; B 138 NBROOK159; R 138<br>TRIP BRANCH FROM BUS 270942 TO BUS 270915 CKT 1 / ZION STA ;0B 345 WAUKEGAN ; R 345<br>END |
| **AEP_P4_#2978_05DUMONT_FSA** | CONTINGENCY 'AEP_P4_#2978_05DUMONT_FSA'<br>OPEN BRANCH FROM BUS 243206 TO BUS 907040 CKT 1 / 243206 05DUMONT 765 X1-020<br>OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTON ; 765 1<br>END |
| **COMED_P7_138-L11106_B-R_+_345-L15502_B-R** | CONTINGENCY 'COMED_P7_138-L11106_B-R_+_345-L15502_B-R'<br>TRIP BRANCH FROM BUS 271390 TO BUS 271586 CKT 1 / ELECT; B 138 W541 ; B 138<br>TRIP BRANCH FROM BUS 271560 TO BUS 271558 CKT 1 / GLIDD;BT 138 GLIDD; B 138<br>TRIP BRANCH FROM BUS 271560 TO BUS 272728 CKT 1 / GLIDD;BT 138 WATER; B 138<br>TRIP BRANCH FROM BUS 271586 TO BUS 272114 CKT 1 / W541 ; B 138 N AUR; B 138<br>TRIP BRANCH FROM BUS 272114 TO BUS 272522 CKT 1 / N AUR; B 138 SUGAR; B 138<br>TRIP BRANCH FROM BUS 272522 TO BUS 271560 CKT 1 / SUGAR; B 138 GLIDD;BT 138<br>MOVE 100 PERCENT LOAD FROM BUS 271586 TO BUS 271587 / W541 ; B 138 W541 ; R 138<br>MOVE 100 PERCENT LOAD FROM BUS 272522 TO BUS 272523 / SUGAR; B 138 SUGAR; R 138<br>CLOSE LINE FROM BUS 272114 TO BUS 272115 CKT 1 / N AUR; B 138 N AUR; R 138<br>TRIP BRANCH FROM BUS 270828 TO BUS 943410 CKT 1 / NELSON ; B 345 AF1-012<br>END |
| **COMED_P1-2_345-L97116__-R_FSA** | CONTINGENCY 'COMED_P1-2_345-L97116__-R_FSA'<br>TRIP BRANCH FROM BUS 960580 TO BUS 270883 CKT 1 / U3-021 SILVE; R 345<br>END |

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| Contingency Name | Contingency Definition |
|---|---|
| **COMED_P4_171-38-L17121_** | CONTINGENCY 'COMED_P4_171-38-L17121_'<br>TRIP BRANCH FROM BUS 272240 TO BUS 271897 CKT 1 / PECAT; B 138 LANCA; R 138<br>TRIP BRANCH FROM BUS 272747 TO BUS 272240 CKT 1 / WEMPL; R 138 PECAT; B 138<br>MOVE 100 PERCENT LOAD FROM BUS 272240 TO BUS 272746 / PECAT; B 138 WEMPL; B 138<br>DISCONNECT BUS 272747 / WEMPL; R 138<br>END |
| **COMED_P1-2_695_B2** | CONTINGENCY 'COMED_P1-2_695_B2'<br>OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTO; 765 1<br>END |
| **COMED_P2-1_194-L15626__** | CONTINGENCY 'COMED_P2-1_194-L15626__'<br>TRIP BRANCH FROM BUS 271096 TO BUS 272432 CKT 1 / BHAWK;BT 138 SABRO; B 138<br>END |

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| Contingency Name | Contingency Definition |
|---|---|
| **OMED_P4_194-38-L19414_** | CONTINGENCY 'COMED_P4_194-38-L19414_'<br>TRIP BRANCH FROM BUS 271483 TO BUS 273154 CKT 1 / FORDAM ; R 138 FORDHAM ; R 12.5<br>TRIP BRANCH FROM BUS 271495 TO BUS 274184 CKT 6 / FREEPORT ;5R 138 FREEPORT; 34.5<br>TRIP BRANCH FROM BUS 271499 TO BUS 271495 CKT 1 / FREEPORT ;5T 138 FREEPORT ;5R 138<br>TRIP BRANCH FROM BUS 271499 TO BUS 271897 CKT 1 / FREEPORT ;5T 138 LANCASTER; R 138<br>TRIP BRANCH FROM BUS 272245 TO BUS 271483 CKT 1 / PIERPONT ; R 138 FORDAM ; R 138<br>TRIP BRANCH FROM BUS 272247 TO BUS 272245 CKT 1 / PIERPONT ;RT 138 PIERPONT ; R 138<br>TRIP BRANCH FROM BUS 272247 TO BUS 272491 CKT 1 / PIERPONT ;RT 138 S PECATON; R 138<br>TRIP BRANCH FROM BUS 272433 TO BUS 272247 CKT 1 / SABROOKE ; R 138 PIERPONT ;RT 138<br>TRIP BRANCH FROM BUS 272599 TO BUS 271499 CKT 1 / ESS B427 ;4T 138 FREEPORT ;5T 138<br>TRIP BRANCH FROM BUS 272599 TO BUS 272491 CKT 1 / ESS B427 ;4T 138 S PECATON; R 138<br>TRIP BRANCH FROM BUS 272599 TO BUS 272597 CKT 1 / ESS B427 ;4T 138 ESS B427 ; R 138<br>MOVE 100 PERCENT LOAD FROM BUS 271495 TO BUS 271494 / FREEPORT ;5R 138 FREEPORT ;2R 138<br>MOVE 100 PERCENT LOAD FROM BUS 272245 TO BUS 272244 / PIERPONT ; R 138 PIERPONT ; B 138<br>MOVE 50 PERCENT LOAD FROM BUS 272491 TO BUS 272240 / S PECATON; R 138 PECATONIC; B 138<br>MOVE 50 PERCENT LOAD FROM BUS 272491 TO BUS 272244 / S PECATON; R 138 PIERPONT ; B 138<br>CLOSE BRANCH FROM BUS 272596 TO BUS 272597 CKT 1 / ESS B427 ; B 138 ESS B427 ; R 138<br>MOVE 100 PERCENT LOAD FROM BUS 272433 TO BUS 272432 / SABROOKE ; R 138 SABROOKE ; B 138<br>DISCONNECT BUS 272433 / SABROOKE ; R 138<br>END |
| **COMED_P2-1_119-L17121__** | CONTINGENCY 'COMED_P2-1_119-L17121__'<br>TRIP BRANCH FROM BUS 272240 TO BUS 271897 CKT 1 / PECAT; B 138 LANCA; R 138<br>END |

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| Contingency Name | Contingency Definition |
|---|---|
| **COMED_P1-2_138-L19414GR-R** | CONTINGENCY 'COMED_P1-2_138-L19414GR-R'<br>TRIP BRANCH FROM BUS 271483 TO BUS 273154 CKT 1 / FORDAM ; R 138 FORDHAM ; R 12.5<br>TRIP BRANCH FROM BUS 271495 TO BUS 274184 CKT 6 / FREEPORT ;5R 138 FREEPORT; 34.5<br>TRIP BRANCH FROM BUS 271499 TO BUS 271495 CKT 1 / FREEPORT ;5T 138 FREEPORT ;5R 138<br>TRIP BRANCH FROM BUS 271499 TO BUS 271897 CKT 1 / FREEPORT ;5T 138 LANCASTER; R 138<br>TRIP BRANCH FROM BUS 272245 TO BUS 271483 CKT 1 / PIERPONT ; R 138 FORDAM ; R 138<br>TRIP BRANCH FROM BUS 272247 TO BUS 272245 CKT 1 / PIERPONT ;RT 138 PIERPONT ; R 138<br>TRIP BRANCH FROM BUS 272247 TO BUS 272491 CKT 1 / PIERPONT ;RT 138 S PECATON; R 138<br>TRIP BRANCH FROM BUS 272433 TO BUS 272247 CKT 1 / SABROOKE ; R 138 PIERPONT ;RT 138<br>TRIP BRANCH FROM BUS 272599 TO BUS 271499 CKT 1 / ESS B427 ;4T 138 FREEPORT ;5T 138<br>TRIP BRANCH FROM BUS 272599 TO BUS 272491 CKT 1 / ESS B427 ;4T 138 S PECATON; R 138<br>TRIP BRANCH FROM BUS 272599 TO BUS 272597 CKT 1 / ESS B427 ;4T 138 ESS B427 ; R 138<br>MOVE 100 PERCENT LOAD FROM BUS 271495 TO BUS 271494 / FREEPORT ;5R 138 FREEPORT ;2R 138<br>MOVE 100 PERCENT LOAD FROM BUS 272245 TO BUS 272244 / PIERPONT ; R 138 PIERPONT ; B 138<br>MOVE 50 PERCENT LOAD FROM BUS 272491 TO BUS 272240 / S PECATON; R 138 PECATONIC; B 138<br>MOVE 50 PERCENT LOAD FROM BUS 272491 TO BUS 272244 / S PECATON; R 138 PIERPONT ; B 138<br>CLOSE BRANCH FROM BUS 272596 TO BUS 272597 CKT 1 / ESS B427 ; B 138 ESS B427 ; R 138<br>END |
| **Base Case** | |
| **COMED_P4_023-65-BT2-3__** | CONTINGENCY 'COMED_P4_023-65-BT2-3__'<br>TRIP BRANCH FROM BUS 270644 TO BUS 243206 CKT 1 / WILTO; 765 05DUMONT 765<br>TRIP BRANCH FROM BUS 270607 TO BUS 270630 CKT 1 / COLLI; 765 PLANO; 765<br>END |
| **COMED_P2-1_194-L15622__** | CONTINGENCY 'COMED_P2-1_194-L15622__'<br>TRIP BRANCH FROM BUS 271097 TO BUS 272433 CKT 1 / BHAWK;RT 138 SABRO; R 138<br>END |

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| Contingency Name | Contingency Definition |
|---|---|
| **AEP_P4_#2978_05DUMONT_NON_FSA** | CONTINGENCY 'AEP_P4_#2978_05DUMONT_NON_FSA'<br>OPEN BRANCH FROM BUS 243206 TO BUS 907040 CKT 1 / 243206 05DUMONT 765 X1-020<br>OPEN BRANCH FROM BUS 243207 TO BUS 907040 CKT 1<br>OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTON ; 765 1<br>END |

# 14 Affected Systems

## 14.1 MISO

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

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