



**Generation Interconnection
Feasibility Study Report
for
Queue Project AG1-464
HARRINGTON 69 KV
20 MW Capacity / 50 MW Energy**

January 2021

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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 DPL.

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

3 General

The Interconnection Customer (IC), has proposed a Storage generating facility located in Kent County, Delaware. The installed facilities will have a total capability of 50 MW with 20 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is September 17, 2023. This study does not imply a TO commitment to this in-service date.

| | |
|----------------------------|------------------|
| Queue Number | AG1-464 |
| Project Name | HARRINGTON 69 KV |
| State | Delaware |
| County | Kent |
| Transmission Owner | DPL |
| MFO | 50 |
| MWE | 50 |
| MWC | 20 |
| Fuel | Storage |
| Basecase Study Year | 2024 |

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

4 Point of Interconnection

AG1-464 will interconnect with the DPL system via a new terminal position on the 69kV bus at the Harrington Substation.

5 Cost Summary

The AG1-464 project will be responsible for the following costs:

| Description | Total Cost |
|---|----------------------|
| Total Physical Interconnection Costs | \$2,475,000 |
| Total System Network Upgrade Costs | \$178,358,315 |
| Total Costs | \$180,833,315 |

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

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

6 Transmission Owner Scope of Work

AG1-464 will require a new terminal position on the 69kV ring bus at the Harrington Substation

Major Equipment:

- One (1) 2000A 69 kV circuit breaker
- Three (3) 2000A 69 kV disconnect switches
- Associated Bus work
- Three Relay Panels
- FL & BU Bus relays
- Two (2) breaker control relays

Estimated Cost: \$2,475,000

Estimate Assumptions:

- Any additional land required will be provided by IC and is not included in the cost estimate
- Site prep to be performed by IC if additional land required
- Existing control house can accommodate necessary relaying equipment.

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

| Description | Total Cost |
|---|--------------------|
| Total Physical Interconnection Costs | \$2,475,000 |

7 Schedule

Design, procurement and construction of the new terminal position will take approximately 24-30 months from the date of execution of an ISA

8 Transmission Owner Analysis

None

9 Interconnection Customer Requirements

9.1 Required Relaying and Communications

Front line and back-up line protection will be required. One relay panel for each new terminal will be required for front line and back-up protection

A breaker control relay on a breaker control panel will be required for the control and operation of each new 69 kV circuit breaker

9.2 Interconnection Customer Scope of Direct Connection Work

The IC is responsible for all design and construction related to activities on their side of the Point of Interconnection. Site preparation, including grading and an access road, as necessary, is assumed to be by the IC. Route selection, line design, and right-of-way acquisition of the direct connect facilities is not included in this report and is the responsibility of the IC. Protective relaying and metering design and installation must comply with DPL's applicable standards. The IC is also required to provide revenue metering and real-time telemetering data to PJM in conformance with the requirements contained in PJM Manuals M-01 and M-14 and the PJM Tariff.

9.3 DPL Interconnection Customer Scope of Direct Connection Work Requirements

DPL requires that an IC circuit breaker is located within 500 feet of the DPL substation to facilitate the relay protection scheme between DPL and the IC at the Point of Interconnection (POI).

9.4 Special Operating Requirements

1. DPL will require the capability to remotely disconnect the generator from the grid by communication from its System Operations facility. Such disconnection may be facilitated by a generator breaker, or other method depending upon the specific circumstances and the evaluation by DPL.

2. DPL reserves the right to charge the Interconnection Customer operation and maintenance expenses to maintain the Interconnection Customer attachment facilities, including metering and telecommunications facilities, owned by DPL.
3. Interconnection Customer shall design its non-synchronous generation facility with the ability to maintain a power factor between 0.95 leading and 0.95 lagging measured at the generator terminals.

10 Revenue Metering and SCADA Requirements

10.1 PJM Requirements

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

10.2 Meteorological Data Reporting Requirements

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

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

10.3 Interconnected Transmission Owner Requirements

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

<http://www.pjm.com/planning/design-engineering/to-tech-standards/>

Metering requirements are as follows:

A three phase 69 kV revenue metering point will need to be established within the Interconnection Customer Facilities at the Point of Interconnection. The Interconnection Customer will purchase and install all metering instrument transformers as well as construct a metering structure per the DPL's specifications. The secondary wiring connections at the instrument transformers will be completed by the Interconnection Customer and inspected by DPL, while the connections at the metering enclosure will be completed by the DPL. The metering control cable and meter cabinets will be supplied by the DPL and installed by the Interconnection Customer. The Interconnection Customer will install conduit for the control cable between the instrument transformers and the metering enclosure. The location of the metering enclosure will be determined during

construction. The Interconnection Customer will provide 120V power to the meter cabinet. The DPL will provide, program, install, and own the primary & backup solid state multi-function meters for the new metering position.

Each meter will be equipped with load profile, telemetry, and DNP outputs. The Interconnection Customer will be provided with one-meter DNP output for each meter. DPL will supply a wireless modem for MV90 interrogation. In the event that a wireless modem is unable to reliably communicate, the IC will be required to make provisions for a POTS (Plain Old Telephone Service) line or equivalent technology approved by DPL within approximately three feet of the DPL metering position to facilitate remote interrogation and data collection. It is the Interconnection Customer's responsibility to send the data that PJM and DPL require directly to PJM. The Interconnection Customer will grant permission for PJM to send DPL the following telemetry that the Interconnection Customer sends to PJM: real time MW, MVAR, volts, amperes, generator status, and interval MWH and MVARH.

DPL's revenue meters will be the official meters and must be the source for reporting generation output to PJM. The Interconnection Customer is responsible for installing telemetry equipment necessary to obtain the revenue meter data and submitting the data to PJM.

11 Summer Peak - Load Flow Analysis

The Queue Project AG1-464 was evaluated as a 50.1 MW (Capacity 20.0 MW) injection in the DPL area. Project AG1-464 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-464 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

11.1 Generation Deliverability

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

None

11.2 Multiple Facility Contingency

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

None

11.3 Contribution to Previously Identified Overloads

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

| ID | FROM BUS# | FROM BUS | kV | FROM BUS AREA | TO BUS# | TO BUS | kV | TO BUS AREA | CK T ID | CONT NAME | Type | Rating MVA | PRE PROJECT LOADIN G % | POST PROJECT LOADIN G % | AC/D C | MW IMPACT |
|-----------|-----------|------------|-------|---------------|---------|------------|-------|-------------|---------|-----------------------|-------|------------|------------------------|-------------------------|--------|-----------|
| 165124159 | 232003 | CARTANZA | 230.0 | DP&L | 232013 | SILVER RUN | 230.0 | PJM | 1 | DPL_P7_1_DBL_1NCB_FSA | tower | 790.0 | 179.88 | 180.69 | DC | 14.27 |
| 165124214 | 232012 | HOPE CREEK | 230.0 | PJM | 200029 | HOPE CRK | 500.0 | PSE&G | 1 | DPL_P7_1_DBL_4NC | tower | 1117.0 | 137.91 | 140.01 | DC | 23.7 |
| 166828649 | 232100 | CHURCH | 138.0 | DP&L | 232107 | TOWNSE ND | 138.0 | DP&L | 1 | DPL_P7_1_DBL_1NCB_FSA | tower | 348.0 | 196.15 | 197.37 | DC | 9.72 |
| 166828659 | 232106 | MIDL TNT P | 138.0 | DP&L | 232104 | MT PLSNT | 138.0 | DP&L | 1 | DPL_P7_1_DBL_1NCB_FSA | tower | 348.0 | 176.43 | 177.64 | DC | 9.72 |
| 166828644 | 232107 | TOWNSE ND | 138.0 | DP&L | 232106 | MIDL TNT P | 138.0 | DP&L | 1 | DPL_P7_1_DBL_1NCB_FSA | tower | 348.0 | 201.89 | 203.1 | DC | 9.72 |

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 | CK T ID | CONT NAME | Type | Rating MVA | PRE PROJECT LOADIN G % | POST PROJECT LOADIN G % | AC/D C | MW IMPACT |
|-----------|-----------|----------|-------|---------------|---------|-----------|-------|-------------|---------|---|-----------|------------|------------------------|-------------------------|--------|-----------|
| 168008774 | 231002 | HARMONY | 230.0 | DP&L | 231001 | EDGE MR 5 | 230.0 | DP&L | 1 | PECO_P1-2_5014/* \$ CHESCO \$ PECO_P1-2_5014 \$ L | operation | 924.0 | 116.73 | 117.26 | DC | 10.9 |

| 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 PROJE CT LOADIN G % | POST PROJE CT LOADIN G % | AC D C | MW IMPAC T |
|-----------|-----------|-------------|-------|---------------|---------|-------------|-------|-------------|--------|---|------------|------------|-------------------------|--------------------------|--------|------------|
| 168008741 | 231124 | GLASGOW | 138.0 | DP&L | 231130 | CECIL138 | 138.0 | DP&L | 1 | PECO_P1-2_5014/* \$ CHESCO \$ PECO_P1-2_5014 \$ L | operatio n | 378.0 | 122.62 | 123.17 | DC | 4.7 |
| 168008635 | 232000 | STEELE | 230.0 | DP&L | 231003 | KEEN_230 | 230.0 | DP&L | 1 | DPL_P1_2_AB 2-037 KEENEY | operatio n | 552.0 | 137.6 | 138.39 | DC | 9.82 |
| 168008797 | 232000 | STEELE | 230.0 | DP&L | 923960 | AB2-037 TAP | 230.0 | DP&L | 2 | DPL_P1_2_CK T 23001 | operatio n | 727.0 | 112.69 | 113.41 | DC | 11.71 |
| 168008489 | 232002 | CEDAR CK | 230.0 | DP&L | 232013 | SILVER RUN | 230.0 | PJM | 1 | CKT 23032B | operatio n | 678.0 | 177.32 | 180.41 | DC | 24.04 |
| 168008491 | 232002 | CEDAR CK | 230.0 | DP&L | 232013 | SILVER RUN | 230.0 | PJM | 1 | Base Case | operatio n | 550.0 | 139.12 | 140.39 | DC | 19.28 |
| 168008504 | 232003 | CARTANZ A | 230.0 | DP&L | 232013 | SILVER RUN | 230.0 | PJM | 1 | DPL_P1_2_CK T 23031 | operatio n | 790.0 | 167.34 | 168.02 | DC | 12.0 |
| 168008505 | 232003 | CARTANZ A | 230.0 | DP&L | 232013 | SILVER RUN | 230.0 | PJM | 1 | Base Case | operatio n | 650.0 | 165.67 | 166.32 | DC | 9.33 |
| 168008472 | 232004 | MILF_230 | 230.0 | DP&L | 232000 | STEELE | 230.0 | DP&L | 1 | CKT 23032B | operatio n | 550.0 | 195.21 | 196.29 | DC | 13.15 |
| 168008474 | 232004 | MILF_230 | 230.0 | DP&L | 232000 | STEELE | 230.0 | DP&L | 1 | Base Case | operatio n | 550.0 | 129.45 | 131.18 | DC | 9.54 |
| 168008569 | 232004 | MILF_230 | 230.0 | DP&L | 232002 | CEDAR CK | 230.0 | DP&L | 1 | CKT 23032B | operatio n | 738.0 | 146.57 | 147.22 | DC | 10.81 |
| 167737577 | 232012 | HOPE CREEK | 230.0 | PJM | 200029 | HOPE CRK | 500.0 | PSE& G | 1 | PJM500_PS_P 1-2_5015 | operatio n | 1117.0 | 115.82 | 116.64 | DC | 12.5 |
| 168008644 | 232013 | SILVER RUN | 230.0 | PJM | 231004 | RL_230 | 230.0 | DP&L | 1 | PJM500_PS_P 1-2_HOPE-SILVER | operatio n | 678.0 | 127.65 | 129.66 | DC | 13.7 |
| 168008767 | 232013 | SILVER RUN | 230.0 | PJM | 231004 | RL_230 | 230.0 | DP&L | 2 | PJM500_PS_P 1-2_HOPE-SILVER | operatio n | 790.0 | 109.97 | 111.69 | DC | 13.72 |
| 168008625 | 232100 | CHURCH | 138.0 | DP&L | 232107 | TOWNSEN D | 138.0 | DP&L | 1 | DPL_P1_2_AB 2-037 KEENEY | operatio n | 348.0 | 140.58 | 142.41 | DC | 7.11 |
| 168008626 | 232100 | CHURCH | 138.0 | DP&L | 232107 | TOWNSEN D | 138.0 | DP&L | 1 | Base Case | operatio n | 280.0 | 136.6 | 138.63 | DC | 5.67 |
| 168008733 | 232106 | MIDLNTNP | 138.0 | DP&L | 232104 | MT PLSNT | 138.0 | DP&L | 1 | DPL_P1_2_AB 2-037 KEENEY | operatio n | 348.0 | 123.52 | 125.35 | DC | 7.11 |
| 168008735 | 232106 | MIDLNTNP | 138.0 | DP&L | 232104 | MT PLSNT | 138.0 | DP&L | 1 | Base Case | operatio n | 273.0 | 118.25 | 120.33 | DC | 5.67 |
| 168008575 | 232107 | TOWNSEN D | 138.0 | DP&L | 232106 | MIDLNTNP | 138.0 | DP&L | 1 | Base Case | operatio n | 273.0 | 150.7 | 152.78 | DC | 5.67 |
| 168008576 | 232107 | TOWNSEN D | 138.0 | DP&L | 232106 | MIDLNTNP | 138.0 | DP&L | 1 | DPL_P1_2_AB 2-037 KEENEY | operatio n | 348.0 | 148.98 | 150.81 | DC | 7.11 |
| 168008807 | 232114 | SHARNGT N | 138.0 | DP&L | 232112 | FELTON | 138.0 | DP&L | 1 | DPL_P1_2_CK T 23031 | operatio n | 242.0 | 104.8 | 107.63 | DC | 6.89 |
| 168008676 | 232117 | VIENNA 8 | 138.0 | DP&L | 232116 | VIENN138 | 138.0 | DP&L | 1 | Base Case | operatio n | 390.0 | 132.71 | 133.22 | DC | 4.43 |
| 168008840 | 232215 | KENT | 69.0 | DP&L | 232813 | VAUGHN | 69.0 | DP&L | 1 | DPL_P1_3_S HRNGTN AT1 | operatio n | 93.0 | 82.42 | 109.33 | DC | 25.03 |
| 168008899 | 232240 | SHARR_69 | 69.0 | DP&L | 232217 | HARRNGT N | 69.0 | DP&L | 1 | Base Case | operatio n | 67.0 | 46.24 | 101.88 | DC | 37.28 |
| 168008715 | 232247 | DUP-SFRD | 69.0 | DP&L | 232824 | PINE ST | 69.0 | DP&L | 1 | DPL_P1_2_CK T 6722 | operatio n | 136.0 | 126.19 | 128.04 | DC | 4.74 |
| 168008717 | 232247 | DUP-SFRD | 69.0 | DP&L | 232824 | PINE ST | 69.0 | DP&L | 1 | Base Case | operatio n | 105.0 | 103.8 | 108.78 | DC | 5.22 |
| 168008501 | 232249 | LAUREL | 69.0 | DP&L | 232247 | DUP-SFRD | 69.0 | DP&L | 1 | DPL_P1_2_CK T 6722 | operatio n | 93.0 | 178.69 | 181.39 | DC | 4.74 |
| 168008502 | 232249 | LAUREL | 69.0 | DP&L | 232247 | DUP-SFRD | 69.0 | DP&L | 1 | Base Case | operatio n | 82.0 | 126.36 | 132.73 | DC | 5.22 |
| 168008871 | 232249 | LAUREL | 69.0 | DP&L | 232828 | SHORT 1 | 69.0 | DP&L | 1 | DPL_P1_2_CK T 6705 | operatio n | 93.0 | 102.77 | 104.28 | DC | 3.12 |
| 168008809 | 232824 | PINE ST | 69.0 | DP&L | 232246 | NSEAF_69 | 69.0 | DP&L | 1 | DPL_P1_2_CK T 6722 | operatio n | 136.0 | 111.78 | 113.63 | DC | 4.74 |
| 169767846 | 923960 | AB2-037 TAP | 230.0 | DP&L | 231003 | KEEN_230 | 230.0 | DP&L | 2 | DPL_P1_2_CK T 23001 | operatio n | 727.0 | 126.36 | 127.07 | DC | 11.71 |

| 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 |
|-----------|-----------|-------------|-------|---------------|---------|-----------|-------|-------------|--------|------------|-----------|------------|-----------------------|------------------------|-------|-----------|
| 169767848 | 923960 | AB2-037 TAP | 230.0 | DP&L | 231003 | KEEN_230 | 230.0 | DP&L | 2 | Base Case | operation | 650.0 | 106.74 | 107.35 | DC | 8.77 |
| 168008536 | 962380 | AG1-087 TAP | 230.0 | DP&L | 232004 | MILF_230 | 230.0 | DP&L | 1 | Base Case | operation | 650.0 | 139.29 | 140.74 | DC | 9.42 |
| 168008752 | 962380 | AG1-087 TAP | 230.0 | DP&L | 232003 | CARTANZ A | 230.0 | DP&L | 1 | CKT 23030B | operation | 804.0 | 116.94 | 119.12 | DC | 17.9 |

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

| ID | Idx | Facility | Upgrade Description | Cost |
|-----------|-----|--|--|--------------|
| 165124214 | 2 | HOPE CREEK 230.0 kV - HOPE CRK 500.0 kV Ckt 1 | <p>Facility owned by LS Power (457) : This facility is owned by LS Power. LS Power, will not evaluate this violation until the impact study phase. Project Type : FAC Cost : \$0 Time Estimate : Months</p> <p>r_PS_I025a_HC230500 (1326) : Upgrade Hope Creek 500/230kV transformer terminal equipment to achieve a SER of 1748 MVA Project Type : FAC Cost : \$1,608,315 Time Estimate : 15.0 Months</p> | \$1,608,315 |
| 166828649 | 3 | CHURCH 138.0 kV - TOWNSEND 138.0 kV Ckt 1 | <p>ds13833r0001 (979) : To mitigate the (DP&L) CHURCH to TOWNSEND 138 kV line (from bus 232100 to bus 232107 ckt 1) overload will require substation reinforcements at Church Substation. Project Type : FAC Cost : \$500,000 Time Estimate : 24-36 Months</p> <p>ds13833r0002 (980) : To mitigate the (DP&L) CHURCH to TOWNSEND 138 kV line (from bus 232100 to bus 232107 ckt 1) overload will require substation reinforcements (on top of ds13833r001) at Church Substation. Project Type : FAC Cost : \$200,000 Time Estimate : 24.0 Months</p> <p>ds13833r0003 (981) : To mitigate the (DP&L) CHURCH to TOWNSEND 138 kV line (from bus 232100 to bus 232107 ckt 1) overload will require substation reinforcements (on top of ds13833r001, ds13833r002) at Church Substation. Project Type : FAC Cost : \$100,000 Time Estimate : 12-18 Months</p> <p>dt13833r0001 (982) : To mitigate the (DP&L) CHURCH to TOWNSEND 138 kV line (from bus 232100 to bus 232107 ckt 1) overload will require a rebuild of the 13833 Church to Townsend 138 kV Line along with substation reinforcements (on top of ds13833r001, ds13833r002, ds13833r003) at Church and Townsend Substations Project Type : FAC Cost : \$26,000,000 Time Estimate : 48-60 Months</p> | \$26,800,000 |

| | | | | |
|-----------|---|--|--|---------------|
| 165124159 | 1 | CARTANZA 230.0 kV - SILVER RUN 230.0 kV Ckt 1 | <p>dt23032r0001 (452) : Rebuild Cartanza - Silver Run 230 kV line Project Type : FAC Cost : \$65,000,000 Time Estimate : 48-60 Months</p> <p>dt23032r0002 (453) : Rebuild Cartanza - Silver Run 230 kV line Project Type : FAC Cost : \$67,000,000 Time Estimate : 48-60 Months</p> <p>ds23032r0001 (454) : Replace 3000A CBs at Cartanza with 4000A CBs Project Type : FAC Cost : \$1,000,000 Time Estimate : 12-18 Months</p> <p>ds23032r0002 (459) : Upgrade relaying at Cartanza Project Type : FAC Cost : \$300,000 Time Estimate : 12.0 Months</p> | \$133,300,000 |
| 166828644 | 5 | TOWNSEND 138.0 kV - MIDLTNTP 138.0 kV Ckt 1 | <p>ds13808r0001 (959) : Upgrade disconnect switch at Middletown Tap Project Type : FAC Cost : \$100,000 Time Estimate : 12.0 Months</p> <p>ds13808r0003 (1020) : Upgrade terminal equipment at Townsend Substation Project Type : FAC Cost : \$300,000 Time Estimate : 12.0 Months</p> <p>dt13808r0005 (1021) : Rebuild the 13808-1 line from Townsend - Middletown Tap with new poles, conductor, foundations, insulators, and OPGW. Terminal equipment at Townsend would also need to be upgraded Project Type : FAC Cost : \$8,250,000 Time Estimate : 36-48 Months</p> | \$8,650,000 |

| | | | | |
|-----------|---|--|--|---------------|
| 166828659 | 4 | MIDLTNTP 138.0 kV - MT PLSNT 138.0 kV Ckt 1 | <p>ds13808r0001 (959) : Upgrade disconnect switch at Middletown Tap Project Type : FAC Cost : \$100,000 Time Estimate : 12.0 Months</p> <p>ds13808r0002 (960) : Upgrade circuit breaker and associated Current Transformers and Switches from 2000A to 3000A at Mt. Pleasant Substation Project Type : FAC Cost : \$400,000 Time Estimate : 12.0 Months</p> <p>dt13808r0003 (1001) : To mitigate the (DPL) Mt. Pleasant - Middletown Tap 138 kV line (from bus 232104 to 232106) overload is will require increasing the emergency rating of the line by rebuilding the line with new poles, conductor, foundations, insulators and OPGW. In addition, terminal upgrades will be required at Mt. Pleasant Project Type : FAC Cost : \$7,500,000 Time Estimate : 36-48 Months</p> | \$8,000,000 |
| | | | TOTAL COST | \$178,358,315 |

11.6 Flow Gate Details

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

11.6.1 Index 1

| ID | FROM BUS# | FROM BUS | FROM BUS AREA | TO BUS# | TO BUS | TO BUS AREA | CKT ID | CONT NAME | Type | Rating MVA | PRE PROJECT LOADING % | POST PROJECT LOADING % | AC DC | MW IMPACT |
|-----------|-----------|----------|---------------|---------|------------|-------------|--------|-----------------------|-------|------------|-----------------------|------------------------|-------|-----------|
| 165124159 | 232003 | CARTANZA | DP&L | 232013 | SILVER RUN | PJM | 1 | DPL_P7_1_DBL_1NCB_FSA | tower | 790.0 | 179.88 | 180.69 | DC | 14.27 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|---------------------------------|--------------------|-------|----------------|
| 232405 | W1-003 E | 3.6565 | Adder | 4.3 |
| 232407 | W1-004 E | 3.6565 | Adder | 4.3 |
| 232409 | W1-005 E | 3.6565 | Adder | 4.3 |
| 232411 | W1-006 E | 3.6565 | Adder | 4.3 |
| 232412 | X1-032 E | 1.1745 | Adder | 1.38 |
| 232418 | X3-008 E | 3.3865 | Adder | 3.98 |
| 232423 | X3-066 E | 0.5827 | Adder | 0.69 |
| 232425 | Y1-079 E | 1.3965 | Adder | 1.64 |
| 232427 | Y1-080 E | 0.5881 | Adder | 0.69 |
| 232429 | Y3-058 E | 1.7612 | Adder | 2.07 |
| 232432 | Z2-076 C | 0.2217 | 50/50 | 0.2217 |
| 232433 | Z2-076 E | 0.7080 | 50/50 | 0.7080 |
| 232434 | Z2-077 C | 0.2217 | 50/50 | 0.2217 |
| 232435 | Z2-077 E | 0.7080 | 50/50 | 0.7080 |
| 232616 | GEN FOOD | 1.5837 | 50/50 | 1.5837 |
| 232851 | DUP-SFR1 | 2.7717 | Adder | 3.26 |
| 232901 | NORTHST | 4.7928 | 50/50 | 4.7928 |
| 232904 | IR4 | 23.2894 | 50/50 | 23.2894 |
| 232920 | IR10 | 0.9005 | 50/50 | 0.9005 |
| 232922 | MR3 (Deactivation : 01/06/2021) | 67.3618 | 50/50 | 67.3618 |
| 233911 | AB1-137 C | 0.2346 | 50/50 | 0.2346 |
| 233912 | AB1-137 E | 0.6372 | 50/50 | 0.6372 |
| 233916 | AB1-141 E | 1.1818 | Adder | 1.39 |
| 233919 | AB1-142 E | 1.1818 | Adder | 1.39 |
| 233920 | W3-032A-CTG1 | 20.1091 | 50/50 | 20.1091 |
| 233921 | W3-032A-STG1 | 12.1072 | 50/50 | 12.1072 |
| 917082 | CHERRYDALE E | 3.6574 | Adder | 4.3 |
| 918835 | AA1-102 E | 27.2786 | Adder | 32.09 |
| 919831 | AA2-069 (Suspended) | 297.8449 | 50/50 | 297.8449 |
| 923921 | AB2-032 C | 2.5513 | Adder | 3.0 |
| 923922 | AB2-032 E | 1.2006 | Adder | 1.41 |
| 923951 | AB2-036 C | 8.0155 | Adder | 9.43 |
| 923952 | AB2-036 E | 13.1142 | Adder | 15.43 |
| 924681 | AB2-120 C | 13.1921 | 50/50 | 13.1921 |
| 924682 | AB2-120 E | 21.5239 | 50/50 | 21.5239 |
| 924781 | AB2-130 C O1 | 9.1851 | Adder | 10.81 |
| 924782 | AB2-130 E O1 | 14.9862 | Adder | 17.63 |
| 924801 | AB2-133 C O1 | 4.3282 | Adder | 5.09 |
| 924802 | AB2-133 E O1 | 5.4894 | Adder | 6.46 |
| 924821 | AB2-135 C | 5.3552 | Adder | 6.3 |
| 924822 | AB2-135 E | 6.1074 | Adder | 7.19 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|--------------|--------------------|-------|----------------|
| 924831 | AB2-136 C | 6.8664 | Adder | 8.08 |
| 924832 | AB2-136 E | 7.2817 | Adder | 8.57 |
| 924971 | AB2-153 C | 1.4257 | Adder | 1.68 |
| 924972 | AB2-153 E | 2.3262 | Adder | 2.74 |
| 925151 | AB2-172 C | 5.1890 | Adder | 6.1 |
| 925152 | AB2-172 E | 8.4663 | Adder | 9.96 |
| 925261 | AB2-180 C | 4.0422 | Adder | 4.76 |
| 925262 | AB2-180 E | 1.7324 | Adder | 2.04 |
| 925271 | AB2-185 C | 3.1535 | Adder | 3.71 |
| 925272 | AB2-185 E | 1.3515 | Adder | 1.59 |
| 927031 | AC1-190 C | 9.5822 | Adder | 11.27 |
| 927032 | AC1-190 E | 4.1066 | Adder | 4.83 |
| 927191 | AC1-213 C | 0.9301 | Adder | 1.09 |
| 927192 | AC1-213 E | 0.6104 | Adder | 0.72 |
| 930201 | AB1-056 C | 23.0797 | 50/50 | 23.0797 |
| 930202 | AB1-056 E | 65.7269 | 50/50 | 65.7269 |
| 931261 | AB1-176 C | 0.3013 | Adder | 0.35 |
| 931262 | AB1-176 E | 0.4969 | Adder | 0.58 |
| 932161 | AC2-023 C | 7.6175 | Adder | 8.96 |
| 932162 | AC2-023 E | 5.5478 | Adder | 6.53 |
| 933641 | AC2-186 C | 4.6095 | Adder | 5.42 |
| 933642 | AC2-186 E | 7.5208 | Adder | 8.85 |
| 936611 | AD2-076 C O1 | 3.6668 | Adder | 4.31 |
| 936612 | AD2-076 E O1 | 5.9827 | Adder | 7.04 |
| 938651 | AE1-087 C | 4.3697 | Adder | 5.14 |
| 938652 | AE1-087 E | 1.0924 | Adder | 1.29 |
| 938895 | AE1-117 C | 16.9934 | 50/50 | 16.9934 |
| 938896 | AE1-117 E | 45.3158 | 50/50 | 45.3158 |
| 939151 | AE1-145 | 5.9009 | Adder | 6.94 |
| 941021 | AE2-093 C | 4.2623 | Adder | 5.01 |
| 941022 | AE2-093 E | 6.9543 | Adder | 8.18 |
| 941181 | AE2-112 C | 1.2722 | Adder | 1.5 |
| 941182 | AE2-112 E | 2.0756 | Adder | 2.44 |
| 942441 | AE2-257 C | 11.6988 | 50/50 | 11.6988 |
| 942442 | AE2-257 E | 30.8424 | 50/50 | 30.8424 |
| 943361 | AF1-007 C | 0.6809 | 50/50 | 0.6809 |
| 943362 | AF1-007 E | 1.9353 | 50/50 | 1.9353 |
| 943441 | AF1-015 C | 1.6060 | Adder | 1.89 |
| 943442 | AF1-015 E | 2.2178 | Adder | 2.61 |
| 943651 | AF1-036 C | 1.6542 | Adder | 1.95 |
| 943652 | AF1-036 E | 2.2844 | Adder | 2.69 |
| 945661 | AF1-231 C | 2.2416 | Adder | 2.64 |
| 945662 | AF1-231 E | 3.3623 | Adder | 3.96 |
| 945791 | AF1-244 | 2.3465 | Adder | 2.76 |
| 945931 | AF1-258 | 0.9239 | Adder | 1.09 |
| 945941 | AF1-259 | 0.1596 | Adder | 0.19 |
| 957611 | AF2-055 C | 10.3233 | Adder | 12.15 |
| 957612 | AF2-055 E | 4.4243 | Adder | 5.21 |
| 957661 | AF2-060 | 2.6554 | Adder | 3.12 |
| 957671 | AF2-061 O1 | 11.8017 | Adder | 13.88 |
| 959021 | AF2-193 C | 42.6472 | 50/50 | 42.6472 |
| 959022 | AF2-193 E | 115.0400 | 50/50 | 115.0400 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|-------------------|-------------------|--------------------|----------------------|----------------|
| 959031 | AF2-194 C | 42.6472 | 50/50 | 42.6472 |
| 959032 | AF2-194 E | 115.0400 | 50/50 | 115.0400 |
| 959051 | AF2-196 C | 3.1906 | 50/50 | 3.1906 |
| 959052 | AF2-196 E | 7.4447 | 50/50 | 7.4447 |
| 959161 | AF2-207 C O1 | 5.8168 | Adder | 6.84 |
| 959162 | AF2-207 E O1 | 8.7252 | Adder | 10.26 |
| 959571 | AF2-248 C | 0.9837 | Adder | 1.16 |
| 959572 | AF2-248 E | 1.0994 | Adder | 1.29 |
| 959581 | AF2-249 C | 0.1736 | Adder | 0.2 |
| 959582 | AF2-249 E | 0.6944 | Adder | 0.82 |
| 959591 | AF2-250 C | 0.3182 | Adder | 0.37 |
| 959592 | AF2-250 E | 0.2459 | Adder | 0.29 |
| 960221 | AF2-313 C | 2.5342 | Adder | 2.98 |
| 960222 | AF2-313 E | 1.4367 | Adder | 1.69 |
| 960341 | AF2-325 C | 1.1572 | Adder | 1.36 |
| 960342 | AF2-325 E | 1.5980 | Adder | 1.88 |
| 960671 | AF2-358 C O1 | 16.8371 | Adder | 19.81 |
| 960672 | AF2-358 E O1 | 11.2248 | Adder | 13.21 |
| 960871 | AF2-378 C | 0.3066 | Adder | 0.36 |
| 960872 | AF2-378 E | 0.4254 | Adder | 0.5 |
| 960881 | AF2-379 C | 0.4787 | Adder | 0.56 |
| 960882 | AF2-379 E | 0.6597 | Adder | 0.78 |
| 960941 | AF2-385 C | 13.7919 | Adder | 16.23 |
| 960942 | AF2-385 E | 7.8481 | Adder | 9.23 |
| 960961 | AF2-387 C O1 | 16.3042 | Adder | 19.18 |
| 960962 | AF2-387 E O1 | 8.1766 | Adder | 9.62 |
| 961181 | AF2-409 O1 | 28.5031 | Adder | 33.53 |
| 962161 | AG1-061 C O1 | 9.8520 | Adder | 21.87 |
| 962162 | AG1-061 E O1 | 6.5680 | Adder | 14.58 |
| 962261 | AG1-072 | 6.4874 | Adder | 14.4 |
| 962302 | AG1-079 E | 0.1462 | Adder | 0.32 |
| 962381 | AG1-087 C O1 | 49.5802 | 50/50 | 49.5802 |
| 962382 | AG1-087 E O1 | 133.7414 | 50/50 | 133.7414 |
| 963001 | AG1-149 | 0.4664 | Adder | 1.04 |
| 963011 | AG1-150 | 13.8844 | 50/50 | 13.8844 |
| 964551 | AG1-318 C | 0.1061 | 50/50 | 0.1061 |
| 964552 | AG1-318 E | 0.2476 | 50/50 | 0.2476 |
| 964962 | AG1-360 E | 1.3617 | Adder | 3.02 |
| 965321 | AG1-397 C | 0.6508 | Adder | 1.44 |
| 965322 | AG1-397 E | 0.8978 | Adder | 1.99 |
| 965611 | AG1-429 C O1 | 5.5120 | Adder | 12.24 |
| 965612 | AG1-429 E O1 | 3.6736 | Adder | 8.15 |
| 965821 | AG1-450 | 3.7104 | Adder | 8.24 |
| 965921 | AG1-461 C O1 | 2.9786 | Adder | 6.61 |
| 965922 | AG1-461 E O1 | 1.6038 | Adder | 3.56 |
| 965951 | AG1-464 C O1 | 2.5716 | Adder | 5.71 |
| 965952 | AG1-464 E O1 | 3.8575 | Adder | 8.56 |
| 966281 | AG1-497 C O1 | 55.4744 | 50/50 | 55.4744 |
| 966282 | AG1-497 E O1 | 23.7748 | 50/50 | 23.7748 |
| 966601 | AG1-529 C | 7.2988 | Adder | 16.2 |
| 966602 | AG1-529 E | 3.8957 | Adder | 8.65 |
| CALDERWOOD | CALDERWOOD | 0.1839 | Confirmed LTF | 0.1839 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|-------------------|------------|---------------------------|---------------|-----------------------|
| NY | NY | 0.2229 | Confirmed LTF | 0.2229 |
| PRAIRIE | PRAIRIE | 0.9557 | Confirmed LTF | 0.9557 |
| O-066 | O-066 | 2.8199 | Confirmed LTF | 2.8199 |
| SIGE | SIGE | 0.0050 | Confirmed LTF | 0.0050 |
| CHEOAH | CHEOAH | 0.1852 | Confirmed LTF | 0.1852 |
| COTTONWOOD | COTTONWOOD | 0.7770 | Confirmed LTF | 0.7770 |
| G-007 | G-007 | 0.4536 | Confirmed LTF | 0.4536 |
| HAMLET | HAMLET | 0.2131 | Confirmed LTF | 0.2131 |
| GIBSON | GIBSON | 0.2026 | Confirmed LTF | 0.2026 |
| BLUEG | BLUEG | 0.6441 | Confirmed LTF | 0.6441 |
| TRIMBLE | TRIMBLE | 0.2065 | Confirmed LTF | 0.2065 |
| CATAWBA | CATAWBA | 0.1291 | Confirmed LTF | 0.1291 |

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| ID | FROM BUS# | FROM BUS | FROM BUS AREA | TO BUS# | TO BUS | TO BUS AREA | CKT ID | CONT NAME | Type | Rating MVA | PRE PROJECT LOADING % | POST PROJECT LOADING % | AC DC | MW IMPACT |
|-----------|-----------|------------|---------------|---------|----------|-------------|--------|------------------|-------|------------|-----------------------|------------------------|-------|-----------|
| 165124214 | 232012 | HOPE CREEK | PJM | 200029 | HOPE CRK | PSE&G | 1 | DPL_P7_1_DBL_4NC | tower | 1117.0 | 137.91 | 140.01 | DC | 23.7 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|---------------------------------|--------------------|-------|----------------|
| 232405 | W1-003 E | 4.3871 | Adder | 5.16 |
| 232407 | W1-004 E | 4.3871 | Adder | 5.16 |
| 232409 | W1-005 E | 4.3871 | Adder | 5.16 |
| 232411 | W1-006 E | 4.3871 | Adder | 5.16 |
| 232412 | X1-032 E | 1.3954 | Adder | 1.64 |
| 232418 | X3-008 E | 3.6945 | Adder | 4.35 |
| 232423 | X3-066 E | 0.6264 | Adder | 0.74 |
| 232425 | Y1-079 E | 1.3675 | Adder | 1.61 |
| 232427 | Y1-080 E | 0.6616 | Adder | 0.78 |
| 232429 | Y3-058 E | 2.0912 | Adder | 2.46 |
| 232433 | Z2-076 E | 0.7602 | Adder | 0.89 |
| 232435 | Z2-077 E | 0.7602 | Adder | 0.89 |
| 232616 | GEN FOOD | 1.4453 | 50/50 | 1.4453 |
| 232813 | VAUGHN | 0.2195 | 50/50 | 0.2195 |
| 232851 | DUP-SFR1 | 3.8081 | Adder | 4.48 |
| 232899 | W1-062 | 4.4526 | 50/50 | 4.4526 |
| 232900 | DEMECSMY | 4.3617 | 50/50 | 4.3617 |
| 232901 | NORTHST | 4.3739 | 50/50 | 4.3739 |
| 232922 | MR3 (Deactivation : 01/06/2021) | 61.4734 | 50/50 | 61.4734 |
| 233912 | AB1-137 E | 0.6898 | Adder | 0.81 |
| 233916 | AB1-141 E | 1.2494 | Adder | 1.47 |
| 233919 | AB1-142 E | 1.2494 | Adder | 1.47 |
| 233920 | W3-032A-CTG1 | 18.3513 | 50/50 | 18.3513 |
| 233921 | W3-032A-STG1 | 11.0488 | 50/50 | 11.0488 |
| 917082 | CHERRYDALE E | 4.3911 | Adder | 5.17 |
| 918835 | AA1-102 E | 32.3322 | Adder | 38.04 |
| 919831 | AA2-069 (Suspended) | 271.8087 | 50/50 | 271.8087 |
| 923921 | AB2-032 C | 2.6972 | Adder | 3.17 |
| 923922 | AB2-032 E | 1.2693 | Adder | 1.49 |
| 923951 | AB2-036 C | 7.6067 | Adder | 8.95 |
| 923952 | AB2-036 E | 12.4453 | Adder | 14.64 |
| 923961 | AB2-037 C | 16.3092 | Adder | 19.19 |
| 923962 | AB2-037 E | 26.6433 | Adder | 31.35 |
| 924681 | AB2-120 C | 13.4743 | Adder | 15.85 |
| 924682 | AB2-120 E | 21.9843 | Adder | 25.86 |
| 924781 | AB2-130 C O1 | 11.7774 | Adder | 13.86 |
| 924782 | AB2-130 E O1 | 19.2157 | Adder | 22.61 |
| 924801 | AB2-133 C O1 | 5.1399 | Adder | 6.05 |
| 924802 | AB2-133 E O1 | 6.5189 | Adder | 7.67 |
| 924821 | AB2-135 C | 7.6016 | Adder | 8.94 |
| 924822 | AB2-135 E | 8.6694 | Adder | 10.2 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|--------------|--------------------|-------|----------------|
| 924831 | AB2-136 C | 7.6196 | Adder | 8.96 |
| 924832 | AB2-136 E | 8.0804 | Adder | 9.51 |
| 924971 | AB2-153 C | 1.5072 | Adder | 1.77 |
| 924972 | AB2-153 E | 2.4592 | Adder | 2.89 |
| 925151 | AB2-172 C | 5.6609 | Adder | 6.66 |
| 925152 | AB2-172 E | 9.2362 | Adder | 10.87 |
| 925261 | AB2-180 C | 4.7995 | Adder | 5.65 |
| 925262 | AB2-180 E | 2.0569 | Adder | 2.42 |
| 925271 | AB2-185 C | 3.0879 | Adder | 3.63 |
| 925272 | AB2-185 E | 1.3234 | Adder | 1.56 |
| 926131 | AC1-091 C | 4.7147 | 50/50 | 4.7147 |
| 926132 | AC1-091 E | 7.7320 | 50/50 | 7.7320 |
| 926141 | AC1-092 C | 4.7147 | 50/50 | 4.7147 |
| 926142 | AC1-092 E | 7.7320 | 50/50 | 7.7320 |
| 926151 | AC1-093 C | 4.4632 | 50/50 | 4.4632 |
| 926152 | AC1-093 E | 7.3549 | 50/50 | 7.3549 |
| 926161 | AC1-094 C | 3.7717 | 50/50 | 3.7717 |
| 926162 | AC1-094 E | 6.2233 | 50/50 | 6.2233 |
| 927031 | AC1-190 C | 10.4860 | Adder | 12.34 |
| 927032 | AC1-190 E | 4.4940 | Adder | 5.29 |
| 927191 | AC1-213 C | 1.1181 | Adder | 1.32 |
| 927192 | AC1-213 E | 0.7337 | Adder | 0.86 |
| 930201 | AB1-056 C | 24.9494 | Adder | 29.35 |
| 930202 | AB1-056 E | 71.0515 | Adder | 83.59 |
| 931261 | AB1-176 C | 0.3239 | Adder | 0.38 |
| 931262 | AB1-176 E | 0.5341 | Adder | 0.63 |
| 932161 | AC2-023 C | 8.9690 | Adder | 10.55 |
| 932162 | AC2-023 E | 6.5321 | Adder | 7.68 |
| 933631 | AC2-185 C | 9.5550 | 50/50 | 9.5550 |
| 933632 | AC2-185 E | 15.5898 | 50/50 | 15.5898 |
| 933641 | AC2-186 C | 9.0069 | 50/50 | 9.0069 |
| 933642 | AC2-186 E | 14.6955 | 50/50 | 14.6955 |
| 936611 | AD2-076 C O1 | 3.7879 | Adder | 4.46 |
| 936612 | AD2-076 E O1 | 6.1802 | Adder | 7.27 |
| 938651 | AE1-087 C | 4.7671 | Adder | 5.61 |
| 938652 | AE1-087 E | 1.1918 | Adder | 1.4 |
| 938895 | AE1-117 C | 18.3902 | Adder | 21.64 |
| 938896 | AE1-117 E | 49.0405 | Adder | 57.69 |
| 939151 | AE1-145 | 7.0912 | Adder | 8.34 |
| 941021 | AE2-093 C | 3.9383 | Adder | 4.63 |
| 941022 | AE2-093 E | 6.4256 | Adder | 7.56 |
| 941181 | AE2-112 C | 1.3142 | Adder | 1.55 |
| 941182 | AE2-112 E | 2.1442 | Adder | 2.52 |
| 942441 | AE2-257 C | 12.6674 | Adder | 14.9 |
| 942442 | AE2-257 E | 33.3958 | Adder | 39.29 |
| 943361 | AF1-007 C | 0.7361 | Adder | 0.87 |
| 943362 | AF1-007 E | 2.0920 | Adder | 2.46 |
| 943441 | AF1-015 C | 1.4839 | Adder | 1.75 |
| 943442 | AF1-015 E | 2.0492 | Adder | 2.41 |
| 943651 | AF1-036 C | 1.7088 | Adder | 2.01 |
| 943652 | AF1-036 E | 2.3598 | Adder | 2.78 |
| 945661 | AF1-231 C | 2.6907 | Adder | 3.17 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|--------------|--------------------|-------|----------------|
| 945662 | AF1-231 E | 4.0360 | Adder | 4.75 |
| 945791 | AF1-244 | 2.7813 | Adder | 3.27 |
| 945931 | AF1-258 | 1.0970 | Adder | 1.29 |
| 945941 | AF1-259 | 0.1716 | Adder | 0.2 |
| 957611 | AF2-055 C | 12.3941 | Adder | 14.58 |
| 957612 | AF2-055 E | 5.3118 | Adder | 6.25 |
| 957661 | AF2-060 | 3.1910 | Adder | 3.75 |
| 957671 | AF2-061 O1 | 14.1824 | Adder | 16.69 |
| 959021 | AF2-193 C | 46.1021 | Adder | 54.24 |
| 959022 | AF2-193 E | 124.3596 | Adder | 146.31 |
| 959031 | AF2-194 C | 46.1021 | Adder | 54.24 |
| 959032 | AF2-194 E | 124.3596 | Adder | 146.31 |
| 959051 | AF2-196 C | 3.4547 | Adder | 4.06 |
| 959052 | AF2-196 E | 8.0611 | Adder | 9.48 |
| 959161 | AF2-207 C O1 | 7.1013 | Adder | 8.35 |
| 959162 | AF2-207 E O1 | 10.6520 | Adder | 12.53 |
| 959571 | AF2-248 C | 1.1941 | Adder | 1.4 |
| 959572 | AF2-248 E | 1.3345 | Adder | 1.57 |
| 959581 | AF2-249 C | 0.2107 | Adder | 0.25 |
| 959582 | AF2-249 E | 0.8429 | Adder | 0.99 |
| 959591 | AF2-250 C | 0.3863 | Adder | 0.45 |
| 959592 | AF2-250 E | 0.2985 | Adder | 0.35 |
| 960221 | AF2-313 C | 2.7242 | Adder | 3.2 |
| 960222 | AF2-313 E | 1.5444 | Adder | 1.82 |
| 960341 | AF2-325 C | 1.2765 | Adder | 1.5 |
| 960342 | AF2-325 E | 1.7627 | Adder | 2.07 |
| 960671 | AF2-358 C O1 | 18.9909 | Adder | 22.34 |
| 960672 | AF2-358 E O1 | 12.6606 | Adder | 14.89 |
| 960871 | AF2-378 C | 0.3393 | Adder | 0.4 |
| 960872 | AF2-378 E | 0.4708 | Adder | 0.55 |
| 960881 | AF2-379 C | 0.5677 | Adder | 0.67 |
| 960882 | AF2-379 E | 0.7823 | Adder | 0.92 |
| 960941 | AF2-385 C | 16.8375 | Adder | 19.81 |
| 960942 | AF2-385 E | 9.5812 | Adder | 11.27 |
| 960961 | AF2-387 C O1 | 15.0900 | Adder | 17.75 |
| 960962 | AF2-387 E O1 | 7.5676 | Adder | 8.9 |
| 961181 | AF2-409 O1 | 31.1721 | Adder | 36.67 |
| 962161 | AG1-061 C O1 | 12.0296 | Adder | 26.7 |
| 962162 | AG1-061 E O1 | 8.0198 | Adder | 17.8 |
| 962261 | AG1-072 | 6.0043 | Adder | 13.33 |
| 962302 | AG1-079 E | 0.2561 | Adder | 0.57 |
| 962381 | AG1-087 C O1 | 58.9669 | 50/50 | 58.9669 |
| 962382 | AG1-087 E O1 | 159.0619 | 50/50 | 159.0619 |
| 963001 | AG1-149 | 0.5528 | Adder | 1.23 |
| 963011 | AG1-150 | 7.5167 | Adder | 16.69 |
| 964551 | AG1-318 C | 0.0608 | Adder | 0.13 |
| 964552 | AG1-318 E | 0.1419 | Adder | 0.31 |
| 964962 | AG1-360 E | 1.6178 | Adder | 3.59 |
| 965321 | AG1-397 C | 0.7937 | Adder | 1.76 |
| 965322 | AG1-397 E | 1.0949 | Adder | 2.43 |
| 965611 | AG1-429 C O1 | 6.6177 | Adder | 14.69 |
| 965612 | AG1-429 E O1 | 4.4105 | Adder | 9.79 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|-------------------|-------------------|---------------------------|---------------|-----------------------|
| 965821 | AG1-450 | 4.1746 | Adder | 9.27 |
| 965921 | AG1-461 C O1 | 3.8157 | Adder | 8.47 |
| 965922 | AG1-461 E O1 | 2.0546 | Adder | 4.56 |
| 965951 | AG1-464 C O1 | 9.4810 | 50/50 | 9.4810 |
| 965952 | AG1-464 E O1 | 14.2215 | 50/50 | 14.2215 |
| 966281 | AG1-497 C O1 | 50.6251 | 50/50 | 50.6251 |
| 966282 | AG1-497 E O1 | 21.6965 | 50/50 | 21.6965 |
| 966601 | AG1-529 C | 23.5815 | 50/50 | 23.5815 |
| 966602 | AG1-529 E | 12.5865 | 50/50 | 12.5865 |
| CALDERWOOD | CALDERWOOD | 0.1402 | Confirmed LTF | 0.1402 |
| NY | NY | 0.5331 | Confirmed LTF | 0.5331 |
| PRAIRIE | PRAIRIE | 0.7491 | Confirmed LTF | 0.7491 |
| O-066 | O-066 | 8.5336 | Confirmed LTF | 8.5336 |
| SIGE | SIGE | 0.1025 | Confirmed LTF | 0.1025 |
| CHEOAH | CHEOAH | 0.1406 | Confirmed LTF | 0.1406 |
| COTTONWOOD | COTTONWOOD | 0.5985 | Confirmed LTF | 0.5985 |
| G-007 | G-007 | 1.5288 | Confirmed LTF | 1.5288 |
| HAMLET | HAMLET | 0.1542 | Confirmed LTF | 0.1542 |
| GIBSON | GIBSON | 0.1600 | Confirmed LTF | 0.1600 |
| BLUEG | BLUEG | 0.5086 | Confirmed LTF | 0.5086 |
| TRIMBLE | TRIMBLE | 0.1631 | Confirmed LTF | 0.1631 |
| CATAWBA | CATAWBA | 0.0952 | Confirmed LTF | 0.0952 |

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| ID | FROM BUS# | FROM BUS | FROM BUS AREA | TO BUS# | TO BUS | TO BUS AREA | CKT ID | CONT NAME | Type | Rating MVA | PRE PROJECT LOADING % | POST PROJECT LOADING % | AC DC | MW IMPACT |
|-----------|-----------|----------|---------------|---------|----------|-------------|--------|-----------------------|-------|------------|-----------------------|------------------------|-------|-----------|
| 166828649 | 232100 | CHURCH | DP&L | 232107 | TOWNSEND | DP&L | 1 | DPL_P7_1_DBL_1NCB_FSA | tower | 348.0 | 196.15 | 197.37 | DC | 9.72 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|---------------------------------|--------------------|-------|----------------|
| 232405 | W1-003 E | 2.1162 | Adder | 2.49 |
| 232407 | W1-004 E | 2.1162 | Adder | 2.49 |
| 232409 | W1-005 E | 2.1162 | Adder | 2.49 |
| 232411 | W1-006 E | 2.1162 | Adder | 2.49 |
| 232412 | X1-032 E | 0.6923 | Adder | 0.81 |
| 232417 | X3-008 C | 0.3001 | 50/50 | 0.3001 |
| 232418 | X3-008 E | 3.1031 | 50/50 | 3.1031 |
| 232422 | X3-066 C | 0.1518 | 50/50 | 0.1518 |
| 232423 | X3-066 E | 1.2321 | 50/50 | 1.2321 |
| 232424 | Y1-079 C | 0.2221 | 50/50 | 0.2221 |
| 232425 | Y1-079 E | 2.2972 | 50/50 | 2.2972 |
| 232426 | Y1-080 FULL | 0.0468 | 50/50 | 0.0468 |
| 232427 | Y1-080 E | 0.4865 | 50/50 | 0.4865 |
| 232428 | Y3-058 C | 0.1887 | 50/50 | 0.1887 |
| 232429 | Y3-058 E | 1.2800 | 50/50 | 1.2800 |
| 232433 | Z2-076 E | 0.3195 | Adder | 0.38 |
| 232435 | Z2-077 E | 0.3195 | Adder | 0.38 |
| 232813 | VAUGHN | 0.1051 | 50/50 | 0.1051 |
| 232851 | DUP-SFR1 | 1.6269 | Adder | 1.91 |
| 232902 | EASTMUNI | 3.3846 | 50/50 | 3.3846 |
| 232907 | VN8 | 5.4177 | 50/50 | 5.4177 |
| 232910 | NRG_G1 | 1.6595 | 50/50 | 1.6595 |
| 232911 | NRG_G2 | 1.6595 | 50/50 | 1.6595 |
| 232919 | VN10 | 0.4103 | 50/50 | 0.4103 |
| 232922 | MR3 (Deactivation : 01/06/2021) | 9.0454 | Adder | 10.64 |
| 232926 | CRISFLD1 | 0.3223 | 50/50 | 0.3223 |
| 233912 | AB1-137 E | 0.2813 | Adder | 0.33 |
| 233915 | AB1-141 C | 0.9820 | 50/50 | 0.9820 |
| 233916 | AB1-141 E | 2.9046 | 50/50 | 2.9046 |
| 233918 | AB1-142 C | 0.9820 | 50/50 | 0.9820 |
| 233919 | AB1-142 E | 2.9046 | 50/50 | 2.9046 |
| 233923 | AA1-102 C | 1.8373 | 50/50 | 1.8373 |
| 233931 | AB2-179 C | -9.2465 | Adder | -10.88 |
| 293670 | O-025 C | 0.1942 | 50/50 | 0.1942 |
| 917082 | CHERRYDALE E | 2.1143 | Adder | 2.49 |
| 918835 | AA1-102 E | 19.0008 | 50/50 | 19.0008 |
| 919831 | AA2-069 (Suspended) | 39.9949 | Adder | 47.05 |
| 923921 | AB2-032 C | 6.2703 | 50/50 | 6.2703 |
| 923922 | AB2-032 E | 2.9507 | 50/50 | 2.9507 |
| 923951 | AB2-036 C | 12.6635 | 50/50 | 12.6635 |
| 923952 | AB2-036 E | 20.7187 | 50/50 | 20.7187 |
| 924681 | AB2-120 C | 6.4703 | Adder | 7.61 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|--------------|--------------------|-------|----------------|
| 924682 | AB2-120 E | 10.5569 | Adder | 12.42 |
| 924781 | AB2-130 C O1 | 5.4550 | Adder | 6.42 |
| 924782 | AB2-130 E O1 | 8.9003 | Adder | 10.47 |
| 924801 | AB2-133 C O1 | 11.5421 | 50/50 | 11.5421 |
| 924802 | AB2-133 E O1 | 14.6387 | 50/50 | 14.6387 |
| 924821 | AB2-135 C | 12.2976 | 50/50 | 12.2976 |
| 924822 | AB2-135 E | 14.0250 | 50/50 | 14.0250 |
| 924831 | AB2-136 C | 5.9562 | 50/50 | 5.9562 |
| 924832 | AB2-136 E | 6.3165 | 50/50 | 6.3165 |
| 924971 | AB2-153 C | 3.5040 | 50/50 | 3.5040 |
| 924972 | AB2-153 E | 5.7170 | 50/50 | 5.7170 |
| 925151 | AB2-172 C | 4.7548 | 50/50 | 4.7548 |
| 925152 | AB2-172 E | 7.7578 | 50/50 | 7.7578 |
| 925261 | AB2-180 C | 2.9378 | 50/50 | 2.9378 |
| 925262 | AB2-180 E | 1.2590 | 50/50 | 1.2590 |
| 925271 | AB2-185 C | 5.1871 | 50/50 | 5.1871 |
| 925272 | AB2-185 E | 2.2231 | 50/50 | 2.2231 |
| 926131 | AC1-091 C | 0.6418 | Adder | 0.76 |
| 926132 | AC1-091 E | 1.0526 | Adder | 1.24 |
| 926141 | AC1-092 C | 0.6418 | Adder | 0.76 |
| 926142 | AC1-092 E | 1.0526 | Adder | 1.24 |
| 926151 | AC1-093 C | 0.6076 | Adder | 0.71 |
| 926152 | AC1-093 E | 1.0013 | Adder | 1.18 |
| 926161 | AC1-094 C | 0.5135 | Adder | 0.6 |
| 926162 | AC1-094 E | 0.8472 | Adder | 1.0 |
| 927031 | AC1-190 C | 8.6961 | 50/50 | 8.6961 |
| 927032 | AC1-190 E | 3.7269 | 50/50 | 3.7269 |
| 927191 | AC1-213 C | 0.6564 | 50/50 | 0.6564 |
| 927192 | AC1-213 E | 0.4308 | 50/50 | 0.4308 |
| 930201 | AB1-056 C | 9.8959 | Adder | 11.64 |
| 930202 | AB1-056 E | 28.1818 | Adder | 33.16 |
| 931261 | AB1-176 C | 0.6372 | 50/50 | 0.6372 |
| 931262 | AB1-176 E | 1.0507 | 50/50 | 1.0507 |
| 932161 | AC2-023 C | 5.6437 | 50/50 | 5.6437 |
| 932162 | AC2-023 E | 4.1103 | 50/50 | 4.1103 |
| 933631 | AC2-185 C | 1.3008 | Adder | 1.53 |
| 933632 | AC2-185 E | 2.1223 | Adder | 2.5 |
| 933641 | AC2-186 C | 3.1389 | Adder | 3.69 |
| 933642 | AC2-186 E | 5.1214 | Adder | 6.03 |
| 936611 | AD2-076 C O1 | 8.1710 | 50/50 | 8.1710 |
| 936612 | AD2-076 E O1 | 13.3317 | 50/50 | 13.3317 |
| 938651 | AE1-087 C | 4.0040 | 50/50 | 4.0040 |
| 938652 | AE1-087 E | 1.0010 | 50/50 | 1.0010 |
| 938895 | AE1-117 C | 7.5027 | Adder | 8.83 |
| 938896 | AE1-117 E | 20.0072 | Adder | 23.54 |
| 939151 | AE1-145 | 3.4061 | Adder | 4.01 |
| 941021 | AE2-093 C | 5.0565 | 50/50 | 5.0565 |
| 941022 | AE2-093 E | 8.2500 | 50/50 | 8.2500 |
| 941181 | AE2-112 C | 2.8348 | 50/50 | 2.8348 |
| 941182 | AE2-112 E | 4.6253 | 50/50 | 4.6253 |
| 942441 | AE2-257 C | 5.1449 | Adder | 6.05 |
| 942442 | AE2-257 E | 13.5639 | Adder | 15.96 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|--------------|--------------------|-------|----------------|
| 943361 | AF1-007 C | 0.2920 | Adder | 0.34 |
| 943362 | AF1-007 E | 0.8298 | Adder | 0.98 |
| 943441 | AF1-015 C | 1.9052 | 50/50 | 1.9052 |
| 943442 | AF1-015 E | 2.6311 | 50/50 | 2.6311 |
| 943651 | AF1-036 C | 3.6862 | 50/50 | 3.6862 |
| 943652 | AF1-036 E | 5.0904 | 50/50 | 5.0904 |
| 945661 | AF1-231 C | 1.2961 | Adder | 1.52 |
| 945662 | AF1-231 E | 1.9442 | Adder | 2.29 |
| 945791 | AF1-244 | 1.6345 | 50/50 | 1.6345 |
| 945931 | AF1-258 | 0.6715 | 50/50 | 0.6715 |
| 945941 | AF1-259 | 0.3376 | 50/50 | 0.3376 |
| 957611 | AF2-055 C | 5.9678 | Adder | 7.02 |
| 957612 | AF2-055 E | 2.5577 | Adder | 3.01 |
| 957661 | AF2-060 | 1.5328 | Adder | 1.8 |
| 957671 | AF2-061 O1 | 6.8122 | Adder | 8.01 |
| 959021 | AF2-193 C | 18.2859 | Adder | 21.51 |
| 959022 | AF2-193 E | 49.3258 | Adder | 58.03 |
| 959031 | AF2-194 C | 18.2859 | Adder | 21.51 |
| 959032 | AF2-194 E | 49.3258 | Adder | 58.03 |
| 959051 | AF2-196 C | 1.4032 | Adder | 1.65 |
| 959052 | AF2-196 E | 3.2740 | Adder | 3.85 |
| 959161 | AF2-207 C O1 | 3.4920 | Adder | 4.11 |
| 959162 | AF2-207 E O1 | 6.1623 | 50/50 | 6.1623 |
| 959571 | AF2-248 C | 0.6946 | 50/50 | 0.6946 |
| 959572 | AF2-248 E | 0.7763 | 50/50 | 0.7763 |
| 959581 | AF2-249 C | 0.1226 | 50/50 | 0.1226 |
| 959582 | AF2-249 E | 0.4903 | 50/50 | 0.4903 |
| 959591 | AF2-250 C | 0.2247 | 50/50 | 0.2247 |
| 959592 | AF2-250 E | 0.1736 | 50/50 | 0.1736 |
| 960221 | AF2-313 C | 5.3589 | 50/50 | 5.3589 |
| 960222 | AF2-313 E | 3.0381 | 50/50 | 3.0381 |
| 960341 | AF2-325 C | 1.0239 | 50/50 | 1.0239 |
| 960342 | AF2-325 E | 1.4139 | 50/50 | 1.4139 |
| 960671 | AF2-358 C O1 | 13.8072 | 50/50 | 13.8072 |
| 960672 | AF2-358 E O1 | 9.2048 | 50/50 | 9.2048 |
| 960871 | AF2-378 C | 0.2684 | 50/50 | 0.2684 |
| 960872 | AF2-378 E | 0.3724 | 50/50 | 0.3724 |
| 960881 | AF2-379 C | 0.3375 | 50/50 | 0.3375 |
| 960882 | AF2-379 E | 0.4650 | 50/50 | 0.4650 |
| 960941 | AF2-385 C | 9.7407 | 50/50 | 9.7407 |
| 960942 | AF2-385 E | 5.5428 | 50/50 | 5.5428 |
| 960961 | AF2-387 C O1 | 21.7542 | 50/50 | 21.7542 |
| 960962 | AF2-387 E O1 | 10.9098 | 50/50 | 10.9098 |
| 961181 | AF2-409 O1 | 22.4440 | 50/50 | 22.4440 |
| 962161 | AG1-061 C O1 | 13.7777 | 50/50 | 13.7777 |
| 962162 | AG1-061 E O1 | 9.1851 | 50/50 | 9.1851 |
| 962261 | AG1-072 | 16.3320 | 50/50 | 16.3320 |
| 962302 | AG1-079 E | 0.4867 | 50/50 | 0.4867 |
| 962381 | AG1-087 C O1 | 8.5411 | Adder | 18.96 |
| 962382 | AG1-087 E O1 | 23.0393 | Adder | 51.14 |
| 963001 | AG1-149 | 0.6129 | 50/50 | 0.6129 |
| 963011 | AG1-150 | 3.6105 | Adder | 8.01 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|-------------------|-------------------|--------------------|---------------|----------------|
| 964551 | AG1-318 C | 0.0249 | Adder | 0.06 |
| 964552 | AG1-318 E | 0.0581 | Adder | 0.13 |
| 964962 | AG1-360 E | 0.8026 | Adder | 1.78 |
| 965321 | AG1-397 C | 0.3777 | Adder | 0.84 |
| 965322 | AG1-397 E | 0.5210 | Adder | 1.16 |
| 965611 | AG1-429 C O1 | 3.1865 | Adder | 7.07 |
| 965612 | AG1-429 E O1 | 2.1237 | Adder | 4.71 |
| 965821 | AG1-450 | 5.7923 | 50/50 | 5.7923 |
| 965921 | AG1-461 C O1 | 1.7145 | Adder | 3.81 |
| 965922 | AG1-461 E O1 | 0.9232 | Adder | 2.05 |
| 965951 | AG1-464 C O1 | 1.7512 | Adder | 3.89 |
| 965952 | AG1-464 E O1 | 2.6268 | Adder | 5.83 |
| 966281 | AG1-497 C O1 | 3.9481 | Adder | 8.76 |
| 966282 | AG1-497 E O1 | 1.6920 | Adder | 3.76 |
| 966601 | AG1-529 C | 3.8100 | Adder | 8.46 |
| 966602 | AG1-529 E | 2.0336 | Adder | 4.51 |
| CALDERWOOD | CALDERWOOD | 0.0924 | Confirmed LTF | 0.0924 |
| NY | NY | 0.0586 | Confirmed LTF | 0.0586 |
| PRAIRIE | PRAIRIE | 0.4779 | Confirmed LTF | 0.4779 |
| O-066 | O-066 | 0.4576 | Confirmed LTF | 0.4576 |
| CHEOAH | CHEOAH | 0.0931 | Confirmed LTF | 0.0931 |
| COTTONWOOD | COTTONWOOD | 0.3906 | Confirmed LTF | 0.3906 |
| G-007 | G-007 | 0.0378 | Confirmed LTF | 0.0378 |
| HAMLET | HAMLET | 0.1091 | Confirmed LTF | 0.1091 |
| GIBSON | GIBSON | 0.1010 | Confirmed LTF | 0.1010 |
| BLUEG | BLUEG | 0.3212 | Confirmed LTF | 0.3212 |
| TRIMBLE | TRIMBLE | 0.1030 | Confirmed LTF | 0.1030 |
| CATAWBA | CATAWBA | 0.0658 | Confirmed LTF | 0.0658 |

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| ID | FROM BUS# | FROM BUS | FROM BUS AREA | TO BUS# | TO BUS | TO BUS AREA | CKT ID | CONT NAME | Type | Rating MVA | PRE PROJECT LOADING % | POST PROJECT LOADING % | AC DC | MW IMPACT |
|-----------|-----------|----------|---------------|---------|----------|-------------|--------|-----------------------|-------|------------|-----------------------|------------------------|-------|-----------|
| 166828659 | 232106 | MIDLNTNP | DP&L | 232104 | MT PLSNT | DP&L | 1 | DPL_P7_1_DBL_1NCB_FSA | tower | 348.0 | 176.43 | 177.64 | DC | 9.72 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|---------------------------------|--------------------|-------|----------------|
| 232405 | W1-003 E | 2.1162 | Adder | 2.49 |
| 232407 | W1-004 E | 2.1162 | Adder | 2.49 |
| 232409 | W1-005 E | 2.1162 | Adder | 2.49 |
| 232411 | W1-006 E | 2.1162 | Adder | 2.49 |
| 232412 | X1-032 E | 0.6923 | Adder | 0.81 |
| 232417 | X3-008 C | 0.3001 | 50/50 | 0.3001 |
| 232418 | X3-008 E | 3.1031 | 50/50 | 3.1031 |
| 232422 | X3-066 C | 0.1518 | 50/50 | 0.1518 |
| 232423 | X3-066 E | 1.2321 | 50/50 | 1.2321 |
| 232424 | Y1-079 C | 0.2221 | 50/50 | 0.2221 |
| 232425 | Y1-079 E | 2.2972 | 50/50 | 2.2972 |
| 232426 | Y1-080 FULL | 0.0468 | 50/50 | 0.0468 |
| 232427 | Y1-080 E | 0.4865 | 50/50 | 0.4865 |
| 232428 | Y3-058 C | 0.1887 | 50/50 | 0.1887 |
| 232429 | Y3-058 E | 1.2800 | 50/50 | 1.2800 |
| 232433 | Z2-076 E | 0.3195 | Adder | 0.38 |
| 232435 | Z2-077 E | 0.3195 | Adder | 0.38 |
| 232813 | VAUGHN | 0.1051 | 50/50 | 0.1051 |
| 232851 | DUP-SFR1 | 1.6269 | Adder | 1.91 |
| 232902 | EASTMUNI | 3.3846 | 50/50 | 3.3846 |
| 232907 | VN8 | 5.4177 | 50/50 | 5.4177 |
| 232910 | NRG_G1 | 1.6595 | 50/50 | 1.6595 |
| 232911 | NRG_G2 | 1.6595 | 50/50 | 1.6595 |
| 232919 | VN10 | 0.4103 | 50/50 | 0.4103 |
| 232922 | MR3 (Deactivation : 01/06/2021) | 9.0454 | Adder | 10.64 |
| 232926 | CRISFLD1 | 0.3223 | 50/50 | 0.3223 |
| 233912 | AB1-137 E | 0.2813 | Adder | 0.33 |
| 233915 | AB1-141 C | 0.9820 | 50/50 | 0.9820 |
| 233916 | AB1-141 E | 2.9046 | 50/50 | 2.9046 |
| 233918 | AB1-142 C | 0.9820 | 50/50 | 0.9820 |
| 233919 | AB1-142 E | 2.9046 | 50/50 | 2.9046 |
| 233923 | AA1-102 C | 1.8373 | 50/50 | 1.8373 |
| 233931 | AB2-179 C | 27.1217 | 50/50 | 27.1217 |
| 293670 | O-025 C | 0.1942 | 50/50 | 0.1942 |
| 917082 | CHERRYDALE E | 2.1143 | Adder | 2.49 |
| 918835 | AA1-102 E | 19.0008 | 50/50 | 19.0008 |
| 919831 | AA2-069 (Suspended) | 39.9949 | Adder | 47.05 |
| 923921 | AB2-032 C | 6.2703 | 50/50 | 6.2703 |
| 923922 | AB2-032 E | 2.9507 | 50/50 | 2.9507 |
| 923951 | AB2-036 C | 12.6635 | 50/50 | 12.6635 |
| 923952 | AB2-036 E | 20.7187 | 50/50 | 20.7187 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|--------------|--------------------|-------|----------------|
| 924681 | AB2-120 C | 6.4703 | Adder | 7.61 |
| 924682 | AB2-120 E | 10.5569 | Adder | 12.42 |
| 924781 | AB2-130 C O1 | 5.4550 | Adder | 6.42 |
| 924782 | AB2-130 E O1 | 8.9003 | Adder | 10.47 |
| 924801 | AB2-133 C O1 | 11.5421 | 50/50 | 11.5421 |
| 924802 | AB2-133 E O1 | 14.6387 | 50/50 | 14.6387 |
| 924821 | AB2-135 C | 12.2976 | 50/50 | 12.2976 |
| 924822 | AB2-135 E | 14.0250 | 50/50 | 14.0250 |
| 924831 | AB2-136 C | 5.9562 | 50/50 | 5.9562 |
| 924832 | AB2-136 E | 6.3165 | 50/50 | 6.3165 |
| 924971 | AB2-153 C | 3.5040 | 50/50 | 3.5040 |
| 924972 | AB2-153 E | 5.7170 | 50/50 | 5.7170 |
| 925151 | AB2-172 C | 4.7548 | 50/50 | 4.7548 |
| 925152 | AB2-172 E | 7.7578 | 50/50 | 7.7578 |
| 925254 | AB2-179 E | 8.8503 | 50/50 | 8.8503 |
| 925261 | AB2-180 C | 2.9378 | 50/50 | 2.9378 |
| 925262 | AB2-180 E | 1.2590 | 50/50 | 1.2590 |
| 925271 | AB2-185 C | 5.1871 | 50/50 | 5.1871 |
| 925272 | AB2-185 E | 2.2231 | 50/50 | 2.2231 |
| 927031 | AC1-190 C | 8.6961 | 50/50 | 8.6961 |
| 927032 | AC1-190 E | 3.7269 | 50/50 | 3.7269 |
| 927191 | AC1-213 C | 0.6564 | 50/50 | 0.6564 |
| 927192 | AC1-213 E | 0.4308 | 50/50 | 0.4308 |
| 930201 | AB1-056 C | 9.8959 | Adder | 11.64 |
| 930202 | AB1-056 E | 28.1818 | Adder | 33.16 |
| 931261 | AB1-176 C | 0.6372 | 50/50 | 0.6372 |
| 931262 | AB1-176 E | 1.0507 | 50/50 | 1.0507 |
| 932161 | AC2-023 C | 5.6437 | 50/50 | 5.6437 |
| 932162 | AC2-023 E | 4.1103 | 50/50 | 4.1103 |
| 933641 | AC2-186 C | 3.1389 | Adder | 3.69 |
| 933642 | AC2-186 E | 5.1214 | Adder | 6.03 |
| 936611 | AD2-076 C O1 | 8.1710 | 50/50 | 8.1710 |
| 936612 | AD2-076 E O1 | 13.3317 | 50/50 | 13.3317 |
| 938651 | AE1-087 C | 4.0040 | 50/50 | 4.0040 |
| 938652 | AE1-087 E | 1.0010 | 50/50 | 1.0010 |
| 938895 | AE1-117 C | 7.5027 | Adder | 8.83 |
| 938896 | AE1-117 E | 20.0072 | Adder | 23.54 |
| 939151 | AE1-145 | 3.4061 | Adder | 4.01 |
| 941021 | AE2-093 C | 5.0565 | 50/50 | 5.0565 |
| 941022 | AE2-093 E | 8.2500 | 50/50 | 8.2500 |
| 941181 | AE2-112 C | 2.8348 | 50/50 | 2.8348 |
| 941182 | AE2-112 E | 4.6253 | 50/50 | 4.6253 |
| 942441 | AE2-257 C | 5.1449 | Adder | 6.05 |
| 942442 | AE2-257 E | 13.5639 | Adder | 15.96 |
| 943361 | AF1-007 C | 0.2920 | Adder | 0.34 |
| 943362 | AF1-007 E | 0.8298 | Adder | 0.98 |
| 943441 | AF1-015 C | 1.9052 | 50/50 | 1.9052 |
| 943442 | AF1-015 E | 2.6311 | 50/50 | 2.6311 |
| 943651 | AF1-036 C | 3.6862 | 50/50 | 3.6862 |
| 943652 | AF1-036 E | 5.0904 | 50/50 | 5.0904 |
| 945661 | AF1-231 C | 1.2961 | Adder | 1.52 |
| 945662 | AF1-231 E | 1.9442 | Adder | 2.29 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|--------------|--------------------|-------|----------------|
| 945791 | AF1-244 | 1.6345 | 50/50 | 1.6345 |
| 945931 | AF1-258 | 0.6715 | 50/50 | 0.6715 |
| 945941 | AF1-259 | 0.3376 | 50/50 | 0.3376 |
| 957611 | AF2-055 C | 5.9678 | Adder | 7.02 |
| 957612 | AF2-055 E | 2.5577 | Adder | 3.01 |
| 957661 | AF2-060 | 1.5328 | Adder | 1.8 |
| 957671 | AF2-061 O1 | 6.8122 | Adder | 8.01 |
| 959021 | AF2-193 C | 18.2859 | Adder | 21.51 |
| 959022 | AF2-193 E | 49.3258 | Adder | 58.03 |
| 959031 | AF2-194 C | 18.2859 | Adder | 21.51 |
| 959032 | AF2-194 E | 49.3258 | Adder | 58.03 |
| 959051 | AF2-196 C | 1.4032 | Adder | 1.65 |
| 959052 | AF2-196 E | 3.2740 | Adder | 3.85 |
| 959161 | AF2-207 C O1 | 3.4920 | Adder | 4.11 |
| 959162 | AF2-207 E O1 | 6.1623 | 50/50 | 6.1623 |
| 959571 | AF2-248 C | 0.6946 | 50/50 | 0.6946 |
| 959572 | AF2-248 E | 0.7763 | 50/50 | 0.7763 |
| 959581 | AF2-249 C | 0.1226 | 50/50 | 0.1226 |
| 959582 | AF2-249 E | 0.4903 | 50/50 | 0.4903 |
| 959591 | AF2-250 C | 0.2247 | 50/50 | 0.2247 |
| 959592 | AF2-250 E | 0.1736 | 50/50 | 0.1736 |
| 960221 | AF2-313 C | 5.3589 | 50/50 | 5.3589 |
| 960222 | AF2-313 E | 3.0381 | 50/50 | 3.0381 |
| 960341 | AF2-325 C | 1.0239 | 50/50 | 1.0239 |
| 960342 | AF2-325 E | 1.4139 | 50/50 | 1.4139 |
| 960671 | AF2-358 C O1 | 13.8072 | 50/50 | 13.8072 |
| 960672 | AF2-358 E O1 | 9.2048 | 50/50 | 9.2048 |
| 960871 | AF2-378 C | 0.2684 | 50/50 | 0.2684 |
| 960872 | AF2-378 E | 0.3724 | 50/50 | 0.3724 |
| 960881 | AF2-379 C | 0.3375 | 50/50 | 0.3375 |
| 960882 | AF2-379 E | 0.4650 | 50/50 | 0.4650 |
| 960941 | AF2-385 C | 9.7407 | 50/50 | 9.7407 |
| 960942 | AF2-385 E | 5.5428 | 50/50 | 5.5428 |
| 960961 | AF2-387 C O1 | 21.7542 | 50/50 | 21.7542 |
| 960962 | AF2-387 E O1 | 10.9098 | 50/50 | 10.9098 |
| 961181 | AF2-409 O1 | 22.4440 | 50/50 | 22.4440 |
| 962161 | AG1-061 C O1 | 13.7777 | 50/50 | 13.7777 |
| 962162 | AG1-061 E O1 | 9.1851 | 50/50 | 9.1851 |
| 962261 | AG1-072 | 16.3320 | 50/50 | 16.3320 |
| 962302 | AG1-079 E | 0.4867 | 50/50 | 0.4867 |
| 962381 | AG1-087 C O1 | 8.5411 | Adder | 18.96 |
| 962382 | AG1-087 E O1 | 23.0393 | Adder | 51.14 |
| 963001 | AG1-149 | 0.6129 | 50/50 | 0.6129 |
| 963011 | AG1-150 | 3.6105 | Adder | 8.01 |
| 964551 | AG1-318 C | 0.0249 | Adder | 0.06 |
| 964552 | AG1-318 E | 0.0581 | Adder | 0.13 |
| 964962 | AG1-360 E | 0.8026 | Adder | 1.78 |
| 965321 | AG1-397 C | 0.3777 | Adder | 0.84 |
| 965322 | AG1-397 E | 0.5210 | Adder | 1.16 |
| 965611 | AG1-429 C O1 | 3.1865 | Adder | 7.07 |
| 965612 | AG1-429 E O1 | 2.1237 | Adder | 4.71 |
| 965821 | AG1-450 | 5.7923 | 50/50 | 5.7923 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|-------------------|--------------|---------------------------|---------------|-----------------------|
| 965921 | AG1-461 C O1 | 1.7145 | Adder | 3.81 |
| 965922 | AG1-461 E O1 | 0.9232 | Adder | 2.05 |
| 965951 | AG1-464 C O1 | 1.7512 | Adder | 3.89 |
| 965952 | AG1-464 E O1 | 2.6268 | Adder | 5.83 |
| 966281 | AG1-497 C O1 | 3.9481 | Adder | 8.76 |
| 966282 | AG1-497 E O1 | 1.6920 | Adder | 3.76 |
| 966601 | AG1-529 C | 3.8100 | Adder | 8.46 |
| 966602 | AG1-529 E | 2.0336 | Adder | 4.51 |
| CALDERWOOD | CALDERWOOD | 0.0924 | Confirmed LTF | 0.0924 |
| NY | NY | 0.0586 | Confirmed LTF | 0.0586 |
| PRAIRIE | PRAIRIE | 0.4779 | Confirmed LTF | 0.4779 |
| O-066 | O-066 | 0.4576 | Confirmed LTF | 0.4576 |
| CHEOAH | CHEOAH | 0.0931 | Confirmed LTF | 0.0931 |
| COTTONWOOD | COTTONWOOD | 0.3906 | Confirmed LTF | 0.3906 |
| G-007 | G-007 | 0.0378 | Confirmed LTF | 0.0378 |
| HAMLET | HAMLET | 0.1091 | Confirmed LTF | 0.1091 |
| GIBSON | GIBSON | 0.1010 | Confirmed LTF | 0.1010 |
| BLUEG | BLUEG | 0.3212 | Confirmed LTF | 0.3212 |
| TRIMBLE | TRIMBLE | 0.1030 | Confirmed LTF | 0.1030 |
| CATAWBA | CATAWBA | 0.0658 | Confirmed LTF | 0.0658 |

11.6.5 Index 5

| ID | FROM BUS# | FROM BUS | FRO M BUS AREA | TO BUS# | TO BUS | TO BUS AREA | CK T ID | CONT NAME | Type | Ratin g MVA | PRE PROJECT LOADIN G % | POST PROJECT LOADIN G % | AC D C | MW IMPAC T |
|---------------|------------|--------------|----------------|------------|-------------|-------------|---------|---------------------------|-----------|-------------|------------------------|-------------------------|--------|------------|
| 16682864 4 | 23210 7 | TOWNSEN D | DP&L | 23210 6 | MIDLNT P | DP&L | 1 | DPL_P7_1_DBL_1NCB_FS A | towe r | 348.0 | 201.89 | 203.1 | DC | 9.72 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|------------------------------------|--------------------|-------|----------------|
| 232405 | W1-003 E | 2.1162 | Adder | 2.49 |
| 232407 | W1-004 E | 2.1162 | Adder | 2.49 |
| 232409 | W1-005 E | 2.1162 | Adder | 2.49 |
| 232411 | W1-006 E | 2.1162 | Adder | 2.49 |
| 232412 | X1-032 E | 0.6923 | Adder | 0.81 |
| 232417 | X3-008 C | 0.3001 | 50/50 | 0.3001 |
| 232418 | X3-008 E | 3.1031 | 50/50 | 3.1031 |
| 232422 | X3-066 C | 0.1518 | 50/50 | 0.1518 |
| 232423 | X3-066 E | 1.2321 | 50/50 | 1.2321 |
| 232424 | Y1-079 C | 0.2221 | 50/50 | 0.2221 |
| 232425 | Y1-079 E | 2.2972 | 50/50 | 2.2972 |
| 232426 | Y1-080 FULL | 0.0468 | 50/50 | 0.0468 |
| 232427 | Y1-080 E | 0.4865 | 50/50 | 0.4865 |
| 232428 | Y3-058 C | 0.1887 | 50/50 | 0.1887 |
| 232429 | Y3-058 E | 1.2800 | 50/50 | 1.2800 |
| 232433 | Z2-076 E | 0.3195 | Adder | 0.38 |
| 232435 | Z2-077 E | 0.3195 | Adder | 0.38 |
| 232813 | VAUGHN | 0.1051 | 50/50 | 0.1051 |
| 232851 | DUP-SFR1 | 1.6269 | Adder | 1.91 |
| 232902 | EASTMUNI | 3.3846 | 50/50 | 3.3846 |
| 232907 | VN8 | 5.4177 | 50/50 | 5.4177 |
| 232910 | NRG_G1 | 1.6595 | 50/50 | 1.6595 |
| 232911 | NRG_G2 | 1.6595 | 50/50 | 1.6595 |
| 232919 | VN10 | 0.4103 | 50/50 | 0.4103 |
| 232922 | MR3 (Deactivation : 01/06/2021) | 9.0454 | Adder | 10.64 |
| 232926 | CRISFLD1 | 0.3223 | 50/50 | 0.3223 |
| 233912 | AB1-137 E | 0.2813 | Adder | 0.33 |
| 233915 | AB1-141 C | 0.9820 | 50/50 | 0.9820 |
| 233916 | AB1-141 E | 2.9046 | 50/50 | 2.9046 |
| 233918 | AB1-142 C | 0.9820 | 50/50 | 0.9820 |
| 233919 | AB1-142 E | 2.9046 | 50/50 | 2.9046 |
| 233923 | AA1-102 C | 1.8373 | 50/50 | 1.8373 |
| 233931 | AB2-179 C | 27.1217 | 50/50 | 27.1217 |
| 293670 | O-025 C | 0.1942 | 50/50 | 0.1942 |
| 917082 | CHERRYDALE E | 2.1143 | Adder | 2.49 |
| 918835 | AA1-102 E | 19.0008 | 50/50 | 19.0008 |
| 919831 | AA2-069 (Suspended) | 39.9949 | Adder | 47.05 |
| 923921 | AB2-032 C | 6.2703 | 50/50 | 6.2703 |
| 923922 | AB2-032 E | 2.9507 | 50/50 | 2.9507 |
| 923951 | AB2-036 C | 12.6635 | 50/50 | 12.6635 |
| 923952 | AB2-036 E | 20.7187 | 50/50 | 20.7187 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|--------------|--------------------|-------|----------------|
| 924681 | AB2-120 C | 6.4703 | Adder | 7.61 |
| 924682 | AB2-120 E | 10.5569 | Adder | 12.42 |
| 924781 | AB2-130 C O1 | 5.4550 | Adder | 6.42 |
| 924782 | AB2-130 E O1 | 8.9003 | Adder | 10.47 |
| 924801 | AB2-133 C O1 | 11.5421 | 50/50 | 11.5421 |
| 924802 | AB2-133 E O1 | 14.6387 | 50/50 | 14.6387 |
| 924821 | AB2-135 C | 12.2976 | 50/50 | 12.2976 |
| 924822 | AB2-135 E | 14.0250 | 50/50 | 14.0250 |
| 924831 | AB2-136 C | 5.9562 | 50/50 | 5.9562 |
| 924832 | AB2-136 E | 6.3165 | 50/50 | 6.3165 |
| 924971 | AB2-153 C | 3.5040 | 50/50 | 3.5040 |
| 924972 | AB2-153 E | 5.7170 | 50/50 | 5.7170 |
| 925151 | AB2-172 C | 4.7548 | 50/50 | 4.7548 |
| 925152 | AB2-172 E | 7.7578 | 50/50 | 7.7578 |
| 925254 | AB2-179 E | 8.8503 | 50/50 | 8.8503 |
| 925261 | AB2-180 C | 2.9378 | 50/50 | 2.9378 |
| 925262 | AB2-180 E | 1.2590 | 50/50 | 1.2590 |
| 925271 | AB2-185 C | 5.1871 | 50/50 | 5.1871 |
| 925272 | AB2-185 E | 2.2231 | 50/50 | 2.2231 |
| 927031 | AC1-190 C | 8.6961 | 50/50 | 8.6961 |
| 927032 | AC1-190 E | 3.7269 | 50/50 | 3.7269 |
| 927191 | AC1-213 C | 0.6564 | 50/50 | 0.6564 |
| 927192 | AC1-213 E | 0.4308 | 50/50 | 0.4308 |
| 930201 | AB1-056 C | 9.8959 | Adder | 11.64 |
| 930202 | AB1-056 E | 28.1818 | Adder | 33.16 |
| 931261 | AB1-176 C | 0.6372 | 50/50 | 0.6372 |
| 931262 | AB1-176 E | 1.0507 | 50/50 | 1.0507 |
| 932161 | AC2-023 C | 5.6437 | 50/50 | 5.6437 |
| 932162 | AC2-023 E | 4.1103 | 50/50 | 4.1103 |
| 933641 | AC2-186 C | 3.1389 | Adder | 3.69 |
| 933642 | AC2-186 E | 5.1214 | Adder | 6.03 |
| 936611 | AD2-076 C O1 | 8.1710 | 50/50 | 8.1710 |
| 936612 | AD2-076 E O1 | 13.3317 | 50/50 | 13.3317 |
| 938651 | AE1-087 C | 4.0040 | 50/50 | 4.0040 |
| 938652 | AE1-087 E | 1.0010 | 50/50 | 1.0010 |
| 938895 | AE1-117 C | 7.5027 | Adder | 8.83 |
| 938896 | AE1-117 E | 20.0072 | Adder | 23.54 |
| 939151 | AE1-145 | 3.4061 | Adder | 4.01 |
| 941021 | AE2-093 C | 5.0565 | 50/50 | 5.0565 |
| 941022 | AE2-093 E | 8.2500 | 50/50 | 8.2500 |
| 941181 | AE2-112 C | 2.8348 | 50/50 | 2.8348 |
| 941182 | AE2-112 E | 4.6253 | 50/50 | 4.6253 |
| 942441 | AE2-257 C | 5.1449 | Adder | 6.05 |
| 942442 | AE2-257 E | 13.5639 | Adder | 15.96 |
| 943361 | AF1-007 C | 0.2920 | Adder | 0.34 |
| 943362 | AF1-007 E | 0.8298 | Adder | 0.98 |
| 943441 | AF1-015 C | 1.9052 | 50/50 | 1.9052 |
| 943442 | AF1-015 E | 2.6311 | 50/50 | 2.6311 |
| 943651 | AF1-036 C | 3.6862 | 50/50 | 3.6862 |
| 943652 | AF1-036 E | 5.0904 | 50/50 | 5.0904 |
| 945661 | AF1-231 C | 1.2961 | Adder | 1.52 |
| 945662 | AF1-231 E | 1.9442 | Adder | 2.29 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|--------|--------------|--------------------|-------|----------------|
| 945791 | AF1-244 | 1.6345 | 50/50 | 1.6345 |
| 945931 | AF1-258 | 0.6715 | 50/50 | 0.6715 |
| 945941 | AF1-259 | 0.3376 | 50/50 | 0.3376 |
| 957611 | AF2-055 C | 5.9678 | Adder | 7.02 |
| 957612 | AF2-055 E | 2.5577 | Adder | 3.01 |
| 957661 | AF2-060 | 1.5328 | Adder | 1.8 |
| 957671 | AF2-061 O1 | 6.8122 | Adder | 8.01 |
| 959021 | AF2-193 C | 18.2859 | Adder | 21.51 |
| 959022 | AF2-193 E | 49.3258 | Adder | 58.03 |
| 959031 | AF2-194 C | 18.2859 | Adder | 21.51 |
| 959032 | AF2-194 E | 49.3258 | Adder | 58.03 |
| 959051 | AF2-196 C | 1.4032 | Adder | 1.65 |
| 959052 | AF2-196 E | 3.2740 | Adder | 3.85 |
| 959161 | AF2-207 C O1 | 3.4920 | Adder | 4.11 |
| 959162 | AF2-207 E O1 | 6.1623 | 50/50 | 6.1623 |
| 959571 | AF2-248 C | 0.6946 | 50/50 | 0.6946 |
| 959572 | AF2-248 E | 0.7763 | 50/50 | 0.7763 |
| 959581 | AF2-249 C | 0.1226 | 50/50 | 0.1226 |
| 959582 | AF2-249 E | 0.4903 | 50/50 | 0.4903 |
| 959591 | AF2-250 C | 0.2247 | 50/50 | 0.2247 |
| 959592 | AF2-250 E | 0.1736 | 50/50 | 0.1736 |
| 960221 | AF2-313 C | 5.3589 | 50/50 | 5.3589 |
| 960222 | AF2-313 E | 3.0381 | 50/50 | 3.0381 |
| 960341 | AF2-325 C | 1.0239 | 50/50 | 1.0239 |
| 960342 | AF2-325 E | 1.4139 | 50/50 | 1.4139 |
| 960671 | AF2-358 C O1 | 13.8072 | 50/50 | 13.8072 |
| 960672 | AF2-358 E O1 | 9.2048 | 50/50 | 9.2048 |
| 960871 | AF2-378 C | 0.2684 | 50/50 | 0.2684 |
| 960872 | AF2-378 E | 0.3724 | 50/50 | 0.3724 |
| 960881 | AF2-379 C | 0.3375 | 50/50 | 0.3375 |
| 960882 | AF2-379 E | 0.4650 | 50/50 | 0.4650 |
| 960941 | AF2-385 C | 9.7407 | 50/50 | 9.7407 |
| 960942 | AF2-385 E | 5.5428 | 50/50 | 5.5428 |
| 960961 | AF2-387 C O1 | 21.7542 | 50/50 | 21.7542 |
| 960962 | AF2-387 E O1 | 10.9098 | 50/50 | 10.9098 |
| 961181 | AF2-409 O1 | 22.4440 | 50/50 | 22.4440 |
| 962161 | AG1-061 C O1 | 13.7777 | 50/50 | 13.7777 |
| 962162 | AG1-061 E O1 | 9.1851 | 50/50 | 9.1851 |
| 962261 | AG1-072 | 16.3320 | 50/50 | 16.3320 |
| 962302 | AG1-079 E | 0.4867 | 50/50 | 0.4867 |
| 962381 | AG1-087 C O1 | 8.5411 | Adder | 18.96 |
| 962382 | AG1-087 E O1 | 23.0393 | Adder | 51.14 |
| 963001 | AG1-149 | 0.6129 | 50/50 | 0.6129 |
| 963011 | AG1-150 | 3.6105 | Adder | 8.01 |
| 964551 | AG1-318 C | 0.0249 | Adder | 0.06 |
| 964552 | AG1-318 E | 0.0581 | Adder | 0.13 |
| 964962 | AG1-360 E | 0.8026 | Adder | 1.78 |
| 965321 | AG1-397 C | 0.3777 | Adder | 0.84 |
| 965322 | AG1-397 E | 0.5210 | Adder | 1.16 |
| 965611 | AG1-429 C O1 | 3.1865 | Adder | 7.07 |
| 965612 | AG1-429 E O1 | 2.1237 | Adder | 4.71 |
| 965821 | AG1-450 | 5.7923 | 50/50 | 5.7923 |

| Bus # | Bus | Gendeliv MW Impact | Type | Full MW Impact |
|-------------------|--------------|---------------------------|---------------|-----------------------|
| 965921 | AG1-461 C O1 | 1.7145 | Adder | 3.81 |
| 965922 | AG1-461 E O1 | 0.9232 | Adder | 2.05 |
| 965951 | AG1-464 C O1 | 1.7512 | Adder | 3.89 |
| 965952 | AG1-464 E O1 | 2.6268 | Adder | 5.83 |
| 966281 | AG1-497 C O1 | 3.9481 | Adder | 8.76 |
| 966282 | AG1-497 E O1 | 1.6920 | Adder | 3.76 |
| 966601 | AG1-529 C | 3.8100 | Adder | 8.46 |
| 966602 | AG1-529 E | 2.0336 | Adder | 4.51 |
| CALDERWOOD | CALDERWOOD | 0.0924 | Confirmed LTF | 0.0924 |
| NY | NY | 0.0586 | Confirmed LTF | 0.0586 |
| PRAIRIE | PRAIRIE | 0.4779 | Confirmed LTF | 0.4779 |
| O-066 | O-066 | 0.4576 | Confirmed LTF | 0.4576 |
| CHEOAH | CHEOAH | 0.0931 | Confirmed LTF | 0.0931 |
| COTTONWOOD | COTTONWOOD | 0.3906 | Confirmed LTF | 0.3906 |
| G-007 | G-007 | 0.0378 | Confirmed LTF | 0.0378 |
| HAMLET | HAMLET | 0.1091 | Confirmed LTF | 0.1091 |
| GIBSON | GIBSON | 0.1010 | Confirmed LTF | 0.1010 |
| BLUEG | BLUEG | 0.3212 | Confirmed LTF | 0.3212 |
| TRIMBLE | TRIMBLE | 0.1030 | Confirmed LTF | 0.1030 |
| CATAWBA | CATAWBA | 0.0658 | Confirmed LTF | 0.0658 |

11.7 Queue Dependencies

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

| Queue Number | Project Name | Status |
|--------------|------------------------------|---|
| AA1-102 | Kings Creek-Loretto 138kV | Partially in Service - Under Construction |
| AA2-069 | Cartanza 230kV | Suspended |
| AB1-056 | Indian River 230kV I | Engineering and Procurement |
| AB1-137 | Frankford 25kV | Engineering and Procurement |
| AB1-141 | Church-Wye Mills 138 kV I | Engineering and Procurement |
| AB1-142 | Church-Wye Mills 138 kV II | Engineering and Procurement |
| AB1-176 | Price 25kV II | Active |
| AB2-032 | Church-Wye Mills 138 kV | Engineering and Procurement |
| AB2-036 | Church-Steele 138kV | Active |
| AB2-037 | Keeney-Steele 230kV | Active |
| AB2-120 | Piney Grove-New Church 138kV | Active |
| AB2-130 | Laurel 69kV | Active |
| AB2-133 | Chestertown-Church 69kV | Engineering and Procurement |
| AB2-135 | Church-Kent 69kV | Active |
| AB2-136 | West Cambridge-Vienna 69kV | Active |
| AB2-153 | Church-Wye Mills 138 kV | Engineering and Procurement |
| AB2-172 | Todd 69kV | Active |
| AB2-179 | Townsend 138kV | Engineering and Procurement |
| AB2-180 | Rockawalkin 69kV | Engineering and Procurement |
| AB2-185 | Wye Mills 25kV | Active |
| AC1-091 | Cedar Creek 138kV I | Active |
| AC1-092 | Cedar Creek 138kV II | Active |
| AC1-093 | Cedar Creek 138kV III | Active |
| AC1-094 | Cedar Creek 138kV IV | Active |
| AC1-190 | East New Market 69kV | Active |
| AC1-213 | North Salisbury 25kV | Active |
| AC2-023 | Hebron 69kV | Active |
| AC2-185 | Cedar Creek 138kV II | Active |
| AC2-186 | Harrington 25kV | Active |
| AD2-076 | Centreville 69 kV | Active |
| AE1-087 | Todd 69 kV | Active |
| AE1-117 | Bethany 138 kV | Active |
| AE1-145 | Wallops Island 69 kV | Active |
| AE2-093 | Easton-Steele 138 kV | Active |
| AE2-112 | Carville 138 kV | Active |
| AE2-257 | Cedar Neck 69 kV | Active |
| AF1-007 | Indian River 230 kV I | Active |
| AF1-015 | Easton-Steele 138 kV | Active |
| AF1-036 | Carville 138 kV | Active |

| Queue Number | Project Name | Status |
|--------------|----------------------------|-----------------------------|
| AF1-231 | New Church 138 kV | Active |
| AF1-244 | Kingston 12 kV | Active |
| AF1-258 | Rockawalkin 69 kV | Engineering and Procurement |
| AF1-259 | Price 25 kV | Engineering and Procurement |
| AF2-055 | Plaintation Creek 69 kV | Active |
| AF2-060 | Wattsville 12 kV | Active |
| AF2-061 | Wattsville 69kV | Active |
| AF2-193 | Indian River 230 kV I | Active |
| AF2-194 | Indian River 230 kV II | Active |
| AF2-196 | Cedar Neck 69 kV II | Active |
| AF2-207 | Nelson 69 kV | Active |
| AF2-248 | Edgewood 12 kV I | Active |
| AF2-249 | Edgewood 12 kV II | Active |
| AF2-250 | Edgewood 12 kV III | Active |
| AF2-313 | Price 69 kV | Active |
| AF2-325 | Jacktown 12 kV | Active |
| AF2-358 | Airey-Vienna 69 kV | Active |
| AF2-378 | Cambridge 12 kV | Active |
| AF2-379 | Princess Anne 25 kV | Engineering and Procurement |
| AF2-385 | Nelson 69 kV | Active |
| AF2-387 | Hillsboro-Steele 138 kV | Active |
| AF2-409 | Vienna 138 kV | Active |
| AG1-061 | Laurel-Sharptown 69 kV | Active |
| AG1-072 | Hillsboro-Steele 138 kV II | Active |
| AG1-079 | New Meredith 69 kV | Active |
| AG1-087 | Milford-Cartanza 230 kV | Active |
| AG1-149 | Kingston 12 kV II | Active |
| AG1-150 | Wattsville 69 kV II | Active |
| AG1-318 | Ocean Bay 12 kV | Active |
| AG1-360 | Costen 25 kV | Active |
| AG1-397 | Walston 12 kV | Active |
| AG1-429 | Tasley 69 kV | Active |
| AG1-450 | Airey-Vienna 69 kV II | Active |
| AG1-461 | Mumford 69 kV | Active |
| AG1-464 | Harrington 69 kV | Active |
| AG1-497 | Cartanza 230 kV | Active |
| AG1-529 | Farmview 138 kV | Active |
| W1-003 | Oak Hall | In Service |
| W1-004 | Oak Hall | In Service |
| W1-005 | Oak Hall | In Service |
| W1-006 | Oak Hall | In Service |
| W1-062 | Clayton 138kV | In Service |
| W3-032A | Cartanza 230kV | In Service |
| X1-032 | Costen 25kV | In Service |
| X3-008 | Todd 69kV | Under Construction |
| X3-066 | Church Hill 69kV | In Service |
| Y1-079 | Wye Mills 69kV | In Service |
| Y1-080 | Dorchester 12kV | In Service |
| Y3-058 | Rockawalkin 69kV | In Service |
| Z2-076 | Worcester South 25kV | In Service |
| Z2-077 | Worcester North 25kV | In Service |

11.8 Contingency Descriptions

| Contingency Name | Contingency Definition |
|----------------------------|---|
| PJM500_PS_P1-2_HOPE-SILVER | CONTINGENCY 'PJM500_PS_P1-2_HOPE-SILVER' /* HOPE CREEK TO SILVER RUN DISCONNECT BUS 232012 DISCONNECT BUS 232014 END |
| CKT 23030B | CONTINGENCY 'CKT 23030B' OPEN LINE FROM BUS 232002 TO BUS 232013 CIRCUIT 1 /CEDAR CREEK - SILVER RUN 230 END |
| DPL_P1_2_CKT 6722 | CONTINGENCY 'DPL_P1_2_CKT 6722' DISCONNECT BUS 232827 / SUSSEX - PEPPER - MUMFORD 69 DISCONNECT BUS 232826 / MUMFORD - LAUREL 69 DISCONNECT BUS 231940 / T11 END |
| DPL_P1_2_CKT 23031 | CONTINGENCY 'DPL_P1_2_CKT 23031' OPEN LINE FROM BUS 232002 TO BUS 232004 CIRCUIT 1 /CEDAR CREEK - MILFORD 230 END |
| CKT 23032B | CONTINGENCY 'CKT 23032B' OPEN LINE FROM BUS 232013 TO BUS 232003 CIRCUIT 1 /SILVER RUN - CARTANZA 230 END |
| DPL_P7_1_DBL_4NC | CONTINGENCY 'DPL_P7_1_DBL_4NC' /* RED LION-SILVER RUN 230;RED LION-SILVER RUN 230 OPEN LINE FROM BUS 231004 TO BUS 232013 CKT 1 OPEN LINE FROM BUS 231004 TO BUS 232013 CKT 2 END |
| DPL_P1_2_AB2-037 KEENEY | CONTINGENCY 'DPL_P1_2_AB2-037 KEENEY' OPEN LINE FROM BUS 923960 TO BUS 231003 CIRCUIT 2 END |
| DPL_P1_2_CKT 23001 | CONTINGENCY 'DPL_P1_2_CKT 23001' OPEN LINE FROM BUS 231003 TO BUS 232000 CIRCUIT 1 /#1 KEENEY EHV - STEELE 230 END |
| Base Case | |

| Contingency Name | Contingency Definition |
|--|--|
| DPL_P7_1_DBL_1NCB_FSA | CONTINGENCY 'DPL_P7_1_DBL_1NCB_FSA' /* #1 & #2 KEENEY-STEELE 230 OPEN LINE FROM BUS 231003 TO BUS 232000 CKT 1 OPEN LINE FROM BUS 231003 TO BUS 923960 CKT 2 OPEN LINE FROM BUS 232000 TO BUS 923960 CKT 2 DISCONNECT BUS 923961 DISCONNECT BUS 923962 END |
| PECO_P1-2_5014/* \$ CHESCO \$ PECO_P1-2_5014 \$ L PECO_P1-2_5014 \$ L | CONTINGENCY 'PECO_P1-2_5014/* \$ CHESCO \$ PECO_P1-2_5014 \$ L' TRIP BRANCH FROM BUS 200065 TO BUS 200051 CKT 1 /* PCHBTM2S 500.00 ROCKSPGS 500.00 \$ CHESCO \$ PECO_P1-2_5014 \$ L END |
| PJM500_PS_P1-2_5015 | CONTINGENCY 'PJM500_PS_P1-2_5015' /* HOPE CREEK TO RED LION TRIP LINE FROM BUS 200027 TO BUS 200029 CKT 1 /* HOPE CREEK TO RED LION END |
| DPL_P1_3_S HRNGTN AT1 | CONTINGENCY 'DPL_P1_3_S HRNGTN AT1' OPEN LINE FROM BUS 232114 TO BUS 232240 CIRCUIT 1 /SOUTH HARRINGTON AT1 138/69 END |
| DPL_P1_2_CKT 6705 | CONTINGENCY 'DPL_P1_2_CKT 6705' DISCONNECT BUS 232239 / LAUREL - SHARPTOWN - VIENNA 69 & SHARPTOWN XFMR DISCONNECT BUS 232607 / SHARPTOWN 12 END |

12 Short Circuit Analysis

The following Breakers are overdutied

None

13 Affected Systems

None

14 Attachment 1: One Line Diagram