Generation Interconnection

System Impact Study Report

for

Queue Project AF2-055

Cheriton 69 KV

27 MW Capacity / 45 MW Energy

February 2021

Revised: June 2022

Contents

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1 Introduction

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

2 Preface

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

In some instances, an Interconnection Customer may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection or merchant transmission upgrade, may also contribute to the need for the same network reinforcement. The possibility of sharing the reinforcement costs with other projects may be identified in the Feasibility Study, but the actual allocation will be deferred until the System Impact Study is performed.

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

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

3 Revision History

This SIS report was revised in June 2022 to reflect updates to the TO analysis in section 9.

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4 General

The Interconnection Customer (IC) has proposed a Storage; Solar generating facility located in Northampton County, Virginia. The installed facilities will have a total capability of 50 MW with 35 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is June 01, 2025. This study does not imply a TO commitment to this in-service date.

Queue Number	**AF2-055**
Project Name	CHERITON 69 KV
State	Virginia
County	Northampton
Transmission Owner	ODEC
MFO	50
MWE	50
MWC	35
Fuel	Storage; Solar
Basecase Study Year	2023

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

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5 Point of Interconnection

The AF2-055 project will interconnect with the Old Dominion Electric Cooperative (ODEC) transmission system at the Cheriton 69kV Substation (formerly known as Plantation Creek 69kV Substation). Distribution facilities in the vicinity of the AF2-055 project are owned by Accomack & Northampton Electric Cooperative (ANEC). The Cheriton Substation is fed from the ODEC transmission system (see Attachment 1).

6 Cost Summary

The AF2-055 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$ 5,000,000
Total Transmission Owner Identified Network Upgrade Costs	$73,700,000
Allocation towards System Network Upgrade Costs*	$12,612,529
Total Costs	$91,312,529

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

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

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

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

7 Transmission Owner Scope of Work

7.1 Attachment Facilities and Direct Connection Upgrades

The IC requested the POI for AF2-055 to be at the ODEC Cheriton Substation. Cheriton Substation is an ANEC facility on ANEC land which will have provisions for ODEC 69 kV line terminals, busses and ANEC distribution transformers. As such, the AF2-055 project will have to be interconnected on the Kellam - Cheriton 69 kV Line using a separate 69 kV 3-breaker ring-bus substation.

Scope:

Build a new 69kV IC substation with a 3-breaker ring bus. Two of the positions on the ring bus will be transmission line terminals for the tie-in of the Kellam - Cheriton 69 kV line (Line 6750) to the substation. The other position will be a terminal configured for the solar plus storage facility with a disconnect switch. The POI will be at the terminal frame of the disconnect switch on the IC side.

Estimate: $5,000,000

Construction Time: 24 months

Major Equipment Included in Estimate: The major equipment for the IC substation will include circuit breakers, disconnect switches, protective relays, foundations, control building, control wiring, security lighting and fence.

7.2 Anti-Islanding Detection and Fault Protection Requirements

In accordance with PJM requirements as specified in Manual 14A, unintentional islanding or anti-islanding requirements can be met with transfer trip, for which a dedicated fiber network is required. Given the configuration of the transmission system in the ODEC area, anti-islanding will be required for line terminals at Tasley, Kellam, Cheriton, and Kendall Grove substations, as well as switch locations at any points on the associated lines.

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Scope:

1. -Replace the ground wire with OPGW over the 69kV transmission line between Kendall Grove and Kellam.

   Line Differential Relaying at Kellam, Kendall Grove and Cheriton Substations. Replacement of ground wire with OPGW on Line 6750 between Kendall Grove and Cheriton. Replacement of ground wire with OPGW on Line 6750 between Kendall Grove and Kellam is included in the rebuilding of that portion of Line 6750 between the IC Substation and Kellam as described in section 9.1 below.

2. Replace the ground wire with OPGW over the 69 kV transmission line between Tasley and Kellam. ODEC recently rebuilt these transmission lines and replacement of the ground wire with OPGW will notrequire the replacement of any transmission structures. Loop the OPGW on the 69kV transmission line between Tasley and Kellam into Belle Haven Substation.

   Replacement of ground wire with OPGW on Lines 6703 and 6721 between Tasley and Kellam is a PJM RTEP Supplemental Project and as such, there is no cost allocation to project AF2-055.

3. Replace the ground wire with OPGW over the 69kV transmission lines between Oak Hall and Tasley. A detailed engineering study will be required during the facilities study phase to determine the number of transmission structures requiring replacement to carry the OPGW.

   Replacement of ground wire with OPGW on Lines 6778 and 6790 between Oak Hall and Tasley is included in the rebuilding of Lines 6778 and 6790 as described in section 9.1 below.

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7.3 Assumptions

ODEC will begin the project only after the interconnection agreement (ISA/ICSA) is fully executed and ODEC receives a written authorization by PJM to commence activities. The estimated time to complete the direct connection work is approximately 36 months after the execution of an ICSA. The schedule for the 69 kV transmission and substation work to accommodate the AF2-055 project would depend on the project start date. The work to accommodate the AF2-055 project will require transmission line outages. ODEC's outage windows for construction are typically in the spring and fall of the year; missing an outage window could result in project delays.

AF2-055 will only be allowed to parallel with ODEC's transmission system once all of the network upgrades identified in the System Impact and Facilities Study are implemented.

Excepting any operational, governmental and/or environmental regulatory delays, the use of additional resources, such as overtime, premiums for expedited material, and/or contractor labor, may enable ODEC to decrease this construction period. It is also assumed that all right-of-way and easements are secured without impact on anticipated construction start dates.

8 Schedule

Based on the scope of work for the interconnection facilities, it is expected to take a minimum of 36 months after the signing of an Interconnection Agreement and construction kickoff call to complete the installation of the physical connection work. This assumes that there will be no environmental issues with any of the new properties associated with this project, that there will be no delays in acquiring the necessary permits for implementing the defined interconnection work, and that all system outages will be allowed when requested.

The schedule for any required Network Impact Reinforcements will be more clearly identified in future study phases. The estimated time to complete each of the required reinforcements is identified in the "System Reinforcements" section of the report.

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9 Transmission Owner Analysis

9.3 Peak and Light Load Analysis

Network impacts with solar generation were as follows:

FROM BUS#	FROM BUS	kV	FROM BUS ZONE	TO BUS	TO BUS	kV	TO BUS ZONE	ID	CONT NAME	Type	Rating MVA	PRE %	POST %	AC DC	MW IMPACT
232843	Eastville	69	ODEC	232847	Weirwood	69	ODEC		All Lines In		55	25	116	AC	50
232847	Weirwood	69	ODEC	232286	Kellam	69	ODEC		All Lines In		55	15	105	AC	50

Reinforcements:

Facility	Upgrade Description	Cost
Cheriton to Kellam 69 KV	**Rebuild Line About 20 miles** **Project Type: FAC** **Cost: $15,000,000** **Perform system protection study to investigate required protective relay upgrades.** **Time Estimate: 36 Months** **TO: ODEC**	**$15,000,000**
	TOTAL COST	**$15,000,000**

Network impacts with battery charging from the grid no solar generation:

2023 PJM Coincident Summer Peak

FROM BUS#	FROM BUS	kV	FROM BUS ZONE	TO BUS	TO BUS	kV	TO BUS ZONE	ID	CONT NAME	Type	Rating MVA	PRE %	POST %	AC DC	MW IMPACT
232280	Oak Hall	69	ODEC	232844	Hallwood	69	ODEC		6778 and Tasley		113	77	110	AC	30
232844	Hallwood	69	ODEC	232845	Parksley	69	ODEC		6778 and Tasley		113	74	105	AC	30
232845	Parksley	69	ODEC	232284	Tasley	69	ODEC		6778 and Tasley		79	85	128	AC	30

ODEC Coincident Historical Peak

FROM BUS#	FROM BUS	kV	FROM BUS ZONE	TO BUS	TO BUS	kV	TO BUS ZONE	ID	CONT NAME	Type	Rating MVA	PRE %	POST %	AC DC	MW IMPACT
232280	Oak Hall	69	ODEC	232846	Perdue	69	ODEC		6778 and Tasley		120	99	138	AC	30
232846	Purdue	69	ODEC	232284	Tasley	69	ODEC		6778 and Tasley		93	92	135	AC	30

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Reinforcements:

Facility	Upgrade Description	Cost
Oak Hall to Tasley 69 kV	Rebuild Line About 40 miles Project Type: FAC Cost: $30,000,000 Time Estimate: 48 Months TO: ODEC	$30,000,000
Oak Hall to Tasley 69 kV	Install breaker stations at Perdue and Greenbush Perform system protection study to investigate required protection system upgrades. Time Estimate: 48 Months	$10,000,000
10 MVAR Capacitor Bank	Install at AF2-055	$200,000
	TOTAL COST	$40,200,000

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9.4 Polar Vortex Analysis

Loss of either Line 6778 or Line 6790 followed by loss of generation at Tasley (n-1-1) results in a voltage collapse in the vicinity of Tasley Substation. This will require dynamic VAR compensation. The particulars will be worked out during the facilities study; the cost is currently estimated to be $15 million.

9.5 Facilities Study Costs

The System Impact Study results included in this report only cover a portion of the System Impact Study results. The results in this report do not include the additional studies required by ODEC to determine all impacts to ODEC's 69kV system. Since the amount of generation on the ODEC system will exceed load present at various times during the year, and that operation of the ODEC system cannot be controlled separately from the rest of PJM, the following study tasks will need to be performed during the Facilities Study phase of the project to detect possible problems:

- Construction of a dynamic model of new generators,
- Harmonic Study,
- Steady State Analysis of island Combinations,
- Temporary Overvoltage Analysis, and
- System Protection and Control Evaluation.

ODEC cannot perform the studies needed to determine those impacts, or estimate the costs of related network upgrades, until after the Interconnection Customer provides ODEC with the data required to perform the studies. If the Interconnection Customer chooses to proceed with the project, it shall pay all costs of those additional studies and provide the required data during the Facilities Study phase. The studies will need to be reperformed, at the Interconnection Customer's cost, if the Interconnection customer changes the data submitted as a result of changes to the equipment selection or any Material Modifications to this project.

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10 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.

11 Revenue Metering and SCADA Requirements

11.3 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.

11.4 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

11.5 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/

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12 Summer Peak Analysis

The Queue Project AF2-055 was evaluated as a 45.1 MW (Capacity 27.0 MW) injection tapping the Kellam to Bayview 69 kV line in the ODEC area. Project AF2-055 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-055 was studied with a commercial probability of 100.0 %. Potential network impacts were as follows:

12.3 Generation Deliverability

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

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
101566345	232275	LORET_69	69.0	DP&L	232288	FRUITLND	69.0	DP&L	1	DPL_P1_2_CKT 6728	single	112.0	98.47	100.81	AC	3.11
101566138	232280	OAKHL_69	69.0	DP&L	232281	WATTSVIL	69.0	DP&L	1	DPL_P1_2_CKT 13789	single	88.0	89.25	105.21	AC	14.5
101566123	232847	WEIRWOOD	69.0	DP&L	232286	KELLAM	69.0	DP&L	1	Base Case	single	29.0	-12.63	115.78	AC	35.0
101566059	957610	AF2-055 TAP	69.0	DP&L	232843	EASTVILL	69.0	DP&L	1	Base Case	single	10.1000003815	-10.21	341.28	AC	35.0
101566060	957610	AF2-055 TAP	69.0	DP&L	232843	EASTVILL	69.0	DP&L	1	DPL_P1_1_232905 BAYVIEW1 24.9	single	10.1000003815	-135.89	218.95	AC	35.0

12.4 Multiple Facility Contingency

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

None

12.5 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
101565857	232128	PINEY138	138.0	DP&L	232127	LORETTO	138.0	DP&L	1	DPL_P4-2_DP58	breaker	158.0	102.89	111.32	AC	15.76
101565718	232233	PRESTON	69.0	DP&L	232821	TANYARD	69.0	DP&L	1	DPL_P4-2_DP11	breaker	93.0	126.95	131.98	AC	5.67
101565703	232234	TODD	69.0	DP&L	232233	PRESTON	69.0	DP&L	1	DPL_P4-2_DP11	breaker	93.0	131.67	136.71	AC	5.67
101565733	232291	ROCKAWLKN	69.0	DP&L	232271	NSALSBRY	69.0	DP&L	1	DPL_P4-2_DP56	breaker	58.0	166.53	171.38	AC	3.01
161068013	232291	ROCKAWLKN	69.0	DP&L	232271	NSALSBRY	69.0	DP&L	1	DPL_P4-2_DP55	breaker	58.0	165.82	170.39	AC	2.84

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12.6 Steady-State Voltage Requirements

To be determined

12.7 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
101566288	232128	PINEY138	138.0	DP&L	232127	LORETTO	138.0	DP&L	1	DPL_P1_2_CKT 13787	operation	158.0	102.96	111.4	AC	15.76
101566344	232275	LORET_69	69.0	DP&L	232288	FRUITLND	69.0	DP&L	1	DPL_P1_2_CKT 6728	operation	112.0	102.65	106.1	AC	4.45
101566136	232280	OAKHL_69	69.0	DP&L	232281	WATTSVIL	69.0	DP&L	1	DPL_P1_2_CKT 13789	operation	88.0	115.74	137.93	AC	20.71
101566210	232286	KELLAM	69.0	DP&L	232847	WEIRWOOD	69.0	DP&L	1	DPL_P1_1_232905 BAYVIEW1 24.9	operation	29.0	60.63	176.96	AC	30.0
101566212	232286	KELLAM	69.0	DP&L	232847	WEIRWOOD	69.0	DP&L	1	Base Case	operation	29.0	24.52	130.61	AC	30.0
101566061	232843	EASTVILL	69.0	DP&L	957610	AF2-055 TAP	69.0	DP&L	1	DPL_P1_1_232905 BAYVIEW1 24.9	operation	10.10000003815	138.58	473.81	AC	30.0
101566062	232843	EASTVILL	69.0	DP&L	957610	AF2-055 TAP	69.0	DP&L	1	Base Case	operation	10.10000003815	33.9	343.33	AC	30.0
101566435	232843	EASTVILL	69.0	DP&L	232847	WEIRWOOD	69.0	DP&L	1	Base Case	operation	64.0	21.65	100.5	AC	50.0
101566120	232847	WEIRWOOD	69.0	DP&L	232286	KELLAM	69.0	DP&L	1	Base Case	operation	29.0	32.08	206.84	AC	50.0
101566057	957610	AF2-055 TAP	69.0	DP&L	232843	EASTVILL	69.0	DP&L	1	Base Case	operation	10.10000003815	-10.24	486.51	AC	50.0

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12.8 System Reinforcements

<table>
<tr><th>ID</th><th>Idx</th><th>Facility</th><th>Upgrade Description</th><th>Cost</th><th>Cost Allocated to AF2-055</th><th>Upgrade Number</th></tr>
<tr><td>101565719,101565718</td><td>5</td><td>PRESTON 69.0kV - TANYARD 69.0kV Ckt 1</td><td>ProjectId : b2946
Description : PJM baseline upgrade b2946 conversion of Preston station to a Ring Bus
Type : CON
Total Cost : $6,000,000
Time Estimate : 30-36 Months
Ratings : 136.0/173.0/173.0
Notes : Baseline upgrades do not receive Cost Allocation</td><td>$6,000,000</td><td>$0</td><td>B2946</td></tr>
<tr><td>101566345</td><td>1</td><td>LORET_69 69.0kV - FRUITLND 69.0kV Ckt 1</td><td>ProjectId : n7145 (ds6711r0001)
Description : To mitigate the (DPL) Loretto - Fruitland 69 kV line (from bus 232288 to 232275) overload, it will required increasing the emergency rating of the Loretto - Fruitland 69 kV line by replacing terminal equipment at the Loretto Substation
Type : FAC
Total Cost : $100,000
Time Estimate : 9-12 Months
Ratings : 91.0/123.0/123.0
<table><tr><th>Queue</th><th>MW</th><th>Cost %</th><th>Cost $</th></tr><tr><td>AF2-055</td><td>0.91</td><td>100.00%</td><td>$100,000</td></tr></table></td><td>$100,000</td><td>$100,000</td><td>N7145</td></tr>
</table>

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ID	Idx	Facility	Upgrade Description	Cost	Cost Allocated to AF2-055	Upgrade Number
101565704,101565703	6	TODD 69.0kV - PRESTON 69.0kV Ckt 1	ProjectId : b2946 Description : PJM baseline upgrade b2946 conversion of Preston station to a Ring Bus Type : CON Total Cost : $6,000,000 Time Estimate : 30-36 Months Ratings : 136.0/173.0/173.0 Notes : Baseline upgrades have no cost allocation. ProjectId : n5788 (ds6716r0001) Description : To mitigate the (DP&L) TODD to PRESTON 69 kV line (from bus 232234 to bus 232233 ckt 1) overload will require substation reinforcements at Todd Substation. Replace 600A Disconnect Switch at Todd Type : FAC Total Cost : $100,000 Time Estimate : 12.0 Months Ratings : 95.0/130.0/130.0 Notes : This constraint is driven by a prior queue. Per PJM cost allocation rules, this project presently does not receive cost allocation for this upgrade. ProjectId : n6231 (ds6716r0002) Description : To mitigate the (DP&L) TODD to PRESTON 69 kV line (from bus 232234 to bus 232233 ckt 1) overload will require substation reinforcements at Preston Substation and Todd Substation. Type : FAC Total Cost : $100,000 Time Estimate : 12.0 Months Ratings : 136.0/173.0/173.0 Notes : This constraint is driven by a prior queue. Per PJM cost allocation rules, this project presently does not receive cost allocation for this upgrade.	$6,200,000	$0	B2946 N5788 N6231
161068013,101565733	7	ROCKAWLKN 69.0 kV - NSALSBRY 69.0 kV Ckt 1	ProjectId : N/A Description : No Violation – Rating Increase Type : FAC Total Cost : $0 Time Estimate : 0.0 Months Ratings : 0.0/0.0/	$0	$0	N/A
101566138	2	OAKHL_69 69.0kV - WATTSVIL 69.0kV Ckt 1	ProjectId : N6227 (dt6717r0001) Description : Rebuild 6717 69 kV line from Oak Hall to Wattsville. Upgrade terminal equipment at Wattsville Substation Type : FAC Total Cost : $1,500,000 Time Estimate : 18-24 Months Ratings : 143.0/143.0/143.0 Notes : Per PJM cost allocation rules, this project presently does not receive cost allocation for this upgrade.	$1,500,000	$0	N6227

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<table>
<tr><th>ID</th><th>Idx</th><th>Facility</th><th>Upgrade Description</th><th>Cost</th><th>Cost Allocated to AF2-055</th><th>Upgrade Number</th></tr>
<tr><td>101566059,101566060</td><td>4</td><td>AF2-055 TAP 69.0kV - EASTVILL 69.0kV Ckt 1</td><td>ProjectId : s2027
Description : New Relays at Plantation Creek Delivery Point will remove loadability problem
Type : FAC
Total Cost : $0
Time Estimate : 12 Months
Ratings : 55.0/64.0/</td><td>$0</td><td>$0</td><td>S2027</td></tr>
<tr><td>101566123</td><td>3</td><td>WEIRWOOD 69.0kV - KELLAM 69.0kV Ckt 1</td><td>ProjectId : N/A
Description : No Violation – Rating Increase
Type : FAC
Total Cost : $0
Time Estimate : 0.0 Months
Ratings : 0.0/0.0/</td><td>$0</td><td>$0</td><td>N/A</td></tr>
<tr><td>101566289,101565857</td><td>8</td><td>PINEY138 138.0kV - LORETTO 138.0kV Ckt 1</td><td>ProjectId : N6405 (dt13777r0001)
Description : Reconductor Line with 1590 ACSR and replace line disconnect switch at Loretto
Type : FAC
Total Cost : $17,300,000
Time Estimate : 32-48 Months
Ratings : 183.0/247.0/247.0
<table><tr><th>Queue</th><th>MW</th><th>Cost %</th><th>Cost $</th></tr><tr><td>AF1-231</td><td>6.03</td><td>27.67%</td><td>$4,787,471</td></tr><tr><td>AF2-055</td><td>15.76</td><td>72.33%</td><td>$12,512,529</td></tr></table></td><td>$17,300,000</td><td>$12,512,529</td><td>N6405</td></tr>
<tr><td></td><td></td><td></td><td>TOTAL COST</td><td>$31,100,000</td><td>$12,612,529</td><td></td></tr>
</table>

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

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12.9 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".

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11.7.1 Index 1

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
101566345	232275	LORET_69	DP&L	232288	FRUITLND	DP&L	1	DPL_P1_2_CKT 6728	single	112.0	98.47	100.81	AC	3.11

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
232404	W1-003 C	0.2341	80/20	0.2341
232406	W1-004 FULL	0.2341	80/20	0.2341
232408	W1-005 C	0.2341	80/20	0.2341
232410	W1-006 C	0.2341	80/20	0.2341
232905	BAYVIEW1	0.1868	80/20	0.1868
232912	OH NUG1	0.4837	80/20	0.4837
232913	OH NUG2	0.4772	80/20	0.4772
232914	OH NUG3	0.4837	80/20	0.4837
232915	OH NUG4	0.4837	80/20	0.4837
232916	OH NUG5	0.4837	80/20	0.4837
232917	OH NUG6	0.4815	80/20	0.4815
232918	OH NUG7	0.4805	80/20	0.4805
232921	TASLEY2G	0.3234	80/20	0.3234
232926	CRISFLD1	0.1798	80/20	0.1798
917081	Z2-012 C	0.1136	80/20	0.1136
918831	AA1-102	0.6743	80/20	0.6743
924681	AB2-120 C OP	3.3482	80/20	3.3482
939151	AE1-145	1.7518	80/20	1.7518
945661	AF1-231 C	0.6785	80/20	0.6785
945791	AF1-244	0.8561	80/20	0.8561
957611	AF2-055 C	3.1129	80/20	3.1129
957661	AF2-060	0.7883	80/20	0.7883
957671	AF2-061 O1	3.5036	80/20	3.5036
960881	AF2-379 C	0.5293	80/20	0.5293
NEWTON	NEWTON	0.0236	Confirmed LTF	0.0236
FARMERCITY	FARMERCITY	0.0012	Confirmed LTF	0.0012
GIBSON	GIBSON	0.0120	Confirmed LTF	0.0120
NY	NY	0.0122	Confirmed LTF	0.0122
PRAIRIE	PRAIRIE	0.0568	Confirmed LTF	0.0568
COFFEEN	COFFEEN	0.0044	Confirmed LTF	0.0044
CHEOAH	CHEOAH	0.0110	Confirmed LTF	0.0110
EDWARDS	EDWARDS	0.0077	Confirmed LTF	0.0077
TILTON	TILTON	0.0139	Confirmed LTF	0.0139
CALDERWOOD	CALDERWOOD	0.0109	Confirmed LTF	0.0109
BLUEG	BLUEG	0.0382	Confirmed LTF	0.0382
TRIMBLE	TRIMBLE	0.0122	Confirmed LTF	0.0122
CATAWBA	CATAWBA	0.0077	Confirmed LTF	0.0077

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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
101566138	232280	OAKHL_69	DP&L	232281	WATTSVIL	DP&L	1	DPL_P1_2_CKT 13789	single	88.0	89.25	105.21	AC	14.5

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
232404	W1-003 C	0.5895	80/20	0.5895
232406	W1-004 FULL	0.5895	80/20	0.5895
232408	W1-005 C	0.5895	80/20	0.5895
232410	W1-006 C	0.5895	80/20	0.5895
232905	BAYVIEW1	0.8701	80/20	0.8701
232912	OH NUG1	1.1273	80/20	1.1273
232913	OH NUG2	1.1123	80/20	1.1123
232914	OH NUG3	1.1273	80/20	1.1273
232915	OH NUG4	1.1273	80/20	1.1273
232916	OH NUG5	1.1273	80/20	1.1273
232917	OH NUG6	1.1223	80/20	1.1223
232918	OH NUG7	1.1198	80/20	1.1198
232921	TASLEY2G	1.5063	80/20	1.5063
232926	CRISFLD1	0.1717	80/20	0.1717
917081	Z2-012 C	0.5290	80/20	0.5290
918831	AA1-102	0.6439	80/20	0.6439
924681	AB2-120 C OP	6.6337	80/20	6.6337
945661	AF1-231 C	1.5813	80/20	1.5813
945791	AF1-244	0.8175	80/20	0.8175
957611	AF2-055 C	14.4980	80/20	14.4980
NEWTON	NEWTON	0.0612	Confirmed LTF	0.0612
FARMERCITY	FARMERCITY	0.0032	Confirmed LTF	0.0032
GIBSON	GIBSON	0.0311	Confirmed LTF	0.0311
NY	NY	0.0321	Confirmed LTF	0.0321
PRAIRIE	PRAIRIE	0.1472	Confirmed LTF	0.1472
COFFEEN	COFFEEN	0.0114	Confirmed LTF	0.0114
CHEOAH	CHEOAH	0.0285	Confirmed LTF	0.0285
EDWARDS	EDWARDS	0.0199	Confirmed LTF	0.0199
TILTON	TILTON	0.0359	Confirmed LTF	0.0359
CALDERWOOD	CALDERWOOD	0.0283	Confirmed LTF	0.0283
BLUEG	BLUEG	0.0990	Confirmed LTF	0.0990
TRIMBLE	TRIMBLE	0.0317	Confirmed LTF	0.0317
CATAWBA	CATAWBA	0.0199	Confirmed LTF	0.0199

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11.7.3 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
101566123	232847	WEIRWOOD	DP&L	232286	KELLAM	DP&L	1	Base Case	single	29.0	-12.63	115.78	AC	35.0

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
232905	BAYVIEW1	2.1003	80/20	2.1003
917081	Z2-012 C	1.2770	80/20	1.2770
957611	AF2-055 C	34.9965	80/20	34.9965
NEWTON	NEWTON	0.0107	Confirmed LTF	0.0107
FARMERCITY	FARMERCITY	0.0006	Confirmed LTF	0.0006
GIBSON	GIBSON	0.0055	Confirmed LTF	0.0055
NY	NY	0.0061	Confirmed LTF	0.0061
PRAIRIE	PRAIRIE	0.0258	Confirmed LTF	0.0258
COFFEEN	COFFEEN	0.0020	Confirmed LTF	0.0020
CHEOAH	CHEOAH	0.0050	Confirmed LTF	0.0050
EDWARDS	EDWARDS	0.0035	Confirmed LTF	0.0035
TILTON	TILTON	0.0063	Confirmed LTF	0.0063
CALDERWOOD	CALDERWOOD	0.0050	Confirmed LTF	0.0050
BLUEG	BLUEG	0.0174	Confirmed LTF	0.0174
TRIMBLE	TRIMBLE	0.0056	Confirmed LTF	0.0056
CATAWBA	CATAWBA	0.0035	Confirmed LTF	0.0035

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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
101566059	957610	AF2-055 TAP	DP&L	232843	EASTVILL	DP&L	1	Base Case	single	10.1000003815	-10.21	341.28	AC	35.0

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
232905	BAYVIEW1	2.1003	80/20	2.1003
957611	AF2-055 C	34.9976	80/20	34.9976
NEWTON	NEWTON	0.0075	Confirmed LTF	0.0075
FARMERCITY	FARMERCITY	0.0004	Confirmed LTF	0.0004
GIBSON	GIBSON	0.0038	Confirmed LTF	0.0038
NY	NY	0.0039	Confirmed LTF	0.0039
PRAIRIE	PRAIRIE	0.0181	Confirmed LTF	0.0181
COFFEEN	COFFEEN	0.0014	Confirmed LTF	0.0014
CHEOAH	CHEOAH	0.0035	Confirmed LTF	0.0035
EDWARDS	EDWARDS	0.0025	Confirmed LTF	0.0025
TILTON	TILTON	0.0044	Confirmed LTF	0.0044
CALDERWOOD	CALDERWOOD	0.0035	Confirmed LTF	0.0035
BLUEG	BLUEG	0.0122	Confirmed LTF	0.0122
TRIMBLE	TRIMBLE	0.0039	Confirmed LTF	0.0039
CATAWBA	CATAWBA	0.0025	Confirmed LTF	0.0025

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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
101565718	232233	PRESTON	DP&L	232821	TANYARD	DP&L	1	DPL_P4-2_DP11	breaker	93.0	126.95	131.98	AC	5.67

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
232404	W1-003 C	0.2957	50/50	0.2957
232405	W1-003 E	0.5112	50/50	0.5112
232406	W1-004 FULL	0.2957	50/50	0.2957
232407	W1-004 E	0.5112	50/50	0.5112
232408	W1-005 C	0.2957	50/50	0.2957
232409	W1-005 E	0.5112	50/50	0.5112
232410	W1-006 C	0.2957	50/50	0.2957
232411	W1-006 E	0.5112	50/50	0.5112
232412	X1-032 E	0.4732	50/50	0.4732
232417	X3-008 C	0.5049	50/50	0.5049
232418	X3-008 E	4.9022	50/50	4.9022
232426	Y1-080 FULL	0.0583	50/50	0.0583
232427	Y1-080 E	0.5687	50/50	0.5687
232428	Y3-058 C	0.1481	50/50	0.1481
232429	Y3-058 E	1.4383	50/50	1.4383
232433	Z2-076 E	0.1512	Adder	0.18
232435	Z2-077 E	0.1512	Adder	0.18
232907	VN8	3.8431	50/50	3.8431
232914	OH NUG3	0.6139	50/50	0.6139
232915	OH NUG4	0.6139	50/50	0.6139
232916	OH NUG5	0.6139	50/50	0.6139
232919	VN10	0.3816	50/50	0.3816
232926	CRISFLD1	0.2007	50/50	0.2007
293670	O-025 C	0.1347	50/50	0.1347
917082	Z2-012 E	1.1943	Adder	1.41
918831	AA1-102	0.7527	50/50	0.7527
923282	AB1-137 C	0.2878	Adder	0.34
923283	AB1-137 E	0.1234	Adder	0.15
924681	AB2-120 C OP	3.6457	Adder	4.29
924682	AB2-120 E OP	5.9482	Adder	7.0
924781	AB2-130 C OP	3.8508	50/50	3.8508
924782	AB2-130 E OP	6.2829	50/50	6.2829
924831	AB2-136 C	7.6300	50/50	7.6300
924832	AB2-136 E	8.0915	50/50	8.0915
925151	AB2-172 C OP	7.5115	50/50	7.5115
925152	AB2-172 E OP	12.2555	50/50	12.2555
925261	AB2-180 C	2.1652	50/50	2.1652
925262	AB2-180 E	0.9280	50/50	0.9280
927031	AC1-190 C	13.3007	50/50	13.3007
927032	AC1-190 E	5.7003	50/50	5.7003
927191	AC1-213 C	0.4276	50/50	0.4276

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
927192	AC1-213 E	0.2806	50/50	0.2806
930201	AB1-056 C	4.1159	Adder	4.84
930202	AB1-056 E	11.7214	Adder	13.79
930881	AB1-137 C	0.2878	Adder	0.34
930882	AB1-137 E	0.1234	Adder	0.15
932161	AC2-023 C	4.4910	50/50	4.4910
932162	AC2-023 E	3.2708	50/50	3.2708
938651	AE1-087 C	6.3254	50/50	6.3254
938652	AE1-087 E	1.5814	50/50	1.5814
938891	AE1-117 C O1	2.8516	Adder	3.35
938892	AE1-117 E O1	7.5929	Adder	8.93
939151	AE1-145	1.9208	Adder	2.26
942441	AE2-257 C	2.2451	Adder	2.64
942442	AE2-257 E	5.9190	Adder	6.96
943361	AF1-007 C	0.1214	Adder	0.14
943362	AF1-007 E	0.3451	Adder	0.41
945661	AF1-231 C	0.7320	Adder	0.86
945662	AF1-231 E	1.0980	Adder	1.29
945791	AF1-244	0.9556	50/50	0.9556
945931	AF1-258	0.4949	50/50	0.4949
957611	AF2-055 C	3.3710	Adder	3.97
957612	AF2-055 E	1.4447	Adder	1.7
957661	AF2-060	0.8644	Adder	1.02
957671	AF2-061 O1	3.8417	Adder	4.52
959021	AF2-193 C	7.6055	Adder	8.95
959022	AF2-193 E	20.5156	Adder	24.14
959031	AF2-194 C	7.6055	Adder	8.95
959032	AF2-194 E	20.5156	Adder	24.14
959051	AF2-196 C	0.6123	Adder	0.72
959052	AF2-196 E	1.4287	Adder	1.68
959161	AF2-207 C O1	2.5387	50/50	2.5387
959162	AF2-207 E O1	3.8081	50/50	3.8081
959571	AF2-248 C	0.4379	50/50	0.4379
959572	AF2-248 E	0.4894	50/50	0.4894
959581	AF2-249 C	0.0773	50/50	0.0773
959582	AF2-249 E	0.3091	50/50	0.3091
959591	AF2-250 C	0.1417	50/50	0.1417
959592	AF2-250 E	0.1095	50/50	0.1095
960341	AF2-325 C	1.4218	50/50	1.4218
960342	AF2-325 E	1.9635	50/50	1.9635
960671	AF2-358 C O1	15.4410	50/50	15.4410
960672	AF2-358 E O1	10.2940	50/50	10.2940
960871	AF2-378 C	0.3573	50/50	0.3573
960872	AF2-378 E	0.4957	50/50	0.4957
960881	AF2-379 C	0.2067	50/50	0.2067
960882	AF2-379 E	0.2849	50/50	0.2849
960941	AF2-385 C	6.0195	50/50	6.0195
960942	AF2-385 E	3.4253	50/50	3.4253
961181	AF2-409 O1	14.9480	50/50	14.9480
NEWTON	NEWTON	0.0752	Confirmed LTF	0.0752
FARMERCITY	FARMERCITY	0.0039	Confirmed LTF	0.0039
GIBSON	GIBSON	0.0382	Confirmed LTF	0.0382

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
NY	NY	0.0288	Confirmed LTF	0.0288
PRAIRIE	PRAIRIE	0.1808	Confirmed LTF	0.1808
O-066	O-066	0.2890	Confirmed LTF	0.2890
COFFEEN	COFFEEN	0.0140	Confirmed LTF	0.0140
CHEOAH	CHEOAH	0.0350	Confirmed LTF	0.0350
EDWARDS	EDWARDS	0.0245	Confirmed LTF	0.0245
TILTON	TILTON	0.0441	Confirmed LTF	0.0441
G-007	G-007	0.0374	Confirmed LTF	0.0374
CALDERWOOD	CALDERWOOD	0.0348	Confirmed LTF	0.0348
BLUEG	BLUEG	0.1215	Confirmed LTF	0.1215
TRIMBLE	TRIMBLE	0.0390	Confirmed LTF	0.0390
CATAWBA	CATAWBA	0.0245	Confirmed LTF	0.0245

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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
101565703	232234	TODD	DP&L	232233	PRESTON	DP&L	1	DPL_P4-2_DP11	breaker	93.0	131.67	136.71	AC	5.67

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
232404	W1-003 C	0.2957	50/50	0.2957
232405	W1-003 E	0.5112	50/50	0.5112
232406	W1-004 FULL	0.2957	50/50	0.2957
232407	W1-004 E	0.5112	50/50	0.5112
232408	W1-005 C	0.2957	50/50	0.2957
232409	W1-005 E	0.5112	50/50	0.5112
232410	W1-006 C	0.2957	50/50	0.2957
232411	W1-006 E	0.5112	50/50	0.5112
232412	X1-032 E	0.4732	50/50	0.4732
232417	X3-008 C	0.5049	50/50	0.5049
232418	X3-008 E	4.9022	50/50	4.9022
232426	Y1-080 FULL	0.0583	50/50	0.0583
232427	Y1-080 E	0.5687	50/50	0.5687
232428	Y3-058 C	0.1481	50/50	0.1481
232429	Y3-058 E	1.4383	50/50	1.4383
232433	Z2-076 E	0.1512	Adder	0.18
232435	Z2-077 E	0.1512	Adder	0.18
232907	VN8	3.8431	50/50	3.8431
232914	OH NUG3	0.6139	50/50	0.6139
232915	OH NUG4	0.6139	50/50	0.6139
232916	OH NUG5	0.6139	50/50	0.6139
232919	VN10	0.3816	50/50	0.3816
232926	CRISFLD1	0.2007	50/50	0.2007
293670	O-025 C	0.1347	50/50	0.1347
917082	Z2-012 E	1.1943	Adder	1.41
918831	AA1-102	0.7527	50/50	0.7527
923282	AB1-137 C	0.2878	Adder	0.34
923283	AB1-137 E	0.1234	Adder	0.15
924681	AB2-120 C OP	3.6457	Adder	4.29
924682	AB2-120 E OP	5.9482	Adder	7.0
924781	AB2-130 C OP	3.8508	50/50	3.8508
924782	AB2-130 E OP	6.2829	50/50	6.2829
924831	AB2-136 C	7.6300	50/50	7.6300
924832	AB2-136 E	8.0915	50/50	8.0915
925151	AB2-172 C OP	7.5115	50/50	7.5115
925152	AB2-172 E OP	12.2555	50/50	12.2555
925261	AB2-180 C	2.1652	50/50	2.1652
925262	AB2-180 E	0.9280	50/50	0.9280
927031	AC1-190 C	13.3007	50/50	13.3007
927032	AC1-190 E	5.7003	50/50	5.7003
927191	AC1-213 C	0.4276	50/50	0.4276

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
927192	AC1-213 E	0.2806	50/50	0.2806
930201	AB1-056 C	4.1159	Adder	4.84
930202	AB1-056 E	11.7214	Adder	13.79
930881	AB1-137 C	0.2878	Adder	0.34
930882	AB1-137 E	0.1234	Adder	0.15
932161	AC2-023 C	4.4910	50/50	4.4910
932162	AC2-023 E	3.2708	50/50	3.2708
938651	AE1-087 C	6.3254	50/50	6.3254
938652	AE1-087 E	1.5814	50/50	1.5814
938891	AE1-117 C O1	2.8516	Adder	3.35
938892	AE1-117 E O1	7.5929	Adder	8.93
939151	AE1-145	1.9208	Adder	2.26
942441	AE2-257 C	2.2451	Adder	2.64
942442	AE2-257 E	5.9190	Adder	6.96
943361	AF1-007 C	0.1214	Adder	0.14
943362	AF1-007 E	0.3451	Adder	0.41
945661	AF1-231 C	0.7320	Adder	0.86
945662	AF1-231 E	1.0980	Adder	1.29
945791	AF1-244	0.9556	50/50	0.9556
945931	AF1-258	0.4949	50/50	0.4949
957611	AF2-055 C	3.3710	Adder	3.97
957612	AF2-055 E	1.4447	Adder	1.7
957661	AF2-060	0.8644	Adder	1.02
957671	AF2-061 O1	3.8417	Adder	4.52
959021	AF2-193 C	7.6055	Adder	8.95
959022	AF2-193 E	20.5156	Adder	24.14
959031	AF2-194 C	7.6055	Adder	8.95
959032	AF2-194 E	20.5156	Adder	24.14
959051	AF2-196 C	0.6123	Adder	0.72
959052	AF2-196 E	1.4287	Adder	1.68
959161	AF2-207 C O1	2.5387	50/50	2.5387
959162	AF2-207 E O1	3.8081	50/50	3.8081
959571	AF2-248 C	0.4379	50/50	0.4379
959572	AF2-248 E	0.4894	50/50	0.4894
959581	AF2-249 C	0.0773	50/50	0.0773
959582	AF2-249 E	0.3091	50/50	0.3091
959591	AF2-250 C	0.1417	50/50	0.1417
959592	AF2-250 E	0.1095	50/50	0.1095
960341	AF2-325 C	1.4218	50/50	1.4218
960342	AF2-325 E	1.9635	50/50	1.9635
960671	AF2-358 C O1	15.4410	50/50	15.4410
960672	AF2-358 E O1	10.2940	50/50	10.2940
960871	AF2-378 C	0.3573	50/50	0.3573
960872	AF2-378 E	0.4957	50/50	0.4957
960881	AF2-379 C	0.2067	50/50	0.2067
960882	AF2-379 E	0.2849	50/50	0.2849
960941	AF2-385 C	6.0195	50/50	6.0195
960942	AF2-385 E	3.4253	50/50	3.4253
961181	AF2-409 O1	14.9480	50/50	14.9480
NEWTON	NEWTON	0.0752	Confirmed LTF	0.0752
FARMERCITY	FARMERCITY	0.0039	Confirmed LTF	0.0039
GIBSON	GIBSON	0.0382	Confirmed LTF	0.0382

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
NY	NY	0.0288	Confirmed LTF	0.0288
PRAIRIE	PRAIRIE	0.1808	Confirmed LTF	0.1808
O-066	O-066	0.2890	Confirmed LTF	0.2890
COFFEEN	COFFEEN	0.0140	Confirmed LTF	0.0140
CHEOAH	CHEOAH	0.0350	Confirmed LTF	0.0350
EDWARDS	EDWARDS	0.0245	Confirmed LTF	0.0245
TILTON	TILTON	0.0441	Confirmed LTF	0.0441
G-007	G-007	0.0374	Confirmed LTF	0.0374
CALDERWOOD	CALDERWOOD	0.0348	Confirmed LTF	0.0348
BLUEG	BLUEG	0.1215	Confirmed LTF	0.1215
TRIMBLE	TRIMBLE	0.0390	Confirmed LTF	0.0390
CATAWBA	CATAWBA	0.0245	Confirmed LTF	0.0245

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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
101565733	232291	ROCKAWLKN	DP&L	232271	NSALSBRY	DP&L	1	DPL_P4-2_DP56	breaker	58.0	166.53	171.38	AC	3.01

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
232417	X3-008 C	0.1840	50/50	0.1840
232418	X3-008 E	1.7868	50/50	1.7868
232426	Y1-080 FULL	0.0374	50/50	0.0374
232427	Y1-080 E	0.3651	50/50	0.3651
232428	Y3-058 C	0.6203	50/50	0.6203
232429	Y3-058 E	6.0231	50/50	6.0231
232919	VN10	0.3197	50/50	0.3197
924831	AB2-136 C	4.0937	50/50	4.0937
924832	AB2-136 E	4.3413	50/50	4.3413
925151	AB2-172 C OP	2.7379	50/50	2.7379
925152	AB2-172 E OP	4.4671	50/50	4.4671
925261	AB2-180 C	9.0671	50/50	9.0671
925262	AB2-180 E	3.8859	50/50	3.8859
927031	AC1-190 C	5.1716	50/50	5.1716
927032	AC1-190 E	2.2164	50/50	2.2164
932161	AC2-023 C	14.4526	50/50	14.4526
932162	AC2-023 E	10.5258	50/50	10.5258
938651	AE1-087 C	2.3056	50/50	2.3056
938652	AE1-087 E	0.5764	50/50	0.5764
939152	AE1-145 BAT	1.9922	Merchant Transmission	1.9922
945663	AF1-231 BAT	1.9008	50/50	1.9008
945792	AF1-244 BAT	0.9510	50/50	0.9510
945931	AF1-258	2.0725	50/50	2.0725
957613	AF2-055 BAT	3.0090	50/50	3.0090
957662	AF2-060 BAT	0.8965	Merchant Transmission	0.8965
957672	AF2-061 BAT	3.9844	Merchant Transmission	3.9844
959163	AF2-207 BAT	4.2921	Merchant Transmission	4.2921
959583	AF2-249 BAT	0.3914	50/50	0.3914
960341	AF2-325 C	0.6623	50/50	0.6623
960342	AF2-325 E	0.9146	50/50	0.9146
960671	AF2-358 C O1	10.6260	50/50	10.6260
960672	AF2-358 E O1	7.0840	50/50	7.0840
960871	AF2-378 C	0.1795	50/50	0.1795
960872	AF2-378 E	0.2490	50/50	0.2490
961181	AF2-409 O1	4.3597	Adder	5.13
WEC	WEC	0.0085	Confirmed LTF	0.0085
LGEE	LGEE	0.0154	Confirmed LTF	0.0154
CPLE	CPLE	0.0179	Confirmed LTF	0.0179
G-007A	G-007A	0.0456	Confirmed LTF	0.0456
VFT	VFT	0.1354	Confirmed LTF	0.1354
CBM-W2	CBM-W2	0.2211	Confirmed LTF	0.2211

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
TVA	TVA	0.0378	Confirmed LTF	0.0378
CBM-S2	CBM-S2	0.1561	Confirmed LTF	0.1561
CBM-S1	CBM-S1	0.2300	Confirmed LTF	0.2300
MEC	MEC	0.0429	Confirmed LTF	0.0429
CBM-W1	CBM-W1	0.3378	Confirmed LTF	0.3378

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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
101565857	232128	PINEY138	DP&L	232127	LORETTO	DP&L	1	DPL_P4-2_DP58	breaker	158.0	102.89	111.32	AC	15.76

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
232405	W1-003 E	1.2123	Adder	1.43
232407	W1-004 E	1.2123	Adder	1.43
232409	W1-005 E	1.2123	Adder	1.43
232411	W1-006 E	1.2123	Adder	1.43
232912	OH NUG1	1.7187	50/50	1.7187
232913	OH NUG2	1.6958	50/50	1.6958
232914	OH NUG3	1.7187	50/50	1.7187
232915	OH NUG4	1.7187	50/50	1.7187
232916	OH NUG5	1.7187	50/50	1.7187
232917	OH NUG6	1.7110	50/50	1.7110
232918	OH NUG7	1.7072	50/50	1.7072
917082	Z2-012 E	3.3222	Adder	3.91
924681	AB2-120 C OP	12.0688	50/50	12.0688
924682	AB2-120 E OP	19.6912	50/50	19.6912
930201	AB1-056 C	3.4618	Adder	4.07
930202	AB1-056 E	9.8585	Adder	11.6
938653	AE1-087 BAT	1.4798	Merchant Transmission	1.4798
939151	AE1-145	5.3208	Adder	6.26
943361	AF1-007 C	0.1021	Adder	0.12
943362	AF1-007 E	0.2903	Adder	0.34
945661	AF1-231 C	2.0491	Adder	2.41
945662	AF1-231 E	3.6161	50/50	3.6161
945792	AF1-244 BAT	3.6112	50/50	3.6112
957611	AF2-055 C	9.3772	Adder	11.03
957612	AF2-055 E	4.0188	Adder	4.73
957661	AF2-060	2.3944	Adder	2.82
957671	AF2-061 O1	10.6417	Adder	12.52
959021	AF2-193 C	6.3967	Adder	7.53
959022	AF2-193 E	17.2550	Adder	20.3
959031	AF2-194 C	6.3967	Adder	7.53
959032	AF2-194 E	17.2550	Adder	20.3
961182	AF2-409 BAT	15.0650	Merchant Transmission	15.0650
NEWTON	NEWTON	0.0731	Confirmed LTF	0.0731
FARMERCITY	FARMERCITY	0.0038	Confirmed LTF	0.0038
GIBSON	GIBSON	0.0371	Confirmed LTF	0.0371
NY	NY	0.0332	Confirmed LTF	0.0332
PRAIRIE	PRAIRIE	0.1756	Confirmed LTF	0.1756
O-066	O-066	0.3763	Confirmed LTF	0.3763
COFFEEN	COFFEEN	0.0136	Confirmed LTF	0.0136
CHEOAH	CHEOAH	0.0340	Confirmed LTF	0.0340
EDWARDS	EDWARDS	0.0238	Confirmed LTF	0.0238

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Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
TILTON	TILTON	0.0428	Confirmed LTF	0.0428
G-007	G-007	0.0551	Confirmed LTF	0.0551
CALDERWOOD	CALDERWOOD	0.0338	Confirmed LTF	0.0338
BLUEG	BLUEG	0.1180	Confirmed LTF	0.1180
TRIMBLE	TRIMBLE	0.0378	Confirmed LTF	0.0378
CATAWBA	CATAWBA	0.0238	Confirmed LTF	0.0238

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12.10 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
AB1-000	N/A	N/A
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
AC2-018	Rock Springs 500kV	In Service
AC2-023	Hebron 69kV	Active
AC2-185	Cedar Creek 138kV II	Active
AC2-186	Harrington 25kV	Active
AD2-059	Chapel Street 138 kV	Active
AD2-076	Centreville 69 kV	Active
AE1-087	Todd 69 kV	Active
AE1-107	Mt. Pleasant-Lums Pond 138 kV	Active
AE1-117	Bethany 138 kV	Active
AE1-145	Wallops Island 69 kV	Active
AE2-010	Paper Tap 69 kV	In Service

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Queue Number	Project Name	Status
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
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
AF2-208	Colora 230 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
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
X1-032	Costen 25kV	In Service
X2-083	Newark 12kV	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
Z2-012	Weirwood-Eastville 69kV	In Service
Z2-076	Worcester South 25kV	In Service
Z2-077	Worcester North 25kV	In Service

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12.11 Contingency Descriptions

Contingency Name	Contingency Definition
DPL_P4-2_DP6	CONTINGENCY 'DPL_P4-2_DP6' /*MILFORD BUS BREAKER TO STEELE DISCONNECT BRANCH FROM BUS 232000 TO BUS 232004 CKT 1 /*MILFORD STEELE 230 230 DISCONNECT BRANCH FROM BUS 232003 TO BUS 232004 CKT 1 /*CARTANZA MILFORD 230 230 END
DPL_P1_2_AB2-037 KEENEY_FSA	CONTINGENCY 'DPL_P1_2_AB2-037 KEENEY_FSA' OPEN LINE FROM BUS 923960 TO BUS 231003 CIRCUIT 2 END
DPL_P4-2_DP3	CONTINGENCY 'DPL_P4-2_DP3' /*MILFORD BUS BREAKER TO STEELE DISCONNECT BRANCH FROM BUS 232004 TO BUS 232000 CKT 1 /*MILFORD STEELE 230 230 DISCONNECT BRANCH FROM BUS 232006 TO BUS 232004 CKT 1 /*MILFORD INDIAN RIVER 230 230 END
DPL_P1_2_23085 &13710	CONTINGENCY 'DPL_P1_2_23085 &13710' DISCONNECT BUS 232005 /STEELE - VIENNA 230 & VIENNA AT20 DISCONNECT BUS 232116 /VIENNA XFMR - VIENNA 138 END
DPL_P1_2_PINEY138-WATTSVILLE	CONTINGENCY 'DPL_P1_2_PINEY138-WATTSVILLE' DISCONNECT BRANCH FROM BUS 232128 TO BUS 232133 CKT 1 END
DPL_P4-2_DP60C	CONTINGENCY 'DPL_P4-2_DP60C' /*PINEY GROVE BUS BREAKER DISCONNECT BRANCH FROM BUS 232128 TO BUS 232133 CKT 1 /*PINEY GROVE WATTSVILLE 138 138 DISCONNECT BRANCH FROM BUS 232128 TO BUS 232127 CKT 1 /*PINEY GROVE LORETTO 138 138 END
DPL_P4-2_DP8	CONTINGENCY 'DPL_P4-2_DP8' /*STEELE BUS BREAKER TO KEENEY DISCONNECT BRANCH FROM BUS 231003 TO BUS 232000 CKT 1 /*KEENEY STEELE 230 230 DISCONNECT BRANCH FROM BUS 232000 TO BUS 232103 CKT 1 /*STEELE STEELE 230 138 END

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Contingency Name	Contingency Definition
DPL_P4-2_DP56	CONTINGENCY 'DPL_P4-2_DP56' /*LORETTO BUS BREAKER DISCONNECT BRANCH FROM BUS 232127 TO BUS 232117 CKT 1 /*LORETTO VIENNA 138 1380 DISCONNECT BRANCH FROM BUS 232127 TO BUS 232128 CKT 1 /*LORETTO PINEY GROVE 138 138 END
DPL_P4-2_DP55	CONTINGENCY 'DPL_P4-2_DP55' /*LORETTO BUS BREAKER DISCONNECT BRANCH FROM BUS 232117 TO BUS 232127 CKT 1 /*VIENNA LORETTO 138 138 DISCONNECT BRANCH FROM BUS 232129 TO BUS 232127 CKT 1 /*LORETTO KINGS CREEK 138 138 END
DPL_P4-2_DP58	CONTINGENCY 'DPL_P4-2_DP58' /*OAK HALL BUS BREAKER DISCONNECT BRANCH FROM BUS 232132 TO BUS 232130 CKT 1 /*OAK HALL POCOMOKE 138 138 DISCONNECT BRANCH FROM BUS 232132 TO BUS 232131 CKT 1 /*OAK HALL NEW CHURCH 138 138 END
DPL_P4-2_DP12	CONTINGENCY 'DPL_P4-2_DP12' /*STEELE BUS BREAKER TO VIENNA DISCONNECT BRANCH FROM BUS 232000 TO BUS 232103 CKT 2 /*STEELE STEELE 230 138 AT21 DISCONNECT BRANCH FROM BUS 232000 TO BUS 232005 CKT 1 /*STEELE VIENNA 230 230 END
DPL_P4-2_DP11	CONTINGENCY 'DPL_P4-2_DP11' /*STEELE BUS BREAKER TO MILFORD DISCONNECT BRANCH FROM BUS 232004 TO BUS 232000 CKT 1 /*MILFORD STEELE 230 230 DISCONNECT BRANCH FROM BUS 232000 TO BUS 232005 CKT 1 /*STEELE VIENNA 230 230 END
DPL_P4-2_DP36	CONTINGENCY 'DPL_P4-2_DP36' /*COOL SPRINGS BUS BREAKER TO IR 2 DISCONNECT BRANCH FROM BUS 232001 TO BUS 232006 CKT 1 /*COOL SPRINGS INDRIV 4 230 230 DISCONNECT BRANCH FROM BUS 232001 TO BUS 232004 CKT 1 /*COOL SPRINGS MILFORD 230 230 END
DPL_P1_2_CKT 23069	CONTINGENCY 'DPL_P1_2_CKT 23069' OPEN LINE FROM BUS 232001 TO BUS 232004 CIRCUIT 1 /COOL SPRINGS - MILFORD 230 END

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Contingency Name	Contingency Definition
DPL_P4-2_DP15	CONTINGENCY 'DPL_P4-2_DP15' /*INDIAN RIVER BUS BREAKER TO PINEY GROVE DISCONNECT BRANCH FROM BUS 232007 TO BUS 232006 CKT 1 /*PINEY GR INDRIV 4 230 230 DISCONNECT BRANCH FROM BUS 232007 TO BUS 232128 CKT 1 /*PINEY GR PINEY GR 230 138 DISCONNECT BRANCH FROM BUS 232006 TO BUS 232004 CKT 1 /*MILFORD INDIAN RIVER 230 230 END
DPL_P1_2_CKT 6728	CONTINGENCY 'DPL_P1_2_CKT 6728' OPEN LINE FROM BUS 232272 TO BUS 232274 CIRCUIT 1 /MOUNT HERMON - PINEY GROVE 69 DISCONNECT BUS 230912 / PINEY GROVE 69 CAP END
DPL_P1_2_CKT 23002	CONTINGENCY 'DPL_P1_2_CKT 23002' DISCONNECT BUS 232007 /INDIAN RIVER - PINEY GROVE 230 & PNY GRV AT-20 XFMER 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
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
DPL_P1_3_NELSON AT1	CONTINGENCY 'DPL_P1_3_NELSON AT1' OPEN LINE FROM BUS 232119 TO BUS 232250 CIRCUIT 1 /NELSON AT1 138/69 DISCONNECT BUS 230905 / NELSON 69 CAP END
CKT 23030B	CONTINGENCY 'CKT 23030B' OPEN LINE FROM BUS 232002 TO BUS 232013 CIRCUIT 1 /CEDAR CREEK - SILVER RUN 230 END
CKT 23032A	CONTINGENCY 'CKT 23032A' OPEN LINE FROM BUS 231004 TO BUS 232013 CIRCUIT 2 /RED LION - SILVER RUN 230 END

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Contingency Name	Contingency Definition
CKT 23032B	CONTINGENCY 'CKT 23032B' OPEN LINE FROM BUS 232013 TO BUS 232003 CIRCUIT 1 /SILVER RUN - CARTANZA 230 END
PECO_P4_PEACH215/* $ CHESCO $ PEACH215 $ STBK	CONTINGENCY 'PECO_P4_PEACH215/* $ CHESCO $ PEACH215 $ STBK' TRIP BRANCH FROM BUS 200065 TO BUS 200051 CKT 1 /* PCHBTM2S 500.00 ROCKSPGS 500.00 $ CHESCO $ PEACH215 $ STBK REMOVE MACHINE 1 FROM BUS 200034 /* PCHBTM 2 22.00 $ CHESCO $ PEACH215 $ STBK END
DPL_P4-2_DP10	CONTINGENCY 'DPL_P4-2_DP10' /*STEELE BUS BREAKER TO VIENNA DISCONNECT BRANCH FROM BUS 231003 TO BUS 232000 CKT 1 /*KEENEY STEELE 230 230 DISCONNECT BRANCH FROM BUS 232000 TO BUS 232103 CKT 2 /*STEELE STEELE 230 138 AT21 END
PECO_P1-2_5014/* $ CHESCO $ 5014 $ L	CONTINGENCY 'PECO_P1-2_5014/* $ CHESCO $ 5014 $ L' TRIP BRANCH FROM BUS 200065 TO BUS 200051 CKT 1 /* PCHBTM2S 500.00 ROCKSPGS 500.00 $ CHESCO $ 5014 $ L END
Base Case	
DPL_P1_1_232905 BAYVIEW1 24.9	CONTINGENCY 'DPL_P1_1_232905 BAYVIEW1 24.9' REMOVE MACHINE 1 FROM BUS 232905 // PMAX=12.0 MW / PGEN=11.6 MW END
PECO_P4_PEACH205/* $ CHESCO $ PEACH205 $ STBK	CONTINGENCY 'PECO_P4_PEACH205/* $ CHESCO $ PEACH205 $ STBK' TRIP BRANCH FROM BUS 200065 TO BUS 200066 CKT 1 /* PCHBTM2S 500.00 PCHBTM1N 500.00 $ CHESCO $ PEACH205 $ STBK TRIP BRANCH FROM BUS 200064 TO BUS 200065 CKT Z1 /* PCHBTM1S 500.00 PCHBTM2S 500.00 $ CHESCO $ PEACH205 $ STBK TRIP BRANCH FROM BUS 200013 TO BUS 200066 CKT Z1 /* PCHBTM2N 500.00 PCHBTM1N 500.00 $ CHESCO $ PEACH205 $ STBK TRIP BRANCH FROM BUS 200065 TO BUS 200051 CKT 1 /* PCHBTM2S 500.00 ROCKSPGS 500.00 $ CHESCO $ PEACH205 $ STBK END
DPL_P1_2_CKT 23034	CONTINGENCY 'DPL_P1_2_CKT 23034' OPEN LINE FROM BUS 232006 TO BUS 232004 CIRCUIT 1 /INDIAN RIVER - MILFORD 230 END

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Contingency Name	Contingency Definition
DPL_P1_2_CKT 23076	CONTINGENCY 'DPL_P1_2_CKT 23076' OPEN LINE FROM BUS 232004 TO BUS 232000 CIRCUIT 1 /MILFORD - STEELE 230 END
DPL_P1_2_CKT 13787	CONTINGENCY 'DPL_P1_2_CKT 13787' OPEN LINE FROM BUS 232132 TO BUS 232130 CIRCUIT 1 /OAK HALL - POCOMOKE 138 END
DPL_P1_2_CKT 13789	CONTINGENCY 'DPL_P1_2_CKT 13789' OPEN LINE FROM BUS 232132 TO BUS 232133 CIRCUIT 1 /OAK HALL - WATTSVILLE 138 END

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13 Light Load Analysis

The Queue Project AF2-055 was evaluated as a 50.1 MW injection tapping the Kellam to Bayview 69 kV line in the ODEC area. Project AF2-055 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-055 was studied with a commercial probability of 100.0 %. Potential network impacts were as follows:

13.3 Light Load Deliverability

(Single or N-1 contingencies)

None

13.4 Multiple Facility Contingency

(Double Circuit Tower Line, Fault with a Stuck Breaker, and Bus Fault contingencies)

None

13.5 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)

None

13.6 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.

None

13.7 System Reinforcements

None

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13.8 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".

None

13.9 Contingency Descriptions

None

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14 Short Circuit Analysis

The following Breakers are overdutied:

None

14.3 System Reinforcements - Short Circuit

None

15 Stability and Reactive Power

To be determined in the Facilities Study Phase.

16 Affected Systems

DPL as an affected entity will need to install Transfer Trip schemes for ant-islanding purposes and may also need to upgraded line and breaker relaying at Oak Hall Substation for the 6790 and 6778 lines. This scope will be finalized and estimated during the facilities studies phase working along with DPL.

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17 Attachment 1: One Line Diagram