



**Generation Interconnection
Feasibility Study Report
for
Queue Project AF1-269
AIREY-GOLDEN HILL 69 KV
11 MW Capacity / 11 MW Energy**

January, 2020

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1 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.

PJM utilizes manufacturer models to ensure the performance of turbines is properly captured during the simulations performed for stability verification and, where applicable, for compliance with low voltage ride through requirements. Turbine manufacturers provide such models to their customers. The list of manufacturer models PJM has already validated is contained in Attachment B of Manual 14G. Manufacturer models may be updated from time to time, for various reasons such as to reflect changes to the control systems or to more accurately represent the capabilities turbines and controls which are currently available in the field. Additionally, as new turbine models are developed, turbine manufacturers provide such new models which must be used in the conduct of these studies. PJM needs adequate time to evaluate the new models in order to reduce delays to the System Impact Study process timeline for the Interconnection Customer as well as other Interconnection Customers in the study group. Therefore, PJM will require that any Interconnection Customer with a new manufacturer model must supply that model to PJM, along with a \$10,000 fully refundable deposit, no later than three (3) months prior to the starting date of the System Impact Study (See Section 4.3 for starting dates) for the Interconnection Request which shall specify the use of the new model. The Interconnection Customer will be required to submit a completed dynamic model study request form (Attachment B-1 of Manual 14G) in order to document the request for the study.

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.

2 General

The Interconnection Customer (IC), has proposed a Storage generating facility located in Dorchester, Maryland. The installed facilities will have a capability of 11 MW with 11 MW of the output being recognized by PJM as capacity. Note that this project is an increase to the Interconnection Customer's prior queue project, which will share the same property and connection point. The conduct of light load analysis as required under the PJM planning process is not performed during the Generation Interconnection Feasibility Study phase of the PJM study process. Additional reinforcement requirements for this Interconnection Request may be defined during the conduct of the light load analysis which shall be performed following execution of the System Impact Study agreement.

Queue Number	AF1-269
Project Name	AIREY-GOLDEN HILL 69 KV
State	Maryland
County	Dorchester
Transmission Owner	DPL
MFO	67
MWE	11
MWC	11
Fuel	Storage
Basecase Study Year	2023

2.1 Point of Interconnection

AF1-269 will interconnect with the DPL system as an uprate to AE2-209 tapping the Airey to Golden Hill 69 kV line.

2.2 Cost Summary

The AF1-269 project will be responsible for the following costs associated with the physical interconnection of this project:

Description	Total Cost
Attachment Facilities	\$0
Direct Connection Network Upgrade	\$0
Non Direct Connection Network Upgrades	\$0
Total Costs	\$0

In addition, the AF1-269 project may be responsible for a contribution to the following costs associated with network upgrades:

Description	Total Cost
System Upgrades	\$25,456,600

Cost allocations for these upgrades will be provided in the System Impact Study Report.

3 Transmission Owner Scope of Work

4 Attachment Facilities

There is no Delmarva Power & Light attachment facilities or direct connection work scope. The Interconnection Customer is responsible for contacting the Choptank Electric Cooperative (CEC) directly for attachment facilities, work scope, and single line drawing.

5 Direct Connection Cost Estimate

The total preliminary cost estimate for the Direct Connection work is given in the table below. These costs do not include CIAC Tax Gross-up.

Description	Total Cost
Total Direct Connection Facility Costs	\$0

6 Non-Direct Connection Cost Estimate

The total preliminary cost estimate for the Non-Direct Connection work is given in the table below. These costs do not include CIAC Tax Gross-up.

Description	Total Cost
Total Non-Direct Connection Facility Costs	\$0

7 Schedule

The Interconnection Customer is responsible for contacting Choptank Electric Cooperative (CEC) directly for the schedule to construct the physical interconnection for the AF1-269 project. For Transmission Owner schedule see Section 16 System Reinforcements.

8 Transmission Owner Analysis

None

9 Interconnection Customer Requirements

The Interconnection Customer is responsible for contacting Choptank Electric Cooperative (CEC) for any additional Interconnection Customer requirements.

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.

11 Network Impacts

The Queue Project AF1-269 was evaluated as a 11 MW (Capacity 11 MW) injection as an uprate to AE2-209 tapping the Airey to Golden Hill 69 kV line in the DPL area. Project AF1-269 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF1-269 was studied with a commercial probability of 53%. Potential network impacts were as follows:

Summer Peak Load Flow

12 Generation Deliverability

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

None

13 Multiple Facility Contingency

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

None

14 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
41677479	232233	PRESTON	69.0	DP&L	232821	TANYARD	69.0	DP&L	1	DPL_P4-2_DP11	breaker	93.0	176.81	179.59	DC	2.98
41677480	232233	PRESTON	69.0	DP&L	232821	TANYARD	69.0	DP&L	1	DPL_P4-2_DP12	breaker	93.0	103.49	106.45	DC	2.76
41677474	232234	TODD	69.0	DP&L	232233	PRESTON	69.0	DP&L	1	DPL_P4-2_DP11	breaker	93.0	181.87	184.65	DC	2.98
41677475	232234	TODD	69.0	DP&L	232233	PRESTON	69.0	DP&L	1	DPL_P4-2_DP12	breaker	93.0	108.54	111.51	DC	2.76
41366371	232241	VIENN_69	69.0	DP&L	232239	SHARPTW N	69.0	DP&L	1	DPL_P1_2_CKT 13707	single	42.0	104.17	108.25	DC	1.71
41366372	232241	VIENN_69	69.0	DP&L	232239	SHARPTW N	69.0	DP&L	1	DPL_P1_3_COOLS PG AT20	single	42.0	103.79	107.58	DC	1.59
41366162	232291	ROCKAWLKN	69.0	DP&L	232271	NSALSBR Y	69.0	DP&L	1	DPL_P1_2_CKT 6728	single	58.0	135.79	138.71	DC	1.7
41366163	232291	ROCKAWLKN	69.0	DP&L	232271	NSALSBR Y	69.0	DP&L	1	DPL_P1_3_LORET O AT1&2	single	58.0	133.61	136.64	DC	1.75
41366167	232291	ROCKAWLKN	69.0	DP&L	232271	NSALSBR Y	69.0	DP&L	1	Base Case	single	58.0	109.0	112.14	DC	1.82
41366225	936690	AD2-088 TAP	69.0	DP&L	232249	LAUREL	69.0	DP&L	1	DPL_P1_2_CKT 13707	single	42.0	115.67	119.75	DC	1.71
41366226	936690	AD2-088 TAP	69.0	DP&L	232249	LAUREL	69.0	DP&L	1	DPL_P1_3_COOLS PG AT20	single	42.0	115.33	119.12	DC	1.59

15 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 PROJE CT LOADIN G %	POST PROJE CT LOADIN G %	AC D C	MW IMPAC T
41366929	232233	PRESTON	69.0	DP&L	232821	TANYARD	69.0	DP&L	1	DPL_P1_2_23085 & 13710	operatio n	93.0	102.73	105.7	DC	2.77
41366842	232234	TODD	69.0	DP&L	232233	PRESTON	69.0	DP&L	1	DPL_P1_2_23085 & 13710	operatio n	93.0	107.67	110.65	DC	2.77
41366427	232239	SHARPTWN	69.0	DP&L	936690	AD2-088 TAP	69.0	DP&L	1	DPL_P1_2_CKT 6716C	operatio n	42.0	136.51	141.34	DC	2.03
41366432	232239	SHARPTWN	69.0	DP&L	936690	AD2-088 TAP	69.0	DP&L	1	Base Case	operatio n	42.0	108.09	111.95	DC	1.62
41366365	232241	VIENN_69	69.0	DP&L	232239	SHARPTWN	69.0	DP&L	1	DPL_P1_2_CKT 6708	operatio n	42.0	145.36	150.23	DC	2.05
41366370	232241	VIENN_69	69.0	DP&L	232239	SHARPTWN	69.0	DP&L	1	Base Case	operatio n	42.0	120.23	124.09	DC	1.62
51112531	232241	VIENN_69	69.0	DP&L	232838	MARDELA	69.0	DP&L	1	232249 LAUREL 69.0 936690 AD2-088 TAP 69.0 1	operatio n	64.0	113.1	116.64	DC	2.27
41366854	232242	VIENNALC	69.0	DP&L	232241	VIENN_69	69.0	DP&L	1	DPL_P1_2_CKT 6715	operatio n	95.0	97.88	109.46	DC	11.0
41366444	232270	HEBRON	69.0	DP&L	232291	ROCKAWLKN	69.0	DP&L	1	Base Case	operatio n	51.0	138.75	142.33	DC	1.82
51112401	232270	HEBRON	69.0	DP&L	232291	ROCKAWLKN	69.0	DP&L	1	232249 LAUREL 69.0 936690 AD2-088 TAP 69.0 1	operatio n	64.0	136.98	140.53	DC	2.27
41366156	232291	ROCKAWLKN	69.0	DP&L	232271	NSALSBR Y	69.0	DP&L	1	DPL_P1_2_CKT 6728	operatio n	58.0	191.65	194.57	DC	1.7
41366161	232291	ROCKAWLKN	69.0	DP&L	232271	NSALSBR Y	69.0	DP&L	1	Base Case	operatio n	58.0	168.29	171.43	DC	1.82
41366907	232292	BAYLY	69.0	DP&L	232237	CAMBRIDG	69.0	DP&L	1	Base Case	operatio n	50.0	106.09	111.98	DC	2.94
41366809	232816	AIREY	69.0	DP&L	232242	VIENNALC	69.0	DP&L	1	DPL_P1_2_CKT 6715	operatio n	95.0	99.35	110.93	DC	11.0
41366910	232838	MARDELA	69.0	DP&L	232270	HEBRON	69.0	DP&L	1	Base Case	operatio n	50.0	99.7	103.34	DC	1.82
51112588	232838	MARDELA	69.0	DP&L	232270	HEBRON	69.0	DP&L	1	232249 LAUREL 69.0 936690 AD2-088 TAP 69.0 1	operatio n	64.0	102.94	106.48	DC	2.27
41366937	924830	AB2-136 TAP	69.0	DP&L	232292	BAYLY	69.0	DP&L	1	Base Case	operatio n	51.0	104.01	109.78	DC	2.94
41366219	936690	AD2-088 TAP	69.0	DP&L	232249	LAUREL	69.0	DP&L	1	DPL_P1_2_CKT 6708	operatio n	42.0	174.0	178.87	DC	2.05
41366224	936690	AD2-088 TAP	69.0	DP&L	232249	LAUREL	69.0	DP&L	1	Base Case	operatio n	42.0	147.77	151.63	DC	1.62

16 System Reinforcements

ID	Index	Facility	Upgrade Description	Cost
41677474,41677475	2	TODD 69.0 kV - PRESTON 69.0 kV Ckt 1	<p>ds6716r0001 (4) : Previously identified in AB2-172, 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. Replace 600A Disconnect Switch at each substation. Project Type : FAC Cost : \$67,000 Time Estimate : 12.0 Months</p> <p>ds6716r0002 (5) : Previously identified in AE1-188, 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. Project Type : FAC Cost : \$39,000 Time Estimate : 12.0 Months</p>	\$106,000
41366167,41366163, 41366162	4	ROCKAWLKN 69.0 kV - NSALSBRy 69.0 kV Ckt 1	<p>s0835 (8) : To mitigate the ROCKAWLKN to NSALSBRy 69 kV line (from bus 232291 to bus 232271 ckt 1) overloads will require DPL to complete supplemental project (s0835) in place to upgrade this entire circuit 6708 from Vienna to N Salisbury. The portion from Hebron to N Salisbury (which includes Rockawalkin N Salisbury Line#6775) is estimated to cost approximately \$8.6M and is scheduled to be completed by 12/31/2020. Total cost of the entire project (Vienna to N Salisbury) is approximately \$21.1M. Expected ISD is 12/31/2023. Project Type : CON Cost : \$0 Time Estimate : 0.0 Months</p>	\$0
41366225,41366226	5	AD2-088 TAP 69.0 kV - LAUREL 69.0 kV Ckt 1	<p>s2072 (22) : Rebuild 6705 line from Sharptown - Laurel Project Type : FAC Cost : \$11,700,000 Time Estimate : 36-48 Months</p>	\$0
41677479,41677480	1	PRESTON 69.0 kV - TANYARD 69.0 kV Ckt 1	<p>b2946 (16) : PJM baseline upgrade b2946 conversion of Preston station to a Ring Bus Project Type : CON Cost : \$6,000,000 Time Estimate : 30-36 Months</p>	\$0
41366372,41366371	3	VIENN_69 69.0 kV - SHARPTWN 69.0 kV Ckt 1	<p>n5455 (9) : Rebuild Line 6705 2 from sharptwn to vienn 69 kV with 1590 ASCR, upgrade all substation equipment to 2000 A Project Type : CON Cost : \$12,469,800 Time Estimate : 0.0 Months</p>	\$24,939,600
			TOTAL COST	\$25,456,600

17 Flow Gate Details

The following indices contain additional information about each flowgate presented in the body of the report. For each index, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact. It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

17.1 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
41677479	232233	PRESTON	DP&L	232821	TANYARD	DP&L	1	DPL_P4-2_DP11	breaker	93.0	176.81	179.59	DC	2.98

Bus #	Bus	MW Impact
232404	W1-003 C	0.2456
232405	W1-003 E	0.5111
232406	W1-004 FULL	0.2456
232407	W1-004 E	0.5111
232408	W1-005 C	0.2456
232409	W1-005 E	0.5111
232410	W1-006 C	0.2456
232411	W1-006 E	0.5111
232412	X1-032 E	0.4731
232417	X3-008 C	0.4194
232418	X3-008 E	4.9020
232426	Y1-080 FULL	0.0484
232427	Y1-080 E	0.5687
232428	Y3-058 C	0.1230
232429	Y3-058 E	1.4381
232433	Z2-076 E	0.1512
232435	Z2-077 E	0.1512
232905	BAYVIEW1	0.1977
232907	VN8	3.1919
232915	OH NUG4	0.5240
232916	OH NUG5	0.5240
232919	VN10	0.3257
232921	TASLEY2G	0.3517
232926	CRISFLD1	0.1667
293670	O-025 C	0.1119
917081	Z2-012 C	0.1202
917082	Z2-012 E	1.4048
918831	AA1-102	0.6251
923282	AB1-137 C	0.2878
923283	AB1-137 E	0.1233
924681	AB2-120 C OP	3.6451
924682	AB2-120 E OP	5.9472
924781	AB2-130 C OP	3.8502
924782	AB2-130 E OP	6.2818
924831	AB2-136 C	7.6295
924832	AB2-136 E	8.0909
925151	AB2-172 C OP	7.5111
925152	AB2-172 E OP	12.2549
925261	AB2-180 C	2.1648
925262	AB2-180 E	0.9278
927031	AC1-190 C	13.3000
927032	AC1-190 E	5.7000

Bus #	Bus	MW Impact
927191	AC1-213 C	0.4276
927192	AC1-213 E	0.2806
930201	AB1-056 C	4.1148
930202	AB1-056 E	11.7183
930881	AB1-137 C	0.2878
930882	AB1-137 E	0.1233
932161	AC2-023 C	4.4904
932162	AC2-023 E	3.2704
933641	AC2-186 C	0.8249
933642	AC2-186 E	1.3460
936691	AD2-088 C	2.8620
936692	AD2-088 E	1.9080
938651	AE1-087 C	6.3251
938652	AE1-087 E	1.5813
938891	AE1-117 C O1	2.8509
938892	AE1-117 E O1	7.5910
938901	AE1-118 C O1	2.8629
938902	AE1-118 E O1	7.6230
939151	AE1-145	1.9205
939361	AE1-167 C O1	0.5761
939362	AE1-167 E O1	0.4801
939621	AE1-192 C O1	5.3246
939622	AE1-192 E O1	2.6057
941971	AE2-209 C	8.9367
941972	AE2-209 E	6.2286
942441	AE2-257 C	2.2443
942442	AE2-257 E	5.9167
942821	AE2-301 C	0.2627
942822	AE2-301 E	0.9316
943361	AF1-007 C	0.0643
943362	AF1-007 E	0.1829
944921	AF1-157 C O1	0.6949
944922	AF1-157 E O1	0.4633
945661	AF1-231 C	0.3878
945662	AF1-231 E	0.5818
945781	AF1-243	0.5664
945791	AF1-244	0.9554
945931	AF1-258	0.4948
946041	AF1-269	2.9789
DUCKCREEK	DUCKCREEK	0.0829
NEWTON	NEWTON	0.0774
FARMERCITY	FARMERCITY	0.0040
NY	NY	0.0304
PRAIRIE	PRAIRIE	0.1860
O-066	O-066	0.3091
COFFEEN	COFFEEN	0.0381
EDWARDS	EDWARDS	0.0252
CHEOAH	CHEOAH	0.0360
TILTON	TILTON	0.0454
G-007	G-007	0.0416
GIBSON	GIBSON	0.0393
CALDERWOOD	CALDERWOOD	0.0358

Bus #	Bus	MW Impact
BLUEG	BLUEG	0.1250
TRIMBLE	TRIMBLE	0.0401
CATAWBA	CATAWBA	0.0252

17.2 Index 2

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
41677474	232234	TODD	DP&L	232233	PRESTON	DP&L	1	DPL_P4-2_DP11	breaker	93.0	181.87	184.65	DC	2.98

Bus #	Bus	MW Impact
232404	W1-003 C	0.2456
232405	W1-003 E	0.5111
232406	W1-004 FULL	0.2456
232407	W1-004 E	0.5111
232408	W1-005 C	0.2456
232409	W1-005 E	0.5111
232410	W1-006 C	0.2456
232411	W1-006 E	0.5111
232412	X1-032 E	0.4731
232417	X3-008 C	0.4194
232418	X3-008 E	4.9020
232426	Y1-080 FULL	0.0484
232427	Y1-080 E	0.5687
232428	Y3-058 C	0.1230
232429	Y3-058 E	1.4381
232433	Z2-076 E	0.1512
232435	Z2-077 E	0.1512
232905	BAYVIEW1	0.1977
232907	VN8	3.1919
232915	OH NUG4	0.5240
232916	OH NUG5	0.5240
232919	VN10	0.3257
232921	TASLEY2G	0.3517
232926	CRISFLD1	0.1667
293670	O-025 C	0.1119
917081	Z2-012 C	0.1202
917082	Z2-012 E	1.4048
918831	AA1-102	0.6251
923282	AB1-137 C	0.2878
923283	AB1-137 E	0.1233
924681	AB2-120 C OP	3.6451
924682	AB2-120 E OP	5.9472
924781	AB2-130 C OP	3.8502
924782	AB2-130 E OP	6.2818
924831	AB2-136 C	7.6295
924832	AB2-136 E	8.0909
925151	AB2-172 C OP	7.5111
925152	AB2-172 E OP	12.2549
925261	AB2-180 C	2.1648
925262	AB2-180 E	0.9278
927031	AC1-190 C	13.3000
927032	AC1-190 E	5.7000

Bus #	Bus	MW Impact
927191	AC1-213 C	0.4276
927192	AC1-213 E	0.2806
930201	AB1-056 C	4.1148
930202	AB1-056 E	11.7183
930881	AB1-137 C	0.2878
930882	AB1-137 E	0.1233
932161	AC2-023 C	4.4904
932162	AC2-023 E	3.2704
933641	AC2-186 C	0.8249
933642	AC2-186 E	1.3460
936691	AD2-088 C	2.8620
936692	AD2-088 E	1.9080
938651	AE1-087 C	6.3251
938652	AE1-087 E	1.5813
938891	AE1-117 C O1	2.8509
938892	AE1-117 E O1	7.5910
938901	AE1-118 C O1	2.8629
938902	AE1-118 E O1	7.6230
939151	AE1-145	1.9205
939361	AE1-167 C O1	0.5761
939362	AE1-167 E O1	0.4801
939621	AE1-192 C O1	5.3246
939622	AE1-192 E O1	2.6057
941971	AE2-209 C	8.9367
941972	AE2-209 E	6.2286
942441	AE2-257 C	2.2443
942442	AE2-257 E	5.9167
942821	AE2-301 C	0.2627
942822	AE2-301 E	0.9316
943361	AF1-007 C	0.0643
943362	AF1-007 E	0.1829
944921	AF1-157 C O1	0.6949
944922	AF1-157 E O1	0.4633
945661	AF1-231 C	0.3878
945662	AF1-231 E	0.5818
945781	AF1-243	0.5664
945791	AF1-244	0.9554
945931	AF1-258	0.4948
946041	AF1-269	2.9789
DUCKCREEK	DUCKCREEK	0.0829
NEWTON	NEWTON	0.0774
FARMERCITY	FARMERCITY	0.0040
NY	NY	0.0304
PRAIRIE	PRAIRIE	0.1860
O-066	O-066	0.3091
COFFEEN	COFFEEN	0.0381
EDWARDS	EDWARDS	0.0252
CHEOAH	CHEOAH	0.0360
TILTON	TILTON	0.0454
G-007	G-007	0.0416
GIBSON	GIBSON	0.0393
CALDERWOOD	CALDERWOOD	0.0358

Bus #	Bus	MW Impact
BLUEG	BLUEG	0.1250
TRIMBLE	TRIMBLE	0.0401
CATAWBA	CATAWBA	0.0252

17.3 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
41366371	232241	VIENN_69	DP&L	232239	SHARPTWN	DP&L	1	DPL_P1_2_CKT 13707	single	42.0	104.17	108.25	DC	1.71

Bus #	Bus	MW Impact
232417	X3-008 C	0.1373
232426	Y1-080 FULL	0.0278
232907	VN8	1.2581
232919	VN10	0.2445
924831	AB2-136 C	3.6709
925151	AB2-172 C OP	2.4584
927031	AC1-190 C	4.6424
932161	AC2-023 C	1.8399
938651	AE1-087 C	2.0702
941971	AE2-209 C	5.1430
946041	AF1-269	1.7143
DUCKCREEK	DUCKCREEK	0.0035
NEWTON	NEWTON	0.0032
FARMERCITY	FARMERCITY	0.0002
NY	NY	0.0039
PRAIRIE	PRAIRIE	0.0077
COFFEEN	COFFEEN	0.0016
EDWARDS	EDWARDS	0.0010
CHEOAH	CHEOAH	0.0015
TILTON	TILTON	0.0019
GIBSON	GIBSON	0.0016
CALDERWOOD	CALDERWOOD	0.0015
BLUEG	BLUEG	0.0052
TRIMBLE	TRIMBLE	0.0017
CATAWBA	CATAWBA	0.0010

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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
41366162	232291	ROCKAWLKN	DP&L	232271	NSALSBRV	DP&L	1	DPL_P1_2_CKT 6728	single	58.0	135.79	138.71	DC	1.7

Bus #	Bus	MW Impact
232417	X3-008 C	0.1351
232426	Y1-080 FULL	0.0276
232428	Y3-058 C	0.4988
232919	VN10	0.2423
924831	AB2-136 C	3.6275
925151	AB2-172 C OP	2.4198
925261	AB2-180 C	8.7765
927031	AC1-190 C	4.5731
932161	AC2-023 C	13.9022
936691	AD2-088 C	0.9781
938651	AE1-087 C	2.0378
941971	AE2-209 C	5.0889
945931	AF1-258	2.0060
946041	AF1-269	1.6963
LGEE	LGEE	0.0034
CPL	CPL	0.0040
G-007A	G-007A	0.0048
VFT	VFT	0.0129
WEC	WEC	0.0019
CBM-W2	CBM-W2	0.0491
CBM-W1	CBM-W1	0.0751
TVA	TVA	0.0084
CBM-S2	CBM-S2	0.0347
CBM-S1	CBM-S1	0.0511
MEC	MEC	0.0095

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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
41366226	936690	AD2-088 TAP	DP&L	232249	LAUREL	DP&L	1	DPL_P1_3_COOLSPG AT20	single	42.0	115.33	119.12	DC	1.59

Bus #	Bus	MW Impact
232417	X3-008 C	0.1270
232426	Y1-080 FULL	0.0258
232919	VN10	0.2271
924831	AB2-136 C	3.4040
925151	AB2-172 C OP	2.2749
927031	AC1-190 C	4.2977
932161	AC2-023 C	1.7445
936691	AD2-088 C	9.9466
938651	AE1-087 C	1.9157
941971	AE2-209 C	4.7725
946041	AF1-269	1.5908
DUCKCREEK	DUCKCREEK	0.0023
NEWTON	NEWTON	0.0021
FARMERCITY	FARMERCITY	0.0001
NY	NY	0.0028
PRAIRIE	PRAIRIE	0.0052
COFFEEN	COFFEEN	0.0011
EDWARDS	EDWARDS	0.0007
CHEOAH	CHEOAH	0.0010
TILTON	TILTON	0.0013
GIBSON	GIBSON	0.0011
CALDERWOOD	CALDERWOOD	0.0010
BLUEG	BLUEG	0.0035
TRIMBLE	TRIMBLE	0.0011
CATAWBA	CATAWBA	0.0007

Affected Systems

18 Affected Systems

18.1 LG&E

LG&E Impacts to be determined during later study phases (as applicable).

18.2 MISO

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

18.3 TVA

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

18.4 Duke Energy Progress

Duke Energy Progress Impacts to be determined during later study phases (as applicable).

18.5 NYISO

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

Contingency Name	Contingency Definition
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_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_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 6715	CONTINGENCY 'DPL_P1_2_CKT 6715' DISCONNECT BUS 232817 / TODD - EAST NEW MARKET REA - EAST NEW MARKET 69 END
232249 LAUREL 69.0 936690 AD2-088 TAP 69.0 1	CONTINGENCY '232249 LAUREL 69.0 936690 AD2-088 TAP 69.0 1' OPEN BRANCH FROM BUS 232249 TO BUS 936690 CKT 1 END
DPL_P1_2_CKT 6708	CONTINGENCY 'DPL_P1_2_CKT 6708' DISCONNECT BUS 232270 / MARDELA - HEBRON 69 & HEBRON XFMR DISCONNECT BUS 232838 / VIENNA - MARDELA 69 DISCONNECT BUS 232644 / HEBRON 1 12 DISCONNECT BUS 232653 / HEBRON 2 12 DISCONNECT BUS 232291 / ROCKAWALKIN - NORTH SALISBURY 69 END
DPL_P1_3_COOLSPG AT20	CONTINGENCY 'DPL_P1_3_COOLSPG AT20' OPEN LINE FROM BUS 232001 TO BUS 232269 CIRCUIT 1 /COOL SPRINGS AT20 230/69 END
Base Case	
DPL_P1_3_LORETO AT1&2	CONTINGENCY 'DPL_P1_3_LORETO AT1&2' OPEN LINE FROM BUS 232127 TO BUS 232275 CIRCUIT 1 /LORETTO AT1 138/69 OPEN LINE FROM BUS 232127 TO BUS 232275 CIRCUIT 2 /LORETTO AT2 138/69 END

Contingency Name	Contingency Definition
DPL_P1_2_CKT 6716C	CONTINGENCY 'DPL_P1_2_CKT 6716C' DISCONNECT BUS 232233 / TODD - PRESTON - 69 DISCONNECT BUS 232606 END
DPL_P1_2_CKT 13707	CONTINGENCY 'DPL_P1_2_CKT 13707' OPEN LINE FROM BUS 232119 TO BUS 232117 CIRCUIT 1 /NELSON - VIENNA 138 END

Short Circuit

19 Short Circuit

The following Breakers are overduty

None